

**PACKAGING AND ITS SIGNIFICANCE ON THE PRESENTATION OF
TRADITIONAL HERBAL MEDICINE IN GHANA: KUMASI, A CASE STUDY**

By
KNUST

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DECLARATION

I hereby declare that this submission is my own work towards the MPhil degree and that to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the university, except where due acknowledgement has been made in the text.

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ABSTRACT

Packaging has been in life since the creation of man onto the earth, the body of human is packed indirectly, to serve as a protective cover to the internal organs from external hazards. Packaging is highly significant because according to Frost, (2005) the package communicates both emotional and functional benefits to the buyer. Since Traditional Herbal Medicines (THM) remain integral part of indigenous health care system in Ghana it is therefore high time that practitioners of the industry presented it safe to the consumer by packaging. Some producers and practitioners of THM do not observe good packaging practices which affect consumer patronage. Hence to guarantee, increase in patronage, and maintain safety, efficacy and quality of THM packaging is paramount. Ghana is a country well-endowed with various natural resources therefore locally available material such as bamboo, clay and paper was used to produce a suitable package for the selected THM (bark of nkotobena, nyinya dry leaves, and prekese power). This research was carried out using Kumasi, specifically railway station in Ghana as a case study. The samples were chosen based on their popularity. A number of research methodologies were employed in gathering data including qualitative research method with questionnaire administration, personal interviews and descriptive method. The descriptive was purposely employed to describe procedures and processes in designing and constructing packages. The purposive sampling was used to assess the sample size. The general design of the pack should be underpinned with functions of a package (protect, preserve, promote, contain and handle), with good surface graphics, attractive but reduced colours, illustrations presenting a true and honest picture of the content, the shape should provide convenience in handling, easy

for refilling and the ability to stand or with low support. The choice of packaging material should be planned along the principles of the ‘R’ in sustainability (reduce, replace, reuse and recycle).

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CHAPTER ONE INTRODUCTION

1.1 Overview

This chapter is concerned with the following sub-topics. The Philosophical foundation upon which the entire research is built, Thereafter, the problem statement discussing indepth documentation on the area of study, Objectives of the study, research questions, delimitation, limitation(s), the significance of the study, and finally, overview of the rest of the chapters.

1.2 Backgrounds to the Study

The use of plants for curative purposes originates before mankind's history and structures the root of modern medicine. Old Chinese and Egyptian papyrus texts depict therapeutic uses for plants as far back as 3,000 BC. Indigenous societies, (for example, African and Native American) utilized herbs as a part of their curative rites, while others created traditionalistic medical schemes in which natural treatments were utilized. Analysts found that individuals in diverse parts of the world tended to utilize the same or comparable plants for the same purposes (Abellof, 2008).

The sources of advances in technologies, expertise skills, practices and convictions accumulated over generations building up the medicinal potential and therapeutic utilization of herbs developed where tribal personalities use plants of that locale as solutions is the thing that has been alluded to as Indigenous learning in medication (Behera, 2012).

Ghana is a gold mine of regular riches, which envelops different therapeutic plants (Ethnobotany) that serve as drug. Since antiquated times individuals were singularly reliant on such home grown as a solution for curing different illnesses (Saforowa, 1986).

Ethnobotany, as an examination field of science, has been broadly utilized for the documentation of indigenous information on the utilization of plants and for giving a stock of valuable plants from local vegetation in Asian nations (Saforowa, A. 1986; Twumasi, 2005).

According to WHO (2002) traditional pharmaceutical is the totality of the information, aptitudes, and practices in view of the speculations, convictions, and encounters indigenous to diverse societies, whether logical or not, utilized as a part of the upkeep of wellbeing and in addition in the counteractive action, determination, change or treatment of physical and maladjustment. "It's the broadest set of social insurance which joining plant, animal and mineral-based medications, otherworldly treatments, manual methods and activities, connected uniquely or in mix to treat, analyze and forestall sickness or keep up well-being"(WHO, 2004:1).

The traditional medicinal framework incorporates home grown solutions for particular maladies, as well as people learning, customs and qualities, wellbeing conduct standards and designs, and distinguished staff and structures for conveyance and therapeutic treatment (Hevi, 1989). There are numerous sorts of experts accessible in Ghana, each with a particular way to deal with determination and treatment. Gatherings of conventional healers in Ghana incorporate profoundly based Traditional Medicine Healers and non-spiritually based Traditional Medicine Healers (Busia, 2005). It is assessed that roughly more than 4 billion individuals of the world's populace depend on conventional pharmaceutical, for human services (WHO, 2003). The act of Traditional Medicine reaches between the simply otherworldly practices secured in a wide range of ceremonies and the absolutely home grown practice construct just in light of the utilization of herbs or Herbal Medicine.

Herbal medicines are the utilization of plants, plant parts, their water or solvent extracts essential oils, gums, tars, exudates or other type of cutting edge items produced using plant parts utilized remedially to give proactive backing of different physiological systems; or, in a more orthodox medicinal sense, to treat, cure, or keep a sickness in animals or humans.

(WHO, 1996; Busse, 1999, Evans, 1989; Evans, 1996). In like manner, the European Medicine Evaluation Agency (EMA) characterizes Herbal Medicine as restorative items which contain exclusively natural medications or herbal drug preparations as dynamic substances. Herbal drug is a financial and socio-social legacy, adjusting more noteworthy number of the indigenous African populace (Elujoba et al., 2005, Okigbo and Mmeko, 2006; WHO, 2003a; Abbiw et al, 2002, Lucas, 2010). It has made some amazing progress from the seasons of progenitors to the present and still demonstrates the noticeable quality of getting into what's to come.

In the past 20 years in the United States, civic displeasure with the expense of physician endorsed medications, merged with an enthusiasm for coming back to common or natural cures, has prompted an increment in the utilization of herbal pharmaceutical (WHO 2008). It is turning out to be more standard as upgrades in examination and quality control alongside advances in clinical exploration demonstrate the estimation of herbal drug in the treating and preventing illness (Dans et al., 2007).

Traditional Herbal Medicine which is a subset of traditional medicine involves the application of herbs and other parts of medicinal plants such as powder, leaves and barks for the cure of various forms of diseases.

This research is basically concerned with the material aspect of Traditional Herbal Medicine, rather than the spiritual aspect. Also, the study deals with those herbal medicines that are unscientifically processed or tested and approved by the Centre for Scientific

Research into Plant Medicine (CSRPM) as well as those that have not undergone any phyto-chemical and safety test at the centre, but is not concerned with those fetish practices involved with herbal medicine. They are raw and in the crude state.

Over the recent years, the global interest in Traditional Herbal Medicine has developed significantly (GNDP, 2004). Countries like India and China are market leaders at the global level in Traditional Herbal Medicine. Aside the potency and the efficacy of Chinese and Indian drugs, good packaging has also contributed to the high patronage of their products (Ginks, 2013). While Ghana has made significant gains in this endeavor at the local level, penetrating the international market has been the greatest bane. This situation has been blamed on poor packaging (Abbiw et al., 2002).



Plate 1. THM from China



Plate 2. THM from Ghana

The function of *packaging* has advanced from the conventional role of basic container or storage and ensuring the item against earth, harm, and burglary, mishandling, and weakening to being a crucial piece of conveying the advertising goals of the item (Meyer, 1981). In present day times, bundling is likewise used as a showcasing instrument to advance the item, to build *prominence* of the item on the shelf, and to give data to the client (O'Shaughnessy, 1995), (Meyers, 1981). It gives the client fixings and additionally pharmacological data.

Packaging gives off an impression of being important amongst the most critical elements influencing buying choices made at the deal point, and is a vital part in the offering procedure (Pinya and Mark (2004) cited Prendergast and Pitt (1996). It plainly influences customer purchasing *decisions*, furthermore serves as a decent promoting procedure (Ganelle, 2014). *Packaging* has been depicted as the science, art, and technology of encasing or securing items for conveyance, stockpiling, *sale*, and utilize. *Packaging* could cost more than the item itself as far as security, purchaser fascination, advancement and safeguarding. It gives insurance from three noteworthy classes of *exterior influences*: substance, natural, and physical. *Chemical* assurance minimizes compositional changes activated by natural impacts, for example, introduction to gasses (ordinarily oxygen), dampness (increase or misfortune), or light (noticeable, infrared, or bright).

Biological protection provides a barrier to microorganisms (pathogens and ruining specialists), creepy crawlies, rodents, and different creatures, along these lines forestalling sickness and deterioration. Moreover, organic protection keeps up conditions to control senescence (aging and maturing). Such boundaries capacity by means of an assortment of instruments, including anticipating access to the item, averting scent transmission, and keeping up the inward environment of the package. Physical protection shields nourishment from mechanical harm and incorporates padding against the stun and vibration experienced during distribution.

Package design does not only inform the customer, but goes a long way to provoke feelings and communicate emotions Meyers (1998). However, most practitioners fail to recognize the immense contribution packaging plays in the promotion and sales of the product. Whereas it is generally appreciated that packaging plays a role in promoting the physical presentation and increasing the market share of a product, the extent to which this can be achieved is always a source of worry.

Although some companies in Ghana specifically Kumasi such as Tawheed Medical Laboratory, Insaniyya Herbal Ltd, Angel herbal products among others have made significant inroads in delivering and improving their competitiveness on packaging products like, Madam Catharine, Angel herbal capsules, Adutwumwaa herbal bitters among others, there is much to be done especially by the wayside vendors. Herbal products like bark of trees, raw leaves, seeds, sold especially at the Kumasi Railway Station, Dr. Mensah Lorry Park and other markets in and around Kumasi are either packaged in used polythenes, sold bare on tables, bare floor and other unsuitable places. This does not make the products appealing to prospective buyers and contribute greatly to the low patronage (Ganelle, 2014).

Traditional herbal medicine has not penetrated both local and international market because of poor packaging (Abbiw et al., 2002). In spite of the supposed negative presentations the practitioners create about herbal products, some people still choose traditional herbal medicine over the pharmaceutical drugs because of its natural base making it more effective in treating with fewer side effects (Gupta & Raina, 1998). The Government of Ghana through the appropriate ministries has tried to incorporate or integrate traditional herbal medicine in Ghana health care delivery programmed (Hyma & Ramesh, 1994).

Many people have raised doubts about the proliferation of traditional herbal medicine and the treatment of myriads of diseases by a single medicine preparation, dosage of administration, quality and potency, importantly packaging. While THM products have played critical roles in traditional medicine, it is still playing second fiddle to orthodox or conventional medicinal products. This could be attributed to the issue of its packaging, which has not been given prominent attention, in the context of indigenous knowledge.

It is in this direction that the researcher wants to investigate into how good packaging practice can impact positively on the patronage of Traditional Herbal Medicine us

1.3 Statement of the Problem

Some producers and practitioners of Traditional Herbal Medicine do not adhere to good packaging practices which affect consumer patronage. Some put the product in unsterilized and unhygienic polythene sacks, and use used bottles to package medicines. Some put the raw medicines on bare floors exposing them to bad weather conditions, dirty environments, and pathogens in the atmosphere, insect and rodents which easily complicate consumer's ailment (Abbiw et al., 2002).

The study therefore sort to design and produce packages for some selected traditional herbal medicine like prekese powder, nyinya dry leaves and nkotobena using bamboo, clay and paper.



Plate 3. THM displayed at its depot or selling point in kumasi railway station

1.4 Purpose of the Study

To design convenient packages for selected Traditional Herbal Medicines using locally available materials.

1.5 Specific Objectives

The specific objectives for the study are the following:

1. To identify the existing packaging materials used in packaging traditional herbal medicine in the market.
2. To identify the sources of the packaging materials, their usual condition before they are used and how they are treated before they are used for packaging.
3. To design and produce packages convenient for selected traditional herbal medicines on the market using available local materials

1.6 Research Question

1. What are the various existing packaging material used in securing the Traditional Herbal Medicine in the Ghanaian market?
2. What are the sources of the packaging materials, their usual condition, and how they are treated before they are used?
3. How can locally available materials be used to design and produce packages for selected traditional herbal medicines?

1.7 Significance of the Study

The current situation in Ghana where Traditional Herbal Medicines are sometimes displayed on the bare floor, kept in contaminated or used containers and unhygienic polythene sacks are very unfortunate. Ignoring the facts that Packaging is the material that surrounds a consumer item and contains, identifies, describes, protects, displays, and promotes the item and contribute to make a product more or less marketable (Jeanine Prather 2004).

One's desire to get a cure for his ailment by using Traditional Herbal Medicine can easily result in complications owing to poor packaging by the seller or even the producer. Whereas some are well packaged, others are left at the mercy of bad weather conditions, pathogens in the atmosphere just to mention few which render them unhygienic.

The aim of the research is to contribute to existing knowledge on how proper packaging can impact on the visibility, presentation and patronage of the THM and how to safeguard the health and safety of the consumer.

Also the research will serve as a guide to existing and potential producers of THM on some affordable but good materials which could be used for packaging THM in Ghana.

The work, notwithstanding, is important to the THM producer since he will realize the importance of packaging to his work. The producer will improve on the over-all quality of his output which will contribute to the acceptance of his product on the job market. These factors will ensure profitability and ultimately achieve high performance. The research will contribute to academic knowledge.

1.8 Delimitation

The research is limited to the production of packages for some selected traditional herbal medicine to promote its health conditions and sale.

1.9 Limitations

The respondents sounded sceptical so various tactful approaches were employed before genuine responses were given. The respondents are scattered so there was constrains.

This research is basically concerned with the material aspect of Traditional Herbal Medicine, rather than the fetish and spiritual aspect. It will concentrate on Traditional medicine products that are unscientifically processed or tested and approved by the Centre for Scientific Research into Plant Medicine (CSRPM) as well as those that have not undergone any phyto-chemical and safety test at the centre, but is not concerned with those fetish practices involved with herbal medicine. They are raw and in the crude state.

The various conducive conditions suitable for the selected Traditional Herbal Medicinal products like the tree bark, leaves and powdery forms will be studied and a suitable package will be designed and produced for its containment.

1.10 Definition of Terms

Ethnobotany: medicinal plants that serve as medicine.

Packaging: It is the science, workmanship, and innovation of encasing or securing items for *circulation* stockpiling, *trade*, and utilize.

Traditional Medicine: it's a system that includes not only herbal remedies for specific diseases, but also folk knowledge, traditions and values, health behaviour rules and patterns, and identified personnel and structures for delivery and restorative therapy.

Traditional Herbal Medicine: It's a subset of traditional medicine involves the application of herbs and other parts of medicinal plants such as powder, leaves and barks for the cure of various forms of diseases.

Herbal Medicine: Is the utilization of plants, plant parts, their water or solvent extracts, important oils, gums, pitches, exudates or other type of cutting edge items produced using plant parts utilized remedially to give proactive backing of different physiological frameworks; or, in a more ordinary therapeutic sense, to treat, cure, or keep a sickness in animals or people.

1.11 Abbreviations

WHO	World health organization
EMA	European Medicine Evaluation Agency
CSRPM	Centre for Scientific Research into Plant Medicine
GNDP	Ghana National Drug Policy

THM	Traditional Herbal Medicine
TIEPIK	The International Export Packaging Information Kit
3D	Three dimensional
PETE	Polyethylene terephthalate
LDPE	Low-density polyethylene
HDPE	High-density polyethylene
PVC	Polyvinyl chloride
PET	Polyethylene terephthalate
GMPs	Good manufacturing practices
TLC	Thin layer chromatography

1.12 Organisation of the Study

Sequentially, this dissertation has been arranged in six chapters to give logical meaning to the study conducted.

Chapter two contains the review of related literature. It presents studied evidence on traditional herbal medicine and packaging and relates it to this research. It offers relevant information on traditional herbal medicine and packaging.

The chapter three will present the methodology used by the researcher.

Chapter four comprises data presentation, analysis and interpretation of findings.

Chapters five will finally see to the summary of the entire research, conclusions and recommendations possible for improvement are presented.

CHAPTER TWO REVIEW OF RELEVANT LITERATURE

2.1 Overview

Packaging goes past simply the physical structures allied with a product. Packaging is pervasive and necessary as indicated by Marketing Intelligence Service, which tracks new items around the world. In 1991, there were 15,000 items on market racks. Today, there are more than 45,000 (Wallace, 2005). It's estimated that the normal customer spends not lesser than a second examining shelves, and in that time, will settle on a choice on regardless of whether to buy any given item (Rabinowitz, 2004).

The standardised methods of preparing Traditional Herbal Medicine by practitioners always create doubt about surety of its quality. The prospective consumer frowns on the use of THM because of what they refer to as unhygienic ways of preparation and packaging. The choice of one over the other is however a matter of acceptability, affordability and accessibility by the individual (Twumasi, 1975).

Since packaging constitutes a necessary piece of our day by day life, this section will in this way illuminate and enhances our comprehension of the ideas of bundling and its hugeness. It will convey to light the worries that are should have been reflected before items are at last packaged and distributed to the last shopper. This section presents theories identify with the topic of exchange; packaging materials (contemporary and indigenous materials) as displayed in part one. Finally, the concepts of Traditional Herbal Medicine and the government effort in promoting THM in Ghana.

2.2 Packaging and its significance

From the most primitive times, people eat food where it was found. Families and towns made or got what they used. They were likewise self-supporting, so there was little

requirement for packaging of merchandise, either for storing or transportation. At the point when packages were required, nature gave gourds, shells, and clears out. Later, packages were moulded from materials found in nature, for example, emptied logs, woven grasses and animal organs. As minerals and substance mixes were found, metals and earthenware were produced, prompting other packaging types.

According to Rundh (2005) package draws in buyer's interest for specific brand, upgrades its picture, and impacts customer's recognitions about product. According to Ganelle Davis (January 2, 2014) Product packaging clearly influences consumer buying behaviour and also serves as a good marketing strategy. Pilditch (1961) quoted Ernest Dichter, explain the package must literally shout attention to the product. He further explained the package must be its own salesman; it must arrest the gaze of the passing shopper and entice her to pick up the product. Henrion (1962) also supported that, the package must attract attention before it can inform or persuade buyers.

This item packaging particularly entreaties to ladies and it ought to, on the grounds that ladies are 85 percent of the customer business sector. A lady may pick a hand cream that is fragrant, saturates and may show up in a stylishly satisfying package. This item packaging or the calla lilies with a lilac-cool red foundation glamorizes the item, at first draws in the lady purchaser to the item mark on the store rack. Another sort of purchaser that is effortlessly tempted by item bundling is kids. They are effortlessly affected by brilliant hues, super saints and the bait of a sugary treat. Most fundamental interaction occurs between the customer and the brand. Packages that are Smart in design capture consumers' attention and encourage trial or purchase.

Likewise package bequests exceptional worth to products and furthermore functions as an instrument for diversity, i.e. assists buyers with choosing the item from extensive variety

of comparable products and excites clients purchasing conduct (Underwood, Klein and Burke, 2001; Silayoi and Speece, 2004).

In this manner packaging does a critical part in advertising correspondences and could be dealt with as an important feature amongst the most imperative components impacting customer's buying decision. There is probably Packaging assumes a vital part as a medium in the advertising blend, in advancement crusades, as an estimating basis, in characterizing the character of new items, as a setter of developments and as an instrument to make brand personality and rack sway in all item aggregates. However, most manufactures fail to recognize the immense contribution packaging plays in the promotion and sales of the product brings product to the international market. Whereas it is generally appreciated that Packaging plays a role in promoting the physical presentation and increasing the market share of a product the extent to which this can be achieved is always a source of worry. Producers sometimes ignore the facts that packaging could cost more than the product itself in order to lure the consumers to buy it. The world book of encyclopedia puts it; almost everything grown, processed or manufactured must be packaged. The Encyclopedia Britannica (1984), also shares the same view, commenting, virtually all modern manufactured and processed goods needs some sort of packaging at some stage in their production.

Again the kind of packaging material as well as the colour combination has always eluded traditional herbal medicine practitioners. A fact has been established that production and packaging go simultaneously. According to Hanlon (1971), the product and the package are becoming so independent that we cannot consider one without the other. It will be so naïve that at this point of technological advancement, to talk on increase in productivity; packaging will not be giving much consideration. This research therefore seeks to investigate into how good packaging practices can impact positively on consumers and to

design convenient packages for selected Traditional Herbal Medicine using locally available materials.

2.3 The Brief History of Packaging

From the prehistoric times, people dependably devoured what he finds. Families from spots and towns made or got what they utilized. They were *self-reliant*; so much was not required for packaging of products for keeping or transportation. At the point when containers were required, nature gave gourds, shells, and leaves. Later, containers were formed from available natural materials, for example, emptied logs, woven grasses and animal organs.

The eighteenth-century was the industrialization period was saw the time of great commercial expansion and technological advancements in goods produced on a mass level to keep up with the increased population (Sacharow, 1976)) and the increase in agricultural efficiency leading to the sale of food products in the open-air market.

The 19th century from 1800-1900 saw a rapid development of packaging system with the appearance of metal cans in 1818, paper bag in 1850, folded paperboard carton in 1880, corrugated paperboard case in 1890 and milk bottles in 1860.

In the twentieth century, wooden boxes were eliminated while paper and paperboard packaging improved in prominence. Every one of these adjustments in times and season turned out to be much important in light of the fact that people have dependably been occupied with the conservation of sustenance and the increase of its stockpiling life. Packaging turned into a need when sustenance and different things should have been be packaged for comfort, stockpiling, transportation, assurance, estimation, advancement and showcase purposes. A man found through science how to utilize components like minerals and chemicals mixes were found, metals and earthenware were created, prompting other

packaging structures, item packaging tackled new structures which has remained the standard today. Be that as it may, the United States military has been in the background impacting on packaging of products. For the spare movement of both perishable and non-perishable items to servicemen the world over in every distinctive atmosphere prompted numerous bundling developments. The space system has additionally been the hotspot for packaging ideas.

In view of this, the study is adding up with new techniques using already locally available material to upgrade the quality of some selected Traditional Herbal Medicine products to affect its appearance and presentation positively. Since, overall appearance of the products significantly impacts the marketing part, commercial product manufacturing companies are very careful about the packaging services they hire. In summary, packaging has being in existence dated prehistoric time and not recent, it has gone through several phases in life.

2.4 Packaging Types

Packaging of items to customers are for the most part dauntless by the sort of item being packaged or the purpose of that specific package containing sustenance's and nonnourishment items. WHO has helpfully arranged packaging by layer or purpose; essential, optional and tertiary. Essential packaging is the vital line of security and its first encompasses the item, holds and shield the substance from any outer natural risks. It has an immediate contact with the substance and structures a business unit for the client or last customer, for instance, a case containing cleanser powder. To include, Azharuddin (2007) characterized essential bundling as a basic packaging part.

Auxiliary packaging is outside the essential packaging, maybe used to gathering essential bundles together. It consolidates littler bundles making taking care of simple to both the

retailer and the purchaser. Optional, on-basis or Grouped packaging is what contains various deals units, for instance, a cardboard external containing various boxes of detergent powder.

The tertiary otherwise called transport packaging then again is packaging that is utilized to gathering auxiliary packaging together to guarantee safe taking care of and conveyance from the purpose of assembling to the following point in their appropriation. A fitting consolidation of these three can lessen transportation cost and the ecological effect of the transport (Levy 1993).

2.5 Categories of packaging

One way of placing packages into classifications is to portray them as adaptable, semiadaptable, or inflexible. Adaptable packaging incorporates the paper sacks, the plastic packs and the paper or plastic sacks. A sample of semi-adaptable bundling is the paperboard boxes and numerous others. Types of inflexible packaging incorporate cases, glass containers, and metal jars. Material or paper may be the most established types of adaptable packaging. Adaptable packaging is the most "source-lesened" type of bundling, that mean an adaptable package has minimal measure of material contrasted with different types of packages that would hold the item. This likewise implies adaptable packaging adds almost no weight to the general item and there is next to no to dispose of when the packages are void.

The utilization of adaptable packaging materials started with the Chinese, They utilized sheets of treated mulberry bark to wrap foods as ahead of schedule as the first or second century B.C. Amid the next hundreds of years, and the Chinese likewise created and refined the strategies of paper making. Learning of how to make paper bit by bit moved

west crosswise over Asia and into Europe. In 1310, paper making was acquainted with England, America in Germantown, Pennsylvania in 1690.

Other packages are termed Returnable, non-returnable and recuperation packaging. Returnable otherwise called multi-trek bundling alludes to refillable and reusable packages, while non-returnable or one-way packaging more often than not alludes to the disposable packages. Non-reusable packaging as of late are additionally recuperated and reused. All things considered, those that are recouped and reused is not for all time prudent and naturally appropriate. The recoverable packaging is any packaging for which the crude materials can be reused and reused. As indicated by Janonis et al (2007), recoverable can be utilized for unique reason or different purposes, treated the soil, recovered or for which the vitality worth can be used as a wellspring of vitality era.

A Philosopher named Jason F. McLennan said in reasonable plans, fashioners ought to "dispense with negative natural effect totally through skillful, touchy design." Practical application changes among design orders be it product plan or architecture modeling and so on. A Philosophy named Jason F. McLennan said in reasonable plans, fashioners ought to "dispense with negative natural effect totally through skilful, touchy outline."

Practical application changes among configuration orders be it item plan or construction modelling and so on. Common standards of supportability, for example, reuse, reuse, supplant and decrease ought to be considered. Originators are to think along the four 'R's,

2.6 Some indigenous and contemporary packaging materials used in Ghana

The concept of package is not something new, it emanate from the history of men in the society. Packaging began elementary with objects from nature and were suitable for the purpose of containment, protection, preservation etc.

According to Davis (1967) as soon as our ancestors had any valued possessions, they must have needed vessels to hold them and wrapping materials to protect them. Man made use of gourds and hollow tree trunks long before they had learned to make jugs or boxes, animal bladders and skins were the far fore-runners of cellophanes, leaves of wrapping paper. The primitive tribes used their own forms of package to enhance, attract, hide products from gaze of neighbourhood, and wrap gifts to make them more presentable and exciting. Currently, some of the primitive materials are being replaced while others serve side by side to the modern ones. The primitive or indigenous packaging material includes; corn husk, plantain leave, paper, bamboo, gourd, while contemporary or modern include metal, glass, plastics etc.

According to Kenneth and Betty (2007) the right determination of packaging materials and technologies keeps up product quality and freshness amid circulation and storage.

Accordingly packaging material directly affects the quality and the accomplishment of a package. The choice of material relies on upon what sort of item you are going to send to your client or to your adored ones. It is essential that package you are sending ought to be secured in your storing material. Most likely you would never need that your endowment of glass or your gorgeous showpiece reaches your beneficiary in *bits and pieces*. The designer therefore needs to have knowledge about the performance of the material and the qualities and inherent characteristics of the materials for the package. It is important to know materials machinery, and processes, in order to be a graphic designer at the top of the profession, (Henrion, 1962). Kweifio (1981) also commented that for effective packaging, knowledge about the packaging material is necessary.

In all embrace, the knowledge, performance and attraction on the packaging material is very essential. The packaging materials according to this study have been grouped into

two that is contemporary and indigenous. The researcher after heighten on most packaging materials will therefore limit his scope on three main materials (bamboo, clay and paper) and give an in dept. study on the three.

2.6.1 Metal

The suitable material for packaging foods especially canned food such as drinks, tinfoil or aluminium is predominantly used. It is indeed a contemporary or modern material. Aluminium stands attractive, light in weight and strong, but it requires a lot of raw materials energy to manufacture it. As foil it can be used in multi-laminate constructions or as a blister pack or container seal. For this reason it must be recycled.

Metal containers made of aluminium are much helpful as they are impermeable to moisture, microorganisms, lights, odours, etc.

Metal can be misused to deliver the accompanying conspicuous packaging qualities:

- Strong and unbending
- Barrier to gas and dampness
- Pressure safe
- Temperature safe/tolerant
- Corrosion resistance by means of coatings
- Sterilisable
- Directly beautified or marked

The limits of metal packaging are in weight and shapes achievable, particularly when contrasted with bamboo, paper and clay. Although aluminium. Despite the fact that aluminium is useful for packaging, the test is, it is entirely costly that is the reason individuals attempt to assemble used cans for reutilizing

2.6.2 Glass

Despite the fact that glass-production started in 7000 B.C. as a branch of earthenware, it was initially industrialized in Egyptian 1500 B.C. Produced using base materials (limestone, pop, sand and silica), which were in copious supply, all fixings were just liquefied together and shaped while hot. Since that early revelation, the blending procedure and the fixings have changed practically nothing, yet the trim strategies have advanced drastically. As a sort of "inflexible packaging," glass has numerous uses today. High weight, delicacy and expense have diminished the glass markets for metal and plastic containers. The package glass utilized today is the main kind of glass acknowledged in US reusing projects.

It's likewise mainstream and perfect material for packaging foods, particularly fluids segment. It is the most established, inalterable, solid and simple to reuse again and again. It is named conventional vessel in the home.

Glass is popular based on the following desirable characteristics:

- Transparent in appearance
- Good in preservation
- Protects food from moisture, past microorganism
- Inert
- Sterilisable
- Pressure resistant to a degree since some drinks have gases added up so it helps to resist internal pressure
- Can be moulded into a variety of shapes
- Glass is also highly recyclable, reuse and nonporous
- Can be manufactured in varieties of colours as well as labelled

Along with different advantages it has certain disadvantages too. They are heavier and can increase the weight of the product. The clearest disadvantage is delicacy and the threat of broken glass. The straightforwardness of glass can be an issue where the item is corrupted by light.

2.6.3 Paper and Board

Paper is essentially a slim sheet of cellulose. Cellulose is a stringy material got from plants. Early paper was produced using cellulose fibre got from flax, the plant that likewise gives fibre for material fabric. As interest for paper developed, old material clothes were looked for as a wellspring of fibre. In 1867, the procedure for getting valuable cellulose fibre from wood mash was produced.

A vital stride for the utilization of paper in packaging accompanied the improvement of paper packs. Business paper bags were initially produced in Bristol, England, in 1844. Further progressions amid the 1870s included stuck paper sacks and the gusset design, manufacturing the sorts of paper packs utilized today. In 1905, machines were designed and developed to consequently manufacture in-line printed paper sacks.

Another imperative utilization of paper in bundling accompanied the improvement of paperboard. The primary paperboard container (regularly called a cardboard box) was delivered in England in 1817, more than two hundred years after the Chinese concocted cardboard or paperboard.

Another regular type of "cardboard" in form of corrugated paper showed up in the 1850s. Nonetheless, around 1910, after much tussle between the producers and the railways, shipping containers of corrugated paperboard started to supplant hand-made wooden cartons and boxes utilized for the trade. Today, cardboard boxes (all the more precisely called C-flute corrugated paperboard containers) are used all around for article delivering.

Similarly as with numerous advancements, the improvement of the container was coincidental. Paper and paperboard packing expanded in acceptance all through a great part of the twentieth century. At that point with the approach of plastics as a noteworthy player in packaging (late 1970s and mid 1980s), paper and its related items were supplanted in numerous employments. Of late that pattern has lessened as designers have attempted to react to the claims that plastic is ecologically hostile.

Commercial-grade accessible paper is mostly produced using cellulose fibre from Box pulped wood, yet can likewise be produced using different sources, for example, cotton, straw, sisal and hemp. All are recyclable.

As indicated by Pam Robinson and V. Ryan (2004) retrieve 19 February, different types of papers/cards are used in the production of packaging, examples corrugated, tracing paper foil lined solid white board, duplex board, cartridge paper etc. Each of these types has its own features.

Paper and board are normally measured by weight or calliper. Material weighing under 250 grams for every square meter (gsm) is alluded to as paper and material at around 250 gsm is alluded to as paperboard. Paper is quite often treated, covered, overlaid, or impregnated with materials, for example, waxes, pitches, or polishes to enhance practical and protective properties. The a wide range of paper types utilized in food packaging are the following Kraft paper, Sulfite paper, Greaseproof paper, Glassine, Parchment paper, Paperboard which has samples as takes after White board, Solid board, Chipboard, Fibreboard. As per Soroka (1999) these are ordinarily used to make containers for transportation, for example, boxes, auto tons, and plate—and at times utilized for direct food contact.

The fibres of machine-made paper run parallel to the length of the machine that is used to manufacture it. This machine or grain heading influences execution:

- Paper tears most easily along the strands
- Folding is most easily along the strands
- Fold durability is most prominent over the strands
- Stiffness is most prominent when flexed over the strands
- Its reasonable expense, holds its shape, and is effortlessly adorned
- Paper and board holders are mostly extricated from wood pulps

Paper can likewise be covered to build quality or give *barrier* properties. The materials utilized can be sparkle or matt completed or *embossed*. Different materials can be covered onto paperboard e.g. foil or plastics.

Packaging delivered utilizing paper and board incorporates containers, names, handouts, tubes, layered cases, rigid boxes and pulp packs.

2.6.4 Plastic

Plastic is the most current packaging material in contrast with metal, glass, and paper. Albeit found in the nineteenth century, most plastics were saved for military and wartime use. Plastics have turned out to be essential materials and a wide assortment of plastics have been created in the course of recent years as of not long ago. Today some water and vegetable oil container are produced using vinyl chloride.

One of the most usually utilized plastics is polyethylene terephthalate (PETE). As per (Foil, 2000), the plastic materials in business over the sub-region comprise low-thickness polyethylene (LDPE) usually called polyethylene movies, high-thickness polyethylene

(HDPE) and different plastics, for example, polypropylene, polystyrene, polyvinyl chloride (PVC) and polyethylene terephthalate (PET).

Currently in Ghana the public has developed a strong prevalent use of plastics for product packaging, substituting other materials such as glass, metals, so most products are now packaged in polyethylene films example is the package of sachet water (IRIN, 2006). It is the most widely recognized packaging material and, in the meantime, a standout amongst the most hard to discard so tree huggers have pushed to lessen this material as it expands vitality utilization, climatic discharges, and strong waste.

The factors common to all plastics are

- they are portable
- enhance easy transportation of products
- Ensures good protection.
- It is strong, more efficient and cheap to manufacture.
- Others also perceive it is cleaner, relatively low energy consumption

It is for these reasons that they are used so much, as an alternative but its nature of heat retention will not make it do well in the packaging of raw herbal products.

2.6.5 Corn Husk

The following characterises Corn husk:

- Its nature is not too broad
- It does not tear easily
- It does not produce any stain or odour when used
- It is mostly used as wrapper for food like Kenkey

- It serves as a protective cover, contains the product for easy handling and identification
- It sometimes serves as a dispenser
- It serves as a means of measurement for the producer
- It is sometimes used in the market as a wrapper at the purchasing point of some small quantities of items including THM

2.6.6 The Plantain Leaf

The following characterises plantain leaves

- It has a broad surface , though not as tough as the corn husk
- It is soft and flexible in its dry state
- It is used in both dry and wet states but more pliable and much used when dry.
- It serves as a container for protection and to facilitate easy handling
- It controls the temperature of the content as well as delaying the deterioration process of the product
- The leaves help in retaining the freshness of the content

Ntentrema Leave as called by the Akans is one of the most popular leaves widely used in Ghana. It grows widely in the thick tropical rain forest specifically along river banks. Its leaves are widely broad with an average of 25cm wide and 40cm long. It has a glossy surface and a mild odour especially at its fresh state making it likeable and exceptionally acceptable when used to packed food. The unique quality of the leaf is its medicinal content.

2.6.7 Bamboo

Bamboo is a biologically grown composite material which becomes plentifully in the greater part of the tropical nations and has a long history with mankind. It is the quickest

developing species and a high return renewable asset which its development relies on upon species, however by and large all bamboo develops rapidly.

As indicated by Wang and Shen 1987, Over 1200 bamboo species have been recognized internationally. It comprises of cellulose filaments imbedded in a lignin framework. Aminuddin and Abd. Latif (1991) expressed that bamboo may have 40 to 50 stems in one bunch, which adds 10 to 20 culms yearly. Bamboo can achieve its most extreme stature in 4 to 6 months with an everyday augmentation of 15 to 18 cm (5 to 7 inches). It is recommended that with a decent administration of the bamboo asset, the cutting cycle is typically 3 years. As per Lee et al. (1994) bamboo adult in around 3 to 5 years, which implies its development, is quicker than whatever other plant on the planet. Along the length of the bamboo is a cellulose fiber which gives most extreme pliable flexural quality and unbending nature in that course (Lakkad and Patel 1980).

Wong (1995) additionally expressed that culms take 2 to 6 years to develop, which relies on upon the species. It is broadly for family unit items, Industrial applications, in development, building application. It is more hard to join bamboo than bits of wood however as indicated by Jassen (1995), it can be stuck extremely well. The width, thickness, and multi-purpose length have a perceptibly evaluated structure while the fiber circulation shows a minutely reviewed construction modeling, which prompt ideal properties of bamboo (Amada et al., 1998).

- It is a tropical and sub-tropical grass.
- It has a hollow-jointed woody stem, sometimes with thin walls
- It grows wildly in savanna belt and tropical rain forest
- The hollow stem of the bamboo makes it qualify for containing or keeping traditional herbal medicine

- It is hard and light when dried

2.6.8 Clay

Since the very beginning of civilization clay has been used for making cooking pots for food, medicine and for storage, manufacturing of clay pipes, for floor and wall tiles etc. *Clay* is the basic name for various fine-grained, natural materials that get to be plastic when wet. The Columbia Electronic Encyclopedia (2012) expressed that, *clays* are separated into two classes, remaining (essential *clay*) *clay* found in the spot of beginning and sedimentary *clay* (transported) which is expelled from the spot of starting point by a specialists of disintegration and put in an alternate and conceivably far off position. Synthetically, *clays* are hydrous aluminum silicates, more often than not containing minor measures of debasement, for example, potassium, sodium, calcium, magnesium, or iron. Properties of earth minerals incorporate pliancy, shrinkage under terminating and air drying, fineness of grain, shading subsequent to terminating, hardness, union and limit of the surface to change in accordance with design.

Fire *clays* are utilized for more obstinate purposes, for example, heat-safe tiles or blocks.

Ball *clays* are utilized for earthenware production, as a filler and in medication make.

Extended *clays* are utilized as a lightweight total as a part of the assembling of consumed *clay* pieces utilized for protection. However the ball mud which is suitable for ceramics wares will be appropriate for the production of the package for the Traditional Herbal Medicine.

2.7 Functions of packaging

Toward the start of the twentieth century most food was sold free. It was measured and apportioned and put in packs or specifically into the customer's sack to convey home.

Packaging was essentially obscure however today, it is an enormous, lucrative industry

and regularly it is the way packaging looks that influences the customer to purchase the item inside (Ryan, 2011). In today's general public, packaging is pervasive and important.

Purposes of packaging are important issues to this study. A number of authors who ever wrote on packaging in relation to a product commented generously on the numerous functions of the package. Primarily, the package of a product must Protect, Preserve, facilitate distribution and handling, and promote Customer Choices, Inform and Instruct Sales, Position the Product and Promote. Commenting on this Pilditch (1961) assert the package conveys the product from factory to the final consumer, irrespective on the destination of the consumer.

As indicated by Coles (2003) the primary parts of food packaging are to care for food items from outside impacts and harm, to contain the food, and to give customers ingredient and dietary data. It defends merchandise in solidified transfer autos or on burning ports. Furthermore, it conveys the merchandise, after a time of bother and clamor, as new and crunchy as when they exited the protected request of your work. From the above functions it presupposes that a good package must protect, preserve, promote, inform and instruct and what have you.

2.7.1 Protection

The key purpose of packaging is to cover item from sun, downpour, dampness, creepy crawlies, and barometrical contacts and so forth.

The essential employment of a pack is to likewise ensure its substance against stun, vibration, scent, microscopic organisms, dampness, pilferage, compound response and physical dangers, Pilditch (1961), Smith (2003). Bundling must have the capacity to survive vivacious physical taking care of amid conveyance so that the items are gotten by end client in the same capacity they exited the maker. The merchandise must be shielded

against assaults from all edges, be it mugginess, warmth, air, crushes endured over the span of transportation (TIEPIK, 2005). As stated by Robertson (2006) Packaging procedures and material might not transmit contaminants or offensive substance to the item, should comply with any appropriate nourishment added substance regulation and ought to give satisfactory assurance from tainting. Items like powder, tree bark and dry leaves can't be expended a long way from the site of assembling without bundling it to the end client. The Package will shield dry items from presentation to dampness, sun and water or different gasses and fluids.

2.7.2 Preservation

Packaging must hold the goodness of the item by ensuring the item against potential harm (Stewart, 1995).

Packaging must conceal the item from obliteration and contaminated so that the strength of the last customer is not traded off. Hanlon (1971) accentuated that, items which won't not be devoured quickly, must be safeguarded and ensured for a more drawn out timeframe, and this point, the bundling must have the capacity to accomplish.

As stated in Britannica (1984), the greater part of bundling for nourishment is intended to offer assurance to the sustenance against its encompassing furthermore to postpone the procedure of the nourishment turning sour past the time required for movement, promoting and utilization.

2.7.3 Packaging for Distribution and Handling

Compelling and very much outlined bundling is chief in guaranteeing that the items get to their destination in finest condition. Packaging gives accommodation in the transportation and capacity of the item. The package ought to along these lines empower safe treatment of the merchandise from the season of pressing until it achieves the last customer for use.

Taking care of strategies additionally includes the transfer or reusing of the utilized packaging. The packaging plan ought to be all around arranged so that all constituents are effortlessly taken care of in the dissemination chains of target markets, whether robotized or not (TIEPIK, 2005).

2.7.4 Packaging Facilitates Customer Choices

Packaging advances and enables brand rivalry and recognizable proof. As stated by Herdeg (1961), with everything practical needs met, a very much planned bundle is masterfully significant as well as it is vital for the advancement of customer decisions in a dynamically aggressive field. Pilditch (1961), upheld the certainty and has this to say, the exemplary perspective is that the bundle exists to ensure the item the pack has obtained another occupation; it must offer the great it contains. As indicated by Hanlon (1971), the package turns into an effective power in impacting the potential purchaser to make a buy and to advance the offer of a brand instead of the other.

2.7.5 Packaging Instructs and Informs

Packaging conveys vital and related messages to the end client. Pilditch (1961) citing Bernard Bolter composes: 'the need in packaging is not for workmanship but rather for correspondence. It is further expressed that designers test is to exchange the right message as quick and commandingly however much as could reasonably be expected.'

The principle purpose of communication in packaging is to illuminate purchasers about the item. Indeed, even the introductory types of packaging reflect this informative capacity of packaging. Perusing the mark on the packaging ought to edify customers about the substance of the item, its fixings, its indorsed technique for conservation and use. Gould (1966) upheld that the package needs to enlighten the customer regarding its substance. Laws on packaging require that an increasing number of realities be specified.

Packaging speaks to a unique amongst the most vital devices for conveying the brand message specifically to the last purchaser (Nancarrow et al., 1998). As the retail environment gets to be soaked with contenders competing for purchasers' consideration, packaging needs to work harder than any time in recent memory if the item is to be seen through the packing of aggressive items (Milton, 1991). Close to this test, retailers are confronted with the mindfulness that purchasers vary by the way they perceive brands as well as by the way they identify with these brands (Muniz and O'Guinn, 2001).

2.7.6 Packaging Position the Product and Promote Sales

It is rightly said that packaging fills in as noiseless salesperson. It gets the consideration of clients, who get the items, experience its depiction and are affected to buy the item. Self-administration is turning out to be more basic in the field of shopping where the client grabs the item and pays on the counter. Packaging in these circumstances advances the sale.

The primary individual to characterize ping as the "quiet salesperson" was Pilditch (1957). It is said that the pack must wake up at the point of procurement, to speak to the sales representative (Vazquez et al., 2003). It shows and portrays the product it contains; leaving the buyer to pick which item is most appropriate for his or her taste. This, together with the visual advance of the package, is frequently an unequivocal component in the purchasing circumstance.

Under the business advancement and correspondence titles come variables, for example, the exactness of data on the name and congruity with legal and natural prerequisites in the objective business sector. The bundle advances the brand dedication, which prompts proceeding with support by purchasers. (TIEPIK, 2005)

2.8 Components of a Good Package

2.8.1 Surface Graphics

As indicated by Pilditch (1961), cited by Bernard bolter, composes, the need in packaging is not for workmanship, but rather for correspondence. He further affirms that the creators test is to convey the right message as quick and eagerly as he can. The package ought to inform the customer regarding the substance. Meyers (1998), states that however physical configuration can make pictures that engage the customer's feelings, visual communication additionally has a considerably more prominent opportunity to support the buying of an item through the utilization of visuals. The packaging representation must be established on a particular situating methodology for the item and undertaking this system in the most intense and sensible way. The critical issue in the visual communication works is to make equalization and a coordinated outline utilizing the configuration components. Meyers further accentuation that Graphics incorporate format. Packaging originator works for the most part with the accompanying outline components to make a sure package appearance. The components incorporate shape, size of outline, shading, and surface of the materials utilized, logotype, typography, pictures and representation.

Representation correspondence can make and ensure selectiveness, fortify a brand name or picture, reposition, expand rack vicinity, and so on further it is clarified that these graphical components include esteem by adding tasteful quality to the package (Smith 2003).

2.8.2 Shape

According to Pilditch (1961), the physical Shape and structure of the package can affect deal. The shape can be a general package diagrams furthermore the layout of an image or beautification. Regularly an exceptional shape is the thing that customers look for, however it may not generally be effortlessly figured it out. Soroka (1996) likewise included

that shape is the genuine pack blueprint, outline, or group of content furthermore the portrayal of an image or adornment. Shape can be joined with some essential components of outline with different components of packaging to pass on general implications and aide the eye or arrange data. He further declare that there are three fundamental sorts of shapes which are geometric (circles, octagons and so forth), regular (shapes in nature like leaves, eye boll and so forth and man-made like ink smudge), and conceptual (shapes that are adapted or rearranged).

Pilditch (1973) recommends for case that, a rectangular shape makes pictures of sharpness, tidiness and cleanliness, while a round shape had relationship of security, abundant and liberality. This is upheld by Smith and Taylor (2003) who demonstrated that a few brands have such extraordinary package shapes, that the brand is identifiable from the shape alone. Other package shapes impart cognizant and oblivious implications.

The package shape can be utilized to convey pictures that impact customer recognition, respond to the purchaser's feelings, and build up cravings for the item before the buyer even peruses the mark or sees the real item (Meyers, 1999). As indicated by Silayoi and Speece (2004) package size, shape and prolongation influences customer judgments and choices, despite the fact that this is not effortlessly seen and considered. Judd, Aalders and Melis (1989) further express that shape frequently frames the premise of a Product Uniform and brand image. For shapes to be genuine it must be anything but difficult to be depicted in words that are; effortlessly recollected, went on and less demanding to picture personality a primary concern when different prompts are missing. As per Danger (1987), standards administering the physical state of a package can't be settled in light of the fact that it is normally controlled by the way of the item, mechanical contemplations, offering conditions, show contemplations, and the way that the package is utilized.

At the point when a package shape is practicable and particular, it can give a decent chance to strengthen the item's *brand image*, (TIEPIK, 2005).

2.8.3 Size of illustrations

The reason for purchasing, according to Pilditch (1961), spreads over the whole attributes of the item and package weight, size, prize, outline, even retail environment. Every product made has a physical structure. The physical structure is the genuine measurements of the piece - tallness, width, thickness/weight (of paper), and profundity (3D objects). Every component in the configuration (lines, photographs, and content squares) has its own particular structure in respect to the entire piece, (Porter, 1998).

2.8.4 Colour

Pilditch (1961) citing Albert Kner, said colour is the speediest way to feeling. He proceeds that nobody can question the mental impact colour can have on individuals. Does colouring have mental impact, as well as have physical impact. The immense noteworthiness of colouring lies in the way that it can impact all the distinctive parts of man (physical, enthusiastic, mental and spiritual).

Roth (1981) communicates comparable feeling on colouring, he expresses that colouring makes a lovely first stunning impression. Colouring has the mental point of preference of altering visual impression in memory and invigorates interest. Colouring offers notoriety to the package, item or publicizing. Klimchuk (2006) additionally included that the human eye sees colouring before the brain perceives symbolism as shapes, images, words, or other visual components.

Colouring is connected with emotions and states of mind and can draw consideration and effect impression of the item not disregarding the way that the encounters of Colouring

contrast and we can't make certain that a given Colouring will propose the same quality to all spectators. Orange, red, yellow, chestnut and ordinarily "warm" hues convey fun, while "icy" hues, for example, green and metallic impart wellbeing focused and rich items separately. It is additionally vital to consider that hues have diverse ethnic and social relations and implications in distinctive societies. Conventional importance joined to Colouring differs now and again and from spot to put. In outline there are times when these customary qualities ought to be regarded. Shading in a configuration may have two importance, one is its plastic substance, and significance get from the way of life of the general population, (Anderson, 1961). Individuals from diverse societies are uncovered, to distinctive Colouring affiliations and create Colouring inclinations in light of their own way of life's affiliations.

To Douglas (1984) —Colouring " has a huge part to play which is to enhance the presence of the item to catch purchaser's consideration. Colouring primly relations on the customer, and furthermore on the product. Customers know colouring affiliations, which lead them to lean toward specific hues for different item classifications (Grossman and Wisenblit, 1999). Utilizing shading as a sign on bundling can be a conceivably solid affiliation, particularly when it is exceptional to a specific brand.

2.8.5 Texture of the material

Texture is the seeming smoothness or unpleasantness of the packaging material which adds significance to the impression of the item. It structures some portion of design whether deliberate or not. There are two principle sorts of texture, visual or tactile or material. In desktop distributed, composition originates from the paper utilized. There can be expansion of visual compositions through the course of action of lines and shapes or the utilization of photographic pictures of particular surfaces (Ramsland, 2002). A paper sack will gives very much an alternate vibe contrasted with a plastic pack.

2.8.6 Logotypes

They are symbols that convey messages about the item inception, identification, ownership or authorization of an organization or an individual.

2.8.7 Typographical

Typographical centers on Fonts or type, spacing orientation and size of the printed text. Basic guidelines that exist in typography are, text stands out best when on white or lighter background, reading becomes difficult when all captions are written in capital letters, black letters on white background/support make it easy to read even from a distance.

According to Miles. A. Tinker as cited by William Lidwell et al., the visual clearness of a text is based generally on the size, typeface, contrast, text block, and spacing. He further stated categorically that, for a printed text, the optimal standard is 9-12 points and smaller font sizes are limited to captions and notes.

In view of this, the choice of typeface is totally based on aesthetic preference and a proportionally spaced typeface is more ideal over monospaced. If a surface or a background is textured or patterned, dramatically it can affect the legibility of the text so possibly it should be avoided.

2.8.8 Illustrations

It is one of the utmost operative means of transmitting product information and can also be used for proposing the end usage of the product also. Overly promising images should however, be avoided since they have the potential to disappoint the consumer. The illustrations or the designs on the package can be used to satisfy or change the emotional needs of the consumer.

According to Pilditch (1961) the design on the package not only attracts shoppers, but sometimes shapes the character of the product itself. Nevett (1982) also commented on the emotional and psychological factors and had this to say, consumer goods manufacturers were coming to realize that the products they were selling was more than the sum of the ingredients plus performance and concerning themselves with the psychological factors involved in a product success. Finally illustration on package can be utilized to demonstrate the product, portray the target buyer, set an inclination, give trustworthiness, and appeal to the taste.

2.9 The Concept of Medicine

Medicine is gotten from the Latin word as *medicina*, which means the craft of recuperating. It alludes to: The Science of Healing; the act of the finding, treatment and avoidance of infection, and the advancement of wellbeing prescriptions, drugs, substances used to treat and cure maladies, and to advance wellbeing. (Oxford Dictionary online).

As indicated by Medilexicon's medical dictionary, Medicine is a medication or the specialty of averting or curing infection; the science worried with sickness in every one of its relations or the study and treatment of general ailments or those influencing the inside parts of the body, particularly those not more often than not requiring surgical involvement..

Medicine as an art can be classified in two main groups that are allopathic, orthodox medicine or conventional and complementary, alternative or traditional medicine. Orthodox solution is a framework in which therapeutic specialists and other social insurance experts, (for example, medical attendants, drug specialists, and advisors) treat indications and infections utilizing medications, radiation, or surgery. Different names for

Orthodox medication incorporate allopathic solution, biomedicine, ordinary pharmaceutical, standard prescription, and Western drug.

The utilization of plants as pharmaceuticals to treat sickness has a long and respected history. Throughout the Centuries the indigenous people groups of the world have created modern social frameworks and their customary healers, through oral convention and exact means, have obtained and assembled point by point learning in regards to the utilization of therapeutic plants, which has been disseminated from era to era.

Traditional pharmaceutical has been a part of the Ghanaian society. The customary medication system incorporates natural solutions for particular diseases, as well as people learning, conventions and *standards, health performance* guidelines and designs, and distinguished work force and structures for conveyance and remedial treatment (Hevi, 1989). There are numerous sorts of experts accessible in Ghana, each with a particular way to deal with conclusion and treatment.

Groups of traditional healers in Ghana include spiritually based traditional medicine healers (Spiritualists or Diviners (fetish priests and priestesses) Shrine Devotees, Faith Healers) and non-Spiritually based traditional medicine healers (Herbalists, Bonesetters, and Traditional Birth Attendants).

As indicated by the World Health Organization (WHO) the term TM alludes to an expansive "arrangement of social insurance practices, methodologies, information and convictions consolidating plant, creature and mineral-based solutions, otherworldly treatments, manual systems and activities, connected independently or in blend to treat, analyze and avoid sickness or keep up well-being'(WHO, 2004).

Ghana's Traditional Medicine Practice Act 595 of 2000 characterizes home grown drugs as "any completed named restorative items that contain as dynamic fixings, aeronautical or underground parts of plants or other plant materials or a blend of them whether in rough state or plant formulations. Therefore, Herbal pharmaceuticals incorporate herbs, natural materials, *Herbal medicines* formulations and completed *Herbal medicines* items. Traditional herbal medicine is the practices, approaches, knowledge and beliefs in the use of herbs in a community or ways indigenous to a locality. For the avoidance of doubt, this research concentrates on Traditional Herbal Medicine which comprise the herbal components or material aspect of plants and how it is presented to the end user.

2.10 History of use of Traditional Herbal Medicines

By definition, traditional utilization of herbal meds suggests significant recorded use, and this is absolutely valid for some items that are accessible as traditional herbal pharmaceuticals' (WHO, 2002). In numerous emerging nations, a large percentage of the populace depends on traditional specialists and their armamentarium of curative plants keeping in mind the end goal to address human services issues. Albeit contemporary drug may exist next to each other with such traditional practice, herbal prescriptions have regularly kept up their fame for chronicled and social reasons. Such products have turned out to be all the more broadly accessible economically, particularly in developing nations. In this present day setting, fixings are here and there showcased for utilizations that were never thought about in the traditional curative systems from which they developed. A case is the utilization of ephedra (Ma huang) for weight reduction or athletic performance improvement (Shaw, 1998). While in a few nations, herbal medicines are liable to thorough assembling standards; this is not so at all places. In Germany, for instance, where herbal items are sold as 'phyto-solutions', they are liable to the same criteria for viability, safety and quality as are other medication items (Keller 1991). In the USA, by difference, most

home grown items in the commercial center are showcased and directed as dietary supplements, an item class that does not require preendorsement of items on the premise of any of these criteria (Rivera et al., 2013).

Most herbal items available today have not been subjected to medication endorsement procedure to exhibit their safety and viability. (Kew et al., 1993) A very much planned clinical trial is the system for decision to demonstrate the security and adequacy of a curative product. Makers of the natural items must stick to the necessities of good assembling practices (GMPs) and preclinical testing before these items can be utilized by human.

2.11 Challenges confronting Traditional Herbal Medicine Development in Ghana

There is high support of the Traditional Herbal Medicine (THM) for some reasons including belief, trust, closeness and expense and method of payment. It gives job to indigenous individuals and there is the need to enhance the practice. The principle issues influencing the act of Traditional Medicine incorporate the absence of data on experts including their capability, enrolment, instructive foundation, area, number and the items utilized as a part of their practices. Different issues incorporate unseemly premises for practice, insufficient record keeping by specialists, lacking offices for conclusion and the utilization of un-institutionalized items.

Moreover, there are differed and obscure THM hones in the nation. Some of these practices especially TM, are limited to families and the practice is home-based. These practices are not sorted out for preparing purposes. There are, additionally an excess of sellers and merchants practicing in the framework. Option Medicines specifically are essentially outside and imported. Much of the time there are no perceived privately authorize preparing foundations and/or expert bodies. The hindrances approaching the setting up of

a solitary responsible association speaking to THM specialists incorporate the vicinity of numerous fragments amasses each with disparate perspectives, dreams and desires. Singular affiliation shows up not to be all around spoke to at the grassroots level and there is regularly misjudging and absence of data sharing among partners. Suspicion between individuals from diverse gatherings, identity projections, and Research into THM is hampered by the absence of assets, work force and offices. Inquiries about that are completed is awkward across the country with practically zero prioritization. There is next to no cooperation in between researchers and specialists and by and large, there is a worrying absence of acknowledgment of the requirement for the advantages of innovative work towards enhancing practice.

There is lack of adequate knowledge among a segment of the overall population of the abilities and advantages of TM. Consequently, segments of the general population have some level of doubts about plant medicine.

The health insurance system is predisposed towards allopathic drug. These issues are not helped by the fact that no documentation exists on the practice and results of THM. A few items are likewise being sold to people in general without established confirmation of safety and viability. Manufacturing of traditional/plant solution item don't meet the guidelines of Good Manufacturing Practices (GMP) and they do not have standardization. A few experts are not willing to follow Food Drug Board's (FDB) prerequisites to reveal the personality of the plants they use for their product preparation.

Another major problem facing the THM industry is proper packaging. According to Rivera et al., (2013), consumers, in some cases, may prefer packaging that resembles that of pharmaceuticals. It is vital that principles are followed for both the growing and the manufacturing of herbs. The WHO has published guidelines for the growing, collecting

and manufacturing of herbs that should be considered by all countries as a template for global standardization of herbs.

The quality of traditional medicines has to do with issues concerning the absence or presence of foreign material in the medicine. It also includes issues such as the packaging and labelling of medicines (Sittie, 2008).

People despise the use of TM for a number of reasons. Some of the reasons given as factors discouraging their use of TM were unhygienic ways of preparation, poor packaging, lack of or inadequate dosage instructions, taste and mode of application and inadequate preservation methods (WHO, 2006).

In Ghana, Packaging as a factor also discourages utilization of THM by prospective users. Some traditional medicines on the market do not even have labels, let alone dosage instructions. Manufacturing and expiry dates are most times missing. Some very effective drugs, because of their poor packaging as regards their crude labelling, or worse still, the absence of labels, are totally frowned upon by potential users. The use of old bottles to package medicines by some producers is a major set-back.

Related to packaging of Traditional Herbal Medicine is the dosage. Some medicine usually does not have this reliable information on their cases. Others that have are difficult to understand. Article 59 (3) of the Directive gives that "the bundle pamphlet should mirror the aftereffects of counsels with target patient gatherings to guarantee that it is neat, clear and simple to utilize".

Article 63(2), 1st sub-section of the Directive gives that "the bundle pamphlet must be composed and intended to be clear and justifiable, empowering the clients to act fittingly, when vital with the help of wellbeing experts."

On these, reference is on the rule on Product data formats, lucidness of the marking and bundle pamphlet of therapeutic items for human utilization and reference records arranged by the Quality Review of Documents gathering and distributed by the EMA.

As indicated by Scuppan et al. (1999) experts regularly neglect to recognize particularly, that is by logical name, the botanicals in the item tried, and also the exact measurements managed.

The researcher through interview observed that some practitioners refrained from incorporating scientific knowledge with the mind that it will reduce the potency and efficacy of the medicine. Tyler 1999 also assert that the Equal determined the conclusions of some traditional botanist who trust that natural common product have an inalienable predominance and that the magical atmosphere encompassing herbs will by one means or another be obliterated by extraction and institutionalization.

2.12 Effort at Promoting Traditional Herbal Medicine in Ghana

Being a member state of the WHO (1978), Ghana has promoted the modernization of THM through its Ministries, Departments and Agencies (MDAs) with the aim of facilitating its integration into the national healthcare delivery system. There are various institutions including the Centre for Scientific Research into Plant Medicine (CSRPM), the Noguchi Memorial Institute for Medical Research (NMIMR), the Association of Ghana Industries (AGI), Food and Drugs Authority (FDA), Ghana Standards Authority (GSA), Institute of Packaging ,Ghana (IOPG), the Faculty of Pharmacy of the Kwame Nkrumah University of Science and Technology and The Faculty of Science of the University of Ghana implementing the Government of Ghana (GoG) policy of modernizing traditional herbal medicine through research and development.

The CSRPM, which was established in 1974 at Mampong Akuapem in the Eastern

Region of Ghana, is seen by many as a monumental testimony of the government's commitment to the modernization of traditional medicine and its eventual integration into the healthcare delivery System. The Center's prime purpose is to produce herbal medicines that may be acceptable on the market and to conduct clinical trials at its own clinic. The Centre's clients are treated with mostly herbal medicines in liquid form, powder or ointment. The center has about forty herbal drugs.

Another institution that has contributed to the development of THM is Noguchi Memorial Institute for Medical Research. The NMIMR was established as a semiautonomous Institute of the University of Ghana in November 1979. The workforces in the above-mentioned departments are helping the institute to affect its mandate of conducting research into what NMIMR calls —priority health problems‖ in support of the delivery of health care programmes. According to E .Asante (2010), the research staffs have conducted several studies that have assessed the safety, efficacy and quality of TM.

The College of Pharmacy of the Kwame Nkrumah University of Science and Technology, for the past 40 years has been piloting investigations into THM in Ghana (Fleischer, 2004). The objective of the centre is concentrated on identifying active constituents of medicinal plants and also studying the practices of traditional healers and to validate the therapeutic effect of herbal medicines and discover local sources of raw materials for the production of medicines.

The College in 2001/2002 has commenced its novel Herbal Medicine Programme for four-year Bachelor of Science degree programme in Herbal Medicine.

The University of Ghana's Faculty of Science has also for some time now, been involved in the transformation of traditional medicine in Ghana. The Faculty's Department of Botany has, in alliance with the Centre for Scientific and Industrial Research (C.S.I.R.)

executed a project dubbed ‘Herbs of Ghana’, and Professor Ebenezer Laing, the then Head of Department supervised the project at its inception (Laing,1995). The team led by the professor has undertaken a comprehensive taxonomic inventory of the herbaceous species of plants of Ghana. They came out with vernacular and scientific names of the herbs, their habitat, botanical description and the uses of these herbs. It was also discovered that more than hundred species of the plants investigated on had therapeutic properties.

The Departments of Biochemistry and Chemistry have also been actively involved in the verification of the efficacy and safety of numerous herbal plants.

Professor Marian Ewurama Addy, formerly of the Department of Biochemistry, and her colleagues in contributing evaluated the healing effects of medicinal plants used to treat varied illnesses.

Formally, a practitioner only gets up to produce but currently because institute has been acquired to assist in the area of testing the potency of the medicine, several others of the practitioners use this means to check the potency as well as the efficacy of their produce.

2.13 Effort in Promoting Packaging Industry in Ghana

Ghana has watched a noteworthy financial development as of late and this has been credited to the changed economy over the previous decade. As per Obeesi (2004), Economy liberalization has brought about the developed rivalry in the nearby market only products from countries like India, China, Dubai, Malaysia, Thailand and what have you. Consumers have recently been shown to high quality packaging. The increase in export of agricultural based products, minerals and many others has also led to the increased interest for packaging materials in the local market.

The packaging business in Ghana began in the late 1950s after Independence when the then administration of Ghana included in a gigantic industrialization project to make import substituted buyer merchandise like canned sustenance's alcoholic and non-mixed beverages and family unit hardware.

The 1990s presentation of the monetary reform program and exchange liberalization prompted the springing up of a few little and medium scales plastic and paper industries in Ghana. The little and medium scale endeavours found in Ghana depend to a great extent on nearby converters for their packaging needs however when these are not locally accessible, some of them rely on upon post-customers packages, for example, folded boxes, glass, plastic jugs and jugs for bundling items. Things like newsprint, chestnut papers, wicker baskets, jute sacks, wooden boxes and leaves of plantain and others are still utilized as packaging materials for some products.

The assembling organizations and exporters that are significantly high frequently require quality packaging and generally favour imported packaging materials to guarantee alluring and equal to worldwide guidelines overlooked that similarly a locally accessible material can just as be dealt with and took care of to be in like manner the global standard. The thought of importing materials has been a noteworthy mishap influencing organizations in Ghana. It has rendered the organizations uncompetitive because of the similar low nature of their bundling.

IOPG in 2009 said that, different difficulties that have frustrated the development of the local packaging industry incorporate old design innovation, deficient apparatus for printing, absence of raw materials for production. Ghana has the attitude of importing all raw materials for packaging which turns to increase the cost of packaging. This challenge also results in increase in production cost. If not recently, even not adequate skills and

packaging innovation because of nonappearance of organizations that will prepare individuals. Until 2009 when the Kwame Nkrumah University of Science and Technology started preparing individuals to be able, a considerable measure of skill in realistic expressions plan and printing has as of late flourish. Presently, nearby packaging converters have discovered a prepared safety of new materials or innovations to address quality issues or meet clients' requests. Non-appearance of offices for testing and accreditation of package, absence of offices and programming for packaging advancement since the capital expense required is so tremendous, and nonattendance of solid information on the packaging business.

Until 2005, the Ghanaian packaging industry was not well structured, there were nothing like standards, rules and regulations, but the arrival of these institutions IOPG, AGI, FDA, GSB and AAG has helped describe packaging as developing. It has made Packaging industry perceived a significant transformation from relatively sad state to one where modern know-hows and inventive concepts overflows.

Presently, there have been a ton of mindfulness creation projects and exercises by IOPG and AAG bodies. AGI additionally concedes that the packaging tenets and regulations are not being entirely implemented by the state offices, for example, the Food and Drugs Authority and the Ghana Standards Board for clear reasons which incorporate deficient asset distribution.

Producers formally did not value the huge positive effect of good packaging practices on the increment in piece of the overall industry of their items while buyers additionally bought items, without respect to the way it was bundled. GINK noticed that a few individuals are starting to dis-credit customary prescription just because of the way that

the packaging is not well done. A few specialists swing to package their drugs in utilized water bottles, polythene sacks and so forth and individuals don't patronize.

However, challenges confronting the industry include inadequate, outmoded second hand technologies which are frequently foreign made from Europe and China. Adjusting backing for packaging gear is for all intents and purposes truant and plants may be closed down for a considerable length of time because of absence of extra parts or ability in altering a breakdown. The innovative aptitudes in packaging are lacking, because of the nonappearance of more specific preparing establishments and courses. Additionally, interest for great bundling is moderately low in light of the fact that a substantial piece of the populace can't manage the cost of them and fare opportunities are constrained. This does not support significant interests in the packaging sector.

With the exception of wood with bamboo attachment and to some degree cotton fabrics all packaging natural materials were transported in. This outcomes in abnormality of crude materials supply, value treks and long lead times in conveyances. The packaging business is exceptionally focused on plastics for the most part polyethylene movies and plastic compartments. Another element is that poor administration of bundling waste particularly plastics, has given a negative picture to packaging and clouded the positive commitment of packaging to monetary development.

Meanwhile there are equally good locally available packaging materials like bamboo, clay, paper and many more that are less cost effective and can produce a nice finished products as well as ensuring efficacy and potency of the medicine.

2.14 Samples of traditional herbal medicinal Plants to be used in the formulation

The plants chosen as samples for the study are Tetra pleura tetraptera (prekese. Akan name), Momordicacharantia (nyinya in twi) and Butyrespermumparkii (nkotobena in Akan), these plants were chosen because of their availability on the Ghanaian market, high in patronage, nutritional and health benefits. Each of the plants is described below.

2.14.1 Tetraplura tetraptera

Tetrapleuratetraptera, a mainstream restorative plant having a place with the family Leguminosae (once in the past Fabaceae: Mimosoideae), is generally known as "prekese" among the Ashantis' (Akans) in Ghana. It is likewise called "Aridan" or "Aidan" among the Yoruba ethnic gathering of South Western Nigeria, "Abogolo" among the Igala individuals of north focal Nigeria, and "Dawo" among the Hausa individuals of Northern Nigeria. It is for the most part found in the swamp woodland of numerous tropical African nations, and known not organic product that comprises of beefy mash and little, caramel dark seeds, and a trademark fragrant and sharp sweet-smelling scent.

It is utilized as a flavor as part of soups in Ghana and utilized as a part of the administration and treatment of numerous infirmities. The organic product is ordinarily utilized as flavor and as a characteristic multivitamins. It is rich in protein, lipids, potassium, iron, magnesium, phosphorous, and vitamin C. Nigerians and Ghanaians cook it in soup and sustained to moms to avoid baby blues constriction. In Ghana, prekese has been utilized as a part of the readiness of decoctions and tonics to diminish hypertension diminish the seriousness of asthma assaults, and advance blood stream.

It is used traditionally in the treatment and management of malaria, gastric ulcer and dysentery (Mshana 2000). Its fruits are used for the management of convulsions(Nwaiwu

and Akah 1986), leprosy, inflammation, rheumatism , flatulence, jaundice and fevers (Ajayi, Fajemilehin et al., 2011).

Tetraptera in the diet could play a role in the decrease of the extreme levels of total cholesterol, LDL-cholesterol, triglycerides and as well reduce the LDL/HDL ratio in the body and hence prevents cardiovascular ailments. Moreover the presence of flavonoids and antioxidants make them very useful in reducing stress and scavenging of free radicals (Abii and Amarachi 2007). The mineral content based on dry weight was iron, zinc, copper, magnesium, sodium, calcium and potassium. Conditions that affect deterioration of prekese are moisture, light, temperature so there is the need to study traditional packaging materials that will prevent these conditions.

Taking into consideration the numerous health benefits and usage as a spice in Ghana, Nigeria and many parts of West Africa (OKWU, 2003), it would be very necessary to formulate and package tetrapleura powder to make it more attractive, safe and easy to use. Proper packaging of it would prevent wastage of this precious fruit since using a tea spoonful (4-6) of powder would be enough to flavour or spice the soup than as using the whole fruit.

2.14.2 Momordicacharantia

Momordicacharantia Linn. Is a trailing herb from the family Cucurbitaceae. It is a perpetual climbing vine with long leaves, yellow blooms, and lengthened natural product that takes after a gourd or cucumber. Common names includes African cucumber, balsam pear, and bitter lemon, bitter gourd, bitter cumber, vegetable insulin and many more. In Ghana, it called Nyinya in Twi, Nyanya in fante and Nzema and daddagu, gaaraaunii, garahuni in Hausa (Busia, Science et al. 2007). Momodicacharantia is seen as a weed in Ghana by most people except for few people and traditional herbalists who plant them

close to their houses but it is developed in the tropics, particularly of China, India, East Africa, Central and South America and the Caribbean.

It is used traditionally in Ghana for the treatment or management of high blood pressure, diabetes, diarrhoea, fever, skin fungal infections, gastrointestinal cramps, psoriasis, hyperlipidemia, hemorrhoids, glaucoma, infertility etc(Mshana 2000).

Chemical constituents of the plant include alkaloids, glycoside, peptides, acids, cucurbitins, charantin, cucurbitacins, momordine, momorcharins, and proteins (Busia, Science et al. 2007, WANG, LI et al., 2011).

2.14.3 ButyrospermumParkii

Butyrospermumparkii, Shea or Shea nut, (syn. Vitellariaparadoxa, B. paradoxa) is a tree indigenous to Africa, happening in Mali, Cameroon, Congo, and Côte d Ivories, Ghana, Guinea, Togo, Nigeria, Senegal, Sudan, Burkina Faso and Uganda. The Shea organic product comprises of a slim, tart, nutritious mash that encompasses a moderately vast, oil-rich seed from which is removed Shea margarine.

2.15 Summary

After reviewing the relevant literature on the concepts of packaging and the concept of Traditional Herbal Medicine to the subject area, the researcher has got learning exercise covering a broad horizon on packaging and its significance in the presentation of Traditional Herbal Medicine. Specifically, the theoretical and empirical reviews of documented information have been the focal points of the exercise.

Subsequently, areas researched into include packaging and its significance, packaging types, categories of packaging, history of packaging, functions of packaging, component of packaging, packaging materials, concepts of traditional herbal medicine, history of

traditional herbal medicine, challenges facing the development of packaging in Ghana, efforts in promoting traditional herbal medicine in Ghana, finally and effort in promoting traditional herbal medicine in Ghana. This gives adequate backing for the achievement of the research objectives. The next chapter, chapter three will present the methodology employed to achieve the set objectives.

CHAPTER THREE METHODOLOGY

3.1 Overview

This chapter brings out the research methodology employed to serve as the structure for the procedures followed to achieve the expectation of the study. It defines the activity of the research, the population for the study, sampling techniques, the systematic application of the research tools to collect the data to answer the research questions and to achieve the set objectives, how to proceed, how to measure the progress and what constitutes success. A lot of research work on packaging of Traditional Herbal Medicine has been undertaken using different research design and instruments to assess the role packaging plays on products.

3.2 Research Design

Gummeson (1936) cautions that there are three main challenges of an academic research that one should be mindful of in selecting a method(s) for a particular study – access to reality, pre-understanding and understanding, and quality. He explains his concept as follows: —Access refers to the opportunities available to find empirical data (real-world data) and information.¶

In respect to the understanding of Gummesson's caution, a critical consideration of the features of the various research methods has been observed in relation to the research problem.

Twumasi (2001), and Adentwi and Amartei (2009) also assert that research design should be governed by the notion of 'fitness for purpose', and the purpose of the research determines the methodology and design of the research. The researcher when choosing the appropriate research methods as means to reveal the reality regarding packaging and its significance in the presentation of Traditional Herbal Medicine in Ghana, carefully considered the major implications and impacts a chosen method of research could have on the nature of data to be collected.

With respect to this an architectural plan to serve as a procedure and strategy for meeting the research question and the objectives towards the identifiable problem became imperative (Leedy & Ormrod, 2005).

The study employed the qualitative research method with questionnaire administration, observation and personal interviews to collect data on packaging and its significance in the presentation of Traditional Herbal Medicine in the Kumasi Metropolis of Ashanti Region. These approaches offered the best means of obtaining valid data to answer research questions one (1) and two (2).

3.3 Qualitative Research

Qualitative research answers questions about the intricate nature of phenomena, frequently with the purpose of describing and comprehension the phenomena from the partakers' perspective.

(Leedy & Ormond, 2005). Shank (2002) also defines qualitative research as —a form of systematic empirical inquiry into connotation.‖ Denzin and Lincoln (2000) concur that qualitative research includes an interpretive and naturalistic methodology.

Qualitative research therefore deals with exploring the quality of relations, activities, situations or materials in their natural settings. Although qualitative inquiry emphasizes the description and the interpretation of information in words instead of numbers, numerical data are collected in the process and analyzed.

Though the nature of this study made it necessary to adopt qualitative method of research, the quantitative method has been invaluable in dealing with the data statistically in the form of numbers, charts and averages.

3.4 Case Study Research

According to Tryfos (1996); Leedy and Ormrod (2005) and Cohen et al., (2007), case study is a description of a real situation that lends itself to the application of methods and also invites reflection and provides an opportunity for discussion.

Yin (2003) indicates that a case study with many units of analysis is an entrenched case and it is good for developing theories.

Since the population under study is homogeneous in character and for that matter the results from a selected location would not be different from others, case study is appropriate for this study.

3.5 Descriptive Research

Descriptive research on the other hand, describes data and characteristics about the population or phenomenon being studied. The descriptive method was employed to describe the procedures followed to execute the experiments. The experiment conducted

needs to be chronologically described in order to produce packaging product that will be wholly accepted in packaging Traditional Herbal Medicine.

Descriptive studies are gone for figuring out "what is," so observational and survey systems are every now and again used to gather Descriptive information (Borg and Gall, 1996). Distinct exploration includes gathering information that portrays occasions and after that composes, arranges, delineates, and depicts the information accumulation.

3.6 Library Research

Library research was the basis through which a researcher greatly developed the writing of an academic thesis. It provided majority of the secondary data needed for the study.

The libraries where relevant data was collected included The KNUST main library, the College of Art Library, Department of Art Education Library, Department of Herbal Medicine Library, KSB Library all in the Kwame Nkrumah University of Science and Technology. Other include; K' Poly Library and Institute of the Centre for Scientific and Industrial Research at Fumesua in Kumasi. Books, publications, periodicals, magazines were the sources from which secondary data were collected. In all these libraries, sufficient efforts were made to obtain majority information for the secondary data needed for the study. The sources of data from these libraries include books, encyclopaedia, newspapers, catalogues, magazines, and the internet. Significant information on traditional herbal medicine products and packaging were critically looked at. The researcher can confidently say that about thirty five (35) articles related to the topic were accessed from the internet. Four (4) books were read. The literature was sourced from both local and foreign writers. Significant effort was made to understand all technologies for the benefit of the related literature.

3.7 Population

A population is the group or individuals to whom the result of the study is intended to apply (Tryfos, 1996; Twumasi 2001; Leedy & Ormrod, 2005). It also refers to a complete set of individuals (subjects), objects or events having common observable characteristics. It may be finite or infinite. For a finite population, its members (elements) can presumably be counted and a finite number obtained. Holme and Solvang, (1997) emphasises that it is of great importance to find the right respondents to get the right information for the attainment of research objectives. In this study the population have been found to be homogeneous in nature, due to the similarity in characteristics of the study.

In this work the population is finite and comprises the wayside sellers of THM who sell around the Kumasi Railway Station and the Dr. Mensah lorry station in Kumasi, some professionals in the industry and some patrons of the products.

The Kumasi Railway Station and Dr. Mensah Lorry station have two hundred (200) registered sellers and about four hundred (400) yet-to-register sellers. An average of one thousand (100) people patronizes their products every week. The researcher focused on the registered sellers for the purposes of the sampling technique to be used in the research. Also some professionals from the Department of Herbal Medicine were interviewed. Identifying the relevant population was very necessary to aid in data collection since it could be a costly exercise and also can include people who do not have anything to do with the research.

3.8 Sampling technique

Simple random sampling was used to select the sellers of the THM in Dr. Mensah Lorry Park and the Kumasi Railway station. It was also used to sample the patrons of the products

in these selected areas. Purposive sampling techniques were employed in selecting the sample for the professional people in the industry. Lecturers at the KNUST School of Herbal Medicine would be sampled using the purposive sampling.

3.9 Sample Size

The research work will deal with a sample of one hundred and fifty five (155) respondents made up of one hundred (100) registered sellers or practitioners, fifty (50) buyers and five (5) professionals.

3.10 Research Instruments

Outstanding amongst the most essential case study of contextual analysis is the meeting (orally or written), which was picked as the most vital technique in this study for information accumulation. As demonstrated by Yin (2003) contextual analyses can use archival records, meetings, direct perception, members and documentation base on Yin's proposition. The following data collection tools were employed: Questionnaire, unstructured interviews, direct observation and documentary analysis. (Saunders et al., 2007)

Questionnaires were the main instrument used to gain a thorough understanding from the sellers, buyers (patrons) and professionals. Also most of the questions were largely close ended to make coding easier.

Eldabi et al (2002) came out with the recommendation that questionnaires should not contain personal questions. Avoid jargons or specializes languages and two questions on one issue. Close ended questions were used because it provides precise answers while open ended questions offered rich and deeper insight or understanding, open ended questions were included in the questionnaire. The questionnaire was structured, which was the close ended type which required the respondent to make a choice by ticking or circling the one

respondent may wish. The questionnaire encompasses dichotomous response, multiple choices, rating scale and ranking items.

The choice of the interview strategy was done considering Robson (2002) classification of interview which are; respondent interview and informant interview. The researcher used probing questions in both formal and informal manner, because a number of the respondents could not read and or write in English.

The researcher also made a critical direct observations on the activities which went on at the Railway Station and the Dr. Mensah lorry park all in Ghana specifically Kumasi.

3.11 Sources of Data

The research was made up of the following instruments:

3.11.1 Primary

The primary sources of data included information that was gathered from the in-depth interviews and the observation that took place at the Railway Station and the Dr. Mensah lorry station. Questionnaires were designed for the purpose of primary research. Experts and knowledgeable people from the school of herbal medicine were interviewed on the subjects pertaining to the study.

The benefit of utilizing essential information is that they are more solid since they originate from the first sources and are gathered particularly with the end goal of the study.

3.11.2 Secondary

Secondary Data was gathered from the written sources fundamentally helped with the advancement of essential information accumulation. Yin (1994) likewise expresses that written data is likely to be pertinent to the contextual investigation. Data was taken from documentary materials and online sources to gain more understanding on packaging.

Readings were made from the libraries of KNUST and Kumasi Polytechnic. The rationale for using these sources of information was that they were cheaper and easily accessible.

3.11.3 Tertiary

Tertiary data were sought from newspapers, magazines, and other publications

3.12 Data Collection Procedure

The researcher visited some libraries to collect the secondary data from documentary sources (books, publications, periodicals, newspapers, brochures and theses). A framework of the study was built and based on that, the researcher identified and also established the applicable techniques and requisite materials to the study.

The researcher visited the Kumasi Railway station and the Dr. Mensah lorry park to have preliminary interactions with the main respondents where official introduction was made. The researcher booked suitable appointment dates with the respondents when interviews, observation and questionnaire were recorded for interpretation.

3.13 Data Analysis

Raw data collected was critically analysed to ensure regularity and validity. Next the data was coded and tallied item by product and input into a computer. Statistical Package for Social Scientists (SPSS) and excel were used to analyse the data. Descriptive statistics was used to summarize and present the information in the form of percentages, frequencies and graphs.

3.14 Validity and reliability

Yin (2003) states that the research design is a logical process that connects the research question posed, empirical data collected and conclusions drawn.

3.14.1 Validity

This is worried with the precision of estimation and the degree to which an instrument measures. So as to enhance the legitimacy in this study, a meeting aide was outlined in light of the edge of reference of this study. In the meantime scopes of inquiry sorts were utilized including testing and close finished inquiries.

3.14.2 Reliability

Unwavering quality of an instrument concerns its consistency of estimation. As indicated by Saunders et al (2007) unwavering quality alludes to the degree to which an instrument measures the same way every time it is utilized under the same conditions with the same subjects. To build the dependability of this study, the current hypotheses were explored from diverse researchers and analysts and after that introduced and thought about. Likewise taking into account the literature review, ideas were precisely characterized and afterward the frame of reference and speculations in the current research regions.

Along these lines the discoveries of this study can give better comprehension of how packaging of Traditional Medicine can have a positive significance on the consumer.

3.15 Working Procedure

3.15.1 Research Question One

What are the various existing materials used in securing the Traditional Herbal Medicine in the Ghanaian market?

One of the intentions of the study is to ascertain the various existing packaging materials used in packaging Traditional Herbal Medicine in the Ghanaian market.

This was achieved through interviews and observation; the researcher identified these materials used in securing the raw herbal materials. The identified materials were in two forms; wrapper and containers respectively.

3.15.1.1 Paper (Brown paper)

Paper is both indigenous and contemporary material based on the transitions it has gone through. According to Davis (1967) paper for wrapper in this country was mostly old newspaper and brown paper (cement paper). The commonly used paper is what they called 'cement paper'. The nature of the brown paper allows it to be used in packaging large quantity of product unlike paper which has to be packed bit-by-bit. Both the news print, newspaper and the brown paper was used in wrapping product sold and conveniently has to be carried by hand. Through observation, the different types of papers after loading it with products were folded into a conical shape and sometimes put in black small polythene bag.



Plate 4. Brown Paper for packaging THM

3.15.1.2 Polythene

The polythene used as wrapper was found to be the most common ones identified in the market. They are converted into sachet to carry the Traditional Herbal Medicine instead of the use of paper. They are transparent and have the ability for its content to be identified

easily. Others are black not transparent to see the content. The types used by the practitioners are fabricated locally.



Plate 5. Polythene sacks for THM

3.15.1.3 Plastics

Varieties of shape, types and sizes of plastic containers were identified. Each of the types, shapes identified has a specific purpose and function. Due to the technological advancement, most of the types identified were locally fabricated and they are transparent in nature.



Plate 6. Plastics bottles for THM

3.15.1.4 Glass bottles

Through observations made, glass bottles were also one of the common packaging materials used by practitioners to secure Traditional Herbal Medicine products. The types

observed are locally manufactured and re-usable. Few of the bottles were virgin or fresh bottles. The bottles are prevalent in the packaging of liquid products.



Plate 7. Glass bottles for THM

3.15.1.5 Baskets

Basket is also another packaging container which has its source from nature and has long been used before the invention of the modern ones. They are in sizes and types; each has the ability of re-use, for measurement, containing and protection. The baskets observed were made from rushes, twigs, back of palm branches etc. The contemporary baskets observed involve the use of natural, pliable materials like cane, raffia, palm rachis and bamboo. It is interesting to note that in addition to the natural materials, other baskets have involved the use of synthetic cords and bars or poles instead of sticks.



Plate 8. Baskets for packing THM

3.15.1.6 Raffia

Raffia is a kind of fibre obtains from leaves of the raffia palm tree. The practitioners use the raffia for tying or binding the tree backs, stitching those in the sack. The leaves can be prepared by cutting the young leaves and carefully removing the thin threads, split the rest of the leaves with needle into strips for weaving. The branches, fronds or rachis are useful for basket, construction of furniture. The pith is used for construction of toys, cages leaves and fibres for stitching of beads, knotting, tying into bags, mats etc.



Plate 9. Raffia thread for binding THM

3.15.1.7 Indigenous ceramic Pottery

Pots are purely indigenous container which has served in various capacities. In the Ghanaian environment or society pots are used to express ideas and beliefs of the people which are not different from traditional herbal medicine practitioners. Ghanaian pottery works are made in several shapes and sizes. They include semi-spherical, wider semispherical, narrowed semi-spherical, oval shape but the type widely used by practitioners of traditional herbal medicine was spherical shape. Through observation the researcher identified a large use of circular or spherical shape pottery for the storing of medicine.

The main material for the production of pots is clay which has been well fired and turns black or brown.



Plate10. Ceramic pots for boiling and storing THM

3.15.1.8 Calabash/Gourd

It is an old world climbing plant with hard-shelled bottle-shaped gourds as fruits. They come in different sizes, shape and forms.



Plate11. Calabash pots for storing THM

3.15.2 Research Question Two

What are the sources of the packaging materials, their usual conditions, and how they are treated before they are used?

The objective of the study is to identify the various sources of the existing packaging materials as well as their conditions before they are used and how they are treated before used in packaging the Traditional Herbal Medicine in Ghanaian market, Kumasi railway

station a case study. Through interviews and observation, the researcher identified these packaging materials, their conditions before used and how they are treated.

3.15.2.1 Plastics

They perform efficiently as a container, very good in measuring the products. The plastic also has the ability to protect and preserve the content but has not exhibited maximum performance in protecting and preserving the content from heat. Because plastics are termed as a good conductor of heat, it easily absorbs heat from the sun potentially releasing some chemicals from the plastics to the medicine which affect the potency of the medicine. It is an industrial product manufactured in Ghana by companies like Marssily Ghana Limited in Tema and many more. Plastic containers are either obtained newly from shops or as second hand from scavengers who wash the containers with detergents and/or sand before selling them.

3.15.2.1 Glass Bottle

The glass bottles observed at the practitioners' end were obtained from second-hand dealers for re-use. Through its handling most of the bottles have their corks broken or cracked. With some too, the closure device mostly does not firmly fit the glass therefore allowing external air to be tracked inside the bottle. The second hand dealers sometimes use bleach to clean them to make the bottles more transparent.

3.15.2.2 Paper (Brown Paper)

The brown paper identified was really doing well in the Ghanaian market in terms of containment in carrying as compared to protection and preservation. The paper does not do well in water. Another greatest performance exhibited on the use of paper is measurement and communicating as well as shelf decoration. The papers identified were those which had already been used in packaging Portland cement.

3.15.2.3 Polythene Sachets

The usage of polythene sachets was in high ascendency meaning they were commonly found in the market. It has the highest ability to carry and contain the product but has the lesser advantage of preserving, protecting as well as motivating a class or a group of people to patronize the product. They are mostly obtained from shops and had not been previously used to package any product.

3.15.2.4 Raffia

Raffia fibres have many uses, especially in the area of textiles and in construction not ignoring the area of packaging. It is locally used in the herbal practitioner's environments as garden tie or as a natural string for tying the medicines together. Their lightweight is an advantage in handling and transport.

Practitioners prefer the use of raffia because it is flexible, durable, pliable enough, cheap, readily available, and resistant to tearing and easy for packaging medicines. It can be used in place of grass and so many other packaging materials, the disadvantage here is it exposes the products to various environmental hazards.

3.15.2.5 Basketry

Basically baskets are produce from materials which are subject to decay, the surety of its lasting long is unknown. It is relatively easy to make, low in cost, and it can be used to store the traditional herbal medicine. Although different human cultures have a tradition of basketry, the practitioner of traditional herbal medicine uses it as a package. Because the materials used to make the framework are larger and stronger than the material woven around them, it makes the basket heavy. The end result of the basket offers good stacking characteristics, carrying and handling, protect product from coming together or crushing but offers little in protection and preservation.

3.15.2.6 Indigenous ceramic Pottery

Clay pots are widely better for storage of liquids and solid substances including Traditional Herbal Medicine. Their heavyweight is a disadvantage in handling and transport although would survive better against its modern competitors in the preservation of medicine, but for its weight and fragility, can easily break. Large number of pots observed were unglazed vessels making it more porous but highly suitable for medicines that need cooling. Being not glaze does render it lightproof, cannot restrict the entry and growth of micro-organisms, insects and rodents.

3.15.2.7 Gourd /Calabash

Practitioners obtained the fruits from a gourd plant which is basically found in the tropical regions. It has a thick shell which is used as a container and also prevents permeation of liquids. The food in the fruit is scrapped off leaving the empty shell to dry to obtain a natural brown colour. When the gourd is split in parts, each half is called a calabash. The gourd is for storage of the medicine whereas the calabash is used to take the drug.

3.15.3 Research Question three

How can locally available materials be used to design and produce packages for selected traditional herbal medicines?

3.15.3.1 Design and Production Stages

The design and production of the selected Traditional Herbal Medicine packaging started by producing series of preliminary designs for each of the locally available materials. Four designs from each of the materials were selected for further development and production. The sketches were chosen and with the aid of CorelDraw®, Rhinoceros®, key shot v4 software and Photoshop the packages were designed from two dimensional to three dimensional.

3.15.3.2 Identified Variables for Determining Production

Four products were selected from the preliminary stages, developed and produced based on the variables. As states in chapter two that, physical design has the capability to create images that appeal to the customer's feelings, graphic design or the surface graphics and materials for packaging also has an even better prospect to encourage the purchase of a product through the use of the illustrations as well as maintaining the potency of the medicine.

The general function of a package was also a pertinent issue before designing and production. The finished packaging was finally accessed at the laboratory to ensure its safety usage.

- i. **Functionality:** The containers function as protection, preservation, promotion, easy handling and holds the contents (Prekese powder, Nyinya dried leaves and nkotobena).
- ii. **Accessibility:** The container is made in such a way that users can have easy access to the product in the container. The principles of accessibility according to Lindwell et al (2003), designs of a package should be useful to the target users who are of varied capacities without special disparity. In summary, the design of a package should be useful to all potential users.
- iii. **Easy identification:** Product on shelves are easily identified by the uniqueness of the shape and size of its container. Thus, packaging is said to be a silent salesman.
- iv. **Colour:** Colour as an element of design has the ability of creating visual interest and aesthetic as well as reinforce the organization and giving meanings to the elements. If colour is not properly fused can harm both the functions and forms of

the package designed. As a result, Colour choices were determined by the natural state of the products. Green was prominent for the Nyinya leaves, Shades of brown for the Prekese powder and the Nkutobena. Also, white was used to indicate purity of the products.

- v. **Typography:** from the writings typography is the study of how letterforms are used to create positive effects on the package, from bold to well-designed, to inform the final consumer on the content. The name of the product will be clearly written on the pack
- vi. **Materials:** With respect to materials used, three natural/locally materials were selected. These were Bamboo, Clay and Paper. Efforts was made to reduce environmental impact on the packaging materials so the various principles considered were the ‘R’ in sustainability (Reuse, Reduce, Recycle and Replace)
- vii. **Illustration:** The literature proves that, illustrations or the designs on the package can be used to satisfy or change the emotional needs of the consumer so pictures were embossed on their respective containers, especially on the paper.
- viii. **Aesthetic:** In most instances, consumers perceive more aesthetic designs to be easier to use than less aesthetic designs even though this perception might not be the case. By this, less aesthetic designs may not have the needed acceptance in the market causing the product to die out, stifling creative thinking. The researcher therefore chose materials that produced interesting result and proper finishing techniques were also employed.
- ix. **Cost benefit:** According to Lindwell et al (2003), the principle of cost benefit analysis is mainly used to assess the monetary returns associated with new features

and elements. The design becomes a failure if the cost associated with the design exceeds the benefits. The choice of the three materials for the pack was based on its less cost effectiveness. They are not difficult to come by. Bamboo is widely grown, clay is an earthly material seen in most places, and paper is one of the most common graphic design material.

- x. **Development cycle:** Lindwell et al (2003) stated that they are four stages of creation for all products; Requirements, Design, Development and Testing. Product creation requires a sequential progression through these basic stages of creation.

Through observation and interaction with the target audience, the researcher gathered design requirements and through series of designs, brainstorming and prototyping were done at the development stage to reach optimal design. For the researcher to improve on quality the packs were tested both scientifically and unscientifically.



3.15.3.3 Designing of Packages

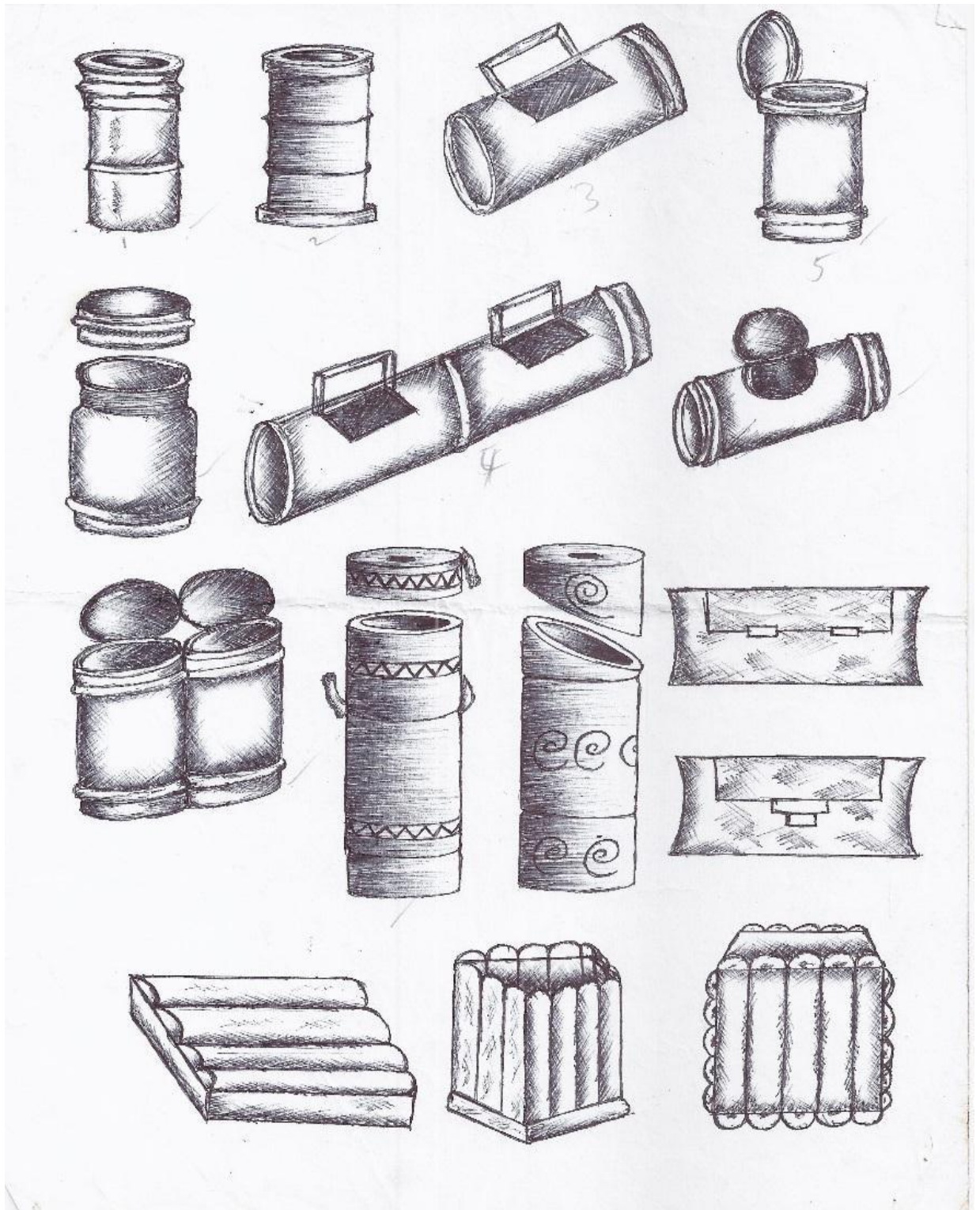


Plate 12. Preliminary sketches of bamboo with freehand

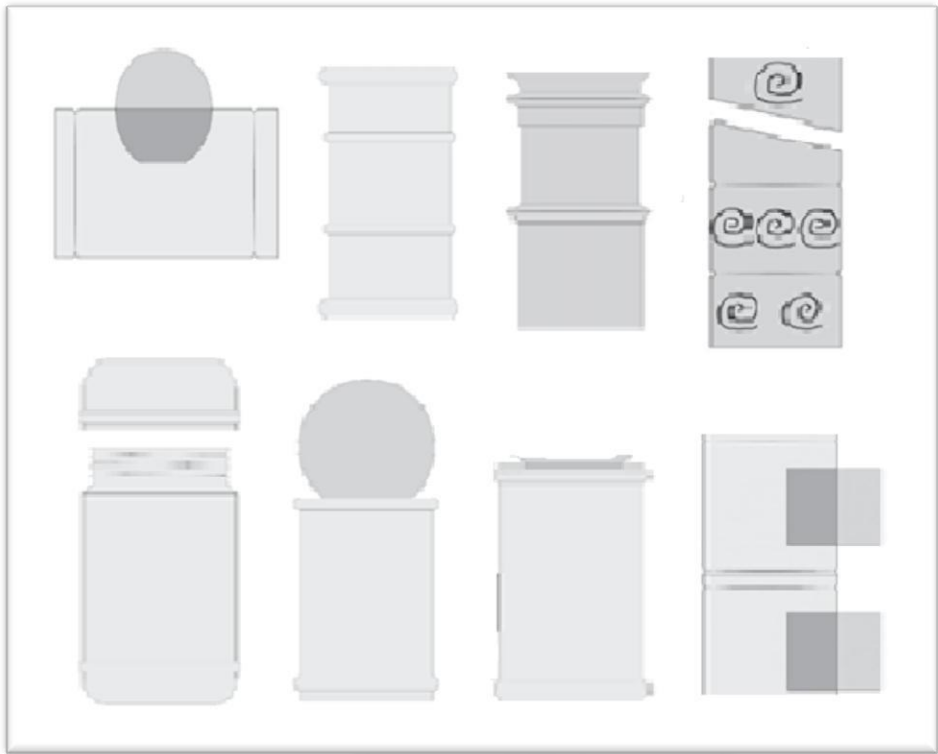


Plate 12.1 Packages in Corel Draw



Plate 12.2 Bamboo Packages in Rhinoceros® and key shot v4 software was use



Plate 13. Preliminary sketches of clay with freehand

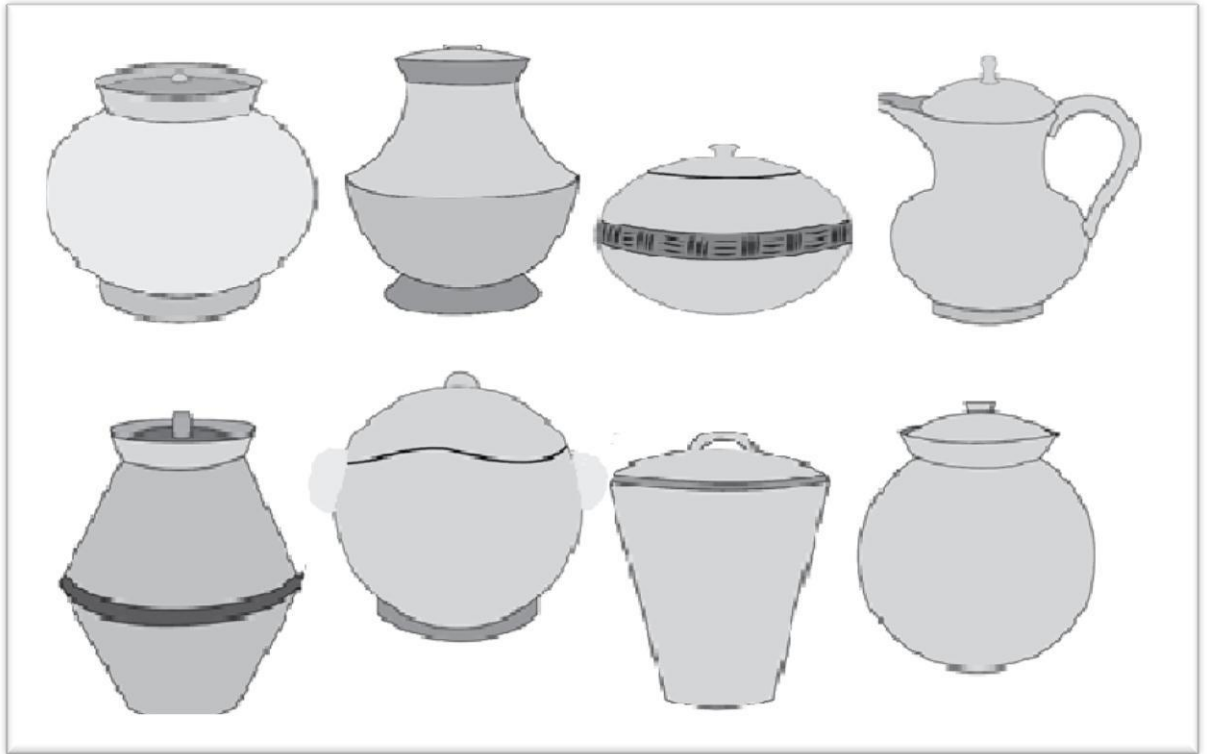


Plate13.1 Ceramic pot in corel Draw



Plate 13.2 Ceramic pots in Rhinoceros® and key shot v4 software was use

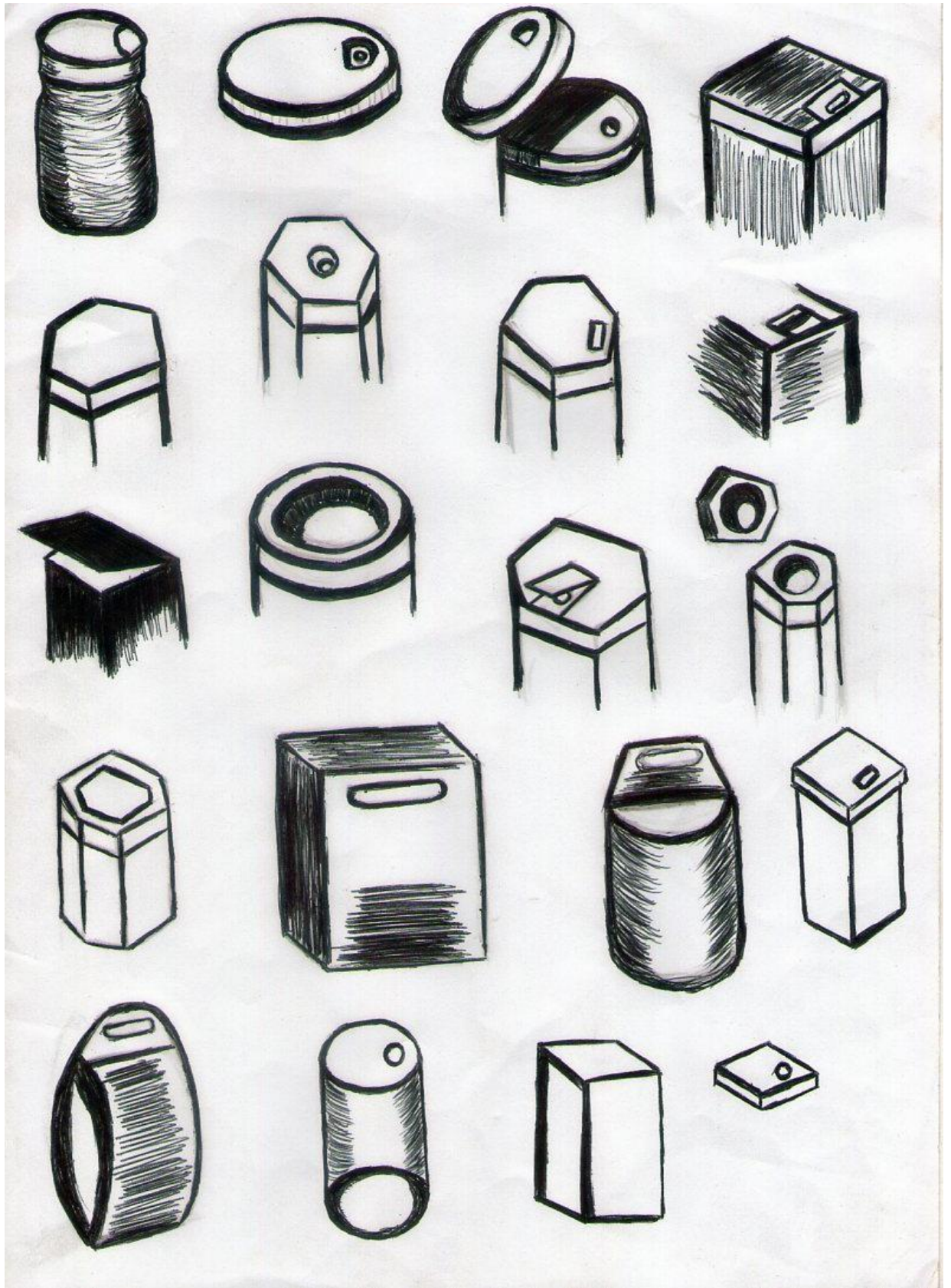


Plate 14. Preliminary sketches of paper with freehand

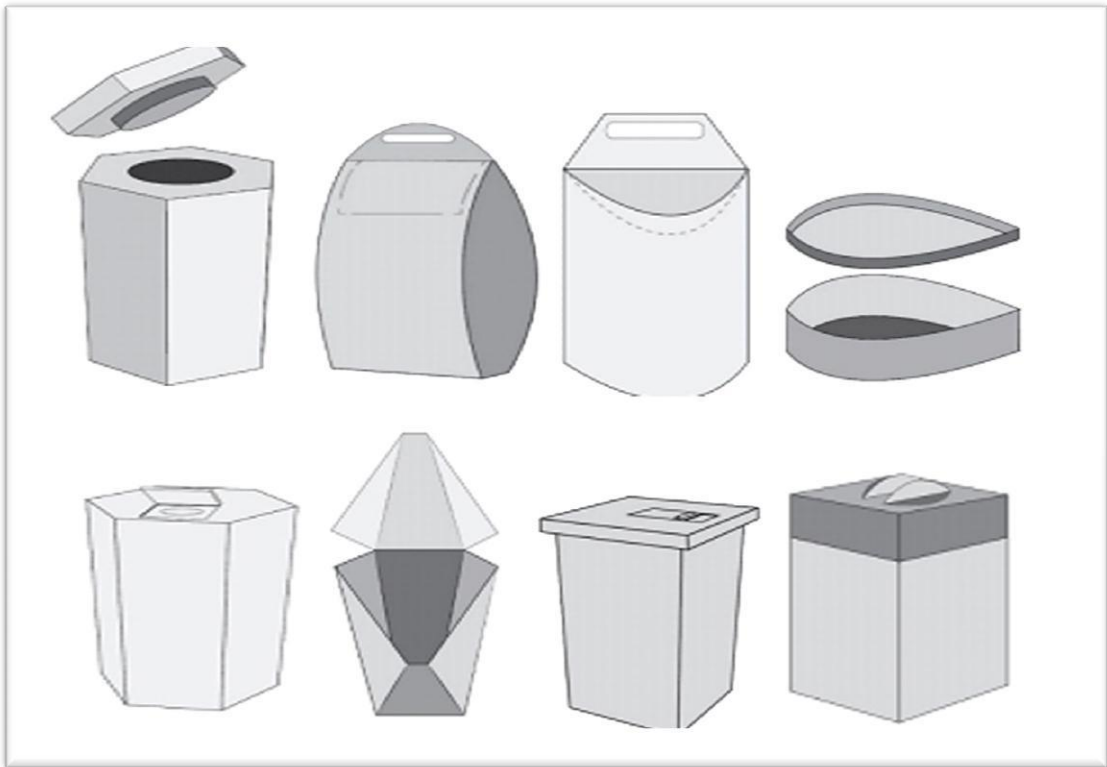


Plate14.1 Paper building products in coral Draw



Plate14.2 Paper Packages in Rhinoceros® and key shot v4 software was use

3.16 Production Process

Project 1. Bamboo production processes

Step 1. After harvesting the raw product, allowed it to dry up, cut into sizes

Step 2. Lath the bamboo by using lathing machine. This process is to give the bamboo shape and to expose the tissue for preservation.

Step 3. Through biological preservation boiled the bamboo in water and salt to make it unattractive to pesticide

Step 4. Dry for about six weeks to ensure its strength, stability and to prevent decay.

Step 5. Create openings and sand them with the various emery papers ranging from 150, 220, 320, and 400

Step 6. Apply sanding sealer; allowed it to dry after which emery paper with grade 600 was used again to smoothen the product. Repeat this process three times. For the third time emery paper with grade 1200 was used

Step 7. Metal Plate was done for all the names of the product

Step 8. The names of the various products were written on the four containers with acrylic paint and were finally polished with wax.



Plate 15. Tools and materials for bamboo lathing



Plate 16. Cutting bamboo for lathing



Plate 17. Bamboo ready for lathing



Plate 18. Lathing process



Plate 19. Sanding in lathing



Plate 20. Preservation process



Plate 21. Bamboo products ready for sanding



Plate 22. Creating and shaping openings for the containers



Plate 23. Sanding processes



Plate 24. Application of sanding sealer



Plate 25. Embossing names on the packages

Project 2: Ceramic pots production process

Step 1. Roll the clay and pressed into a ball form

Step 2. Weigh the ball clay with a scale

Step 3. Kneaded to remove air bubbles and foreign materials from it

Step 4. Centre clay on the potter's wheel for throwing. Canter is done to ensure stability and to prevent warbling

Step 5. With the help of the thumb pull and regulate the clay to the desirable shape.

Step 6. Allow the container to dry into leather hard state for easy turning or

Step 7. Trim to the desirable shape, size of forms in order to transform a weighty earth bound pot into one that is pleasurable to observe, to hold and use.

Step 8. The shape in the round was thrown in two halves

Step 9. Scooped both surfaces and apply clay slip on the surfaces for easy joining. This process is done at the leather hard state.

Step 10. Still at the leather hard state small and big holes were created on top of the bowls for easy access of the medicine.

Step 11. Allow it to dry into bone dry state before firing is done.



Plate 27. Tools and materials for throwing



Plate 28. Scaling of ball clay for throwing



Plate 29. Kneading of ball clay



Plate 30. Centering ball clay



Plate 31. Pulling clay to desirable shape



Plate 32. Throwing of lid



Plate 33. Turning lid



Plate 34. Turning halves of the round bowl



Plate 35. Joined halves going through turning



Plate 36. Clay products after firing

Project 3. Paper production process

Step1. Coral draw and photoshop softwear was used to design the pattern

Step2. The necessary measurement were given to the various containers

Step3. They were printed out

Step 4. The patterns were cut out after which it was folded/moulded according to the designed pattern with the aid of white glue

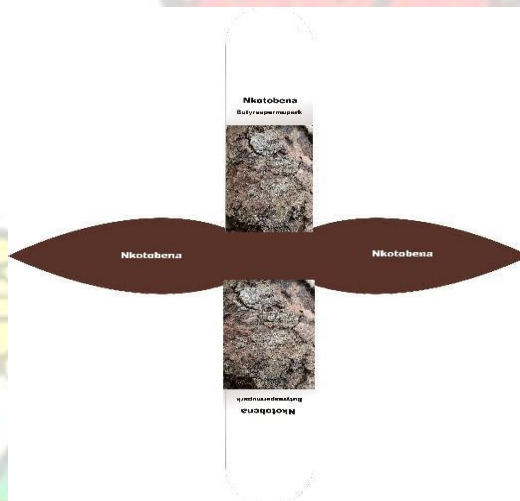


Plate 37. Pack for nktobena

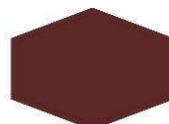
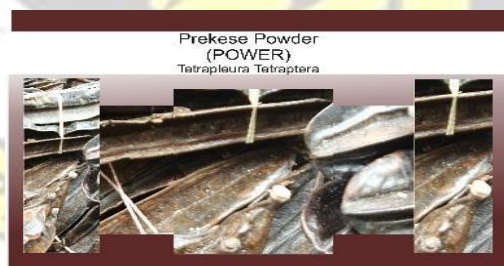


Plate 38. Pack for prekese powder



Plate 39. Pack for nyinya leaves



Plate 40. Pack for prekese powder



Plate 41. Tools and materials



Plate 42. Measuring from the printed pattern



Plate 43. Cutting out from pattern



Plate 44. Cutting strawboard for moulding



Plate 45. Gluing strawboard to cardboard



Plate 46. Moulding packages



Plate 47. Creating hole for handle

3.16.1 Laboratory Assessment on the samples

To assess whether the samples will do well in the pack, laboratory test was run on the samples and kept in the container for three month after which another laboratory test was run to assess whether there was a break down in compounds.

Step 1. The dried samples were pounded and sieved to get it fine

Step 2. The powdered dried samples were macerated with 20ml of chloroform

Step 3. The extracts were shaken at five minutes intervals for 2hours

Step 4. The extracts were then filtered with petri dish

Step 5. The extract was then spotted on TLC plate and run in a solvent system of 9:1 petroleum ether: ethyl acetate. The mobile phase was run in Chroma tank

Step 6. The plate was put in UVGL fluorescent machine to identify compounds

Step 7. 10% of Sulphuric Acid in methanol was prepared and sprayed on the plate with spraying gun

Step 8. After which several separate compounds were retrieved.



Plate 48. Pounding and sieving of samples



Plate 49. Masuration of the powdered samples

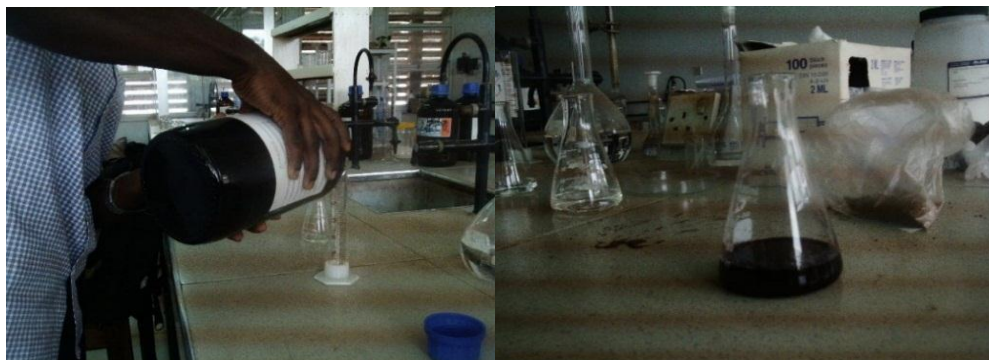


Plate 50. Samples in 20ml of chloroform



Plate 51. Three samples at the shaking position



Plate 52. Extracts filtered with petri dish



Plate 53. Spotting on the TLC plate

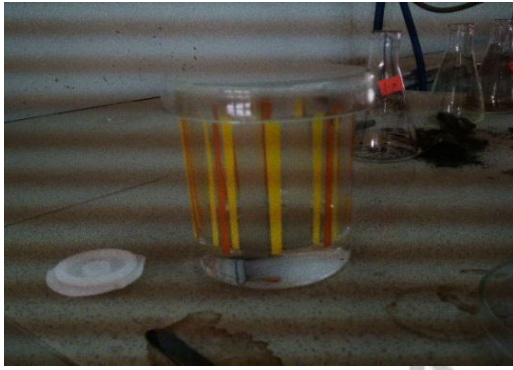


Plate 54. Chroma tank for mobile phase

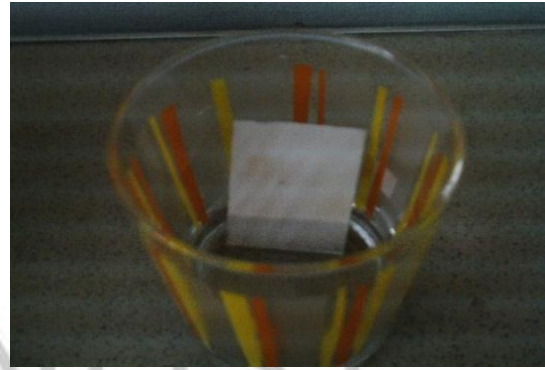


Plate 55. Plate in Chroma tank



Plate 56. UVGL machine

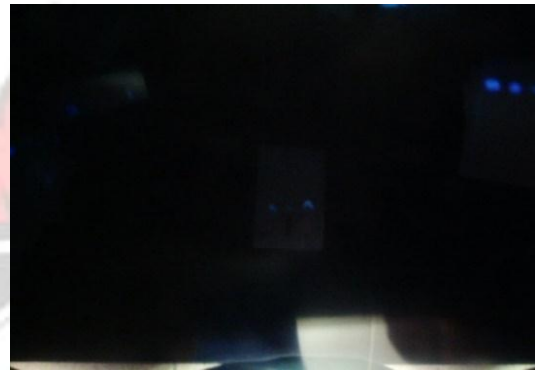


Plate 57. Compounds identified in the UVGL

CHAPTER FOUR RESULTS AND DISCUSSION OF FINDINGS

4.1 Overview

This chapter covers the analysis and interpretation of the data collected from the field on the benefits and challenges of the significance of packaging in the presentation of traditional herbal medicine. Data was collected in three main categories from the country; that of the practitioners, professionals and consumer. The data covered variables such materials used in packaging the product, the sources of the packaging materials and the functionality of the packaging. The respondents' views and other data were tallied and presented in a number of tables.

4.2 Discussion of Results for Research Question One

What are the various existing packaging material used in securing the Traditional Herbal Medicine in the Ghanaian market?

RESPONSES FROM PRACTITIONERS

Table 1. What do you use in packaging the product for the consumer?

ITEMS		Frequency	Percent
	Plastics	28	28.0
	Paper	9	9.0
	Glasses	4	4.0
	Polythene	20	20.0
	Baskets	10	10.0
	Raffia	18	18.0
	Ceramic pot	6	6.0
	Calabash/gourd	5	5.0
Total		100	100.0

Source: Field Data, 2015

The objective of the study is to identify the various existing packaging materials used in packaging Traditional Herbal Medicine in the Ghanaian market. Through interviews and observation, the researcher identified these materials used in securing the raw herbal materials.

From Table 1, 20 sellers use plastic for packaging representing 20%. Varieties of shape, types and sizes of plastic containers were identified. Due to the technological advancement, most of the types identified were locally fabricated and they are transparent in nature. Paper also recorded 9% constituting 9 sellers. The commonly used paper is what they called ‘cement paper’. 4 sellers representing 4% of sellers use glass bottles through observations made. The bottles are prevalent in the packaging of liquid products.

28 sellers representing 28% use Polythene in their packaging, the polythene used as wrapper was found to be the most common ones identified in the market. They are converted into sachet to carry the Traditional Herbal Medicine instead of the use of paper. Basket record 10 seller’s representing 10%. 18 sellers representing 18% use raffia. It is

used as thread to bind the medicines. Indigenous ceramic pot also recorded 6 sellers constituting 6%. Formally it was commonly used but due to production challenges practitioners have reduce its use. 5 sellers representing 5% make use of calabash.

The study placed polythene at a highest pedestal which after keeping it under the sun for longer period affects the potency of the medicine. The researcher saw the need to eliminate or design and replace polythene using any locally available material that will help maintain both the efficacy and the potency of the medicine.

4.3 Discussions of Result for Research Question Two

What are the sources of the packaging materials, their usual conditions and how they are treated before they are used?

RESPONSES FROM PRACTITIONERS

Table 2. Where do you get the containers for your packaging from?

Item	Frequency	Percent
Scavengers	59	59.0
Shops	41	41.0
Total	100	100.0

Source: Field Data, 2015

From the above, 59 respondent representing 59.0% had their container from scavengers, thus people who move from place to place including dumpsite looking for used containers to sell. These containers are cleaned with detergents and water. Very dirty ones are washed with bleach and/or gravels. 41 respondents representing 41.0% also had their container from shop. These are dealers who sell new containers directly from factory. Patrons of these new containers rinse the product with clean water before using them for packaging.

4.4 Discussion of Result for Research Question Three

How would packaging materials for the selected Traditional Herbal Medicine be designed and produced by the use of locally available materials?

4.4.1 Design and Production Stages

As specified by Calver 2007, usefulness, the part of packaging configuration has transitioned into an essential instrument utilized by associations to "make its vicinity felt in a group, and offer items at the purpose of procurement".

Elliot Young as referred to by Emmanuel Kwadwo Saka, most buys depend on drive or experience. He further said that 81% of in store buys are because of motivation purchasing (Young, 1990). In America a normal shopping for food trek takes 41 minutes (Goodman, 2007). A greater part of the choice making in purchasing item is the outline that gets the purchaser's attention. According to David and Stephen (2008) design indeed means to plan, to organize. In planning one is aimed at achieving a purpose.

4.4.2 Identified Variables for Determining Production

- i. **Functionality:** The general appearance of the package designed and the products itself ensured protection, preservation, promotion, easy handling, attract consumers, and holds the contents, (Prekese powder, Nyinya dried leaves and nkotobena).
- ii. **Accessibility:** The powder could be poured through carefully made openings since it serves as both spices and medicine. The dried leaves and tree bark pack had relatively bigger whole to allow easy exit.
- iii. **Easy identification:** Bamboo material was used to manufacture a package based on its uniqueness and its ability to hold content through all conditions. The ceramic product could easily be identified by their unique oval shape and size. Although paper package is common, this stands out due to the way it has been moulded,

especially that of pentagonal shape, the bag and those that have special openings at the top.

- iv. **Colour:** All the colours employed contribute to the brightness of the pack. The choices of colours were determined by the natural state of the products. Green colour was conspicuous for the Nyinya leaves container because, naturally, leaves are green, Shades of brown for the Prekese powder and the Nkotobena. Also, white colour shows in all the containers to indicate purity of the products.
- v. **Typography:** The information on the package was legible so reading was very easy. The scientific names of the products were clearly visible and readable. Also, the choice of font colour did not conflict with the background colour of the package. Black and white colours were used in writing the names on the product.
- vi. **Materials:** With regard to materials used, three natural materials were selected. These were Bamboo, Clay and Paper. One of the bamboo containers for packaging powder had plastic used as the primary container while bamboo serves as the secondary container. All the containers were very well treated and tightly sealed. With respect to clay, high grade clay was used for the pot and well fired by a professional and quality paper (straw board and cardboard) also moulded by the researcher. Because any food or medicinal packaging that is not recycled or properly disposed of is likely to end up as litter, the researcher saw the need to adopt materials and designs that can be reused, recycled, replaced and reduced in order to obey the principles of sustainability. According to EPA (2012), to alleviate bacteria contamination, the choice of material for packaging is very essential. All the materials the researcher selected provide recovery for recycling. The clay and bamboo also create room for refilling while the bamboo pack labelled 50 can be

- used as purse and the other ones can serve in the kitchen as salt containers and cutlery set holders.
- vii. **Illustration:** Pictures of the herbal products were designed on their respective containers, especially on the paper. Prekese can be seen on their containers, Nyinya leaves and Nkotobena all on their containers for easy identification and surety of the products. Consumers were able to identify the container by the illustrations.
- viii. **Aesthetic:** To ensure aesthetic qualities in all the materials used for the production, the researcher chose fine clay which was glossy in nature after firing. The paper too has similar quality. The colours were nicely combined while saturated colours were employed to attract attention, create excitement and dynamics.
- ix. **Cost benefits:** Raw bamboo everywhere, has low patronage because in this area of our world, attention has not been drawn to its usage. Clay, not to talk about appears by itself and wherever it is located cannot be sold because nobody owns it. Paper is a cheap commodity base on what you will opt for. The researcher, to reduce cost want low cost effective one but equally durable and produces nice effect.
- x. **Development cycle:** Through observation, interview and questionnaire administered the feedback based on the design requirements of the target group was factored into designing of the product. The consumers expected containers that will not expose the content, free from sun, rodent and many others. The containers, therefore, has the ability to contain, promote, protect, preserve and inform. To assess the potency or whether the samples will do well in the containers, the researcher went further to do Thin Layer Chromatography (TLC) test in the laboratory. The results proved that there will not be any breakdown in compounds when the pack is used for packaging the samples.

RESPONSES FROM PROFESSIONALS

Table 3: Level of packaging satisfaction

Item	VS	%	S	%	QS	%	NT	%
CONTAINMENT	0	(0.0)	0	(0.0)	3	(60.0)	2	(40.0)
PRESERVATION	0	(0.0)	0	(0.0)	3	(60.0)	2	(40.0)
PROMOTING								
CONSUMER CHOICE	0	(0.0)	1	(20.0)	2	(40.0)	2	(40.0)
INFORMATION	0	(0.0)	0	(0.0)	1	(20.0)	4	(80.0)
PROTECTION	0	(0.0)	1	(20.0)	1	(20.0)	3	(60.0)

Source: Field Data, 2015

In Table 3 above, the variables for satisfaction were assessed on the following: VS – Very Satisfied, S– Satisfied, and QS – Quite Satisfied, NT – Not Satisfied.

The data presented in Table 4 examined respondents' satisfaction of packaging presentation on THM. These respondents represented highly skilled professionals in the THM or academicians.

Containment: With regard to the containment variable, 60% of respondents were quite satisfied with the kind of containers used to package the product while 40% are not satisfied. This indicated that no respondent was very satisfied or even satisfied with containment.

Preservation: this variable dealt with how the products were kept safely for human consumption. This also proved that 60% respondents were quite satisfied and the rest, 40%, were not satisfied. No respondent was either very satisfied or satisfied. This indicates that the professionals do not like how the THM is preserved.

With respect to the package promoting consumer choice, 20% respondents were satisfied, 40.0% were quite satisfied and 40% Not Satisfied with promoting consumer choice of THM.

Information: This indicated whether the package bears the name of the raw product in the market. 80.0% respondents were not satisfied and only 20.0% respondents were quite satisfied. Meaning, most of the THM product on the market do not have labels bearing the products name.

Protection: This variable also indicates if the already packaging material is able to protect the content from atmospheric conditions that affect the medicines negatively and environmental conditions that welcome rodent, pathogens, insect and many others that make the medicine go bad. The data above shows 60.0% respondents not satisfied and 20.0% respondents quite satisfied while 20.0% respondents were also satisfied. This implies, most of the THM products on the market are not well protected, meaning they are not saved.

In summary, it is clear that respondents stated that they are not satisfied with the containment, preservation, promoting consumer choice, information and protection on THM. Their response also conclude that most THM products are shabbily prepared with respect to packaging and professionals do not take into consideration the interest of the consumer and this accounted for the reasons why more customers reject products on the account of poor packaging.

RESPONSES FROM CONSUMERS

Table 4: Customers satisfaction on packaging of THM

Item	0	%	1	%	2	%	3	%	4	%	5	%
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The container looks hygienic	13	26	16	32	7	14	7	14	4	8.0	3	6.0
The sealing of the package cannot be contaminated	12	24	16	32	12	24	5	10	5	10	0	0
The product was well handle before purchased	8	16	18	36	15	30	5	10	3	6	1	2
Product looked clean before I purchased	16	32	18	36	6	12	0	0	0	0	0	0
Information on the usage of the THM is adequate	8	16	15	30	13	26	12	24	2	4	0	0
The product appears attractive	3	6	28	56	13	26	3	6	2	4	1	2
I would prefer improved package	1	2	1	2	5	10	17	34	21	42	5	10

Source: Field Data, 2015

Table 9 Key

5– Strongly agree, 4 – Agree, 3–quite certain 2- uncertain 1– disagree, 0 – Strongly disagree

The data presented in Table 7 examined how packaging materials for the selected Traditional Herbal Medicine be designed. The container look hygienic was strongly disagreed, by 13 (26%) and disagreed 16 (32.0%) respondents respectively. On the sealing of the package cannot be contaminated 12 (24.0%) respondents strongly disagreed while 16 (32.0%) agreed, Only 5(10.0%) was uncertain. This indicates that the sealing of the package can be easily been contaminated. Similarly 8 (16.0%) and 18 (36.0%) respondents

strongly disagreed and disagreed respectively that the product was well handle before purchased. Product looked clean before I purchased had 16(32%) and 18(36.0%) respondents disagree and strongly disagree respectively. Information on the TMH is adequate had 8(16.0%) and 15(30%) respondents disagree and strongly disagree respectively. Similarly 3 (6.0%) and 28 (36.0%) respondents strongly disagreed and disagreed respectively that the product appears attractive.

In summary, the respondents response clearly that packaging in the presentation of traditional herbal medicine have great influence in buying and selling on the herbal medicine, therefore the need of a package that will satisfy consumer desire and serve the function of a proper package. The researcher base on the answers given by the respondent examined materials like paper, bamboo and clay to design a suitable package based on the variables discussed.

4.5 Results of Laboratory Assessment on samples

Per the TLC run there was no significant difference between the freshly stored product and the second test after three months. TLC gives the state of the compound. The result shows that the packaging material used for the pack is suitable and appropriate for the samples.

FINISHED PACKAGING PRODUCTS



Plate 58. Bamboo packs for prekesse powder (power)



Plate 59. Pack for nyunya dry leaves



Plate 60. Pack for nkotobena

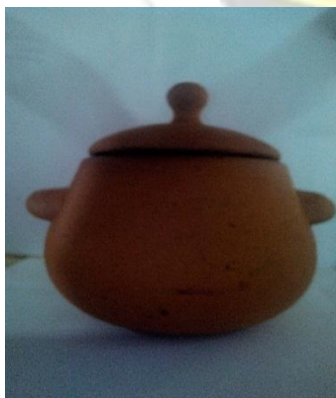


Plate 61. Bowl for cooking herbs



Plate 62. Bowls for storing dry herbs



Plate 63. Packs for prekese powder (power)



Plate 64. Pack for nkotobena



Plate 65. Pack for nyinya dry leaves

CHAPTER FIVE SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Overview

This chapter finally presents the summary of the research conducted, the conclusions drawn and recommendations from the findings of the study.

5.2 Summary

The application of herbs and other parts of medicinal plants for the cure of various types of diseases is widely accepted world over as an alternative to orthodox medicine. The WHO estimates that 4 billion people (about 80% of world population) use Herbal Medicines for some kind of primary healthcare. The WHO established a policy on

traditional medicines between the period 2002-2005 and as part of the major objectives was to promote efficacy, safety and quality of Traditional Medicine. The safety and efficacy of herbal medicine can be as a result of proper packaging of THM.

Ghana is richly endowed with different varieties of medicinal plants which is also patronized by most people. This gold mine is not gaining ground in the Ghanaian market owing to how the products are presented to the potential patrons- packaging.

The writing demonstrates that packaging is unique amongst the most vital elements impacting consumer choices made at the purpose of offer, and is a vital part in the offering procedure (Pinya and Mark (2004) cited Prendergast and Pitt (1996). It obviously impacts purchaser purchasing practices furthermore serves as a decent advertising methodology (Ganelle, 2014). Unfortunately, contemporary materials have been used mostly in the production of packages for Traditional Herbal Medicine neglecting the local materials. The researcher after a critical observation and interview through questionnaire, concluded on the role or the significance of packaging in the presentation of THM. Meanwhile some practitioners are oblivious of this fact; hence, they are not ensuring good packaging practices. For this reason the researcher adopted the following objectives to assist coming up with a solution.

- i. To identify the existing packaging materials used in packaging traditional herbal medicine in the market
- ii. To identify the sources of the packaging materials, their usual condition before they are used and how they are treated before they are used for packaging
- iii. To design and produce packages convenient for selected traditional herbal medicines on the market using available local materials

To achieve the set objectives, the researcher reviewed literature based on the topic, interviewed 155 respondent made up of consumers, practitioners and professionals. The

case study and descriptive method of research were employed to arrive at the proposed project.

5.3 Conclusion

As much as THM provides alternative to the orthodox medicine to improve the health conditions of people, it can be potentially dangerous to its user due to how it is handled before getting to the user. The products are not properly packaged, exposing the product to atmospheric contaminations and unfavourable weather conditions. Those who attend a form of packaging also use potentially dangerous materials. Such materials include recycled polythenes, used bottles, used cement papers etc.

Plastics were found to be widely used for packaging THM. However, the research found it not safe since the product in the containers are left at the mercies of sunlight for very long time. The plastics emit dangerous chemicals to contaminate the medicine.

The research revealed that nature-based packaging materials from bamboo, clay and paper are good for preservation, protection, containment, promotion and handling of THMs.

The preservation techniques of bamboo do not have any negative effect on the medicine as compared to the plastics. It can withhold moisture and is resistant to water.

Fired clay is resistant to water and also keeps the medicine in its right temperature.

The paper also keeps the medicine in its natural state. It is easy to be handled and manipulated.

5.4 Recommendations

It was revealed that very little attention has been given to the packaging of THMs in Ghana. This has rendered a huge potential market very dormant. It is recommended that the

Institute of Packaging Ghana be empowered to educate dealers of THM on the best practices of packaging.

Secondly, handlers are to be trained on patronizing packages which are made from indigenous local materials. These materials are relatively less costly, making the medicine very affordable to increase patronage.

There is insufficient knowledge about the existence of laws on packaging among the general public. It is the responsibility of FDA, GSA, and CSRIPM to publish the existing laws on packaging and educate their members on what the law entails and why they as dealers must ensure that the packaging designers obey the basic functions of packaging.

Good packaging with local materials can attract foreign market since the packaging materials are natural and would be different from what already exists

Practitioner of THM can employ professional from integrated rural art and industry to design and produce the packages using locally materials.

The consumers also have the responsibility of ensuring that any product they buy has its real identity illustrated on the packs if not samples of product placed on the pack for surety and consumers' confidence.

The general design of the pack should be underpinned with functionalities of packaging (protect, preserve, promote, contain and handle).

With respect to the surface graphics, the colours selected should strongly be associated with the product to package. The number of colours should also be reduced to not more than three if possible. The pictures or the illustrations on the package should present a true and honest picture of the content and should be understandable.

The shape of the pack should provide convenience in handling, easy for refilling and the ability to stand or with low support.

The choice of packaging material should be planned along the principles of the '3R' in sustainability (reduce, replace, reuse and recycle).

The typography on the pack should be clearly visible, easy to read, understandable and a sense of easy attraction. At least the product name should not be omitted from the pack.

Special attention should be taken at the storage areas. The place should be well organized and tidy since there is a risk of contamination. An effective measure should be observe to reduce the spread of animals like rodents, insects, pest attacking the materials. According to WHO (2002-2005 and 2007) The raw herbal materials should be kept in a very dry area free from moisture and the sun and also stored at a cool place between 8-25 degree Celsius by GMP. After a day's work it should be covered well.

Because the origin of the Traditional Herbal Medicine materials may contain microbiological contaminants, further research can be conducted on ensuring hygiene from the point of harvesting and drying processing, so that the products cannot be prone to microbiological contaminations. Furthermore, to additionally keep away from changes and decrease contamination when all is said in done, following an abnormal state of sanitation and cleanliness amid development, transportation and production is vital.

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APPENDICES

APPENDIX A

QUESTIONNAIRE TO BE ANSWERED BY SELLERS OF TRADITIONAL HERBAL MEDICINE

Do you package the product for sale? A. Yes B. No

1. If yes, what do you use in packaging the product for the consumer? A.

Plastics B. Cans C. Glasses D. Paper E. Others.....

2. Where do you get the containers for your packaging from?

A. Scavengers B. shops

3. In what condition(s) are the containers in before you use them?

A. Clean B. Semi Clean C. Dirty

4. How do you treat them before packaging? A. Water

B. Detergent. C. Sterilization

5. Do you find your package attractive to users? A.

Yes B. No C. Somehow

6. Do you leave your products at the mercies of the weather?

A. Yes B. No C. Sometimes

7. For Yes and Sometimes: Please give reasons for your choice.....

8. Is it possible for the packaged product to get contaminated before the user buys it?

A. Very possible B. Possible

C. Quiet possible D. Not possible

9. If 'A', 'B' or 'C' is the answer to question 10, please state the form(s) of packaging that has the potential of contamination

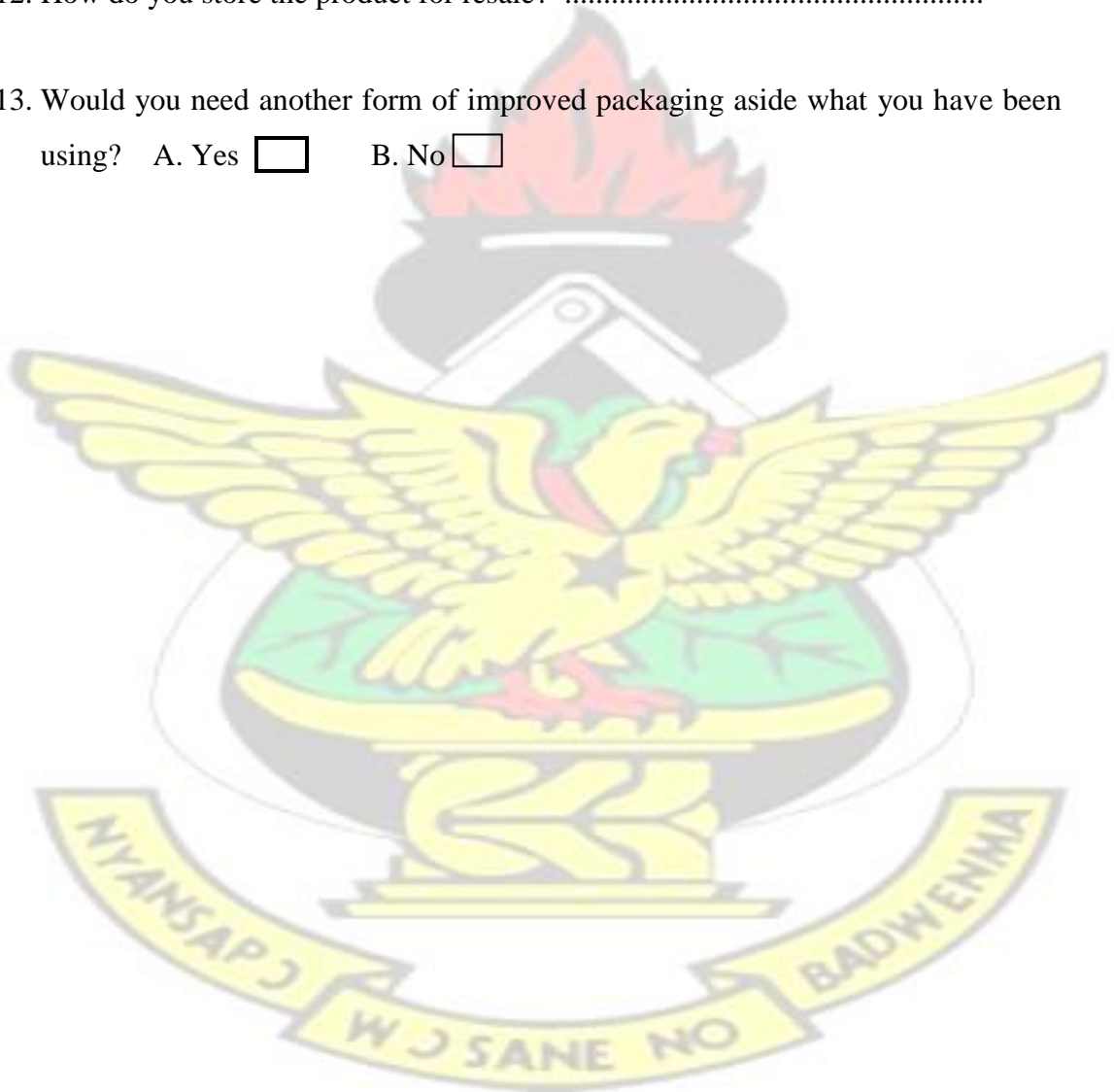
10. Is the potency of the drug affected when it is exposed to the weather?

A. Yes B. No C. Sometimes

11. How do you ensure that customers are safe when they buy your product?
.....

12. How do you store the product for resale?

13. Would you need another form of improved packaging aside what you have been using? A. Yes B. No



APPENDIX B

QUESTIONNAIRE TO BE ANSWERED BY SOME BUYERS OF TRADITIONAL HERBAL MEDICINE

1. What is your status of employment? A. Employed B. Unemployed C. Retired
2. If employed, which sector do you work? A. Public B. Private C. Self employed
3. Which age bracket do you fall? A. 18-35 B. 36-60 C. 61 and above
4. How often do you patronize THM? A. Very often B. Often C. Sometimes
5. What attracts you to buy the THM? A. Potency B. Packaging
6. Do you feel safe in using THM? A. Very sure B. Sure C. Unsure

PLEASE USE THE SCALE BELOW TO ANSWER QUESTIONS 7-13

		5	4	3	2	1	0
7	The container look hygienic						
8	The sealing of the package cannot be contaminated						
9	Information on the usage of the THM is adequate						
10	The product appears attractive						
11	The product was well handled before purchased						
12	Product looked clean before I purchased						
13	I would prefer improved package						

