

MEDICINAL PLANTS: USES AND PRESERVATION TO ENSURE
THEIR SUSTAINABILITY IN THE NADOWLI DISTRICT OF THE
UPPER WEST REGION, GHANA

BY

DAVID WITOL



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UNIVERSITY FOR DEVELOPMENT STUDIES

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CANDIDATE DECLARATION

While acknowledging information from other sources, I would like to state with academic honesty that, this thesis is the result of my original research and that this thesis has never been presented either in whole or in part for any purpose anywhere.

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SUPERVISOR'S DECLARATION

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DEDICATION

This thesis is dedicated to my late parents, my siblings and my loving wife and children whose love, care and support saw me through the ladder of my education.



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I wish to express my sincere thanks to Dr Ernest Kufaa my supervisor, whose comments, criticisms and useful suggestions has enabled me to come this far with this thesis.

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ABSTRACT

Both practitioners and non practitioners are aware of the benefits derived from medicinal plant species as a source of medicine that takes care of the become a matter of concern partly because of the time spent in traveling to harvest the needed plant species, the expense of purchase as well as the extinction of some of particular plant species of great importance. The ultimate purpose of this study was to identify the measures taken by herbalists in the study area to use and preserve the available medicinal plants to ensure their sustainability, identify the commonly used medicinal plants in the study area and the parts of the plants used in the treatment of various disease conditions in the study area. In the collection of data, the researcher employed interview through a structured questionnaire as a tool for effective data collection. Also, the purposive sampling technique was used in the selection of the respondents for the study carried out in April, 2010. The analyses of the study revealed that, some amount of efforts has been demonstrated by the traditional medicine practitioners to put in place measures to preserve and conserve the medicinal plants species to ensure their sustainability. The study however concluded that, for the traditional medicine practitioners to be able to pay much attention to the conservation and preservation of the medicinal herbal plants for sustainability, a concerted effort should be directed at solving problems encountered by practitioners through the involvement of the District Assembly, the NGOs and CBOs in the District and the practitioners themselves. The researcher recommends that, the Forestry Department of the Ministry of Agriculture and NGOs should come to the aid of these practitioners by way of training them on new and improved methods of propagating the plant species. Such as, Leune, Gonsugla, Pelaa, Gango, Kakalaa, Vuuronton, Dazugo,



Kolitaaga, Ambagnee, Ponpoluore, Punpugo, Ngmaabeenu, Kpantala, Ngmaadele etc. Again, the District Assembly and other benevolent organizations should support herbalist with financial assistance to help them create reserves to conserve the existing medicinal plant species in the District.



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CHAPTER ONE

INTRODUCTION

1.0 BACKGROUND TO THE STUDY

In all countries of the world there exists traditional knowledge related to the health of humans and animals. According to World Health Organization (WHO) the definition of traditional medicine may be summarized as the sum total of all the knowledge and practical, whether explicable or not, used in the diagnosis, prevention and elimination of physical, mental or social imbalance and relying exclusively on practical experience and observation handed down from generation to generation, whether verbally or in writing. Traditional medicine might also be considered as a solid amalgamation of dynamic medical know-how and ancestral experience. Traditional medicine also refers to health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicines, spiritual therapies, manual techniques and exercises, applied singularly, or in combination to treat, diagnose and prevent illnesses or maintain well-being (WHO, 2003). In industrialized countries, adoptions of traditional medicine are termed “Complementary” or “Alternative” Medicine (CAM).

The interest in traditional knowledge is more and more widely recognized in development policies, the media and scientific literature. In Africa, traditional healers and remedies made from plants play an important role in the health of millions of people. The Chinese and the Indians have made use of medicinal plants to cure ailments for thousands of years. In the past, modern science had considered methods of traditional knowledge as primitive and during the colonial era, traditional practices were often declared as illegal by the colonial authorities. Consequently doctors and health personnel have in most cases continued to shun traditional practitioners despite their contribution towards meeting the basic health needs of the population, especially the rural people in developing countries including Ghana. However, recent progress in the fields of environmental science, immunology, medical botany and pharmacognosy have led researches to appreciate in a new way the precise descriptive capacity and rationality of various traditional taxonomies as well as the effectiveness of the treatments employed.



Developing countries have begun to realize that their current health systems are dependent upon technologies and imported medicine that end up being expensive and whose supply is erratic (Cunningham, 2003).

Relegated for a long time to a marginal place in the health planning of developing countries, traditional medicine or more appropriately, traditional system of health care, have undergone a major revival in the last twenty years. Every region has had, at one time in its history, a form of traditional medicine. We can therefore talk of Chinese traditional medicine, Arabic traditional medicine or African traditional medicine.

This medicine is traditional because it is deeply rooted in a specific socio-cultural context, which varies from one community to another. Each community has its own particular approach to health and disease even at the level of ethno-pathogenic perceptions of diseases and therapeutic behaviour. In this respect; we can argue that there are as many traditional medicines as there are communities. This gives traditional medicine its diverse and pluralist nature.

Traditional medicine has been described by the World Health Organization (WHO) as one of the surest means to achieve total health care coverage of the world's population. The same body says that, the goal of 'Health for All' cannot be achieved without herbal medicines. In spite of the marginalization of traditional medicine practiced in the past, the attention currently given by government to widespread health care application has given a new drive to research, investments and design of programmes in this field in several developing countries.

Most developing countries are endowed with vast resources of medicinal and aromatic plants. Worldwide, it is estimated that there are an estimated 21,000 medicinal plants. These are concentrated in the global biodiversity 'hot spot' such as the Amazon rainforest of South America, the Eastern Himalayas and Western Ghats in South Asia and the Eastern Arc Mountains and Coastal Forest of East Africa. In tropical Africa, for example, more than 4,000 plants species are used for medicinal purposes and 50,000 tons of medicinal plants are consumed annually (NTFP, 2006). These plants have been used over the millennia for

human welfare by man in his environment and it continues even today as a large proportion of people in developing countries still live in rural areas. Furthermore, these people are precluded from the luxury of access to modern therapy, mainly for economic reasons.

Many plants are used for their therapeutic values and this has a twofold effect on the world's flora. The demand for herbs, particularly in parts of Africa, has brought some plants near extinction. Even the simplest plant may have a future importance that we cannot predict. Efforts to develop drugs from medicinal plants should address disease and health problems seen in developing countries as well as disease which primarily affect developed countries' population. Saving the world's plant resources calls for more protection and management, more research and an increasing level of public awareness about our vanishing heritage.

Indigenous and local communities are concerned that the rate of knowledge erosion has never been as high as it is in current generation and that such knowledge erosion poses an even more serious threat to the conservation of biological diversity than resource erosion. There is therefore, an urgent need to formulate an array of incentive measures to ensure that members of the younger generations will want to learn value, adapt and apply the traditional knowledge, innovations and practices of their elders. Within the framework and the management of conservation of biological diversity, it is worthwhile noting that at the African level, no exhaustive plan of control and evaluation of the resources of medicinal plants has been proposed.

In Ghana, plant medicine abounds in generous quantities and in many instances, the only treatment option available. According to the Centre for Research into Plant Medicine which was established in 1975, there are 3,000 medicinal plant species in Ghana. 1,000 of them have been identified by the centre and only 40 of them are being used in the treatment of 33 disease conditions. Diseases treated include; malaria, anemia, jaundice, epilepsy, typhoid fever, hypertension, asthma and diabetes. According to Klutse, a medical doctor of the Centre for Research into Plant Medicine, clinical trials for three preparations were conducted from February to August 1999 (Documentary by Ghana Television 10/2/2001). The



heavy reliance on plant medicine in Africa is attributed to their relative accessibility, low prices, local availability, acceptance by local communities and a number of dispensaries and doctors for health care needs in the rural areas. As such, it remains in the forefront of primary health care in the country. (International Workshop on Sustainable Trade and Conservation of Medicinal Plants, Rabat Morocco: 2-4, May, 2002). Many Africans especially the people of the Nadowli District of the Upper West Region of Ghana will use and continue to rely on plant medicine as long as they reside in rural areas which are located far from hospitals or clinics and transport facilities are often not available. It is a known fact that access to health care facilities is an important indicator of welfare as the distance or travel time to a health facility can affect the survival chances of a sick person especially in emergency situations.

Many medicinal plants have other economic uses, such as, supplying fruits and vegetables, hay for livestock and timber for fuel and tool handles. Medicinal plants therefore have a high potential of contributing to enhance rural health care and in poverty reduction through sale of processed products from herbal plants. Undoubtedly, supply of medicinal plants is entirely dependent on wild sources. The multipurpose uses of these plants have subjected them to over exploitation which coupled with increasing desertification has led to severe scarcity of the species. In the Nadowli District of the Upper West Region of Ghana, it is now extremely difficult to locate mature trees of many species except in forest reserves, which may sometimes be at distances of over 50 kms from settlements. Furthermore, rapid methods for propagating are unknown. Cultivation of medicinal plants at the farm level is one of the interventions being focused upon in an effort to meet ever increasing demand. The crucial point is that all medicinal plants cannot be cultivated because of their agro-climatic requirement specificity. Seasonal variation and age have a bearing on the composition of drugs.

On the one hand, these factors limit the number of medicinal plants which are amenable for cultivation and extent to which they can be cultivated. On the other hand, technology and institutional arrangements influence which species are preferred for cultivation and who is going to grow them. Given these factors,



there is an urgent need to assess priority species and adopt effective preservation methods for future planning. As there is real danger that the increasing awareness and uses of herbal medicine in recent times, if not backed by concerted efforts to propagate and cultivate medicinal plants species, many of them will be lost in the near future. Also popular but slow growing and/or naturally rare plant species are often under pressure. Sustainable management of medicinal plant species, which refer to judicious use of the available resources without compromising the needs of future generations. It is therefore important, not only because of their value as a potential source of new drugs but due to reliance on medicinal plants for health care.

1.1 PROBLEM STATEMENT

Biodiversity of plants collectively known as “Plant Genetic Resources” is a key component of any agricultural production system. Indeed it is a key component of any ecosystem, without which natural evolutionary adjustment of the system to the changing environment and biotic conditions would be impossible and this is an irreplaceable resource (Ramakrishnappa, 2002).

Demand for medicinal plants is increasing in Ghana, especially in the Nadowli District of the Upper West Region as the population grows. The threat posed by the over exploitation of medicinal plants has serious negative implications on the survival of several plant species. Many of which are faced with extinction with possible repercussion on the health care delivery system in the Nadowli District of the Upper West Region of Ghana. In Ghana and many other developing countries, the situation is not different as a greater percentage of their populations are still rural and lack adequate knowledge or financial ability to access the modern health facilities if any. While loss of habitat is the major factor contributing to the depletion of natural resources in Africa, collection of wild plants for traditional medicine use is extremely detrimental to certain species. African medicinal plant resources may be doomed to extinction unless energetic and concerted preservation measures are taken to ensure their continued availability. Hence, the decision to investigate into the herbalists’ inability to use measures to preserve and ensure the sustainable use of the existing medicinal plants.

1.2 RESEARCH QUESTIONS

The study would investigate the extent to which medicinal plants are important to the health needs of the rural folks of developing countries, especially the people of the Nadowli District.

1.2.1 Main Research Question

What are the measures taken to preserve and ensure the sustainable use of the existing medicinal plants in the Nadowli District of the Upper West Region?

1.2.2 Sub-Research Questions

To enable the research to gather the data needed for the study, the following sub-research questions will be asked;

1. What are the commonly used medicinal plants species in the communities in the District?
2. Which parts of the plants are used in the treatment of disease conditions by the herbalist in the communities of the District?
3. What are the measures put in place by the herbalists to preserve and conserve the medicinal plants in the District for sustainable use?

1.3 OBJECTIVES OF THE STUDY

Viewed as a global phenomenon and a serious threat, the over-exploitation of medicinal plants species and the inability of the herbal practitioners to put in place measures to preserve and conserve these plant species need to be looked into. It is against this backdrop that the researcher has set the following objectives to be achieved in carrying out the investigation.

1.3.1 Main Objective

The main objective of the study is: to identify the measures taken by the herbalists in the Nadowli District of the Upper West Region to use and preserve the available medicinal plants to ensure their sustainability.



The research shall also work to achieve the following sub-objectives;

1.3.2 Sub-Objectives

1. To identify the commonly used medicinal plants in the Nadowli District.
2. To investigate the parts of the plants used in the treatment of various disease conditions in the District.
3. To identify the measures used to ensure sustainable use of medicinal plants in the District.

1.4 RATIONALE OF THE STUDY

The over exploitation of the medicinal plant viewed as a global phenomenon and a serious threat to the world over, needs some urgent, energetic and concerned efforts to be put to help preserve and protect these valuable assets from total extinction. Their extinction will worsen the already pathetic plight of the rural folks worldwide among where the people of the Nadowli District of the Upper West Region is included. There is no doubt that medicinal plants play an essential role in the health care delivery system of the people of the Nadowli District of the Upper West Region of Ghana. Where most of the rural populace lack access to modern health care facilities, as well as the required financial resources to access the limited ones available. However, the over exploitation of the very medicinal plant species makes the use of these plants unattainable. It is the hope that this study will unearth as well as draw attention on the means of using medicinal plants and the measures to take in their preservation.

1.5 SCOPE OF THE STUDY

The study is limited to and focuses on the uses and preservation of medicinal plants to ensure their sustainability in the Nadowli District of the Upper West Region as the study area. Basically, the study will consider some selected communities in the Nadowli District. The study will include people of different sex groups and ages who possibly will have knowledge on the topic under study.



The work also revolves around the enactment of development interventions and suggested recommendations to ensure the sustainable use of medicinal plants in and around the communities to prevent them from extinction and also for use by the generations yet unborn.

1.6 ORGANIZATION OF THE REPORT

The study will be organized and presented in five chapters. Chapter one will look at a background to the study, objectives, research questions, rationale and scope of the study. Chapter two will examine the views and findings of some writers on the subject matter. Chapter three will contain the profile of the study area and the methodology to employ in carrying out the investigation. Chapter four will cover the analysis, presentation and discussions of the main finding of the gathered data or information from the field and Chapter five will embody the summary of findings of the study, suggested recommendations and conclusion.



CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.0 OVERVIEW

The over exploitation of medicinal plants over the years for the purpose of treating various disease conditions, extraction of drugs and for trade and economic reasons worldwide and for that matter rural communities of the developing countries. Especially the communities in the Nadowli District of the Upper West Region of Ghana, threatens resource base of the medicinal plant species. To curb this alarming situation, an energetic and concerted effort in preservation, development and protection programmes needs to be put in place. An extensive and detail research therefore needs to be done on this subject matter.

This chapter will essentially deal with the findings and views of some writers on the uses and preservation of medicinal plants to ensure their sustainability. These will be reviewed under the following headings:

- a) The types of traditional medicine practitioners.
- b) Health care seeking behaviours.
- c) Patronage of traditional medicine.
- d) Measures for preserving to ensuring sustainability of medicinal plant species.
- e) Types and uses of some medicinal plants.
- f) Safety and Efficacy of Traditional Medicine/Contemporary or Alternative Medicine.
- g) A summary of the related literature reviewed





2.1 TYPES OF TRADITIONAL MEDICINE PRACTITIONERS

In contrast to western medicine, which is technically and analytically based, traditional African medicine takes a holistic approach. Good health, diseases, success or misfortune are not seen as chance occurrences but are believed to arise from the actions of individuals and ancestral spirits according to the balance and imbalance between the individual and the social environment.

The practitioners of traditional medicine specialized in particular areas of their profession, in the same way as orthodox medical practitioners. Thus, some traditional medicine practitioners are experts in the use of herbs (herbalist), others are proficient in spiritual healing, especially the use of incantations, while others combine both. There are also traditional bonesetters and birth attendants.

Some healers have learnt their trade by undergoing treatment as a patient. Upon their recovery, they decided to become practitioners themselves. Another avenue is through spiritual calling, in which case the healer's diagnoses and treatment are strictly determined by the supernatural. A third route is through informal learning from a close family member, such as a father or uncle (or a mother or aunt in the case of a female healer). A fourth possibility is through a long formal apprenticeship under an established practitioner.

Traditional beliefs differ from one ethnic group to the other in Ghana, but the belief in ancestral spirit is one phenomenon that runs through all the cultures. According to the African Conservation Foundation report (2007), there are approximately 45,000 traditional healers in Ghana, most of who are recognized and licensed through various associations that fall under the national mandated Ghana Federation of Traditional Medicine Practitioners' Association (GHAFTRAM). While some traditional healers focus primarily on medicinal plants gathered from their farms, forest or market, some heal with plants through the consultation of ancestral spirit. Literature suggests that, apart from General Traditional Practitioners, there are Specialists who master in the treatment of a narrow range of conditions, for example, bone setters, Traditional Birth Attendants and Mental health practitioners. Others treat combination of a number of conditions ranging from fungal to viral infections.

According to the 2000 Population and Housing Census Report, there is at least one herbalist each in almost all the villages in the Upper West Region of Ghana and other regions in the country. With a degree of specialization some primarily treats fractures, psychiatric conditions, malaria and infertility among others. According to the same report, every locality in the Sissala, Jirapa, Wa, Lawra and Nadowli reported the availability of traditional healing facilities within the district

In the Nadowli District of the Upper West Region which is specifically the study area, there are a number of different kinds of traditional medicinal practitioners. These include fetish priest/priestess healers who are attached to shrines or temples of a deity and may undertake periods of possession or practice divination. Bone setters who are specialized in bone fractures, herbalists and Traditional Birth Attendants (TBAs) who are mostly older women and have extensive experience in childbirth related matters. Though ritual and superstition are common in herbal treatment, the main activities are centered on the knowledge and use of plants with the required medicinal value in disease treatment (Twumasi, 1988).

2.2 HEALTH SEEKING BEHAVIOURS

With the Primary Health Care (PHC) approach of the late 1970s community perspectives on human behaviour experienced real boom. The focus on social science was promoted by the World Bank and World Health Organization (WHO) special programme for Research and Training in Tropical Diseases (TDR) (Kikwawila Study Group, 1994 and 1995; TDR, 2002a; TDR, 2002b).

Early studies funded by the Social and Economic Research (SER) component of TDR contributed to the increasing emphasis on the socio-cultural and socio-economic aspects of health care. Therefore, health seeking behaviour specialist acknowledges that health control tools, where they exist, remain greatly under or inadequately used. Hence, understanding human behaviour is pre-requisite to change behaviour and improved health practices.

Twumasi (1988) observed that in orthodox medication, a patient who is not satisfied would seek appropriate treatment from spiritualist. He also noted that,



they approach healing through herbal applications using methods of treatment and operational procedures similar to modern medical care.

Twumasi (1988:13) also believes that “mystical beliefs form a central part of traditional healer's theoretical approaches to healing”. Thus, the first point of call by rural folks who think they are spiritually-possessed or have been bewitched, are the traditional healers. There are institutions that exist in Ghana where at least scientific research has been carried out and proved successful without any reported reduction in or defects to the efficacy and potency of such remedies. The centre for scientific research into plant medicine (CSRPM) at Mampong, Asenemanso Herbal Training and Research Project at Asenemanso in the Eastern Region, Traditional Healers Project at Dormaa Ahenkro in the Brong Ahafo are few examples of institutions where successful testing are carried out. Understanding the appropriate level where traditional medicine can be placed lies in the health seeking behaviour of individuals within the District.

Hubley, (1993) provides a process of what he described as health seeking behaviour. The typical sequence according to Hubley goes like: Becoming aware of symptoms of illness, considering offers by family members, taking home remedy (self medication), deciding to go for treatment either from a local healer, doctor or other health care providers, following advice and taking prescribed therapy and going for follow up if necessary.

However, a clear distinction is not made between orthodox and traditional medical consultations. Anyinam (1991) divided the medical system in Ghana in to three; the remedy, the traditional and the modern medical sector. It is within the home remedy sector, according to Anyinam (1987) that most people use self medication, being the usually option resorted to as the first therapeutic intervention. The sector is a matrix with several levels of individuals, families' social networks and community beliefs and attitudes is also called the popular sector. The home remedy sectors either orthodox or traditional, perceive health and illness as beliefs about which consultations are made. This leaves traditional medicine not conveniently placed especially in the health care delivery system of rural dwellers. Meanwhile, it is estimated that in Ghana, every one traditional



healer attends to approximately 200 patients in a month, while one orthodox doctor attends to approximately 20,000 patients in a month (ACF, 2007).

2.3 PATRONAGE OF TRADITIONAL MEDICINE

Demand for fast-growing plant species with a wide distribution, high natural plant population density and high percentage seed set is easily met, particularly where leaves, seeds, flowers or fruits are used. The common sale and use of medicinal plants leaves as a source of medicine in Cote d'Ivoire and possibly other parts of West Africa is therefore highly significant as it differs markedly from the high frequency of roots, bark or bulbs at markets in the Southern African region. Throughout Malawi, Mozambique, Zambia, Zimbabwe, Lesotho, Swaziland and particularly South Africa, herbal material that is dried (roots, bark) or has a long shelf-life (bulbs, seeds, fruits) dominates herbal medicine markets. In comparison, six sellers in Abidjan, Cote d'Ivoire, primarily sold leaf material (20-41 species), followed by roots (1-16 species), bark (0-8 species) and whole plant (0-3 species) a situation that was typical of the 111 traditional medicine sellers there.

The exception in Cote d'Ivoire is that of sellers bringing materials from Burkina Faso and Mali, who sell more root bark materials. The situation with chewing sticks sellers in Cote d'Ivoire and other parts of West Africa is somewhat different. However, as stems and roots are the major plants used, with consequent higher impact on favored species.

Despite limited information on population biology of medicinal plants, it is possible to group target plants species according to demand, plant life-form, parts used, distribution and abundance (Cunningham, 1988a; 1991). Countries in Africa, Asia and Latin America use traditional medicine to help meet some of their primary health care needs. In Africa, up to 80% of the population uses traditional medicine for primary health care.

In China, traditional herbal preparations account for 30% -50% of the total medicine consumption whilst in Ghana, Mali, Nigeria and Zambia, the first line of treatment for 60% of children with high fever resulting from malaria is the use of herbal medicine at home (WHO, 2003). According to UNDP (2007) however,



it is estimated that about 80% of the Ghanaian populace relies on herbal preparation for primary health care. The higher patronage of traditional medicine is either because it is cheaper, more convenient or simply believed to be more effective (Voice of America News, 2006).

Studies have also shown that about 3,000 herbal formulations have been documented as being efficacious for specific conditions in Ghana. Out of which over 600 are circulating as herbal medicine products and 60 of which have undergone preliminary phyto-chemical analysis and safety test at the centre for Scientific Research into plant Medicine and through MSc project works (Cultural News, 2007). It is worth noting that three hundred of these herbal products have also been given market authorization by the Food and Drugs Board.

The United States National Cancer Institute (NCI), established in 1937, its mission being “to provide for, foster and aid in coordinating research related to cancer” has screened well over 100,000 plant extracts for anticancer activity.

There are so many people who live in areas where there are no health facilities and so the first point of call for these people is to see the herbal practitioner (Voice of America News, 2006). In many rural-based populations, traditional healers are the only source of health services for majority of the people and in most cases they are the preferred source of health care. In Ghana, for example, in Kwahu district, for every traditional practitioner, there are 224 people compared to one university-trained doctor for nearly 21,000 people (Rukangira, 2001). This is not peculiar to Ghana. The records suggest that people in India, China and a number of other Southeast Asian countries have developed their traditional medical practice better and used this in supplementing and complementing the modern health care system. Thus, it is logical that the burden on public healthcare delivery system in Ghana will be made lighter if traditional medicine is further integrated into the healthcare system. At the centre of Ghana’s modern healthcare system is a serious shortage of health workers. Ghana’s case feeds into the fact that despite the unprecedented advances in health care, the world is immensely confronted with severe shortage of health workers especially in the poor countries. Information on the quantities of plant material being harvested and used or sold whether for the local trade as traditional medicine, or for export and



extraction of active ingredients is scarce. Apart from placing the quantities required from cultivation into perspective, it is also of little relevance unless expressed in terms of impact on the species concerned. In South Africa harvesting from wild plants of certain species is on a scale that is cause for concern amongst conservation organizations and the rural herbalist and a listing of priority species is available (Cunningham, 1988a). The same concern also applies to some chewing sticks sources for example, *Garcinia afzelii* in West Africa. The only quantitative data on volume of plant material sold locally is from South Africa (Cunningham, 1990, 1993; Osborne et. al., 1994; William, 1996). The scale of this trade is such that it can have an immense impact on wild populations. *Stangeria eriopus* cycads collected from the wild, for example, which are sold at a rate of over 3,000 per month, are also sold in the city of Durban, South Africa as an *intelzi* (protective charm), posing a conservation problem which Osborne et al. (1994) have termed “an enigma of the South Africa situation to which it is difficult to find solution”.

An average of 25% of prescription drugs in the USA during the period 1959-1973 contained active ingredients still derived from higher plants (Farnsworth & Soejarto, 1985) significantly overlapping with plant sources used in traditional medicine. Farnsworth (1988) for example, points out that of the 119 chemicals derived from higher plants which are used for modern pharmaceuticals on a global scale, 74% have similar or related uses in traditional medicine. Like the trade in traditional medicine to cities however, neither the impact of harvesting nor the cost of replacing these resources seems to have been taken into account. For this reason, even when the technology for chemical synthesis is available, it can be cheaper for pharmaceutical companies to extract the active ingredients. In the mid-1970s, for example the cost of producing reserpine by chemical synthesis was \$1.25 per gm, compared to \$0.75 per gm by commercial extraction from *Rauvolfia vomitoria* roots (Oldfield, 1984).

While data on the quantities of raw material harvested for export are limited, even less data are available on the environmental impact of harvesting. From what little evidence is available, it is clear, however, that large quantities of material are collected from the wild and that harvesting can be very destructive

(Cunningham and Mbenkum, 1993). For example, Ake-Assi (per.comm.) report that although only fruits are required, commercial gatherers in Cote d'Ivoire chop down *Griffonia simplicifolia* vine and *Voacanga Africana* and *V. thouarsii* trees in order to obtain the fruits. Concern has been expressed about a similar situation in Indonesia (Rifai and Kartawinata, 1991).

A high level of expectations, high unemployment rates, a psychologically stressful environment and often crowded and unhygienic living conditions are a feature of many urban areas in Africa (Udo, 1987). Labour migrancy also creates the need to maintain relationships with wives, or find new partners in the urban environment. Under these circumstances, it is therefore not surprising that many of the traditional medical plants and animal material sold in urban markets has symbolic or psychosomatic value. For luck in finding employment, guiding against jealousy when a person has a job whilst their peer group are unemployed, or love-charms and aphrodisiacs to keep a wife or partner. It is also not surprising that employment options for traditional medicinal practitioners increase, as a rising ratio of medical personnel to total population is a feature of rapid urbanization. In Lagos, Nigeria, for example, the number of medical doctors increased five-fold since 1955, yet the medical doctor: total population ratio in 1975 was 1:5,000 compared to 1:2,000 in 1955, as provision of western-type medical facilities could not cope with the rapidly growing urban population (Udo, 1987). Traditional medical practitioners are therefore attracted to urban centre where employment can be rewarding. Studies in Dar es Salaam (Tanzania), Ibadan (Nigeria), Lusaka (Zambia), Kinshasa (Zaire), Kampala (Uganda) and Nairobi (Kenya) have shown that "urban centre are viable and vigorous areas of traditional medicine" (Good & Kimani, 1980). In Zimbabwe this is clearly shown by the ratio of traditional medical practitioners: total population in urban areas (1: 956) compared to rural areas (1:234) (Gelfand et. al., 1985). This is not always the case, however. In the rural area of Kilungu district, Kenya, rural populations to traditional medical practitioners averaged 1:224 (herbalists 1:665; traditional birth attendants 1:1640 and diviners also 1:665) while in urban Mathare, the overall ratio was 1:883 (Good, 1987).



Rapid urbanization and greater demand for traditional medicines results in an increase in harvesting of medicinal plants from rural areas. A depletion of the rural resource base where certain species are vulnerable to over-exploitation and consequent problems for primary health care. The same applies to harvesting of medicinal plant materials for export and processing into modern pharmaceuticals.

2.4 SUSTAINABLE USE/DEVELOPMENT OF MEDICINAL PLANTS

It is generally accepted that for any resource, a relationship exists between resource stock, population size and sustainable rate of harvest. Low stocks are likely to produce small sustainable yields, particularly if the target species is slow-growing and slow reproducing. Conversely, large stocks of species with a high biomass production and short time to reproductive maturity could be expected to produce high sustainable yields, particularly if competitive interaction is reduced by “thinning”. There is also a clear relationship between the part of the plant harvested, harvesting method used and the impact of these on the plant (African Conservation Forums Conference 22 July 2003).

The World Commission on Environment and Development (WCED) in its report “Our Common Future” defined the term sustainable development as “Development that meets the needs of the present generation without compromising the ability of future generation to meet their own needs - a process of change in which the exploitation of resources, the direction of investments. The orientation of technological development and institutional changes are all in harmony and enhance both current and future potentials to meet human needs and aspirations” (WCED, 1987).

Sustainability may involve a compromise between what is desirable and possible at a practical level and what is feasible in the context of national and international policies and resources. Therefore, since the limits of sustainability are determined by social, political and economic structures and the availability of natural resources. Development must be based on a clear understanding of the full range of constraints facing people in any context.

Due to the number of species involved and the limited amount of information available on biomass, primary production and demography of indigenous



medicinal plants, no detailed assessment is possible to ensure a sustainable move away from natural populations. Even if these data were available, their value would be questionable due to the intensive management inputs required for managing sustainable use of vulnerable species in cases where demand exceeds supply. What can be done is to identify the categories of medicinal plants species that are most vulnerable to over-exploitation by combining the insights of herbal medicine sellers with our knowledge of plant biology and distribution (Cunningham, 1990).

The most vulnerable species are the popular, slow-growing, slow-reproducing species with specific habitat requirements and a limited distribution. Although in theory sustainable use of bark, roots or whole plants used as herbal medicine is possible. The high levels of money and manpower required for intensive management of slow-growing species in multiple-species systems are unlikely to be found in most African counties. Cultivation of alternative supply sources of popular, high conservation priority species outside of core conservation areas is therefore essential. However, commercial cultivation of high conservation priority species is not a simple solution and, at present, unlikely to be a profitable exercise for most species due to their slow growth rates and the low prices paid for traditional medicines. These slow-growing species are a priority for ex-situ conservation and strict protection in core conservation areas. However, the high price paid for some species does make them potential new crop plants for agro forestry systems for example *Warburgia salutaris*, *Garcinia kola*, *G. punctata* or agricultural production for example, *Siphonochilus aethiopicus* and pilot study commercial production is warranted. Priority regions for co-operative actions between health care professionals are considered to be the rapidly urbanizing areas with high level of endemic taxa, particularly West Africa (Guineo-Congolese region), specifically Ghana, Nigeria and Cote d'Ivoire; East Africa (Kenya, Tanzania, Ethiopia) and south-east Africa (Swaziland, South Africa). Most threatened vegetation types are Afro-montane forest, coastal forest of the Zanzibar-Inhambane regional mosaic and those in the Guineo-Congolese region.

Commercial gatherers of medicinal plant material, whether for national or international trade, are poor people whose main aim is earning money and not



resource management. Unsustainable high levels of exploitation is not a new problem, although the problem has escalated in regions with large urban areas and high levels of urbanization since the 1960s. Prior to 1898, local extermination of *Mondia whitei* had been recorded in the Burban areas of South Africa due to collection of its roots for commercial sale. By 1900, *Siphonochilus natalensis* (now considered synonymous with *Siphonochilus aethiopicus*) had disappeared from its only known localities in the Inanda and Urnhloti valleys due to a trade to Lesotho (Medley-Wood & Franks, 1911). This occurred despite a traditional seasonal restriction on harvesting this species. By 1938, all that could be found of *Warburgia salutaris* in Natal and Zululand was “poor coppices, every year cut right down to the bottom” (Gerstner, 1938). With these few exceptions, most botanical and forestry records reflect the impact of commercial collecting of *Ocotea bullata* bark due to the importance of these species for timber (Cunningham, 1993). The situation would appear to be similar in Kenya, where Kokwaro (1991) records that some of the largest *Warburgia salutaris* and *Olea capensis* sub-species, *welwitschii* trees have been completely ring-barked and have died as a result.

Heavy commercial exploitation of *Prunus Africana* trees have devastated populations in Cameroon (Cunningham & Mbenkum, 1993) and Madagascar (Walter and Rakotonirina, 1995). In Zimbabwe, due to the high demand and limited distributions of these species, the situation is worse and all that remains of *Warburgia salutaris* wild populations are a few coppice shoots. In Cote d'Ivoire, *Garcinia afzelii* is considered threatened due to harvesting for chewing stick trade (Ake-Ansi, 1988). Destructive harvesting of *Griffonia simplicifolia*, *Voacanga thuarsii* and *V. africana* fruits for the international pharmaceutical market through felling of the plants bearing them is also of concern. In Sapoba Forest Reserve, Edo state, Nigeria, despite traditional restrictions on bark removal, Hardie (1963) observed how the trunk of a large *Okounaka aubrevillei* tree (a very rare species in West Africa) “was much scarred where pieces of bark had been removed”. There appears to be nothing published on the current status of this species. Botanical records are scanty, particularly for bulbous or herbaceous species, where little remains to indicate former occurrence after the plant has been removed. It would therefore be useful to carry out damage assessment for

exported species such as *Okoubaka aubrevillei*, *Garcinia afzelii* and *G.kola* in West Africa (Ghana, Cote d'Ivoire, and Nigeria) and *Warburgia salutaris* in Kenya, Tanzania and Zimbabwe and assessment of the impact of *Pausinystalia johimbe* bark harvesting in Cameroon and *Griffonia simplicifolia* in Ghana.

Field observation has shown a high level of damage to *Prunus Africana* population in north and west Cameroon (Cunningham and Mbenkum, 1993). In South Africa, bark damage assessment using a 7-point scale (Cunniingham, 1990) were carried out for key "indicator species" (medicinal plants chosen for their relatively slow growth rate). Information was also recorded on popularity as a source of traditional medicine. Bark damage assessment confirmed most of the observations of herbalists and herb traders (Cunningham, 1988a, 1990). The exceptions being species that were scarce not because of over-exploitation, but due to limited geographical distributions in the region, such as *Acacia xanthoploea* and *Synaptolepis kirkii*. They also demonstrate different situations to customary subsistence use. This fact needs to be taken into account in legislation covering protected area management where conservation of biotic diversity is a primary objective. Although the degree of bark damage varies, the level of damage at all sites where commercial gathering takes place is high and involves mainly trees in the larger diameter size classes. What is significant is that, extensive damage has taken place in State Forest, which is theoretically set aside for maintenance of habitat and species diversity in South Africa (Cunningham, 1988a, 1990). In the Malowe State Forest, Transkei, South Africa, if coppices stems of less than 2 cm diameter are excluded, then the level of damage to *Curtisia dentate* and *Ocotea bullata* trees encountered amounted to 51% and 57% of trees with more than half the trunk bark removed. All *Warburgia salutaris* trees found outside strict conservation areas in Natal were ring-barked and many of those inside conserved areas had their bark removed as well. The lack of national legislation or effective international agreements on conservation and sustainable use of bio-diversity has resulted in 'slaughter harvesting' of medicinal plants and massive depletion of bio-diversity. According to the World Health Organization (WHO), the international market of herbal products is estimated to be US \$62 billion which is poised to grow to US \$5 trillion by the year 2050. Developing appropriate technologies for the cultivation



of medicinal plants is therefore a crucial factor in ensuring continuous and uniform supply of raw material for herbal industry and halting the degradation of natural resource base.

Several studies have clearly brought out the economic potentials of medicinal plants in different agro-climatic conditions. The potential return to the farmers from cultivation of medicinal plants is reported to be quite high. Researchers have estimated that the cultivation of certain altitude Himalayan herbs could yield products price anywhere between Rupees 7,150 to 5,5000 per hectare and an average annual income of Rupees 120,000 per hectare through mixed cropping of high altitude medicinal herbs. Some low-altitude crops from the Amarkantak region of Madhya Pradesh showed substantial net returns for four profitable species-Curcuma angutisfolia (Rupees 48,000), Rauwolfia serpentine (Rupees 54,000), Acorns calamus (Rupees 27,000) and Chlorophytum tuberosum (Rupees 13,000).

The foregoing review indicates that there are several studies touching various aspects of medicinal plants but only spherically. More research is therefore needed for proper planning for conservation and utilization of medicinal plants keeping in view their ecological and aesthetic values. Furthermore, there was not a single study among the several studies which addressed the issues in feasibility and viability of cultivation, marketing and trade and bio-prospecting issues in a holistic manner.

2.5 TYPES AND USES OF SOME MEDICINAL PLANTS

Throughout the ages, plants have been used by humans as a source of food, cosmetics and medicine. The significance of tropical forests in the maintenance of the earth's ecological balance is only now being fully appreciated and understood. There is an urgent need to conserve and use these resources in an environmentally sustainable and economically beneficial manner.

Plants have served as the basis of sophisticated traditional medicine systems for thousands of years in countries such as China and India. These plant-based systems continue to play an essential role in health care delivery in many developing countries. It has been estimated by the World Health Organization



their primary health care (WHO, 2003).

Plant products also play an important role in the health care system of the remaining 20% percent of the population who mainly reside in developed countries. Analysis of data on prescriptions dispensed from community pharmacies in the United States from 1959 to 1980 indicates that about 25 percent contained plants extracts or active components derived from higher plants. At least 119 chemical substances, derived from 90 plants species, can be considered as important drugs currently in use in one or more countries.

The development of clinically effective anticancer agents such as taxol and the discovery of potential anti-AIDS agents such as michellamine B, demonstrate the value of plants as sources of potential new drugs. It also highlights the importance of conserving these valuable resources. In Ghana, the Ghana herbal pharmacopia, published in 1992 by the policy Research and Strategic Planning Institute, describes the medicinal properties and chemical constituents of fifty local medicinal plants. Dokosi (1998) cited in Useful Plants of Ghana by Abbiw (1990), both describe the medicinal uses of various indigenous plant species.

2.5.1 Cornflower: A Good Remedy For Eyes

Cornflower covers the golden grain prairies from late spring onwards with its gracious blue flowers. From ancient times, the seeds of crops have been mixed with cornflower seeds and have been dispensed all over the world. Pliny the Elder, a first century Roman naturalist, described the cornflower as “an annoying flower for reapers,” who surely tried not to cut it with sickles and scythes. Its medicinal virtues were discovered by Mattioli, a sixteenth century botanist who declared that “the blue flowers of the cornflower alleviate reddened eyes.” The healing virtues of the Cornflower plant were due, according to Mattioli, (George, 2006). The combination of opposed colors, blue versus red, in compliance with the theory of signs.

Flowers contain anthocyanins and polyines, whose action is antiseptic and anti-inflammatory, bitter substances which act as appetizer and eupeptic (that facilitate digestion) and also falconoid that have a mild diuretic effect.





Cornflower water obtained by the decoction of its flower is primarily used in applications on the eyelids, due to its notable anti-inflammatory effect. Eye irrigation and baths with cornflower water ease itching and eye irritation, besides giving a fresh and smooth look to tired eyelids. Thus, in many places this plant is given the name of “bags-under-eyes.” People who wash their eyes with cornflower water obtain a limpid and shimmering gaze, which flashes just like the cornflower's little blue flowers in golden wheat field. In ancient times, the cornflower was supposed to clear and preserve vision, although only that of the blue-eyed people. Thus, in French language this plant is called casselunettes (glasses-breaker). Today we know that this was merely a myth, nevertheless we should remember that cornflower is good for the eyes. Cornflower flowers also contain anthocyanins which have antiseptic and anti-inflammatory action. Their infusion produces an improvement in the blood circulation in the retinal capillaries, besides having appetizing and eupeptic effects.

2.5.2 Plants For The Nervous System

Medicinal herbs exert notable actions both on the central nervous system, on which our mental functions are based and on the autonomic nervous system, which regulates and coordinates the activity of the diverse organs of the body. Unlike most psycho-pharmaceutical products (medicines which act on the mental functions). Balm and Lavender plants exert their invigorating and sedative effects on the nervous system in a physiological, mild and safe way. Moreover, it is very unlikely that the use of the medicinal herbs recommended may cause any kind of physical or psychological dependence, unlike stimulants, sedatives, narcotics and other chemically synthesized medicines.

Chemical medicines indeed have a more powerful effect than medicinal herbs, although they present a higher degree of side effects and risk. For example, the *Passion Flower* an American anti-stress plant. This Passion Flower attracted the attention of European travelers to the new world, who saw in the diverse organs of its beautiful flowers the representation of the instruments used in the Crucifixion: whip, nails and hammer. The Passion Flower was introduced in Europe and grown as an ornamental vine, until in the late nineteenth century it was found to have a strong sedative effect on the nervous system. The flower and

leaves of maypops, another name for this plant contain small amount of indole alkaloid, flavonoid, diverse steroids and pectin. It is not well known to which of these substances the plant owes its sedative, antispasmodic and narcotic actions, though it is likely due to the combination of them all. The passion flower acts as a mild anxiolytic, without the risk of addiction or dependence. It is the ideal plant for those people who are under nervous pressure. The Larousse Dictionary of Healing plants as cited in Healthy plants by Dr George, states that: “A gift which comes from the ancient Aztec empire, the passion flower seems to be the most necessary plant in our civilization.” The Passion Flower induces natural sleep, without drowsiness or depression on waking up. Passion flower relaxes the hollow abdominal hollow organs whose sudden contractions provoke colics or spasms: stomach, intestines (intestinal colics), bile ducts and gall bladder (livercolics), urinary ducts (kidney colics) and uterus (dysmenorrheal). The use of the passion flower is recommended virtually for all kinds of pain, even neuralgia. The fruits of the passion flower are rich in provitamin A, vitamin C and organic acids. They are refreshing and invigorating, and are highly recommended for physical tiredness, infectious diseases and febrile convalescence.

2.5.3 Valerian: Calms Nervousness And Decreases Blood Pressure

Valerian exerts quite different effects, depending on the living being it acts on: animal or humans. While serving as a strong stimulant for animals, it has notable sedative effects on human beings. Thus; cats become euphoric when they smell the plant, joyfully rubbing against it. The aroma of the valerian, which becomes stronger when the plant is dry, does not have any special attraction for humans, since it resembles the smell of foot sweat. Valerian have been employed in therapeutic science since the Renaissance, when its property to prevent epileptic attacks was discovered. The roots of valerian have around 1% of an essential oil of antispasmodic action with many components (terpenes, borneol ester, etc.) and between 1% and 5% of valepotriats, substances which traditionally, valerian's sedative effects were attributed to. However, today it is known that the most important agent of valerian is baldrinal, which is the metabolite of the valepotriat, called valtrate. Valerian has tranquilizing, sedative, narcotic (favoring sleep), analgesic (calm aches), antispasmodic and anticonvulsive effects. It produces

sedation on the whole autonomic and central nervous systems, decreasing anxiety, as well as blood pressure. Its action is quite similar to that of neuroleptic pharmaceuticals (fenotyzines and derivatives), however it lacks the latter's toxic effects.

2.5.4 Plant Fort The Heart

Medicinal herbs exert notable actions on the heart. Those plants which augment the strength of the heart contractions (called cardiotonic plants), the foxglove being the most important, are especially appreciated. Besides strengthening the heart, medicinal herbs contribute in a decisive way to the prevention of severe heart dysfunctions, such as angina pectoris and heart attacks.

2.5.5 The Camphor Tree; Heart And Breath Invigorating

The camphor tree is a thousand year-old tree which begins to produce camphor when it reaches 30 years of age. In China there are camphor trees which are up to two thousand years old. Camphor is a white, crystalline substance obtained after condensation of the essential oil, distilled from the camphor wood. The camphor stimulates the nervous centers of respiration and heart activity, increasing the frequency and deepness of breath and strengthens the heart. It is used for lungs congestions, fainting, hypotension, arrhythmia and blackout. It is also very useful for influenza and colds. Camphor oil or alcohol is used in external application in lotions in order to alleviate rheumatic aches and neuralgia. It also decreases sexual excitement.

2.5.6 Foxglove; A Powerful Heart Tonic

Foxglove is a typical example of how the same plant can cure or kill. In the seventeenth century, in England, foxglove was given for the first time to an ill person who suffered from a heart-caused case of dropsy (edema in the whole body caused by heart failure). A few years later, foxglove was included in the Edinburgh pharmacopoeia. From then on, much biochemical and biological research on this plant has been carried out, whose active components have not yet been substituted by any chemical product. The glycosides contained in foxglove are responsible for the cardiotonic effects of foxglove on the heart muscle. The



most important ones are digoxin and digitatin. They increase the strength of heart contractions, improving its mechanical performance and also balance the heartbeat rate when it is irregular or too quick (tachycardia). Glycosides of foxglove are an indispensable remedy in cases of coronary insufficiency. They also contain certain diuretic action, which contributes to improve the functioning of the circulatory system.

2.5.7 Plants For The Urinary System

Almost all medicinal herbs act on the kidneys, causing an increase in the amount of urine. These diuretic properties of Cane and Bearberry are enhanced by the water with which herbal teas are prepared. By increasing urine volume, Madder and Saxifrage promote the function of eliminating waste substances which kidneys perform. Hence, they help cleanse the blood and purify the whole body. Buchu and Madder Plants are highly effective in increasing the solubility of mineral salts which usually are dissolved into the urine. There are plants which can even dissolve kidney stones. Buchu also improve the muscle tone of the urinary bladder and promote its functioning, thus the cases of enuresis and urine incontinence will improve (George, 2006).

2.5.8 Agave; Depurative And Diuretic

More than 150 agave species are known, all of them quite similar in appearance and properties and spread all over Mexico and Central America. These Agave species were used by ancient Aztecs for medicinal purposes. They were introduced to Spain in the sixteenth century and quickly spread all over the Mediterranean coastline. All species of the agave genus contain steroid glycosides, among which the most outstanding is hecogenin, as well as saponins. The root and the leaves obtained from these substances their diuretic and blood depurative properties and are successfully used for edema and retention of liquids. In Mexico and Central American countries, agave is traditionally used for infectious diseases, digestive disorders, jaundice and hepatitis. Externally applied, the juice or sap flowing from the stem has vulnerary and wound-healing properties. It is applied in compresses for bruises and skin wounds.



2.5.9 Goldenrod; A Good Friend Of Kidneys

Arnau de Vilanova (Valencia, Spain, 1240-Genova, Italy, 1311), a great Middle Age physician among whose patients were kings and popes and one of the most credited professors of the ancient Medicine College of the University of Montpellier, was first to describe the medicinal properties of this plant, saying that it was “admirable in producing urine and breaking up kidney stones.” More than seven centuries after him, at present, goldenrod is still used with the same aims and its properties have been scientifically proven. This plant contains tannin with astringent properties, saponins and coumarines which have diuretic properties and flavonoids with diuretic effects. Goldenrod is a good diuretic plant which, in addition to increasing urine production, promotes the good functioning of kidneys. It is recommended for treating edema (retention of fluid in tissues), nephritis (inflammation kidneys), nephritis (albuminuria, loss of albumin through urine) and renal calculi (it promotes their dissolution). The agave also provides an anti-inflammatory action on the urinary organs as well as combating urinary discomforts. It also promotes the elimination of metabolic waste substances such as uric acid. It is recommended for arthritis, gout, eczema and as a rule whenever the blood should be cleansed of toxic substances.

2.5.10 Plants For The Sexual Organs

Medicinal herbs can do a lot of good for women's health and well being. Many plants such as Calendula and Damiana can alleviate menstruation pain (dysmenorrheal), balance menstrual cycle when irregular and reduce hemorrhaging during excessive menstruation (George, 2006). These Calendula and Damiana do not only exert a symptomatic action, easing pain or menstrual disorders, but they can even produce a true readjustment on the delicate hormone mechanism which periodically gives birth to menstruation. As in other phototherapeutic fields, in this way medicinal herbs have a true preventive action on many of women's disorders and diseases. When applied locally as a vaginal irrigation, medicinal herbs act successfully against infections of the virgin and the neck of the uterus. During pregnancy and especially during breast-feeding, Calendula can also serve women well. Some plants increase milk production and others decrease it. Actually, most plants like Spirulin and Damiana regarded as

aphrodisiac have a revitalizing and invigorating action on the body. Aphrodisiac properties are just a consequence of the increasing general vitality these plants provide.

2.5.11 Mugwort; Regulates Menstruation And Increases Appetite

Mugwort was already used by the ancient Greeks. Dioscorides, the father of phytotherapy, talked about this plant in the first century A.D. Andres de Laguna, a famous Spanish physician of the sixteenth century, who worked in the Netherlands, Bologna, Rome and Venice, said of this plant that “it is called Artemisia, from the name of the goddess Artemis, also called Diana, since like the goddess, the plant helps women in labor, without ever failing (George, 2006). Mugwort has always been a plant used because of its effects on the female genitals. The French medical school, with its characteristic finesse, said as early as during the Renaissance that “mugwort turns women in to flowers again,” meaning the effects of the plant on menstruation.

The whole Mugwort contains an essence whose main component is eucalyptol or cineole, as well as small amount of thujone, tannin, mucilage and a bitter component. Mugwort can produce menstruation in the case of amenorrhea (lack of menstruation) due to functional disorders. The Mugwort plant also has the properties of normalizing menstrual cycle and easing menstrual pain (dysmenorrhea). The bitter component of the Mugwort plant increases appetite, stimulates the emptying of the stomach, promotes digestion and normalizes the function of the gall bladder. It also has mild laxative properties.

2.5.12 Ginseng

Its scientific name of panax comes from the Greek word pan (all) and axos (healing). For Chinese people; ginseng is a true panacea, able to heal a wide range of afflictions. Its aphrodisiac effects have given it a wide popularity in Western countries, in which stress, tobacco, alcohol and other drugs have become a continuous aggression to sexual performance. The active components of ginseng root are so chemically complex that it has not been possible to synthesize them up to now. They are called ginsenosides and chemically these are steroid glycosides from the group of triterpenic saponins. Therapeutic properties of



ginseng are due mainly to these substances, but are also enhanced by other components. Ginsenosides increase physical performance and endurance. This is not due to any excitant properties, such as in cocaine, coffee, tea, or other drugs but to an improvement of metabolic processes. It also has antidepressive and anxiolytic properties (eliminate anxiety) Ginseng promotes mental performance, increasing concentration and memory capabilities. Ginseng has anti-stress properties due to “adaptogenic” properties, because it increases adaptation capabilities of the body to physical or psychological efforts. Ginseng also has vasoregulating properties balancing blood pressure.

2.5.13 Plants For Convulsion (Fits, Epilepsy)

Smoke of burnt leaves of *Pentaclethra macrophylla* Oil Bean Tree. Leaf juice or lotion or decoction containing *Steganotaenia araliacea* (Pienwogo), *Cussonia arborea* (barteri) (Saa-borofere), *Raphiostylis beninensis* (Akwakora gyahene), *Jatropha curcas* Physic Nut and *Croton zambesicus* (Dodwatu). An enema of the leaf-juice of *Leea guineensis* (Okatakayi). infusion of *Boerhavia diffusa* and *B.repens* Hogweed. The leaf decoction containing *Anthocleista nobilis* Cabbage Palm with lemon and leaf infusion of *Abrus precatorius* Prayer Beads with palm oil. A decoction of leaf and bark of *Rinorea ilicifolia* with *Palisota hirsuta* (Nzhuara). The bark of decoction containing *Newbouldia laevis* (Sasanemasa) and *Lonchocarpus sericeus* Senegal Lilac. Root decoction containing *Sansevieria liberica* and of *Cochlospermum tinctorium* (Kokrosabia) as liniment. Root-bark of *Rauvolfia vomitoria* (Kakapenpen) and root extract of *Maytenus senegalensis* (Kumakuafo) as drink. Leaf infusion of *Desmodium adscendens* var. *adscendens* (Akwamfanu) as bath. The bark of *Ekebergia senegalensis*, *Blighia sapida* Akee Apple, (Akye); *Pseudocedrela kotschyi* Dry-Zone Cedar and bark of *Ficus capensis* (Nwadua) as ingredients in the preparation. *Ehretia cymosa* (Okosua) and *Hoslundia opposita* (Asifuaka) as ingredients in Agbo infusions; decoction of *Terminalia macroptera* (Kwatiri) given to bulls and epileptic men and an unspecified part of *Annona senegalensis* subsp. *onlotricha* (arenaria) (Aboboma) (Abbiw, 1990).





2.5.14 Plants For Cough And Whooping Cough

Leaf decoction containing *Ocimum gratissimum* Tea Bush, (Nunum) *Tricalysia reticulata* (Kwakenya), *Vernonia amygdalina* Bitter Leaf (Bonwen). *V. colorata* *Tetracera potatoria* (Twihamu) drink as strong tea. *Mollugo nudicaulis* (cold), *Crossopteryx febrifuga* Africa Bark (Pakysie), *Ficus sagittifolia*, *Cordia millenii* Drum Tree or dried leaves smoked like tobacco, *Ximenia Americana* Wild Olive, *Psidium guajava* Guava boiled with lemon grass and drink. *F. sycomorus* (gnaphalocarpa) (Kankanga) and *Triplotaxis stellulifera* (Kokoo) for cases of cough and whooping cough in children. Also, *Acanthus montanus* False Thistle for cases involving women and children. Bark decoction containing *Psydrax subcordata* (*Canthium subcordatum*) (Teteadupon), *Canarium schweinfurthii*. Incense Tree, *Nauclea latifolia* Africa Peach (Sukisia) sometimes with spices; *Spondias mombin* Hog Plum, Ashanti Plum as emetic for severe cases (Abbiw, 1990). *Bridelia stenocarpa* (*micrantha*) (Opam) or powdered bark in palm wine. *Macaranga heterophylla* (Opamkokoo) as beverage and for bathing and chips of bark of *Cola acuminata* Commercial Cola Nut Tree with salt and seeds of *Xylopia aethiopica* Spice Tree, (Hwenetia). Bitter bark of *Khaya ivorensis* African Mahogany (Daubing). Bark infusion containing *Milicia excelsa* (*Chlorophora excelsa*) Iroko (Odun). *Acacia albida* (Gozanga) and *Anogeissus leiocarpus* (Sakane) or decoction. Bark or powdered bark of *Uvaria afzelii* and root, *Diospyros mespiliformis* West Africa Ebony as fumigant. *Corynanthe pachyceras* (Pamprama) chewed with water as drink, *Zanthoxylum gillettii* (*Fagara macrophylla*) (Okuo). *Teclea verdoorniana* (Owebiribi) chewed *Carapa procera* Crabwood, *Khaya anthotheca* White Mahogany (Kruben). *Treculia Africana* var. *africana* Africa Breadfruit, *Heisteria parvifolia* (Sikakya) eaten, *Necepsia afzelii* applied to chest and raw inner bark and roasted roots of *Napoleonaea leonensis* (*Napoleona leonensi*) chewed.

2.5.15 Plants for Diarrhoea and Dysentery

Bark decoction containing *Xylopia aethiopica* Ethiopian Pepper (Hwenetia). *Justicia flava* (Ntumenum) are given to children suffering from diarrhea or dysentery (Abbiw, 1990). *Combretum molle* (Gburega), *Allanblackia parviflora* (*floribunda*) Tallow Tree, (Sonkyi). *Pentadesma butyraceum* (Abotoasebie),

Monodora tenuifolia (Motokuradua) or root, *Harungana madagascariensis* (Okosoa) or root. *Albizia ferruginea* (Awiemfosemia), *Tamarindus indica* Indian Tamarind, *Acacia hockii* Shittim Wood or pounded bark sweetened with honey taken as stomachic or in enemas.

Extract of pounded bark of *Maesobotrya barteri* var. *sparsiflora* (Apotrewa). Boiled *Trichodesma africanum* with cereal, sheabutter and natron as paste and eaten. Decoction containing whole plant of *Eleusine indica* (Amico, 1977) as cited in Useful Plants of Ghana by Daniel K. Abbiw (1990). Decoction of *Blumea aurita* var. *aurita* as enema and decoction of *Alternanthera pungens* (repens) (Mpatowansoe) or *Celosia argentea* (Nkyewodue) as enema. Decoction containing bark of resin of *Amphimas pterocarpoides* (Yaya). Decoction containing *Desmodium gangeticum* var. *gangeticum* as beverage. *D. incanum* (canum) or pulped plant. Small doses of bark of *Sesbania grandiflora* and decoction of *Stachytarpheta cayennensis*. Brazilian Tea with natron for both humans and horses.

Leaf or leaf extract of *Ocimum gratissimum*, Tea Bush (Nunum) with *Paullinia pinnata*, (Toa-ntini) and that of *Triumfetta cordifolia* Burweed, (Ekuba); *Dichapetalum pallidum* (Folie), *Desmodium adscendens* (Akwamfanu) mixed with roasted corn and salt as drink. *Millettia thonningii* (Sante), *Myrianthus arboreus* (Anyankoma) with that of *Alchornea cordifolia* Christmas Bush as drink. Infusion of young shoots of *Lophira lanceolata*; lotion of leafy stems and bark of *Hymenocardia acida* (Sabrakyie) as beverage. Decoction containing leafy stems of *Ficus capensis* (Nwadua) and of *Griffonia simplicifolia* (Kagya) with leaves. Root or root extracts of *Uvaria chamae* (Akotompotsen), *Oncoba spinosa* Snuff-box Tree (Asratao). *Combretum zenkeri* (Tadatso) with *Aframomum* and peppers, *Quisqualis indica* Rangoon Creeper with seed, *Margaritaria discoidea* (*Phyllanthus discoideus*) (Pepea). *P. muellerianus* (Potopoleboblo) cooked with maize meal, *Chrysobalanus icaco* (orbiculairs) (Abeble) with leaf and seed oil, *Mezoneuron benthamianus* (Akoobowerew) and *Vernonia nigritiana* (Gyakuruwa).

Infusion of pulped root of *Desmodium velutinum* (Koheni-koko) or leaf decoction. Root-bark infusion of *Allophylus africanus* (Hokple). Hot infusion of



hot-bark of *A. spicatus* (Kotamenyati) and infusion of root-bark of *Mangifera indica* Mango. The whole plant of *Zea mays* Maize and corns of *Gladiolus daleni* (psittacinus), *G. klattianus*, *G. gregarious* and *G. unguiculatus* Sword Lily, Cornflag are used for mucous diarrhoea in horses by rectal injection.

2.5.16 Plants For Elephantiasis (Enlargement of Limbs)

Decoction of pounded leaves of *Mussaenda elegans* (Damaram). Pounded bark of *Duparquetia orchidacea* (Pikeabo) with ingredients applied to affected part. Decoction or cold infusion of macerated inner bark of *Dichrostachys cinerea* (glomerata). Marabou Thorn taken internally, pounded and warmed bark of *Ricinodendron heudelosis* (Wamma) applied and ground root of *Annona senegalensis* var. *senegalensis* and Wild Custard Apple applied as paste and leaf decoction taken (Moro, 1984-5).

2.5.17 Plants For Fractures And Dislocation

Crushed or pulped leaves of *Chasmanthera dependens*, *Mareya micrantha* (Odubrafo), *Parinnari curatellifolia* (Atena), *Maranthes polyandra* (P. polyandra) (Abrabesi) and *Rauvolfia vomitoria* (Kakapenpen) are applied as dressing to the affected parts of the body (Boulos, 1983). Bark decoction of *Alstonia boonei* (Sinduro), roots, leaves and seeds of *Paullinia pinnata* (Toa-ntini) with ginger applied before dressing. Powered bark and leaves of *Allophylus africanus* (Hokple) and pounded roots of *Rhodognaphalon brevisuspe* (*Bombax brevisuspe*) (Onyina-koben).

2.5.18 Plants For Hypertension (High Blood Pressure)

Decoction containing the dried leaves of *Byrsocarpus coccineus* (Awennade), *Carica papaya* (Pawpaw), *Gomphrena celosioides*, *Cymbopogon citrates* Lemon Grass. *Persea Americana* Avocado Pear, *Musa paradisiacal* Plantain, *Tamarindus indica* Indian Tamarind and *Clausena anisata* Mosquito Plant of chewed fruit-pulp of *Hyphaene thebaica* Dum Palm (Moro, 1984-5) as cited in Abbiw (1990). The roasted, dried seeds of *Cassia occidentalis* Negro Coffee brewed as a drink is also recommended as a remedy. The dried stem and roots of *Aristolochia indica*



(an introduced plant) has activity on blood pressure (Jain, 1968) as cited in Abbiw (1990).

2.5.19 Plants For Impotence

Bark decoction containing *Zanthoxylum xanthoxyloides* (*Fagara zanthoxyloides*) Candle Wood (Moro, 1984-5), leaf of *Turtarea heterophylla* (*Afunanyankwa*) taken internally as bitters are used to treat impotence. Tuber of *Ipomoea olivacea* (*senegalensis*) False Yam and roots of *Byrsocarpus coccineus* (*Awennade*) with other roots. Chewed roots of *Acridocarpus smeathmannii* (*Alasaayo*) or tea-like infusion of leaves of *Annona senegalensis* var. *senegalensis* Wild Custard Apple at bedtime (Moro, 1984-5). Bark of *Newbouldia laevis* (*Sasanemasa*) with clay and red pepper (Ayensu, 1978) as cited in Abbiw (1990). Latex of *Funtumia elastica* West African Rubber Tree (Ayensu, 1978). Leaf of *Microdesmis puberula* (*Fema*) (Ayensu, 1978). The bark decoction containing *Commiphora africana* African Bdellium (*Narga*) is used for sterility in men.

2.5.20 Plants For Hepatitis (Inflammation Of The Liver And Liver Problems)

Bark infusion of *Cleistanthus patens*, Salt and Oil Tree as drink or vapour bath. Bark decoction of *Harungana madagascariensis* (*Okosoa*) with *Cajanus cajan* Pigeonpea as a warm drink or enema. Root or bark of decoction containing *Newbouldia* leaves (*Sasanemasa*) or bark applied internally and bruised leaves applied as poultice with fruits of *Xylocarpus*. An unspecified part of *Citrus aurantiifolia* Lime for infectious cases (Ayensu, 1978) and *Oldenlandia affinis* subsp. *fugax* for inflammation of the spleen. Pounded leaves or roots of *Cassia occidentalis* NegroCoffee and root of *Boerhavia diffusa* Hogweed (Ayensu, 1978). Fruits of *Momordica charantia* African Cucumber (Ayensu, 1978), also recommended for the spleen. A poultice of *Paullinia pinnata* (*Toa-ntini*) with boiling water applied to the side and the fruit of *Balanites aegyptiaca* Desert Date (Ayensu, 1978).



2.5.21 Plants For Paralysis

Root bark of *Glyphaea brevis* (Foto) with Guinea-grains as beverage and bath. Root decoction containing *Zanthoxylum xanthoxyloides* (Fagara *xanthoxyloides*) Candle Wood with other drugs. Pulp of leafy stems of *Phyllanthus muellerianus* (Potopoleboblo) as rub. Seeds of *Jatropha curcas* Physic Nut (Ayensu, 1978) and unspecified part of *Trema orientalis* (guineensis) (Sesea) (Abbiw, 1990).

2.5.22 Plants For Hernia (Protrusion Of An Organ-Usually Associated With Abdominal Cavity;Orchitis)

Bark decoction containing *Milicia excelsa* (*Chlorophora excelsa*) Iroko (Odum) or *Zanthoxylum leprieuri* (Fagara *leprieuri*) (Oyaa). Root decoction containing *Cochlospermum tinctorium* (Kokrosabia) or *Clerodendrum capitatum* (Tromen). Leaf decoction containing *Acacia sieberiana* var.*villosa* (Kulgo) or *Carica papaya* (Pawpaw). Leaf vapour bath of *Vernonia conferta* (Flakwa) or *Trema orietalis* (guineensis) (Sesea). Hot application of root and leaf decoction containing *Newbouldia laevis* (Sasanemasa). Powdered root of *Afzelia Africana* (Papao) in millet beer as drink. An enema of leaf juice of *Acacia pentagona*. A tonic of the bark infusion of *Parkia clappertoniana* West African Locust Bean. Bark-pulp of *Blighia sapida* Akee Apple (Akye) eaten with ginger. Young shoots of *Gouania longipetala* (Homabiri) with *Zanthoxylum gillettii* (Fagara *macrophylla*) (Okuo), pepper and salt. Roots of *Cassia sieberiana* African Laburnum with other plants and fresh leaves of *Pseuderanthemum tunicatum* or decoction of the whole plant. The roots of African Labuurnum are used for strangulated hernia or ground root of *Annona seengalensis* var. *senegalensis*, Wild Custard Apple applied as paste (Moro, 1984-5). The leaves of *Heinsia crinita* Bush Apple cooked with rice is given to children for umbilical hernia (Abbiw, 1990).

2.5.23 Plants For Measles

Decoction containing leaves of *Naauclea latifolia* African Peach (Sukisia) with those of *Rauvolfia vomitoria* (Kakapenpen) and *N. diderrichii* (Kusia) use as wash for the body (Ayensu, 1978). Leaf or root decoction containing *Byrsocarpus coccineus* (Awennade) with that of *Cajanus cajan* Pigeonpea followed by a rub of *Cajanus* leaves and in enemas (Moro, 1984-5). Fresh leaf of *Clausena anisata*



Mosquito Plant pounded with clay as rub. Leaf decoction containing *Celtis integrifolia* Nettle Tree (Samparanga) as beverage and macerated leaves of *Grewia carpinifolia* (Ntanta) with Guinea-grains as rub or leaf decoction of *Euphorbia hirta* Australian Asthma Herb (Moro, 1984-5). The powdered bark of *R.vomitoria* applied and rice as rub for the rashes. An estimated 50,000 children die of measles in Ghana yearly. The figure for West Africa could be several millions (Abbiw, 1990).

2.5.24 Plants For Mental Troubles

Seeds of *Datura metel* Hairy Thorn-apple, *Metel* with other ingredients for symptoms. Root of *Uvaria chamae* (Akotompotsen) with Guinea-grains applied to fontanelles. Powered root of *Cnestis ferruginea* (Akitase) taken in ripe pawpaw; root and leaf decoction containing *Psydrax subcordata* (*Canthium subcordatum*) (Tetia-dupon) as vapour bath with pulp as rub. Root decoction containing *Rauvolfia vomitoria* (Kakapenpen) which would be drunk and act as sedative to induce several hours sleep. Bark infusion of *Pericopsis laxiflora* (*Afromosia laxiflora*) Satinwood, leaf of *Albizia zygia* (Okoro). Crushed, red, enlarged calyx-lobes of *Mussaenda erythrophylla* Ashanti Blood in water as drink and unspecified part of *Chrozophora sensgalensis*.

2.5.25 Plants For Menorrhagia (Excessive Blood Flow during Menstruation)

Cabbage of *Elaeis guineensis* and Oil Palm taken with food. Root of *Uvaria chamae* (Akotompotsen). Root and stem of *Stephania dindlagei* and powdered root and root decoction containing *Hunteria umbellata*. The leaf-juice of *Pergularia daemia* (Jain, 1968) and infusion of *Eleusine indica* (Boulos, 1983). The bark decoction containing *Zanthoxylum xanthoxyloides* (*Fagara zanthoxyloides*) Candle Wood is used for profuse bleeding after childbirth (Moro, 1984-5).

2.5.26 Plants For Pneumonia (Inflammation Of The Lung)

Leaf extract of *Ageratum conyzoides*, Billy-goat Weed (Efumomoe) rubbed on chest. Steeped bark of *Acacia albida* (Gonna) as bath and liniment. A decoction containing roots and bark of *Erythrina sensgalensis* Coral Flowers as



national health care system in line with WHO strategies on Traditional Medicine and the establishment of regulated mechanisms to control the safety and quality of products and of practice. Attempts should be made to create awareness about safe and effective Traditional Medicine/Complementary or Alternative Medicine (TM/CAM) therapies among the public and consumers as well as cultivate and conserve medicinal plants to ensure their sustainable use (WHO, 2003).

2.6 SAFETY AND EFFICACY OF TRADITIONAL MEDICINE/CONTEMPORARY ALTERNATIVE MEDICINE

Seeking assistance of WHO in identifying safe and effective herbal medicines for use in national health care system. Against this backdrop, WHO came out with guidelines for assessing herbal medicine to facilitate the work of regulatory authorities, scientific bodies and industry in the development, as well as the assessment of quality, safety, efficacy and intended use of herbal medicines (HerbalGram, 1993). At present, WHO is supporting clinical studies on antimalarials in the Democratic Republic of the Congo, Ghana, Mali, Nigeria, Kenya, Uganda and Zimbabwe in the research and evaluation of herbal treatment for HIV/AIDS, malaria, sickle cell anemia and diabetes mellitus (WHO, 2003).

2.7 SUMMARY OF LITERATURE REVIEWED

The importance of the medicinal plants sector can be gauged from the fact that herbal medicines serve the healthcare needs of about 80 percent of the world's population.

According to the World Health Organization (WHO), the goal of 'Health for All' cannot be achieved without herbal medicines. While there is a growing demand for herbal medicine in the developing countries, healthcare seekers in the developed countries are becoming disillusioned with modern healthcare and are seeking alternatives. This has renewed interest by the multinational pharmaceuticals industry in bioprospecting. However, the lack of national legislation or effective international agreements on conservation of biodiversity has resulted in 'slaughter harvesting' of medicinal plants and massive depletion of biodiversity. This trend does not augur well for sustainable use of medicinal plants resources.



The fact that all medicinal plants are not amenable to cultivation should not be ignored. Hence, conservation and cultivation must go together with prioritization for development of the medicinal plants sector as a whole. To harness the potentials of this sector, there should be an economic outlook, realistic policy and effective planning strategy. Since available evidence is inadequate to fully capture the complex issues of this sector. There is a dying need to undertake in-depth socio-economic and policy research analysis to fill the gaps in understanding the dynamics of the medicinal plants sector. This may begin with conservation and on-farm cultivation of priority species as reported by various high-level experts committees. At the same time, the industry estimates for raw material demand should be available well in advance so as to regulate demand-supply scenario optimally. This is important to ensuring development of this sector in a sustainable manner.

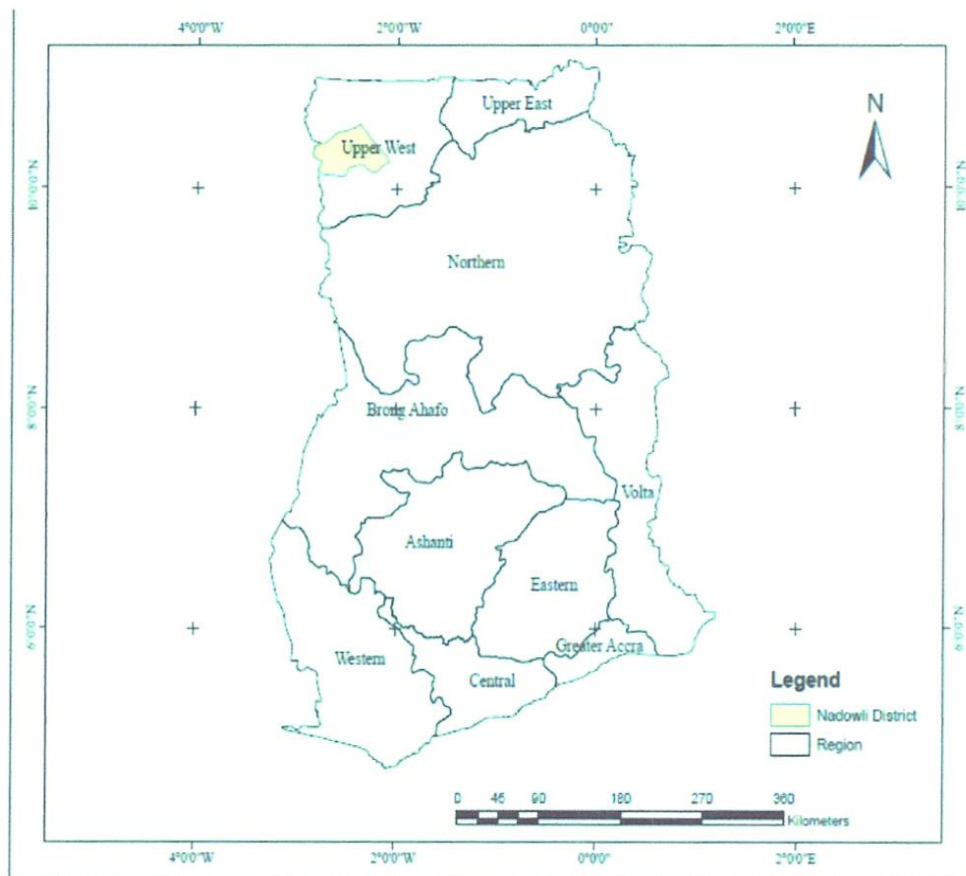


CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This chapter gives a profile of Nadowli District. The profile of the District will be divided into four sections namely, the geographical setting of the district, socio-demographic, spatial features and economic activities in the District. The chapter will also deal with the research design, population of the area under study, sampling techniques, research instrument, administration of the research instrument and procedure for data analysis.

Fig 1:. Map of Ghana showing Nadowli District

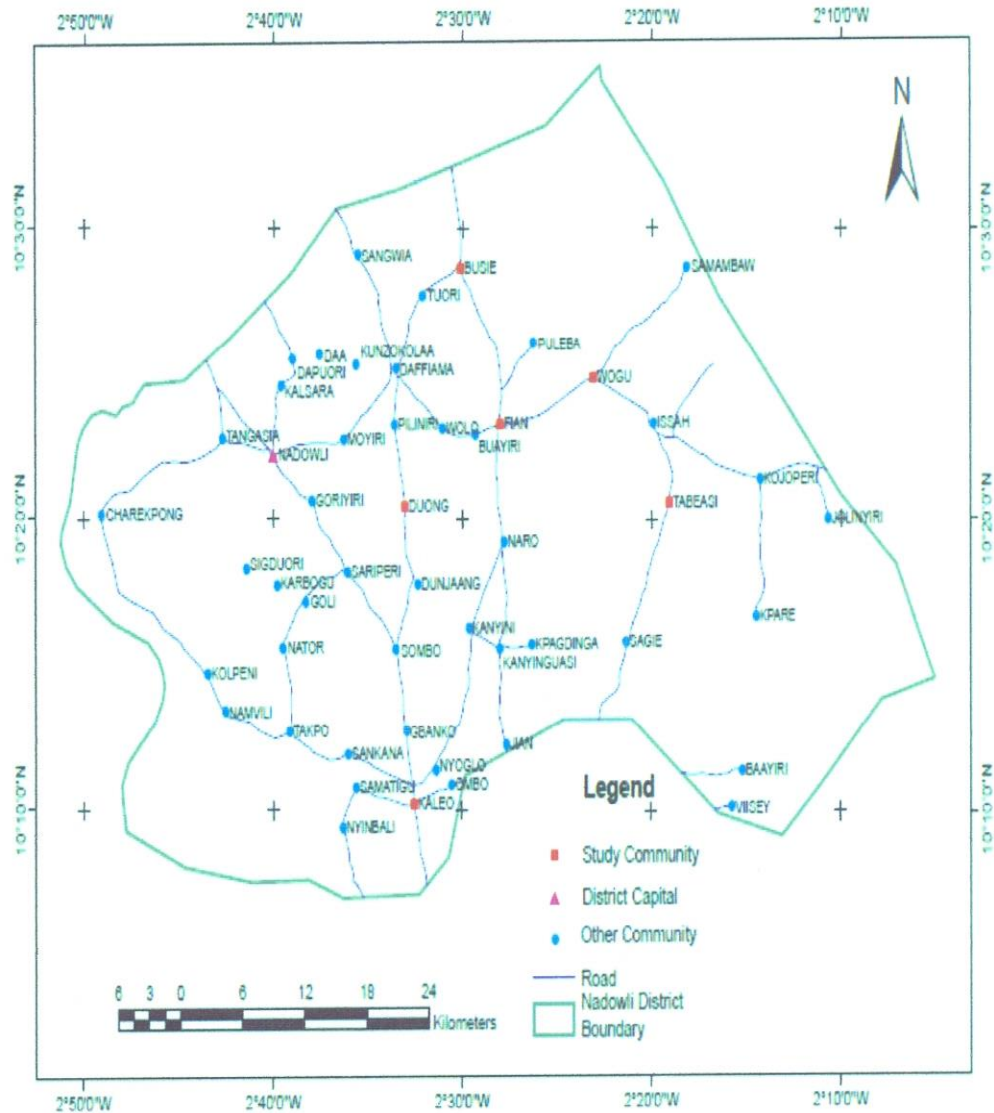


Source: Department of Environment and Resource Studies (UDS, CAMPUS)



3.1 GEO-PHYSICAL CHARACTERISTICS

Figure 2: Map of Nadowli District showing some of the study communities



Source: Department of Environment and Resource Studies (UDS, WA Campus)

3.1.1 Location And Size

The Nadowli district is one of nine districts of the Upper West Region. It is located in the centre of the region and was created in 1988 by legislative instrument (LI) 1437, just as any of the districts of the country. The district capital, Nadowli, is linked to Wa the regional capital by a 41 kilometer-tarred road.

The district lies between latitude 1003° and 1022° north and longitude 300° and 201° west (Nadowli District Development Plan, 1998). The Nadowli district is bounded by the Jirapa District to the north, Wa municipal to the south, Sissala West District to the east, and the Black Volta to the west. The district is subdivided into ten area councils with Nadowli, Kaleo, Daffiama, Sombo, Issah, Jang, Sankana.Takpo, Bussie and Charikpong as their capitals. The Nadowli District covers an area of about 274.25km square. The District stretches over 46 kilometers from the Billi Bridge (4km from Wa) to Dapouri bridge (9km after Nadowli). It also stretches of about 9km East-West from the Black Volta to the Wahabu stream (Nadowli District Development Plan, 1998).

3.1.2 Topography, Drainage And Soil

The District landform nature is generally low-lying but undulating with altitudes between 150-30 meters above sea level. Few areas however, rise to about 600 meters above sea level. Rock outcrops mostly of volcanic origin stand out over the plains. The most outstanding of these outcrops is the steep sided Ombo Wora Hill (557 meters). The Sankana Ridge with its large caves is the major highlands in the district. The commonest rocks in the district are the granite and birimian. The main River in the district is the Black Volta forming a Western boundary with Kulpawn and its tributary-the Bambula Felia Bakpong, Kulkulu and Konplela as prominent rivers (Nadowli District Development Plan, 1998).

3.1.3 Climate

The Nadowli District experiences a single rainy season from May to October with a mean annual rainfall of about 1100 mm and a mean temperature range between 26°C in August and 36°C in March. The district experiences prolonged



draught and sever hammattan during the dry season between the months of November and March. During this period of the year, relatively very little farming activities form the main economic activity of majority of the people (Nadowli District evelopment Plan, 1998).

3.1.4 Vegetation

The vegetation of the district is Guinea Savanna, which consists of grass with isolated trees such as the dawadawa, shea butter and acacia. Intensive cultivation and overgrazing, specially around major settlement as well as bush fires have destroyed the original vegetation in many places of the district. However, there is enough evidence f a major effort by the district at re-forestation (Nadowli District Development Plan, 1998).

3.2 SOCIO-ECONOMIC CHARACTERISTICS 3.2.1 Demographic is Features

The 2000 Population and Housing Census put the population of the District at 85, 093, made up of 3, 961 males and 45,132 females. The district has a population growth rate of 2.3% per annum. The average population density is about thirty-one (31) persons per square kilometer. About 45% of the population falls within the age 0-14, 49% make up the active economic group with 6% being the aged (2000 Population and Housing Census).

3.2.2 Ethnicity and Kinship

The indigenous inhabitants of the district is made up of a population of 96% Dagaabas and 14% Sisaalas. In terms of religion, about 44% are Catholics, 15% Protestants, 18% Moslems and 23% traditional believers (Ghana Population and Housing Census, 2000).

3.2.3 Health

Currently, there e fifteen (15) static health delivery outlets in the district with about 132 outreach points providing Primary Health Care (PHC) and curative services. The District has only two hospitals, six health posts and seven



community clinics. The populace average distance to a health facility is about 9 km as against a national average of 5km and at least about 75% of the people in the District seek medical attention from the health care facilities. The Doctor patient ratio is 1:212 and bed ratio of 1:157.

The disease pattern in the District reflects a situation common in the country-side of Ghana. The top eight diseases are malaria, upper respiratory track infection, skin diseases, acute eye infection, accidents, pneumonia, dysentery and intestinal worms (District Health Directorate, 1998).

3.2.4 Education

The Nadowli District is zoned into eight circuits for effective supervision and management. These are Daffiama, Fian, Issah, Kaleo, Charikpong, Takpo, Jang and the Nadowli circuits. A substantive circuit supervisor is responsible for each of the circuits. There are 17 pre-schools, 69 primary schools, 33 junior high schools, 3 senior high technical schools and 3 vocational schools. There is a concentration of schools west of Jang-Fian-Bussie trunk roads. About 45% of the eligible school-going age children live within 4-5km to the nearest primary school. Staffing is an acute problem in many of the schools. The teacher-pupil ratio is 1:44, 1:25 and 1:35 at the pre-school, primary, junior high and the senior high respectively (District Directorate, Ghana Education Service, 1998).

3.2.5 Water And Sanitation

The existing types of facilities providing water in the district are pipe system, bore-holes and hand dug wells with pumps, some of the facilities are public while others are private. Sanitation facilities in the district are of the following; septic tanks, Kumasi Improved Ventilated Pit (KVIP) and water closets (Community Water and Sanitation Agency Office, 1998).

3.2.6 Housing

The dominant type of housing in the district, are rectangular shaped with flat swish and roofs. They are built of mud, bricks, blocks and roof with zinc, mud or



elephant grasses. The average room occupancy is about four persons per room (Population and Housing Census, 2000).

3.3 ECONOMIC ACTIVITIES

Subsistence agriculture and petty trading dominant the economic activities of the District. About 80-85% of the active population is engaged in agriculture, about 4% in public sector and 10-15% in petty trading.

3.3.1 Crops And Livestock Production

The people of the district depend on rain fed agriculture. Rainfall is erratic and this contributes greatly to the wide fluctuations in the crop yields. Currently; the total land under irrigation is just 50 acres. Application of traditional technology dominant in agriculture, while farmlands are too small to enjoy any economies of scale. Fanning is considered a livelihood rather than a business. The major food crops cultivated in the district are; millet, sorghum, guinea corn, rice, maize, yam and vegetables such as tomatoes, okro and garden eggs. The animals reared include goats, pigs, cows and birds. The most common system adopted in the livestock or animals' production is the semi-intensive and extensive system of husbandry (District Agricultural Development Unit, 1998).

3.4 THE RESEARCH DESIGN

The research design that would be used for the study is descriptive research survey. According to Babbie (1999), descriptive survey describes the current status of a phenomenon and it is also used for assessing the attitudes, opinions and views of a group of people or individuals. Descriptive research is research which specifies the nature of a given phenomenon. It determines and reports the way things are. Descriptive research, thus, involves collecting data in order to test hypotheses or answer research questions concerning the current status of the subject of the study (Gay, 1992).

Also, according to Best and Khan (1998), descriptive research is concerned with the conditions or relationships that exist, such as determining the nature of prevailing conditions, practices and attitudes; opinions that are held; processes





that are going on; or trends that are developed. Amedahe (2002) also maintains that in descriptive research, accurate descriptions of activities, objects, processes and persons is the objective. He also noted that research is not a fact finding per se. In fact, there is considerably more to the descriptive research than just asking questions and reporting answers. In this view the phenomenon under study is investigating the herbalists' inability to use measures to preserve and ensure the sustainable use of the existing medicinal plants in the Nadowli District of the Upper West Region.

3.5 POPULATION OF THE STUDY AND SAMPLING FRAME

The target population of the study would be all herbalists in the Nadowli District of the Upper West Region. However; the sample would be 80 herbalists in the district who benefited from the Zintang Healers Association survey programme.

3.6 SAMPLE AND SAMPLING TECHNIQUE

The 80 herbalists chosen as the sample for the study were selected using the purposive sampling technique, also known as judgmental sampling where a researcher purposely chooses subjects who in their opinion are thought to be relevant to the research topic. This number was taken to offer the researcher the opportunity to interview as many herbalists as he can, taken into consideration the type of the population, the methodology employed in the research, the availability of time and resources, the type of instruments used, the capacity of the researcher as well as the response rate of the population. The study was limited to communities such as Duong, Wugo, Siiru, Kyaan, Kanyene, Naro, Fian, Zupiri, Meguo and Bussie, Kaleo, all in the Nadowli District of the Upper West Region.

3.7 RESEARCH INSTRUMENT AND PROCEDURE FOR DATA ANALYSIS

The research instrument that was used for the study consisted of structured interviews, reports from the Zintang Healers Association and their associates and some key informants.

Both qualitative and quantitative data were gathered using structured questionnaire as the principal tool. The survey questionnaire consisted of open ended questions administered to the respondents in the selected communities in the District. The essence of this is to enable the researcher obtain data on attitude, beliefs and opinions among others in the selected communities. The questions were structured to cover areas such as respondents characteristics, medicinal plant species used, the illnesses and disease conditions treated, the parts of plants and the form in which they are used, mode of propagation, sustainability strategies and the economic uses of the plants.

After collecting the data and editing the questionnaire, responses were coded and analyzed using the computer software SPSS package.

3.8 ADMINISTRATION OF THE RESEARCH INSTRUMENT

The research instrument was administered by the researcher himself. Visits were paid to the selected herbalists who are in the various communities the study covered.



CHAPTER FOUR

4.0 DATA ANALYSIS

This chapter analyses the data gathered from the field in April, 2010 and presented in tables and figures to reflect the picture of the topic under study. The chapter looks at the characteristics of respondents, the common medicinal plants used in the District, the parts of plants used in the treatment of diseases. Measures taken to sustain the available plants and the problems they face in trying to sustain these medicinal plants in the District.

4.1 SEX DISTRIBUTION OF RESPONDENTS

The sex distribution of respondents from the sample size of 80 indicates that, 93.75% of respondents were males while 6.25% of the respondents were females. This means that, traditional medical practice is a male dominated activity in the study area as shown in table 4.1 below.

The gender disparity seems to follow the lines of the role of women in patriarchal societies. It may also be attributed to the fact that the act of healing is held sacred by traditional healers and the knowledge is passed through families mostly to male children who are considered heirs to families especially in the northern sector of the country where the system of inheritance is patrilineal.

Table 4.1: Sex Composition of Respondents

SEX	FREQUENCY	PERCENTAGE
Male	75	93.75
Female	5	6.25
TOTAL	80	100

Source: Field Survey (April, 2010)

The male dominance of this occupation could also be linked to gender roles. Clearly, most of the plants used in curing disease are found in the bush or forest which is usually some distance away from the communities. This is clearly shown in the table 4.10 showing distances covered in obtaining medicinal plants.



Thus, considering the time and effort required in practicing herbal medicine, most women cannot be actively involved in the practice. This is because of the work load on traditional northern women who though have fewer income generating opportunities, assume heavier agricultural responsibilities in addition to housekeeping chores.

4.2 AGE DISTRIBUTION OF RESPONDENTS

The findings suggest generally that Traditional Medicine Practitioners in the study area are largely within the youthful age range. This is clearly shown in the age distribution of the respondents in Table 4.2.

Out of the sample size of 80 respondents, 67.5% fell within the age range of 31-60 years.

This means the age range 31-60 constitutes the largest number of respondents and they come within the active labour force. Further discussions revealed that this trend is mainly due to the interest of the youth in becoming apprentices. This indicates a potential for sustenance of the knowledge of plant medicine in the study area. As such greater effort and interventions are needed to preserve the existing medicinal plants to insure their sustainability. Also the respondents numbering twenty-four fell within the age bracket of 61-90 years (30%) and only two of the respondents fell within the age range of 91-100 years representing 2.5%.

Considering the fact that documentation on the practice in traditional medicine in Ghana is limited, the above revelation that 32% of the respondents were in the age range of 61-100 poses a challenge to any intervention that aims at preserving knowledge of the practice.



Table 4.2: Age Composition of Respondents

RANGE	FREQUENCY	PERCENTAGE
31 — 60	54	67.5
61 — 90	24	30
91 — 100	2	2.5
TOTAL	80	100

Source: Field Survey (April 2010)

4.3 EDUCATIONAL STATUS OF RESPONDENTS

Education is key to overall human development, because it helps people to broaden their horizons to improve their skills (NDPC, 2002). Through education people acquire skills that help them in their day to day endeavors. Although the 2000 Ghana Living Standards Survey Report indicates that only 32% of the Ghanaian adult populace have never been to school, the analyses of the data from this study area indicate that sixty-nine of the respondents have no formal education (86.25%), while those who have been to school before constitute 13.75% of the respondents. However, out of the eleven respondents that had formal education, eight went up to elementary level, two had secondary education and one completed University which represents 10%, 2.5% and 1.25% respectively as indicated in the table below. The low level of their education made the respondents unable to keep data on their activities as well as knowledge on the methods of propagating some of the plant species that are under great threat of extinction, hence, their inability to put in measures to enable them preserve and conserve the existing medicinal plants.



Table 4.3: Educational Status of Respondents

LEVEL	FREQUENCY	PERCENT
No education	69	86.25
Secondary	2	2.5
University	1	1.25
TOTAL	80	100.0

Source: Field Survey (April, 2010)

4.4 TYPE OF TRADITIONAL MEDICINE PRACTITIONERS

Out of the 80 respondents, seven are bone setters, sixty-eight are herbalists; four traditional birth attendants (TBA's) and one a TBA as well as bone setter representing, those forming 8.75%, 85%, 5% and 1.25% of the respondents respectively. This is illustrated in table 4.4.

Table 4.4: Type of Traditional Medicine Practitioners

TYPE	FREQUENCY	PERCENT
Bone setter	7	8.75
Herbalist	68	85
Traditional birth attendant	4	5
Traditional birth attendant and bone setter	1	1.25
TOTAL	80	100.0

Source: Field Survey (April 2010)

From the table above, it is clear that, herbalists form the majority of the traditional medicine practitioners in the study area. This finding can be attributed to the kind of disease conditions people suffer from in the study area. It may also be due to the availability of the needed medicinal plants for those disease conditions. From the survey a further discussion indicates that majority of the





traditional medicine practitioners inherited the practice from direct blood relations mostly parents or grandparents. Others acquired the knowledge either from friends or people who treated them when they suffered from the same disease conditions earlier in life. Others believed they were chosen by their ancestors because they got the skills and knowledge of treating or healing people naturally. It is however worth noting here that those who acquired the knowledge and skills of healing people through inheritance were those who used to assist their parents or grandparents in treating people and thus took over the practice after the death of their relatives. The manner through which knowledge and skills are acquired goes to stress the point that these skills and knowledge in traditional medicine practice are usually held sacred with families and are considered secrets that are only disclosed to trusted family members. Not even to all children of a parent are qualified to inherit the knowledge and skills of the practice.

According to (Good & Kimani, 1980) traditional medical practitioners are attracted to urban centers where their work can be rewarding and studies in Dar es Salaam (Tanzania), Ibandan (Nigeria), Lusaka (Zambia), Kinshasa (Zaire), Kampala (Uganda) and Nairobi (Kenya) have shown that “urban centers are viable and vigorous areas of traditional medicine”. In this study area however, the traditional medicine practitioners took cue from those they inherited or acquired the skills of treating disease conditions who were not interested in monetary rewards. The pride of healing and the acknowledgement of the fact that he or she was chosen by the ancestors to heal and as such do not see the need to leave the village for the urban centers for the purpose of healing people or selling plant medicine. The survey also revealed that, some traditional medicine practitioners were motivated by the payments made by clients for their services. Others motivated by the gifts received from clients who have been cured while others were motivated by both fees paid and gifts.

It is however worth noting that contrary to what happens in other parts of the world such as China and India where traditional medicine has been well integrated into the National Health Service delivery system, making motivation for service well coordinated, this study shows otherwise.



The study findings revealed that, whilst some traditional medicine practitioners take some fees for their services others do not charge any fees at all and depend on the good will of clients in the form of foodstuffs (cereals), poultry and small amount of money though this vary form community to community.

A further research question asked to know whether the current traditional medicine practitioners are making any effort to train any of their family members or relations in order to keep the industry going and to render health care services to people who may not have access to clinics. In response seventy out of the 80 respondents, responded in the affirmative (87.5%) and the remaining ten responded in the negative representing 12.5%.

In the encouraging revelation, the traditional medicine industry has a brighter future in the District. Thus, there is a need to enact measures by the herbalists with the initiation of intervention programmes by Non-Governmental Organizations and the District Assembly to help the herbalist to preserve and conserve the existing medicinal plants available.

4.5 RELIGIOUS AFFILIATION OF RESPONDENTS

Table 4.5: Religious Affiliation of Respondents

RELIGION	FREQUENCY	PERCENT
Christian	50	62.5
Muslim	5	6.25
Traditionalist	25	31.25
TOTAL	80	100.0

Source: Field Survey (April, 2010)

From the table 4.5, it can be deduced that fifty of the respondents are Christians, five are Moslems and twenty-five are traditionalists which represent 62.5%, 6.25% and 31.25% respectively. From the survey it was evident that majority of the traditional medicine practitioners in the study area were of the Christian belief although the 2007 Jubilee calendar indicated that about 45% of Ghanaians were



traditionalist. The above revelation of a higher percentage of traditional medical practitioners being Christians in the study area could be seen as breaking the myth surrounding traditional medical practice as an exclusive industry for traditional believers. This revelation is a source of motivation for most of the youth in the study area to want to come into the industry. Also, the 31.25% of practitioners professing the traditional faith could be due to the mode of operations associated with traditional medicine. In most cases, the healing process involves consulting the gods or ancestors for the cause of the ailment and invoking the spirits to determine the healing process.

This spiritual aspect of traditional medicine practice makes it unattractive to researchers and as such poses a threat to the survival of the practice and the industry. This also makes documentation on the practice difficult as some aspects cannot be explained. The five percent Moslems in the industry in the study area is an encouraging situation for the youth as it used not to be the case because one cannot heal people traditionally and at the same time profess any other faith (Field Survey, April 2010).

Table 4.6 Marital Status of Respondents

MARITAL STATUS	FREQUENCY	PERCENT	CUMULATIVE PERCENT
Married	73	91.25	91.25
Widow/widower	7	8.75	100.0
TOTAL	80	100.0	

Source: Field Survey (April, 2010)

From table 4.6, it can be deduced that seventy-three of the respondents are married with only seven being either a widow/widower or this presents 91.25% and 8.75% respectively. It was also realized that out of the seventy-three men contacted, fifty-one of them were married to one wife, eighteen had two wives, four had more than two wives and this represents 69.9%, 24.6% and 5.5% respectively.



4.7 OCCUPATIONAL DISTRIBUTION OF RESPONDENTS

It was also realized from the survey that seventy-five of the respondents representing 93.75% had other jobs aside their practice as herbal practitioners. Five of them had no other jobs aside being herbal practitioners representing 6.25%. This is illustrated in the table over leaf.

Table 4.7: The Occupation of Respondents Other Than Herbal Practice

RESPONDENTS	FREQUENCY	PERCENT
No	5	6.25
Yes	75	93.75
TOTAL	80	100.0

Source: Field Survey (April, 2010)

However, out of the seventy-five respondents who have other jobs, one is a teacher (1.3%), seventy are farmers (93.3%), three are pito brewers (4%), one is a GPRTU Secretary (1.3%). The greater majority of the respondents having other jobs aside being herbalists attributed it to the fact that the fees charged and gifts received from the good will of patients who have been healed cannot be used to carter for one's family and the practitioner cannot charge more than what they are collecting now because their parents or forefathers from whom they acquired the skill and knowledge of healing never charged more than that. The perception is that if they charged more they stand the risk of losing the power to heal as such the only alternative is to engage themselves in farming to enable them carter for their families. This same argument was put forward by those who also had other jobs aside herbal medicine practice.

4.8 NUMBER OF YEARS IN PRACTICE

The table below shows the number of years the respondents have been practicing as herbalists.

Table 4.8: The Number of Years of Practice

YEARS	FREQUENCY	PERCENTAGE
1 — 20	43	53.75
21 — 40	30	37.5
41 —60	7	8.75
TOTAL	80	100

Source: Field Survey (April, 2010)

From table 4.8, it can be deduced that 53.75% has been practicing between 0-20 years, 37.5% has been practicing between 21 — 40 years and 8.75% has been practicing between 41 — 60 years. Looking at the statistics presented in table 4.7, one may be tempted to believe that those traditional medicine practitioners who have been practicing between one and twenty are the youth but this may not necessarily be so. Since in most cases the assistant who understudies the older practitioner may only practice within the community after the death of the practitioner. This can raise the question of how long one must understudy another person before he or she can practice.

4.9 THE COMMONLY USED MEDICINAL PLANTS IN THE DISTRICT

To identify the commonly used medicinal plants, ten communities in the Nadowli district were chosen. These are, Bussie, Kyaan, Meguo, Kanyene, Nora, Duong, Zupiri, Siiru, Wogu and Fian. The reason being that, these communities are noted to be relatively richer in plant species. The herbal practitioners identified about forty — one different kinds of plants used in the treatment of diseases in the local language (dagaare) with plants such as pelaa, babing, vuurunton, kpinpuhoo, mwankyihaa, bonga, dawadawa, Baataangaa, Gaa, Kolitaangaa, Dondoliyelee, Gango, Gyanimg, Lienii, Gosoglaa, Dazugo, Mkuma pilisengu and the shea tree as the commonly used medicinal plants as they are believed to possess the basic ingredient needed for the preparation of the various herbal formulations.



Also when asked whether the medicinal plants were readily available, sixty three of the respondents responded in the affirmative representing 78.75% of the respondents. Seventeen of the respondents responded in the negative, representing 21.25% of the respondents. This difficulty in getting the required medicinal plant species according to the respondents is as a result of the cutting of trees by firewood collectors, charcoal burners, farming activities and bushfires among others. Hence these practitioners have to travel as far as 0 — 15 km into the forest in order to collect the plants needed for the treatment of diseases in the district.

Table 4.9: Distances Covered By Herbal Practitioners

RANGE	FREQUENCY	PERCENT
0 — 5 km	60	75
5 — 10Km	15	18.75
10 — 15km	3	3.75
15km and above	2	2.5
TOTAL	80	100.00

Source: Field Survey (April, 2010)

From the table 4.10, it can be deduced that 60, 15, 3 and 2 respondents representing 75%, 18.75%, 3.75% and 2.5% respectively travel distances ranging between 0-5km, 5-10km, 10-15km and 15km and above respectively in search of the very plants that take care of our health needs. However the fact that 25% of the respondents travel beyond 5km to collect plants species is an indication that these plant species are gradually getting lost if care is not taken. These medicinal plant species according to a further discussion with the respondents clearly indicates that the plants were around the houses and handy for their works. Now the fact that people will have to go more than a kilometer from the community to look for and harvest these plant species for their work strongly suggest that the medicinal plant species are getting lost. As such pragmatic interventions need to



be put in place to preserve and conserve the existing medicinal plant species in the communities of the study area. This will ensure sustainable use of the traditional medicine industry in the District.

4.11 THE PLANT PARTS USED IN THE TREATMENT OF DISEASES

Plant organs and tissues are used alone or in various combinations with one another depending on the plant species and the illness being treated. From a total of 41 plants harvested for treatment, the use of roots only (8.75%), roots and bark (31.25), leaves and root (27.5%), leaves only (10%) and a combination of roots and branches occurred. About 3.75% of the respondents refused to mention the plant parts used as shown in the table below.

Table 4.10: The Plants Parts Used in Treatment

PLANTS PARTS	FREQUENCY	PERCENT
A combination of all the parts	10	12.5
Roots and bark	25	31.25
Leaves and roots	22	27.5
Leaves only	8	10
Roots only	7	8.75
Branches	5	6.25
Refused to mention	3	3.75
Total	80	100.00

Source: Field Survey (April, 2010)

During the survey, it was realized that 41 plant species were used to cure various diseases. These plants were mentioned in the local dialect (dagaare). These include *babing*, *vuurunton*, *kpinpuhoo*, *zienguo*, *lienee*, *pelaa*, *gufuura*, *shea-tree*, *dawadawa tree* among others. For instance, *pobaahi* (stomach ache) was a common illness treated by the respondents using six different plant species which



were written in dagaare. These are *gufuura*, *zienguo*, *babing*, *kpinpuhoo*, *bariko* and *lienee*. These are used based on soaking the leaves in water only or boiling the leaves and roots together and the patient either drinks or bathes or does both. This practice of using leafs only, roots only, bark only or a combination of these parts of plants in the treatment of disease conditions by traditional medicine practitioners in the study area is the same as elsewhere in Ghana and the world over. This is indicated by Ayensu, (1978) in the treatment of Asthma cited in Abbiw (1990).

Epilepsy was also a disease treated by most of the respondents using plant species such as “donkani”, “babin”, dawadawa tree, “zamatateri”, “vuurunton” and “saadow”. Some of the diseases treated by the herbalists can be seen in table 4.12.





Table 4.11: Types of Diseases Treated by a Herbalist, Plants Used, Parts of Plants Used and the Form in which they are Used.

DISEASE	PLANTS USED	PARTS	FORM USED
Epilepsy	Vuurunton, babing, saadow, pelaa	Roots, branches	Soaking, boiling
Mental disorder	Vuurunton, babing, mwankyihaa, pelaa, soridanyagri	Roots	Soaking and boiling
Stomach disorder	Babing, ponpoluoroo, kpinputhoo	Roots	Pounding and grinding
Typhoid	Honey, biri	Leaves/fruits	mixed with liquid Food
Hepatitis	Leine	Root	Boiling
Loba	Ngmaakyehaa, Baataagna, Peela and Voorongton	Root	Ointment
Fever/Malaria	Kakalaa, Bunegaa, Kogo, Zimbrigaa, Naanyaa and Ngmaanbere	Leaves	Boiled for bathing and drinking
Waist pains	Naaleema zenle, Peela, Gaa and Kandazugidaa	Back of roots	Ointment
Body pains	Kakalaa, Bunegaa & Kolitaaga	Roots	Ointment
Swollen Breast	Lungni, Peele, Ponpoluore	Fruits, leaves, roots	Solid/Ointment
Chest/Rib pains	Yoo, Baabinda	Sticks, roots	Ointment
Fracture	Punpugo, Ambagnee Susubee, Dawadawa, Biyagama	Bark, leaves and roots	Ointment



Snails (Twisted mouth)	Dazugo, Kondozugere, Zanpringa and Kankyeli	Leaves, roots	Burn & mixed with oil
Jemah (Lententi)	Pelaa, Nyagang, Naavaabo and Lingberaa	Roots, bark and leaves	Ointment, soak for bathing
Convulsion	Pelaa, Ngmaakug	Leaves	Ointment
Worms	Pawpaw	Seeds	Powder, liquid & drink
Cancer	Vuuronton	Roots/leaves	Boiled
Impotence	Dazugo,	Roots	Boiled and drink
Poison	Gonsuglaa, Gangobu	Roots	Boiled and drink
Guinea worm	Duleunyikola	Roots	Ointment
Skin rashes	Kpantala	Leaves	Boiled and bath
Delivery Problem	Baamaguo, Gbanpara, Duosun-Gboo, Kuong-komkomo and Yiilaa-sun-Gboo	Roots, leaves and Branches	Boiled and drink
Fibroid	Mistiltoe, Mansugo, Moguu and Gmaakogo	Sticks, roots	Powder in water and drink
Tusker	Leune	Roots	Ointment
Hi-cock	Tuo	Bark	Ointment
Ear pains	Kongdazugdaa	Roots	Liquid
Gonorrhea	Dawadawa, Gmaachira	Roots	Boiled and drink
Elephantiasis	Sobiri, Danyari	Roots and leaves	Ointment
Diabetes	Gonsuglaa	Roots and leaves	Soak and drink



Scorpion sting	Pelaa		Roots	Soaking
Piles (Kookoo)	Anguogna,baatangnaa		Roots	Soak and drink
Snake bite	Creeping plant, Wirijenilu		Whole plant, leaves and roots	Ointment
Stomach Ulcer	Pelaa,vuuronton, Damoi, Gango		Roots and bark	Boiled and drink
Old wound	Gbanturi, kakalaa		Roots	Boiled
Carphosis	Kyuunabenga, Kankanpaga		Roots and leaves	Boiled and bath
Navel pain	Cherin-dau		Roots	Boiled and drink
Hunchback(Gumehii)	Kulitaagna,Taan-tora		Roots and leaves	Liquid
T.B/Cough	Hara and white Beans seeds		Leaves and seeds	Liquid
Diarrhoea	Gbaganyuu		Bark	Boiled and drinks
Barrenness	Gaa-Sunnguo		leaves	Boiled and drink
Chicken pox	Guava, leune, Kpantala		leaves	Ointment
Boils	Nutuz and Ngmandele		Leave	Ointment
Guinea worm	Leene, Ngmaabeenu		Roots and vine	Ointment

Source: Field Survey (April, 2010)

4.13 MEASURES TAKEN BY PRACTITIONERS TO ENSURE THE SUSTAINABLE USE OF MEDICINAL PLANTS

Traditional medicine practitioners like any other service providers adopt various strategies in times of crisis in order to sustain their businesses so as to ensure the continuous existence of the services they provide to their clients in and around the District.

Table 4.12: The Measures put in Place by Herbal Practitioners to Conserve the Medicinal Plants.

MEASURES	FREQUENCY	PERCENT
Cover roots after cutting	13	16.25
Cover roots after cutting and creating firebelts	3	3.75
Creation of fire belt	13	16.25
Nothing	29	36.25
On-farm Planting of plants	10	12.5
Creating forest reserves	12	15
TOTAL	80	100.00

Source: Field Survey (April, 2010)

From table 4.13, it can be deduced that 29 respondents, representing 36.25% of the 80 respondents did nothing to conserve or sustain the existing medicinal plants to prevent plants from extinction. This implies that the very medicinal plants that take care of the health care needs of the rural folks will be lost sooner or later if care is not taken to remedy the situation.

However, ten respondents representing, 12.5% of the respondents, have taken up on-farm planting of some of the plants that are difficult to come by in order to ensure their continuous supply. This is a step in the right direction.





Other measures rarely adopted by herbal practitioners in the study community are covering the roots of plants with soil after cutting to allow them to shout up again and the creations of fire belts to prevent them from bush fires. The creation of forest reserves, in which charcoal burners and firewood, harvesters are prevented from carrying out their activities can only be done by government although twelve of the respondents representing 15%, mentioned it. These and other measures were suggested by Cunningham (2003).

A further discussion on the ownership of a medicinal plant garden by traditional medicine practitioners revealed that only eighteen of the respondents (22.5%) own some sort of medicinal plant garden because not all the gardens are vibrant, some are seasonal while others are just one or two medicinal plant gardens.

A large number of the respondents numbering sixty-two (77.5%) do not have and never made the attempt at owning a medicinal plant garden to preserve and conserve the plant species to ensure their sustainable use for their business. Akerele (1987), Anyinam (1987), Good (1987) and others have pointed out that there is a need, through training and evaluation of effective remedies, to involve traditional medicine practitioners in national health care systems as they are an important and influential group involved in health care. Sustainable use of the major resource base of traditional medicine practitioners, the medicinal plants is therefore essential. Herbal medicine sellers are familiar with the species which are becoming difficult to obtain either because of limited geographical distribution, habitat destruction or over-exploitation. Their insights, coupled with botanical knowledge of the plant species involved, their ecology and distribution, therefore provide an essential source of information for cost-effective surveys (Cunningham, 1991). What is needed is a common methodology applied on the basis of ethnobotanical surveys of markets, as suggested by the IUCN Species Survival Commission Medicinal Plants Specialist Group (MPSG, 1996). The above argument suggests that the traditional medicinal practitioners in the study area are familiar with the plant species that are becoming difficult to obtain due to the botanical knowledge of the plant species, the ecological distribution, habitat destruction and over-exploitation. They need some training in methodology and evaluation of effective remedies either individually or in groups to enable them

apply the needed interventions to preserve and conserve these all important plant species for their work and to sustain the industry in the District. Cunningham, (1990) also pointed out that what needs to be done is to identify the categories of medicinal plant species that are most vulnerable to over-exploitation by combining the insights of herbal medicine sellers with our knowledge of plant biology and distribution to preserve and conserve these medicinal plant species. Cultivation of alternative supply source of popular, high priority species outside core conservation areas is therefore essential.

From the above analyses, one will come to realize that some amount of effort has been demonstrated by the traditional medicine practitioners to put in measures though very negligible to preserve and conserve the medicinal plant species. This will ensure their sustainability to enable the practitioners render services to their clients and remain in business and ensure the continuity of the traditional medicine industry in the District.

4.14 PROBLEMS FACED BY PRACTITIONERS IN TRYING TO CONSERVE THE AVAILABLE MEDICINAL PLANTS

Traditional medicine practitioners like any other service provider are confronted with a number of problems in their bid to conserve the medicinal plants species to ensure their continuous use by generations to come. These problems are presented in table 4.14.



Table 4.13: The Problems which Practitioners Face in Trying to Conserve the Plant Species

PROBLEMS	FREQUENCY	PERCENT
Bush fires	35	43.75
Bush fires and difficulty in securing land	5	6.25
Bush fires and lack of knowledge on how to plant	11	13.75
Lack of funds and knowledge on methods of propagation	4	5
Firewood harvesters.	15	18.75
Difficulty in getting water to water plants	5	6.25
Lack of water and animals destruction	5	6.25

Source: Field Survey (April, 2010)

The table above indicates that, eleven of the respondents (13.75%) lack the knowledge about how the plants species can be propagated in addition to occurrence of bush fires to extinction. The study also revealed that 5% of the respondents also lack the much needed funds as well as propagation techniques to enable them conserve the available medicinal plants. Difficulty in getting water to water plants as well as destruction by animals and bush fires are equally problems that retard their efforts at sustaining the medicinal plant species in the District. This implies that practitioners may find it difficult to conserve the available plant species and replace those under extinction. A very disheartening disclosure was made by the respondent which is a disturbing situation to the traditional medicine practitioners. The very people they render these valuable services of healing to are engaged in bush burning and this apparently affects their business in particular and the industry as a whole. This is because the bush fires destroy the medicinal plants species by burning them to the point of no recognition. Some are unable to sprout again and eventually die while others lose the medicinal properties they contain. Again the bush fires also affect the



business because they lead to reduction in the amount of rainfall and the pattern of the rains which result in prolonged draught. This affects those practitioners who obtain their medicinal plants from the wetlands and along the river banks and this has created an unpleasant situation for traditional practitioners who travel long distances to obtain the needed plant parts for treatment.

Also, the forest ecosystem is being destroyed and used for other activities such as agriculture and human settlement resulting in the reduction of medicinal plants as well as the potential of the forest to regenerate itself. This is yet another reason that explains why traditional medicine practitioners have to travel long distances on foot to get plant parts for their work. Over exploitation of the existing medicinal plant species was also mentioned as one of the challenges traditional medicine practitioners faced in the study area. This is because, some practitioners cut or dig or harvest the plants species to the roots or removing the whole plant therefore giving the plant no chance to regenerate itself. This phenomena, according to the practitioners if care is not taken to put in interventions and efforts to preserve and conserve the existing medicinal plants species, will lead to total disappearance of the very plants species needed for their business in the treatment of disease conditions in the communities in the District.

4.15 ECONOMIC USES OF MEDICINAL PLANTS

The table below shows the responses given by the respondents as to whether the plants used in the treatment of diseases have other economic uses.



Table 4.14: Whether the Plants have Economic Uses or Not

RESPONSES	NUMBER OF RESPONSES	PERCENTAGES
No response	13	16.25
No	17	21.25
Yes	50	62.5

Source: Field Survey (April, 2010)

From table 4.15, it can be deduced that fifty of the people responded and said the plants have other economic uses which can help improve the living conditions of respondents. This represents 62.5% of the total respondents.

It was also realized that these medicinal plants can be used for charcoal production, firewood, produce fruits among others which can be sold and the proceeds used to acquire certain basic needs of the people to improve upon their standard of living. The above trend can be attributed to poverty in the study area and the over dependency of the people on the forest for fire wood for domestic and commercial use. The augment above can be supported by the NDPC (2003) observation that food crops farmers have the highest incidence of poverty. The same document indicated that fifty-nine percent of food crop farmers are poor, which the inhabitants of the study area are not an exception.

4.16 WHERE PLANTS CAN BE OBTAINED

To the layman plant is a plant and can be found anywhere or obtained anywhere for any purpose. In this study the traditional medicine practitioners agree that plants are plants and can be found anywhere but there are certain disease conditions the plants needed for their treatment cannot just be found anywhere but have some specific places that the plants can be found. This according to those medicine practitioners who consult their ancestors to show them the way out in treating the particular disease condition, are directed and sometimes led by the spirits to the particular place where the medicinal plants can be found. Some also argued that their parents or masters from whom they inherited the knowledge



and skills of treating disease conditions obtained the medicinal plants from where they are also getting them from. Such as, along river banks, beneath river waters, in the middle of a thick forest. The general perception which has come to stay is that those areas harbor the plants that contain the medicinal properties.

Table 4.15: Where Medicinal Plants can be Obtained

PLACE	FREQUENCY	PERCENTAGE
Wetlands	23	28.75
Hilly Areas	16	20
Valleys	6	7.5
Others: like along river banks, beneath water, forest	35	43.75
TOTAL	80	100

Source: Field Survey (April, 2010)

From the analyses in table 4.16, it clearly shows that the traditional medicine practitioners obtain their plants from around their houses and other places formed 43.75 percent of the sample.

This can be attributed to kind of disease conditions that they deal with and the fast growing nature of medicinal plants. Also from the table, twenty-three of the respondents (28.75%) obtained the medicinal plants from wetlands, sixteen of the respondents (20%) obtained their plants from hilly areas and six obtained the plants from valleys and that (7.5%) of the respondents.

The revelation above suggest that some of the medicinal plants used in the treatment of disease conditions are secret and are not found everywhere but at specific places.

Also was the interest in knowing whether the traditional medicine practitioners do collect the plants for their work on their own. Out of the 80 respondents sixty-eight (85%) responded they collect the plants themselves and attributed this to the fact that the medicinal plants are readily available. Even those they cannot find





around them are just a walking distance away or along the route to their farms. They also put out an argument that, you may send somebody to obtain the plants for you and the fellow may not know how to harvest the plant. The remaining twelve respondents (15%) responded in the negative and attributed their inability to obtain the medicinal plants on their own to old age, the pressure on them. Also, the quantity needed and unavailability of the needed medicinal plants within a walking distances due to human activities such building of houses and agricultural activities.

It is also interesting to note that, the traditional medicine practitioners in the study area incurred no debt neither do they pay for obtaining the medicinal plants for their work. This came to light when seventy-two of the 80 respondents (90%) answered No to the research question “Do you pay for obtaining the medicinal plants for your work?.” The medicine practitioners argue further that, why should they pay for the plants when the plants have been given to them by God and are just a walking distance away from their houses. The remaining eight respondents (10%) answered that they pay for the plants. This group of the respondents argued that, somebody cannot go into the bush to harvest these plants for you without giving the person anything. However, these respondents do not see it as payment but a form of motivation for the person to get you what you need. Further discussion with the medicine practitioners revealed that, they are trying to educate their colleagues to desist from asking or sending people like children to go and harvest the medicinal plants for them if they cannot go themselves. This is because, it has come to the notice of practitioners that, most of the people they send to harvest the medicinal plants destroy the plants in the process and this can lead to extinction of the affected plants if they are not the fast growing type of medicinal plants.

An overwhelming majority 72.5% of the respondents revealed that there is no taboo in using or harvesting the medicinal plants. According to this group, when the patient comes to the practitioner and explains his or her disease, the various medicinal plants are put together if there are in the house depending on the condition. The patient may be scheduled to come back and the practitioner uses the period to look for the needed plants if the plants are not readily available.

However, depending on the disease which the person complained of he or she may have certain things to follow or observe as taboos. This may either be abstaining from alcohol of any kind and/or the meat of certain animals. About 27.5% of the respondents indicated that there are certain taboos to observe in harvesting the medicinal plants. This group also argued that if those taboos are not properly observed or followed the practitioner may succeed in harvesting the plants but the plants will lose the medicinal value. Also, the practitioner may get to where he knows of the plants but he may not find the plants there. This group again added that, the practitioner sometimes needs to consult ancestors about even the time to go and harvest the medicinal plants. Just as the practitioner needs some time to consult the ancestors where he can find the needed medicinal plants for the treatment of certain disease conditions. This group also agreed with the other group the fact that, the sick person needs to observe certain taboos when under treatment and need to abstain from some type of food, drink and certain type of meat. The above discussion and the revelations were in response to the research question whether there is any taboo in using the medicinal plants by the traditional medicine practitioners.

As to whether a person violates a taboo in the destruction of medicinal plants, sixty-six out of the 80 respondents (82.5%) indicated that “No” taboo is violated when a person destroys a medicinal plant. The practitioners added that the fellow may even do it without knowing is a medicinal plant. If there was a taboo of any form their women would be in trouble because their activities in charcoal burning, harvesting fire wood are some of the major causes threatening the extinction of the medicinal plants, says the practitioners.

The group however added quickly that, if a person is caught deliberately destroying a medicinal plant with the intension of punishing the medicine practitioners the person will be sent to the chief’s place; if possibly, charged with the offence of destruction. The traditional medicine practitioners also indicated that in the near future they might consider the idea of instituting something that will deter people from destroying medicinal plants either knowingly or unknowingly. This will put a stop to destructive activities of people to the

medicinal plants. Such an action will go long way to help preserve and conserve the medicinal plants in the study area.

The traditional medicine practitioners of the study area due to either, lack of awareness or being content with what they have did not solicit for assistance, despite the numerous community based organizations and the international non-governmental organizations on the ground willing to assist small scale businesses. This came to light when 95% of the respondents said they did not seek for assistance to enable medicine practitioners to preserve and conserve the medicinal plants that are under threat. This signifies that, they have never sought for assistance in the form of materials for the propagation of the medicinal plants. They never asked for technical know-how in the planting, harvesting, packaging of the plants from any organization or Ghana Health Service in their attempt to preserve and conserve the medicinal plants that are near extinction. The remaining respondents who admitted that they have ever sought for assistance representing (5%) quickly added that the response to their request was not favourable because what they asked for was not granted them. A further discussion with the first group of respondents revealed that, they were not aware of the existence of some of these organizations and the form in which the request should take. Also, they were afraid that there may be some cost associated with the request. This could be due to the high level of illiteracy (86% never attended formal school) among the respondents.



CHAPTER FIVE

SUMMARY OF KEY FINDINGS, CONCLUSION AND RECOMMENDATIONS

This chapter contains a summary of the key findings, the conclusion and the recommendations for further action to be taken on the plight of traditional medical practitioners to enable them sustain the available medicinal plants for generations to come.

5.0 KEY FINDINGS OF THE STUDY

The study shed light on the background of the study area. It was realized that the vegetation of the District has the potential to support herbal medicinal practice as there are a variety of medicinal plants within it and its surrounding communities. However, the gradual depletion of the vegetative cover due to human activities may be a disposing factor for the extinction of the plants if care is not taken.

The study also revealed an interesting situation where the myth surrounding traditional medicine practice with the perception that the practice involves only people who are following traditional religion and has nothing to do with Christianity or Islam seems to be broken.

This is indicated in the data showing the religious affiliation of the respondents which clearly shows that fifty out of the 80 respondents representing 62.5% profess the Christian faith twice the number that profess the African Tradition faith.

Also the analyses show that traditional medicine practice has the potential for continuity in the study area since the human resource base is available. This is manifested in the analyses on the age of respondents which show that a 67.5% percent of the respondents were within the age range of 31-60. This strongly suggests that, in the next couple of years traditional medicine practice in Nadowli District will continue to have replacement as some of the practitioners will age and pass on giving way to young and energetic ones to continue.



It is also heart warming to note that, the study area is fortunate not to be experiencing commercial gathering of medicinal plants and the movement of the practitioners into urban centers where employment in the industry is much rewarding as it happens in other parts of the globe, for example, Dar es Salam (Tanzania), Ibadan (Nigeria) and Nairobi (Kenya).

It was however, disheartening to note in that, the lack of education of the traditional medicine practitioners in the study area is hampering efforts of the respondents in their attempt to preserve and conserve the available medicinal plants from extinction.

Most herbal practitioners do not make any effort to conserve the available medicinal plants to ensure their continuous use for future generations. Thus, while others try their best to sustain these plants by planting and creating fire belts to protect them a greater proportion of these practitioners do nothing to prevent them from extinction and solely relies on nature as indicated in Table 4.11.

In addition, the results indicate that these herbal practitioners are faced with a number of problems as they try to sustain the very plants that take care of our health needs. These problems range from destruction of reserves by bush fires, animals, lack of funds and knowledge about the propagation techniques among others. They also lack information on the various institution they can contact for the much needed support to enable them sustain the medicinal plants in the District.

The government through the health ministry has introduced some guidelines for the registration of traditional medicine practitioners in order to access each practitioner on merit for accreditation. It is obvious that majority of the practitioners identified in the study area were not aware of these guidelines and therefore did not know how to access this assistance. Hence, there is the need for GHAFAM to extend its activities to the rural communities. As described by de Smet there is a tendency in the Western oriented biomedical tradition to focus on the risk and play down traditional African medicine and expertise of traditional healers. We cannot deny the fact that there are some challenges for traditional



medicine, which include incorrect diagnosis, imprecise dosage, low hygiene standards, the secrecy of some healing methods and the absence of written records about the patients. However, herbal medicine has been in use for ages in the traditional societies and they are based on the belief systems of the societies while utilizing local materials. In recent times the identified problems are:

- Lack of institutional support for production and dissemination of key plant species for cultivation;
- Lack of appropriate technology for post harvest and pre-processing purposes adapted productively and effectively;
- Insufficient documentation and scientific experimentation for verification of the herbalist's claims; and
- Lack of preservation of medicinal extracts for extended shelf life.
- These concerns can be effectively looked into by government agencies with a view of finding solutions.

5.1 CONCLUSION

There was a significant number of traditional medicine practitioners operating in the study area whose services are patronized by seemingly a large number of people in and around the communities in Nadowli District. Although the contributions of these medicine practitioners to the health status of these communities as well as their overall socio-economic development cannot be overlooked, the subject has been relegated to the background for far too long. Hence, there has been no proper documentation of the activities of these traditional medicine practitioners operating especially in the rural areas of the country and Northern Ghana in particular. However, if the third and fourth Millennium Development Goals (MDG) which seeks to reduce child mortality and improve maternal health respectively must be achieved by 2015, then more attention has to be given to this informal sector. The sector should be involved in health care delivery at the grass root level. It is evident from the study that, although some traditional medicine practitioners will want to be recognized and





collaborate with the primary health care institutions in terms of referral, others still hold to the view that their ancestors will never fail them in the treatment of their patients. As such, when they failed they declare the patient hopeless. Government should establish the necessary institutional and financial support to promote the potential role of herbal medicine in primary health care delivery. Priority should be giving to the development of herbal medicine by means of the following:

- taking an inventory and documenting the various medicinal plants and herbs which are used to treat common diseases in Nadowli and other districts of the country.
- establishing local botanical gardens for the preservation of essential medicinal herbal plants in different parts of the country in order to ensure a sustainable supply of safe, effective and affordable medicinal herbs to the practitioners in the industry
- setting up testing laboratories with adequate facilities for the assessment of the efficacy of medicinal herbs, and establishing dosage norms for the most efficacious use of herbal extracts, whether in tablet, capsules, powder, syrup, in liquid or other forms.

The inability of the traditional medicinal practitioners to pay much attention to the conservation and preservation of the medicinal herbal plants needs to be looked into and addressed properly through concerted efforts involving the District Assembly. Also, the NGOs and CBOs in the district and the practitioners themselves as major stakeholders on the ground should be enumerated. This collaboration will ensure the sustainable use of the available medicinal plants to prevent them from extinction. A good model to follow may be the Thailand example where a project for cultivation of medicinal plants of known efficacy has been initiated in about 1,000 villages. Traditional household remedies, with improved formulae, are produced as compressed tablets packed in foil and distributed to “drug cooperatives” set up through a Drug and Medical Project Fund in more than 45,000 villages as well as in community hospitals (Desawadi, 1988). Wondergen et. al., (1989) have already drawn from the Thailand experience in making recommendations regarding primary health care in Ghana.

5.2 RECOMMENDATIONS

Based on the problems identified, the following recommendations are offered:

- The Forestry Department of the Ministry of Agriculture and Non Governmental Organizations (NGOs) should come to the aid of these traditional medicine practitioners by way of training them on new and improved methods of propagating the relevant plant species. Such as Leune, Gonsugla, Pelaa, Gango, Kakalaa, Vuuronton, Dazugo, Kolitaaga, Ambagnee, Ponpoluore, Punpugo, Ngmaabeenu, Kpantala, Ngmaadele etc. which are currently in use in the study area.
- The District Assembly and other benevolent organizations, such as the NGOs and community based organizations, should support herbalists with financial assistance to help them create reserves to conserve the existing medicinal plants for generations yet unborn.
- The Game and Wild Life Division of the Forestry Department should create improved mechanisms for grassroots involvement in medicinal plants production and conservation programme.
- The Ghana Federation of Traditional Medicine Practitioners (GHAFTRAM) should promote documentation on traditional medicine that explains “myths” and realities for better understanding.
- The Stakeholders such as the Ghana Health Service, the District Assemblies and NGOs in the health sector should identify the capacity gaps and build the capacity of traditional medicine practitioners to improve upon the practice



5.3 SUGGESTED AREAS FOR FURTHER RESEARCH.

The researcher will like to suggest the following areas for further research by research students or NGOs into health care delivery system in the District.

1. The possible integration of traditional medicine in the health care delivery system in the District.
2. The encouragement of Traditional Medicine Practitioners to shift from wild crafting to the cultivation of medicinal plant through Land Reforms in the District.



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UNIVERSITY FOR DEVELOPMENT STUDIES

SCHOOL OF GRADUATE STUDIES

(FACULTY OF PLANNING AND LAND MANAGEMENT)

STRUCTURED INTERVIEW-QUESTIONNAIRE ON THE RESEARCH
TOPIC; MEDICINAL PLANTS: USES AND PRESERVATION TO ENSURE
THEIR SUSTAINABILITY IN THE NADOWLI DISTRICT OF THE UPPER
WEST REGION

INTRODUCTION

This study is geared towards the collection of data from herbalist on the above topic. The exercise is purely an academic affair and therefore, any data gathered for the purpose of this study will be accorded the utmost confidentiality for the betterment of the district.

I therefore appeal to you to answer the following questions as candidly as possible because your responses will contribute immensely toward the success of the research.

Thank you.

GUIDELINES/INSTRUCTIONS

1. Where alternatives have been provided tick the appropriate box only.
2. For other questions write your answers in the space provided

SECTION (A)

DEMOGRAPHIC CHARACTERISTICS OF RESPONDANTS

1. Gender: Male [] Female []
2. Age of Practitioner.....





3. Place of origin.....
4. Ethnicity.....
5. Religion: Christian [☐] Moslem [☐] Traditional [☐]
others specify.....
6. Marital status: Single [☐] Married [☐] Divorced [☐] Widowed [☐]
7. If married number of wives: One [☐] Two [☐] More than two [☐]
8. Number of children if any.....
9. Educational status: Formal education [☐] Non-formal education [☐]
10. Level of education: Elementary school [☐] Secondary school [☐] Training
college [☐] Commercial school [☐] University
[☐] others specify.....
11. Type of practice: bone setter [☐] herbalist [☐]
traditional birth attendants [☐]
12. Do you have any other occupation aside been a herbalist?
Yes [☐] No [☐]
13. If yes to the above question specify.....

SECTION (B)

KNOWLEDGE TYPE

14. How many years have you been practicing as a herbalist?.....
15. Which plants are the commonly used medicinal plants in the community?
(A).....
(B).....
(C).....
(D).....



16. Why are they the commonly used plants in the community? Give two reasons.
- (a).....
- (b).....
17. 17. Where do you usually obtain medicinal plants? A) Wet Lands []
B) Valleys [] C) Hilly Areas [] Others Specify.....
18. Are these plants readily available? Yes [] No []
19. If no to the above question why are they not?
- (a).....
- (b).....
- (c).....
20. Do you collect the plants by yourself? Yes [] No []
21. If no to the question above, how do come by the plants for your work?
Specify:.....
22. Do you pay for the plants collected? Yes [] No []
23. Which parts of the plants are used in the treatment of disease condition?
- (a) Root only [] (b) Leaves only [] (c) Bark only [] (d) Whole plant []
- (i)A&B [] (ii) A&C [] (iii) B&C [] (iv) Combination of all []
24. What is the distance covered to obtain these plants?
- 0-5km [] 5-10km [] 10-15km [] 15km and above []
25. How are the medicinal plants harvested?
- (a) Cutting of leaves [] (b) Digging roots [] (c)Removal of bark []
- (d) Digging of whole plant [] others specify.....



26. What measures have you put in place to preserve the available medicinal plants by way of ensuring their continuous use by generations to come?

.....

.....

27. What problems have you faced in trying to preserve/conservate the plants?

(a).....

(b).....

(c).....

28. What have you done to resolve the above problems?

(a).....

(b).....

(c).....

29. Have you trained any member of your family the treatment process?

Yes [] No []

30. List the major diseases you treat, the type of plants use, parts used and the form in which they are used in the table below.

Serial No	Diseases	Type of plants	Parts of plants	Form Used
1				
2				
3				
4				
5				

31. How are herbal formulations extracted from the plants used in the treatment of diseases conditions? (a) Boiling [] (b) Soaking [] (c) Burning of tissues [] (d) Grinding and pounding [] (e) Others specify
32. Do you have a medicinal plant garden of your own? Yes [] No []
33. After harvesting the plants do you do replanting or on- farming cultivation to ensure the continuous existence of the plants?
Yes [] No []
34. Have you ever sorted for assistance from any organization to enable you preserve/conservate the medicinal plants that are under threat?
Yes [] No []
35. If yes, specify.....
36. Was the response favorable? Yes [] No []
37. Have you ever obtained any services or inputs from the Ghana Health Service?

RESPONSE	TYPE OF SERVICE
YES	
NO	WHY NOT

38. Do the plants used for the treatment of diseases conditions have any economic uses to te people in the community (a) Yes [] No []
39. If yes to the above question, what are they?
- (a).....
- (b).....
- (c).....



40. Have these economic uses improve the living conditions of the people in the community? Yes [] No []
41. Does bush burning affects the accessibility of the medicinal plants?
Yes [] No []
42. If yes to the above question, How?
A).....
B).....
C).....
43. Do you incur any cost in obtaining the medicinal plants for your work?
Yes [] No []
44. Is there any taboo in using the medicinal plants?
Yes [] No []
45. Does one violate a taboo for destroying medicinal plants?
Yes [] No []

