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CONSERVATION AND UTILIZATION OF MEDICINAL PLANTS IN GHANAIAN FORESTS

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Executive Summary:

Although the benefits of quality healthcare have long been established, many Ghanaians continue to grabble with accessing orthodox health service. In this regard, traditional herbal medicine has gained increasing prominence, serving as the most affordable and easily accessible source of treatment in the primary healthcare system of many resource poor communities in Ghana. The continued availability of many of the indigenous medicinal plants is in jeopardy. The loss of medicinal plants means not only an immediate loss of livelihood but also rapid erosion of the knowledge and efficacy of their use. The project sought to document the distribution, availability (endangered, common), adopt conservation methods and focus on sustainability of supply of medicinal plant from three different ecological zones. This project promoted and trained forest fringe communities on biodiversity conservation (both timber and non-timber forest products (NTFPs), propagation and management techniques, sustainable harvest and utilization of medicinal plant species. The executing egancy employed a number of approaches in achieving the project objectives;

Ethno-botanic and medicinal plants survey

Ex-Situ- Establishment of plantations (home gardens) of medicinal plants

In-Situ conservation

Training workshops

Three communities in each of the identified districts were selected for Rapid Diagnostic Appraisal (RDA). The fringe community members (herbalists and fetish priests and collectors) led scientists to the field where they harvest the medicinal plants to conduct ethno-botanic survey on important medicinal plant species, perform systematics on the plant species and collected specimen samples for herbarium storage. The plants were authenticated and the voucher specimen lodged at the herbarium of Forestry Research Institute of Ghana (FORIG), Kumasi. The criteria for selecting the medicinal plant species included the following:

Executive Summary:

(1) Species that are harvested in large quantities in the wild or elsewhere.
(2) Species that the whole plant is used (leaves, wood, roots bark, etc).
(3) Species that belong to different habitats.
socioeconomic study was conducted to identify key medicinal plant species that are used by traditional medical practitioners and their uses documented. A total of 147 herbalists were interviewed. Data was collected from the herbalists or traditional herbal practitioners using structured questionnaires in their fetish grooves and homesteads. Indigenous knowledge on over 300 medicinal plant species has been gathered comprising plant names, part used and major uses as well as their levels of availability across different ecological zones.

As part of the ex-situ conservation efforts, the project trained local communities on domestication of wild medicinal plant species that are especially threatened. Such species have been established in home gardens and reforest degraded habitats. Communities were actively consulted in the selection of species planted in home gardens. Seedlings were supplied to interested community members with access to land and were willing to cultivate the identified endangered species. Priority species were initially supplied to communities as incentives. Participants had their capacity built in silviculture techniques. Over 100 participants from the project communities were trained in nursery establishment and management. This provided an avenue for participation communities to raise the needed priority seedling for future planting. The communities praised such training as essential not only to the project implementation but acknowledged that such training could also come handy in their day to day farming which require knowledge on nursery establishment and plant management.
Capacity building on the appropriate harvesting techniques contributed to both in-situ and ex-situ conservation efforts. This helped medicinal plant collectors to reduce the unsustainable extraction of plant parts. Hitherto, collectors harvested plant parts compromising on the ability for plants to regenerate.
incentives provided include provision of water reservoir at Mprim. the community was expected to conserve the riparian vegetation where the reservoir constructed takes it source. individuals were also provided beehives and other cash incentives during the project implementation. the gestation period of trees takes a long time. the beehives would provide extra income as farmers nurture their trees. this income will be most required in hiring extra hands in maintaining farmers' plantations.

Herbarium samples of 21 medicinal medicinal plants species were collected and preserved. The Herbarium specimens are currently available for research and educational purposes.

Context:

This project is derived from three main projects, namely:
1. Conservation and Sustainable Use of Medicinal Plants in Ghana, funded by the Darwin Initiative for the Survival of Species to support the long term conservation and sustainable use of medicinal plants in Ghana.
2. Forestry Research Institute of Ghana (FORIG) and the Centre for Scientific Research into Plant Medicine (CSRPM) cooperative study to conceptually develop strategies on efficient utilization and conservation techniques to establish protocols for mixed medicinal plant species plantation system in home gardens.

3. Northern Savannah Biodiversity Conservation Project (NSBCP), supported by the World Bank. The NSBCP activities are focused on documentation and strengthening the conservation and management programs of flora and faunal biodiversity in the northern savannah zone. Other activities include the identification of demonstrable medicinal plant species cultivation practices.

In the year 2002, Conservation report edited by Harriet Gillett published jointly by Aburi botanic Garden in Eastern Region of Ghana, Department of Botany Botanic Gardens, Legon, Accra and Conservation International on Conservation and Sustainable Use of Medicinal Plants in Ghana, funded by the Darwin Initiative for the Survival of Species to support the long term conservation and sustainable use of medicinal plants in Ghana centred on a broad approach involving development of medicinal plant gardens at the two Botanic Gardens (Aburi and Accra). The two gardens located in Southern part of Ghana are primarily educational resource centres for plant accessions. They are not easily accessible to the public. Whilst the plant population at the nursery was recorded to be 4,196 potted seedlings and 463 on beds, the project team carried out propagation trials on 20 selected plants.
Poverty is associated with the rural savannas and rural forest areas, which account for 60% of total poverty in Ghana. Communities in these areas cannot afford to seek modern health care facilities but depend on medicinal plants for their health needs. The traditional medical practitioners can be located every 2 kilometres in these deprived areas in Ghana. These traditional medical practitioners harvest plants of medicinal value from nearby forests indiscriminately without replacement. This situation calls for urgent action to develop alternative strategies to promote the production, utilization and conservation of medicinal plant species in general and threatened species in particular to cover the entire forest and savanna areas in Ghana principally in rural fringe communities to compliment Governments efforts to provide good and affordable health care. To address this problem the Forestry Research Institute of Ghana (FORIG) organized a workshop in collaboration with the Traditional medical practitioners living in forest fringe communities to conceptually develop strategies on efficient utilization and conservation techniques. A team of researchers from FORIG came together to put up this proposal to develop the strategies and to establish protocols for rehabilitating degraded natural forests, establish medicinal plant plantation systems and ensure availability and sustained use that will provide goods and services to improve livelihoods in deprived rural forest fringe communities in Ghana.

The objectives of this project are in conformity with the overall goal of Ghana to meet the demands of Convention on Biological Diversity obligations, Ghanas 1994 Forest and Wildlife Policy and the Forestry Department Master Plan (1996). This is to conserve and sustainably develop the nations plant resources while maintaining environmental quality and perpetual flow of benefits to the health sector. Specifically, the priority objectives of the 1994 Forest and Wildlife Policy include: Manage and enhance Ghanas permanent forest estate for conservation of biological diversity and sustainable production of domestic and commercial produce; and promote research-based and technology-led forestry and wildlife management, utilisation and development to ensure resource availability, socio-economic growth and environmental stability.
Strategies outlined in the 1994 Forestry and Wildlife Policy, the land policy reform in 1999 that addressed equitability of access to land regardless of gender, marital and migrant status and supported by the project were: in-situ and ex-situ conservation initiatives towards restoring a significant proportion of medicinal plants; promotion of resource development programmes aimed at

Context:

encouraging regeneration of harvested high-valued and endangered medicinal plant species, address the problem of losing medicinal plants, an important timber and non-timber forest product through forest degradation and over-exploitation that ultimately lead to sustainable management of the medicinal plants.

Origin and Problem:

The World Health Organization (WHO) encourages the development and utilization of traditional medicine in the Primary Health Care delivery in developing countries. This policy is based on the sound recognition of the role that traditional medicine plays in health care programmes in most developing countries. The WHO estimates that conservatively, between 60% and 90% of the populations of these countries rely on medicinal plants either totally or partly for their health care needs and 70% of the people in Africa depend on traditional medicines.
Some trees with known medicinal properties are harvested indiscriminately without replacement as timber and the 1994 Forest and Wildlife Policy do not offer the much needed protection to the medicinal plants in general. Therefore there is over-exploitation of medicinal plants both timber and non-timber and potential ones by timber contractors and the forest fringe communities with no control by the Ghana Forestry Commission. The medicinal plant both timber and non-timber species may abound in designated forest reserves and the sanctuaries (e.g. sacred groves) and on farmlands but are under serious threats of degradation. Ghana comprises of 5 major ethnic groups living in different ecological zones. However, no part of Ghana is ethnically homogeneous. The plant species of medicinal value are also diverse within each ecological zone and may only be found in a particular ecosystem. Little effort has been made to assess the supply and demand, develop guidelines for sustainable harvesting and propagation of medicinal plant species. Conservation strategies and education on the part of the government, non-government and other stakeholders are inadequate.

In Ghana, about 11 million people live in forest areas. Forest and woodlands constitute a huge biological wealth and Ghana is rated the 8th successful biodiversity conservation among 50 African countries. Trends of deforestation rates have been quoted as 0.8% in 1970, 2% in 1980, 1.3% in 1990 and 1.7% in 2005. Thus, only 16 out of the 266 gazetted (forest reserves) are in good health. The cost of forest depletion of timber resources is estimated at $270 million per annum and NTFPs at $30 million per annum. Medicinal plants belong largely to the timber and the NTFPs in addition to fauna parts. Thus, medicinal plants are in serious threat of over-exploitation leading to eventual extinction.
About 65-70% of the population in Ghana depends on traditional medicines. A traditional Medical Practitioner to allopathic proportions is 11:1. About 71% of medical doctors in Ghana live in two big metropolitan cities only i.e. Accra (50%) and Kumasi (21%). Modern health care is still beyond reach of many. The Ghana Health Policy of health services proposition that within 8 km, all communities will have access to medical facilities is far from realization. In most rural communities, however, Traditional Medical practitioners are within 1 km distance (Addae-Mensah, 2004).

Project objectives and implementation strategy:

Developmental Objective:

The developmental objective of this project is to To develop conservation and sustainable utilization

strategies for medicinal plant species within forest fringe communities of different ecological zones in Ghana

Specific Objectives

To document the distribution, utilization (endangered, common) and practice conservation methods for sustainable supply of medicinal plants from three different ecological zones in Ghana.

Implementation strategies

Ethno-botanic and medicinal plants survey

The objective of this project was to identify and document the market trends (demand and supply) and prescribe sustainable utilization of medicinal plant species in Ghana to protect them from over-exploitation. Ghana is divided into six (6) ecological zones (Fig. 1), i.e. Sudan savanna, Guinea savanna, Forest savanna transition, Semi-deciduous rain forest, High rain forest and Coastal savanna. Within each zone, one district was identified. In each district, five (5) communities were selected and the selection was based on the closeness to protected area and the presence of traditional medical practitioners or herbalists and fetish priests and collectors in consultation with the District Traditional Medical Practitioners Association. Three communities in each of the identified districts were selected for Rapid Diagnostic Appraisal (RDA). The fringe community members assisted scientists to conduct ethno-botanic survey on important medicinal plant species and collect specimen samples for herbarium storage. The plants were authenticated and the voucher specimen lodged at the herbarium of Forestry Research Institute of Ghana (FORIG), Kumasi.

The criteria for selecting the medicinal plant species included the following:

(1) Species that are harvested in large quantities in the wild or elsewhere.

(2) Species that the whole plant is used (leaves, wood, roots bark, etc).

(3) Species that belong to different habitats.

The ecological zones were grouped into two main broad zones i.e. Forest and Savanna and the data synthesized. This offered the opportunity for the investigators to gather adequate information on all plants with medicinal values under different ecosystems of the ecological zones. Technical assistance and some incentives were given to participating communities. Some traditional tariffs, fees for sourcing information from the fetish priest and any other taxes or monies for pacifications or purification demanded were honoured. However, such incentives were restricted to members who were ready to release information to the research team members. Facilities for better upkeep of the collected samples were updated.

Conservation

Ex-Situ- Establishment of plantations (home gardens) of medicinal plants

Unregulated collection of wild plants for medicinal purposes poses a serious threat to the survival of some potentially useful plants. As the demand for medicinal plants continues to rise, the natural stock alone will not meet the supply. The existing stock of species is rapidly getting extinct and that calls for urgent measure to reverse this trend. Sustainable management of medicinal plant species is important, not only because of their value as a potential source of new drugs but due to reliance on medicinal plants for health care. Although the value of medicinal plants is widely recognized by both rural and urban dwellers, researchers have not introduced appropriate strategies, which may lead to the efficient utilization and management of the medicinal plants, which are commonly used by the

communities. Usually, medicinal plants are collected from the wild without replacement or without ensuring their continuous natural regeneration. They are over-exploited, harvested throughout the year. It is very difficult to control this practice and the surest way of conserving medicinal plants species for posterity is to introduce domestication methods. This project identified domestication as one of the means of achieving medicinal plant conservation and further reducing the exploitation pressure exerted on naturally occurring plant species. This protects plants that are being threatened in their natural habitats. The project trained local communities on domestication (ex-situ conservation) of wild plant species especially threatened species in home gardens and reforest degraded habitats during the project life. Farmers were much willing to use their marginal lands for planting tree species with medicinal value. The medicinal plant species were ranked according to their use, diversity and scarcity. Planting materials of the threatened top 10 medicinal plants under the selecting criteria in each selected forest fringe community were collected and established in FORIG nursery. The seedlings were multiplied in the nursery and supplied to the participating herbalists in each of the districts. Participants were assisted to establish mixed plantations of the nursed medicinal plant species and other useful plant species under each of the selecting criteria in home gardens. Increased cultivation would reduce the need for wild harvesting. The project assisted communities to identify localities and traditional healers who themselves are farmers to cultivate selected medicinal plant species for mass production.

The establishment of pilot farmer-based cultivation (agronomic) trials outside reserves and protected areas utilized farmer knowledge to ensure a sustainable supply of medicinal plants and products. This project determined the value of medicinal plant species and/or their products. The executing agency developed procedures for evaluating and managing medicinal plants and trained participating communities on the procedures for harvesting and cultivation. The ex-situ conservation is predominantly for the purpose of complementing the in-situ measures.

In-Situ conservation

In consultation with the herbal medicinal plants collectors, herbalists and fetish priests in each district, plants collected were subjected to in-situ conservational measures. The local corroborators of this project were trained in natural regeneration techniques, silvicultural practices (enrichment planting, reforestation, etc) and incentives provided. Training of local herbalists and collectors in general nursery and field management of medicinal plant species was undertaken for reforestation in degraded areas. Slow-growing, space-demanding, or low-yielding species are less likely to be economically attractive to commercial growers. Wild harvesting is generally much cheaper than expenses incurred in the establishment of plantations. Collection from the wild may be unavoidable or even preferable for those many medicinal plants that grow slowly or are difficult to domesticate or for which only small quantities are needed. The cost of wild-collection is typically much less than that of cultivation. But risks associated with wild collection include: permits for collections of plants may be refused; collection sites may be too far from the utilization points to increase time for its preparation and marketing, improper handling of harvested plants over long distances for several days may affect potency; over-harvesting of endemic species with very restricted geographic distributions can be vulnerable to extinction; loss of genetic diversity through the reduction or elimination of local plant populations with unique genetic characteristics and the unnecessary destruction of plants resulting from careless and unsophisticated harvesting practices (Harnischfeger 2000). Degraded riparian vegetation continues to be a concern to most rural communities. With the provision seedlings, communities were much willing to restore such areas with identified priority species. Areas where

Project objectives and implementation strategy:

degraded forest reserve was available, the executing agency in collaboration with the forestry commission provided access for replanting and enrichment planting.

Project Performance:

The project though requested for extensions without additional funding, was able to achieve its specific objective. The project was to document the distribution, utilization (endangered, common) and practice conservation methods for sustainable supply of medicinal plants from three different ecological zones in Ghana.

A number of strategies were employed in achieving the set objective.

Ethno-botanic and medicinal plants survey

A socioeconomic survey was conducted to identify and document the market trends (demand and supply) and prescribe sustainable utilization of medicinal plant species in Ghana to protect them from over-exploitation. Specifically, the study: Identified medicinal plant species used by traditional healers or herbal practitioners for curing diseases, documented indigenous knowledge on their utilization, assessed traditional herbal practitioners' knowledge on plant propagation and potential of the development of medicinal plant resources in home gardens and assessed traditional herbal practitioners' perceptions of the availability (endangered, common) of the medicinal plants species as well as their importance to herbalist to guide the development of plant materials of endangered species for conservation by the traditional healers.

The study contributed to the increasing literature on the importance of traditional medical health care in Ghana. In Ghana, 70% of the population depend on traditional medicines for their primary health needs. Plants constitute the major curative materials used in traditional health delivery. However, the uncontrolled exploitation, improper harvesting technique and use of the genetic resources of indigenous medicinal plant species over the years without replacement pose a lot of danger to the continued existence of these species. In order to conserve the germplasm of key medicinal plants used by traditional healers, socioeconomic study was conducted to identify key medicinal plant species that are used by traditional medical practitioners and their uses documented. A total of 147 herbalists were interviewed. Data was collected from the herbalists or traditional herbal practitioners using structured questionnaires in their fetish grooves and homesteads. Indigenous knowledge on over 300 medicinal plant species has been gathered comprising plant names, part used and major uses as well as their levels of availability across different ecological zones.

In the process of identifying key plants species for conservation in home gardens and farms of the herbalists, the following were considered: key diseases treated or specialities of respective herbalists, key plants and their respective parts used for treating these diseases, Status/availability of the plants i.e. abundance, rare/scarce or unavailable/extinct, sources of procurement of plants, knowledge on plant cultivation and indigenous cultivation techniques and prospects of plant cultivation

Ex-Situ- Establishment of plantations (home gardens) of medicinal plants

Unregulated collection of wild plants for medicinal purposes poses a serious threat to the survival of

some potentially useful plants. As the demand for medicinal plants continues to rise, the natural stock alone will not meet the supply.

Sustainable management of medicinal plant species is important, not only because of their value as a potential source of new drugs but due to reliance on medicinal plants for health care. Although the value of medicinal plants is widely recognized by both rural and urban dwellers, researchers have not introduced appropriate strategies, which may lead to the efficient utilization and management of the medicinal plants, which are commonly used by the communities. Usually, medicinal plants are collected from the wild without replacement or without ensuring their continuous natural regeneration. They are over-exploited, harvested throughout the year. It is very difficult to control this practice and the surest way of conserving medicinal plants species for posterity is to introduce domestication methods.

The project sought to train local communities on domestication (ex-situ conservation) of wild plant species especially threatened species in home gardens and reforest degraded habitats during the project life.

In-Situ conservation

In consultation with the herbal medicinal plants collectors, herbalists and fetish priests in each district, plants collected were subjected to in-situ conservational measures. The conservation of vulnerable habitats and species by designation of parks or reserves can attract tourists and provide jobs to local people with few other opportunities for regular employment. The local corroborators (i.e. traditional medicine practitioners, medicinal plants collectors and drug manufacturers) were trained in natural regeneration techniques, silvicultural practices (enrichment planting, reforestation, etc) and incentives were provided. Training of local herbalists and collectors in general nursery and field management of medicinal plant species was undertaken for reforestation in degraded areas. Slow-growing, space-demanding, or low-yielding species are less likely to be economically attractive to commercial growers.

Training on improved harvesting techniques

At the GHAFTRAM and UDO forum, it was learnt that medicinal plants are traded by specialised collectors living in forest fringe communities from all over the country and are sent to the urban towns for sale. The manufacturers of traditional medical products buy their raw materials from them in early hours once a week. It was revealed that medicinal plants are harvested with neither permit nor any guidelines from the Forestry Commission. Therefore, collectors have been operating their business in forest reserves and sacred groves. Thus, no harvesting methods have been prescribed for them

The traditional methods of harvesting the medicinal plant species were monitored by scientists and herbalists of the fringe community together.

Training workshops were organized all the study communities on the sustainable harvesting techniques. Harvesting tree barks was most welcomed participants. Harvesting of root, seeds/fruits and leaves posed no major challaged for medicinal plants resource conservation. Medicinal plant collectors rather acknowledged the harm traditional bark harvesting technique posed on tree species. Medicinal plant collectors often debarked medicinal tree species that are often considered scarce. Identifying such scarce species often resulted in excessive debarking. Capacity building on

Project Performance:

sustainable harvesting therefore has led to the awareness of unsustainable harvesting technique on medicinal plants availability.
Nursery establishment on the other hand is not a new exercise among the project participants who often doubled as farmers. The challenge potential medicinal plant farmers envisaged was access to seed of priority species. This is basically as a result of over exploitation of such species leading to total extinction or severe scarcity.

Herbarium samples of 21 medicinal medicinal plants species were collected and preserved. The Herbarium specimens are currently available for research and educational purposes.
The medicinal plants species specimen were collected from forest reserves and off reserves and preserved at Forig herbarium.
These plants species were selected based on their frequency of use out of the total medicinal plants list generated. Specimens of these medicinal plants species were collected; the bark, flower, fruits and leaves.
Plant specimens collected were pressed flat between newspapers and dried in a plant press board. At the time of collection, we took notes in a field-log about the possible identity of the plant, where and when it was collected, habitat characteristics including soil type and other plant associates, flower color and scent, size and habit of the plant, and any other pertinent information that may not be obtainable from the resultant specimen. Correct pressing prevents plant parts from curling or wrinkling during the drying process, and allows the requisite plant parts to be visible for identification. Care in pressing specimens resulted in more useful and visually appealing herbarium specimens.

The process consists of laying the plant specimens in folded sheets of newsprint separated by cardboard sheets, and placing them in a pressing frame, which is then tightened with straps. After specimens were pressed, it was followed by drying.

After drying, the plant specimen i.e. the leaves is mounted on acid-free paper with a label providing the name and classification of the plant as well as collection data. After mounting, specimens are stored in special cabinets and are filed in order by taxonomic group and then by geographic origin.

Project Outcome, Target Beneficiaries Involvement:

The EA certify that all data emanating from the project execution have been saved

Thematic Programme:

Assessment and Analysis:

The projects was extended twice without additional funding. This enabled a successful completion of all project activities. A number of socioeconomic studies emanated from the project implementation generating insightful results.

Assessment and Analysis:

A study was conducted to document various medicinal plant species and the various diseases they are used to treat. Results from the study together with previous research indicate that, Ghana has diverse plant species with high medicinal value which are distributed across the whole country. Indeed over 1,000 medicinal plants are known to exist in Ghana. Many people especially the poor and excluded, general rely on plant medicine to sustain their health due to their lack of access to the modern health system. The study demonstrate that plant medicine remain vital for many people in the treatment of diseases such as infertility, piles, malaria, cough, headache, convulsion among others. Plant medicine has proven to be effective in treating, managing and preventing diverse ailments. However, the most frequently used plant species such as the kaya species , Alstonia boonei, Milicia excelsa, Terminilia ivorensis seem to be scarce in some parts of the country as a result of anthropogenic activities.

To continually ensure the existence of these tree species, call for conservation mechanisms to ensure that these plants do not go into extinction as a result of human activities. Moreover, given the important role of traditional medicine, this study add voice to the mounting calls to formally integrate traditional medicine into the orthodox system in order to safe primary healthcare in the country.

This project has provided the needed capacity to help regenerate degraded and marginal lands both in and outside forest reserves. Capacities were built in ex-situ and in-situ conservation. Project participants were trained in domestication of wild medicinal plant species that are especially threatened. Interested participants established medicinal plant home gardens so as to reduce pressure on plants from the wild and to reduce access time. Population increase and its associated pressure on land for residential purposes resulted in competing use of building plots close to settlements. Communities where this problem was predominant, farmers incorporated the medicinal trees on their farms while planting medicinal plants that are shrubs at their backyards.

In-situ conservation efforts did not face land issues across the project communities. Forestry commission provided sufficient degraded forest reserve for reforestation and enrichment planting purposes. Chiefs from various communities also provided marginal lands and degraded river banks for in-situ conservation efforts. However, since trees have longer gestation periods, farmers were initially reluctant to commit farm hands to planting trees. Banana and plantain suckers were provided as added incentives to farmers who assisted with the in-situ conservation. The executing agency envisaged the need to continue maintaining the plantation after project completion. Farmers were more likely to maintain the plantation if they could derive immediate benefits from their efforts.

Communities were actively consulted in the selection of species planted in home gardens. Top ten (10) priority seedlings were supplied to project participants with access to land and were willing to cultivate the identified endangered species. Priority species were initially raised and supplied from FORIG nurseries to communities. During the project implementation, participants had their capacity built in silviculture techniques. Over 100 participants from various communities were trained in nursery establishment and field management. This provided an avenue for participation communities to raise the needed priority seedling for future planting. The communities praised such training as essential not only to the project implementation but acknowledged that such training could also come handy in their day to day farming which require knowledge on nursery establishment and plant management.

Assessment and Analysis:

As part of the project implementation, field supplies such as cutlasses, farm-boots and beehives were provided as incentives to project communities. The hives were provided in consultation with project communities as a means of generating income whiles they nurtures their trees to grow. beneficiary communities received training on apiculture. The income from the sale of honey would provide extra income to participants and will enable them pay for extra hands in taking care of their plantations.

Capacity building on the appropriate harvesting techniques contributed to both in-situ and ex-situ conservation efforts. This helped medicinal plant collectors to reduce the unsustainable extraction of plant parts. Hitherto, collectors harvested plant parts unsustainably compromising on the ability for plants to regenerate. Situations where medicinal plant collectors identified a scare medicinal plant in the wild, there was higher tendency to rip the plant parts, often leaving the plant dead in the process. Communities identify unsustainable harvesting techniques as a major threat in resource conservation, and welcomed the initiative.

Another study examined one of the major attributes (acceptability) of Medicinal Plants in the context of urban, peri-urban and rural settings. This revealed a high public affirmation in support of the acceptability of Medicinal Plants, transcending the geographical dichotomy of urbanism and ruralism. In Ghana, Medicinal Plants are perceived to be effective, accessible and natural among other unique attributes. This has partly accounted for the high level of acceptance as a complementary/ alternative source of healthcare to the orthodox system. Public health officials who are confounded with extending healthcare to many communities in Ghana should consider Medicinal Plants resourceful. A call is thus placed for policy direction aimed at securing the resource base not only for sustainability, but also to enhance availability, accessibility and affordability.

Herbarium samples of 21 medicinal medicinal plants species were collected and preserved. The Herbarium specimens are currently available for research and educational purposes. The medicinal plants specimen were collected from forest and off reserves and preserved at Forig herbarium.
These plants species were selected based on their frequency of use out of the total medicinal plants list generated from earlier ethno botany survey. Specimens of these medicinal plants species were collected; the bark, flower, fruits and leaves.
Plant specimens collected were pressed flat between newspapers and dried in a plant pressboard. Data collected include where and when it was collected, habitat characteristics including soil type and other plant associates, flower color and scent, size and habit of the plant, and any other pertinent information that may not be obtainable from the resultant specimen.

Lessons Learned:

Conclusions and Recommendations:

The project in collaboration with stakeholders identified, documented and validated 394 medicinal

plant species (both timber and non-timber) and their uses, with herbarium samples collected and continually updated. In-situ and ex-situ conservation initiatives have been carried out. Herbal practitioners were actively involved in planting frequently used but rare plant species and collaborating communities demarcated lands near their source of drinking water as conservation areas. For example, the Mprim community, near Mampong, has demarcated 12 hectares as a conservation area. This aimed at restoring a significant proportion of medicinal plants and encouraging regeneration of harvested high-valued and endangered medicinal plant species.

Through workshops organised at forestry research institute of Ghana (FORIG), participating traditional herbal practitioners have been trained in silvicultural practices and simple nursery tools supplied to them. The provision of incentives has boosted the interest of participating traditional herbal practitioners in establishing their own private nursery and medicinal plant gardens.

Herbal practitioners acknowledge the importance of locating medicinal plants gardens close to their residence. This they believe could reduces access time. However, because of population growth and its associated settlement expansion, there is competition for land as building plots. Medicinal plants gardens in high population areas often give way to buildings as settlements expand. This is particularly the case for woody medicinal plants. Farmers and herbal practitioners therefore prefer establishing medicinal plants of timber species on their farmlands, watersheds and other marginal lands where settlement expansion is not likely to compete with planted trees. The home garden concept is therefore restricted to non-woody medicinal plant species which could easily thrive in limited space.

The livelihood of herbal practitioners is directly linked to the availability of the plant resources and the market potential of their herbal products. The medicinal products value chain is poorly developed in Ghana. Aside the practitioners, other actors along the chain are not well organized. Products preparation methods are still rudimentary. This translates to short shelf life and lower prices for traditional herbal products. Collectors and practitioners therefore increase the frequency and quantity of medicinal plants parts collected in order to generate enough revenue. Interventions to develop and enhance product value chains and empower actors along the chain will not only ensure a product that will be highly acceptable, but also r guarantee higher product prices and reduce waste along the chain.

There is a long gestation period for indigenous tree species with medicinal properties. It therefore takes long to realize the direct economic benefit from planting such species. The long gestation period is therefore disincentive to some farmers-practitioners who have the fear of not ever enjoying the benefits from such plantations. Future projects should therefore consider incorporating fruit trees with shorter gestation periods. This will also serve as a motivation to maintain community plantations at the end of project implementation.

Annexes

ITTO - FORESTRY RESEARCH INSTITUTE OF GHANA
MEDICINAL PLANT PROJECT
CONSERVATION AND UTILIZATION OF MEDICINAL PLANTS IN GHANA
SOCIO-ECONOMIC STUDY REPORT

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1.0 INTRODUCTION

The importance of traditonal medical health care in many parts of Africa cannot be underscored. In Ghana, 70% of the population depend on traditional medicines for their primary health needs (Arhin, 2008). This is because it is an age old practice, comaparatively inexpensive than orthodox medicine and tradtional medical practioners are often more readily available in communities for consultation compared with modern orthodox health facilties.

Plants consitute the major curative materials used in traditional health delivery. However, the uncontrolled exploitation, improper harvesting technique and use of the genetic resources of indigenous medicinal plant species over the years without replacement pose a lot of danger to the continued existence of these species. Furthermore, the parts of the plants often harvested for use sometimes coincides with the parts used for anchorage, nutrient uptake, photosynthesis and regeneration by the plants. This has posed serious constraints to the natural regeneration as well as vigorous stands development. Hence, continuous existence of the species in natural ecosystems are now greatly threatned. As a result most of them are now either endangered, threatened or nearing extinction (Ofori *et al.*, 2007).

Further, the silvicultural techniques of many of these species are not adequately understood; hence the inability of herbalists or traditional healers to propagate them on farms and home gardens. A great deal of useful ethnobotanical information and some traditional propagation techniques are also being lost. The custodians of these traditional or indigenous knowledge are aging without adequate transfer of their knowledge to younger generations or they are not documented. Where information exists, they are often scanty. About two third of the plant species in tropical Africa have some documentated medicinal use but the actual nomber may be higher (Schemelzer, & Gurib-Fakim, 2008). In order to conserve the germplasm of key medicnal plants used by traditional healers, this study is to identify key medicinal plant species that are used by traditional medical practitioners, document their uses, and develop appropriate regeneration and consevation techniques for them to enhance their avialability and sustainable utilization.

2.0 OBJECTIVES

Consequently, the specific objectives of the study are as follows:

- Identify medcinal plant species used by traditional healers or herbal practitioners for curing diseases and document indigenous knowledge on their utilization in project areas.

- Assess traditional herbal practioners knowledge on plant propagation and potential of the development of medicinal plant resources in home gardens

- Assess traditional herbal practioners perceptions of the availability (endangered, common) of the medicinal plants species as well as their imprtance to herbalsit to guide the development of plant materials of endangered species for conservation by the traditional healers.

3.0 OUTPUT

The major output of the study is to document indigenous knowledge on medicinal plants and identify priority medicinal plants that will be preferred for conservation in home gardens and farms of traditional herbal practioners in project areas.

4.0 METHODOLOGY

4.1 Study sites

Three major ecological zones, Moist Evergreen, Moist Deciduous Forest and Dry Forest zones (forest–savannah transition) have been selected for study. These were selected based on differences in their ecological characteristics.The Socio-economic survey covered 5 regions (Western, Eastern, Ashanti, Brong Ahafo, and Central Regions) spread over these three forest zones. (Figure 1).

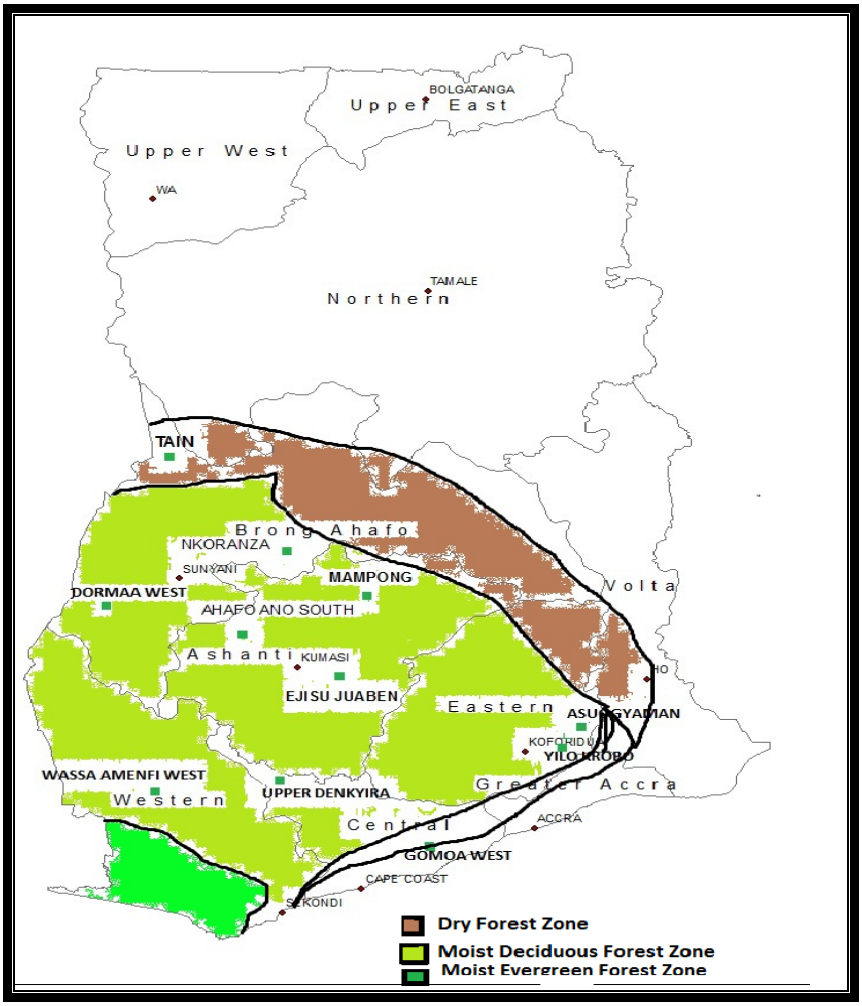

Figure 1: Map of Ghana showing study area

4.2 Activities

The following activities were undertaken to sample communities and respondents/ traditional herbal practioners for detail information documentation.

1. Selection of districts & communities
2. Consultative meetings and interaction with selected community members
3. Preparation of data collection instruments/Rapid Diagnostic Appraisal (RDA) materials

4. Conduct of RDA for identification of priority species for conservation
5. Conduct questionnaire survey of selected traditional herbal practioners for ethno-botanical knowledge.

Rapid Diagnostic Appraisal

An exploratory survey or visits were first made to selected districts in the wet and moist forests and transition ecological zones of the country. These initial visits helped in the following:

- Identify communities & people in traditional herbal medicine practice
- Introduce project
- Establish rapport with the people
- Solicit background information/situational analysis of people, medicinal plants and practice
- Identify issues for further enquiry in questionnaire survey of individuals

4.3 Data collection

The distribution of herbalists surveyed in towns and villages in Ashanti, Brong Ahafo, Central, Eastern and Western Regions is presented in Table 1. A total of 147 herbalists were interviewed. Data was collected from the herbalists or traditional herbal practioners using structured questionnaires in their fetsih grooves and homesteads. Indigenous knowledge on over 300 medicinal plant species has been gathered comprising local plant names, part used and major uses.

Information on the following was emphaized to help identifying key plants species for conservation in home gardesn and farms of the herbalists:

- Key diseases treated or specialities of respective herbalists
- Key plants and their respective parts used for treating these diseases
- Status/availability of the plants i.e. Abundance, rare/scarce or unavailable/extinct
- Sources of procurement of plants
- Knowledge on plant cultivation and indigenous cultivation techniques
- Prospects of plant cultivation

Table 1: Distribution of respondents in districts and towns/communities in each region

District	**Towns/ communities**	**Region**					**Total**
		Brong Ahafo	Ashanti	Eastern	Western	Central	
Nkoranza	Nkoranza	12					12
	Nkwabeng	3					3
	Akuma	11					11
Tain	Brodi	7					7
	Nsakaw	4					4
	Tanoso	2					2
	Nkwakwagya	1					1
Dormaa West	Nkrankwata	5					5
	Diabaa	2					2
	Krakrom	3					3
	Dormaa	1					1
Ejisu-Juaben Municipal Assembly	Ejisu-Juaben		11				11
Ahafo Ano South	Abesewa		3				3

	Domeabra		2				2
Mampong Municipal Assembly	Yonso		4				4
	Penteng		1				1
	Jetiase		1				1
Asuogyaman	South Senchi			17			17
	Maame Water			1			1
	Frankadua			4			4
Yilo Krobo	Abokobi			3			3
Wassa Amenfi West	Akyekyedea				3		3
	Obing				7		7
	Pensanom				1		1
Upper Denkyira	Asikuma					1	1
	Abuakwa Buabinso					1	1
Gomoa West	Mankoadze					3	3
	Dwama(Manford)					10	10
	Gomoa Nduem					14	14
	Gomoa Dago					8	8
	Total	**51**	**22**	**25**	**11**	**37**	**146**

The questionnaire used in data collection is in Appendix 2.

4.4 Data analysis

Data has been analyzed using Microsoft SPSS and Excel and summarized as presented below.

5.0 FINDINGS & DISCUSSION

5.1 Profile of traditional healers or herbal prationers

5.1.1 Gender of herbalists and marital status

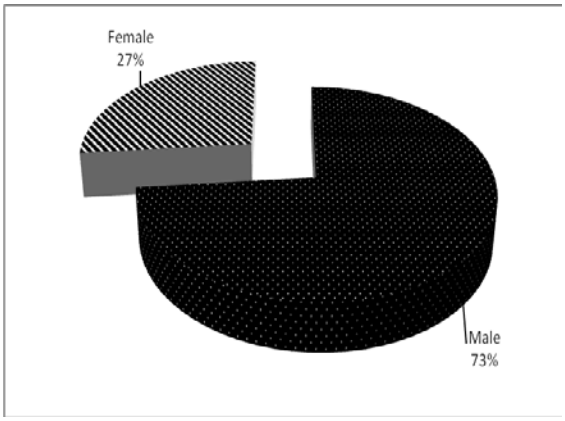

Figure 2: Gender of herbalists

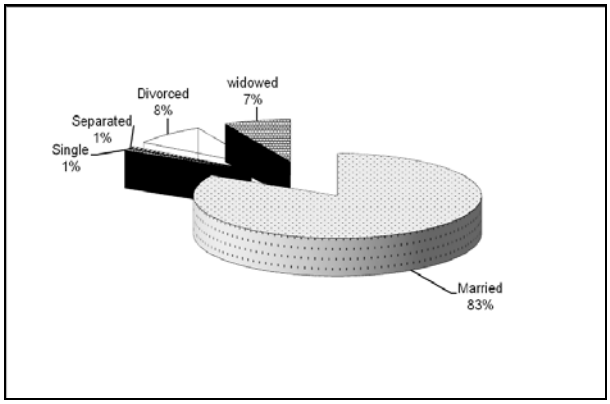

Figure 3: Marital status

Herbalists interviewed in the five regions were predominantly males, comprising 73% of the respondents (Figure 2). Majority (83%) of the respondents were also married (Figure 3).

5.1.2 Age and Education

The ages of the respondents ranged between 21 and more that 90 years. The majority of the respondents who were into herbal medical practice ranged between 30 and more than 90 years. The avreage age of the herbalists interviewed was between 50 and 70 years (Figure 4). This signifies that the traditional medical practice is associated with old age or the older generation is into herbal practice more than the youth.

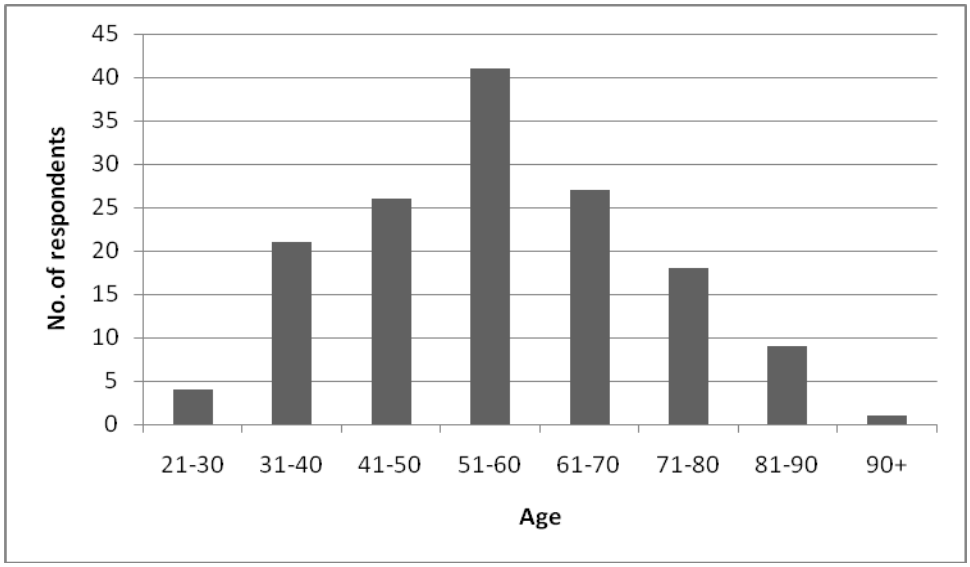

Figure 4: Age distribution of herbalists in Ashanti, Brong Ahafo, Central, Eastern and Western Regions

At least 52% of the herbalists have had formal education with majority being educated up to the first school leaving certificate level (Figure 5). This is very healthy to the extent that it will

be relatively easy to train them in conservation and proper utilization of the medicinal plants for sustainable alternative health delivery system in Ghana.

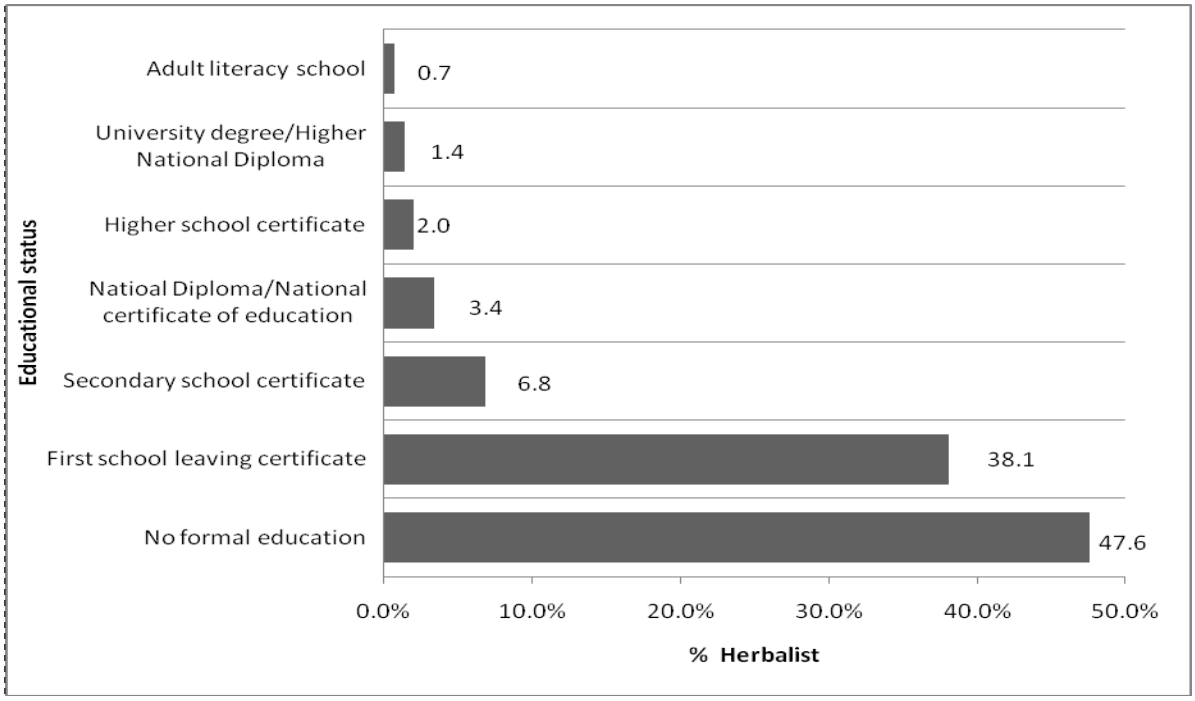

Figure 5: Educational status of herbalists in Ashanti, Brong Ahafo, Central, Eastern and Western Regions

5.1.3 Occupation and mode of acquisition of skill in traditional healing

Generally, traditional herbal practitioners engage in at least two livelihood activities. They are primarily farmers and native doctors in most cases but in few cases farmers and pure herbalist (Table 2 and Figure 6). Majority of the healers (52%) acquired their skill through inheritance from close relatives while 30% acquired theirs through spiritual gift and 18% undergo formal training as a student or an apprentice (Figure 7).

Table 2: Distribution of the occupation of traditional healers by districts

Region	District	Occupation	No. of traditional healers
Ashanti	Ahafo Ano South	Farming	3
	Ahafo Ano South	Herbalist	2
	Ahafo Ano South	Native Doctor	3
	Ejisu-Juaben	Farming	2
	Ejisu-Juaben	Herbalist	4
	Ejisu-Juaben	Native Doctor	5
	Ejisu-Juaben	Spiritual & Herbal Center	1
	Ejisu-Juaben	Traditional birth attendant	1
	Mampong Municipal Assembly	Farming	6
	Mampong Municipal Assembly	Native Doctor	4
		Sub-total	**31**
Brong Ahafo	Dormaa West	Farming	11
	Dormaa West	Native Doctor	9
	Nkoranza	Farming	24
	Nkoranza	Native Doctor	19
	Nkoranza	Traditional birth attendant	1
	Tain	Farming	14

	Tain	Native Doctor	12
		Sub-total	**90**
Central	Gomoa West	Farming	14
	Gomoa West	Herbalist	15
	Gomoa West	Native Doctor	18
	Gomoa West	Prophet	1
	Gomoa West	Trader	3
	Gomoa West	Traditional birth attendant	4
	Upper Denkyira	Farming	2
	Upper Denkyira	Native Doctor	1
		Sub-total	**58**
Eastern	Asuogyaman	Farming	19
	Asuogyaman	Fisherman	2
	Asuogyaman	Herbal Practitioner	1
	Asuogyaman	Herbalist	5
	Asuogyaman	Native Doctor	7
	Asuogyaman	Traditional birth attendant	1
	Yilo Krobo	Herbalist	3
		Sub-total	**38**
Western	Wassa Amenfi West	Farming	9
	Wassa Amenfi West	Herbal Practitioner	1
	Wassa Amenfi West	Herbalist	3
	Wassa Amenfi West	Mallam	1
	Wassa Amenfi West	Pastor	1
		Sub-total	**15**
		Total responses	**232**

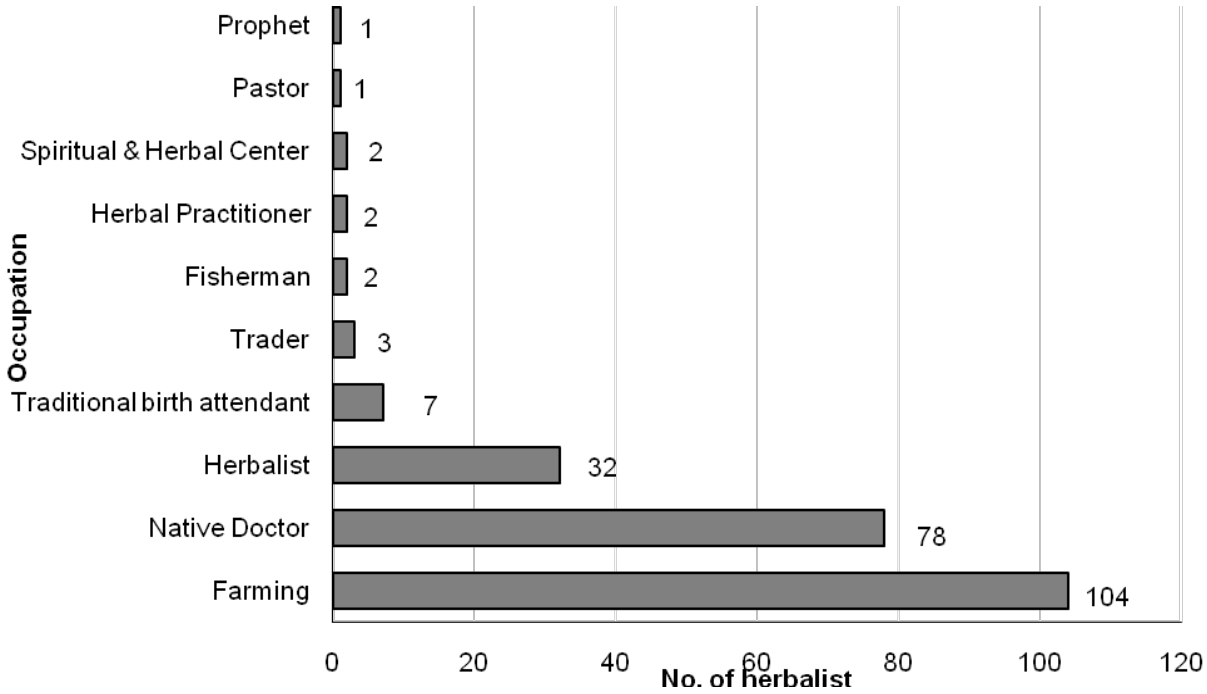

Figure 6: Occupation engaged in by the respondents in the communities

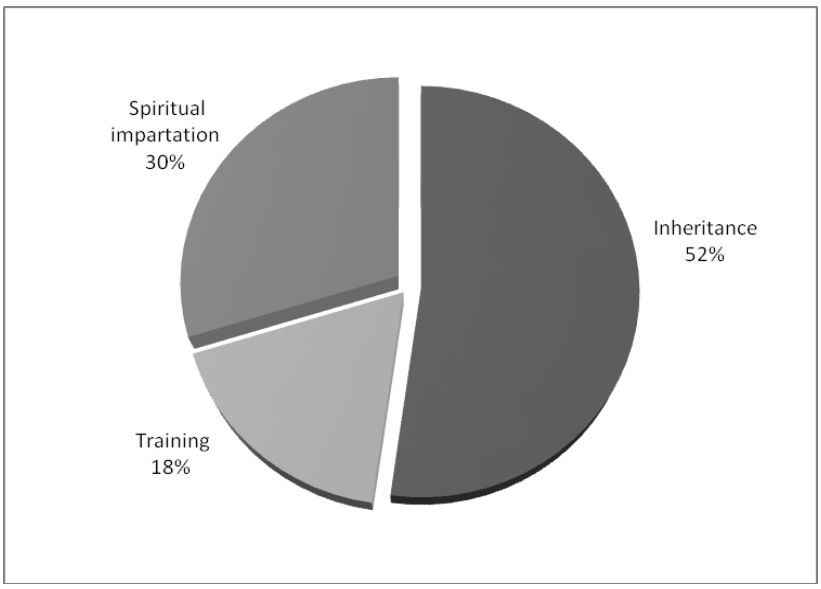

Figure 7: Mode of aquisition of skill in traditional herbal medical practice

5.2 Key diseases treated

Ninety one (91) different kinds of diseases are treated by the tradional healers interviewed (Appendix 3) in the five regions (i.e. Ashanti, Brong Ahafo, Central, Eastern and Western). Based on ranking and the frequency of the occurrence of reported diseases cured in all the regions, the first 30 prominent ones are presented in Figure 8. It ranged from infertility to candidiasis. Ofori *et al.*, (2007) similarly documented 103 common diseases being cured by traditional medical practioners across major ecological zones of the country. These observations indicate the importance and relevance of traditional healthcare to local communities as compared to trestment from orthodox medicine.

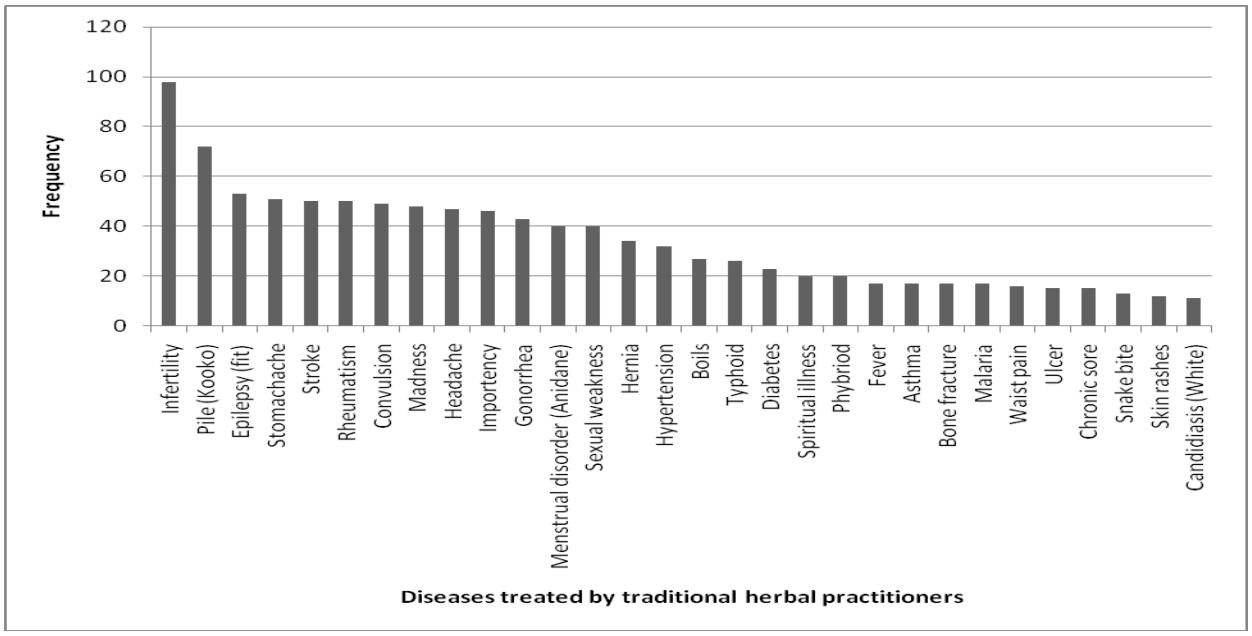

Figure 8: Common diseases treated by traditional herbal practitioners in all the regions

5.3 Plants used for curing diseases, status of availability and source of acquisition

5.3.1. Key plants used for treating diseases and status of availability

About 395 plant species are in use for treating the various diseases (Appendix 4). The first 40 species commonly used are shwon in Figure 9. Most of the frequently used species are scarce/unavailable in some districts (Table 3). This may be due to various reasons including exploitation for timber (Mahogany), clearing for farming, wildfires, destructive harvesting techniques by medicinal plant collectors, demand for plants, etc. The bark and roots are parts of the plant most frequently used for healing (Table, 3). Plants marked in asteriks are also important commercial timber species in the country most of which are known to be scarce in the natural forest.

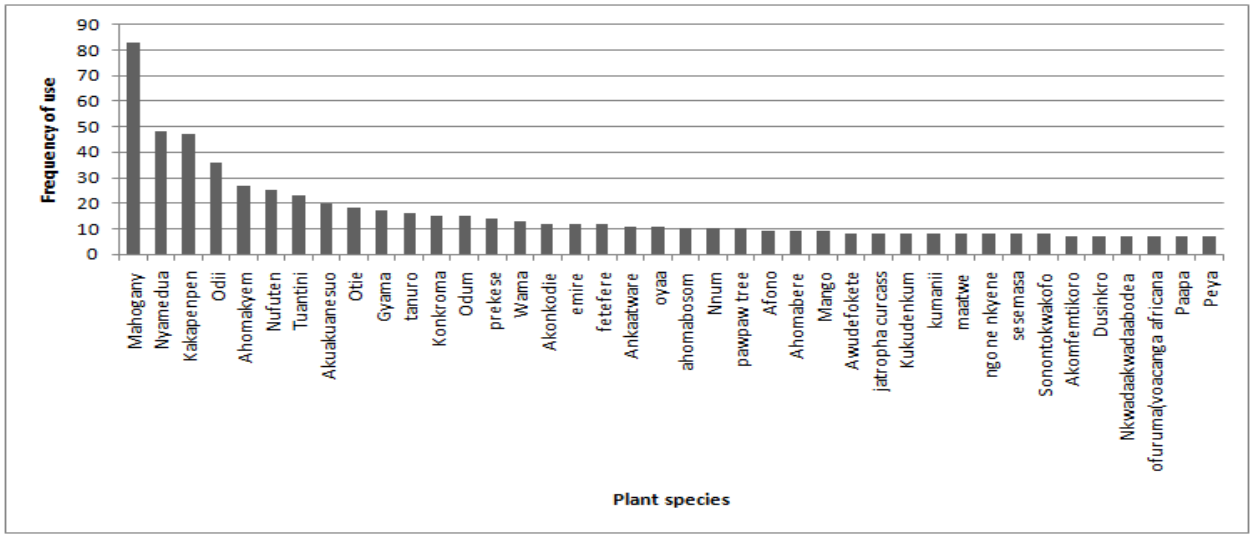

Figure 9: Medicinal plants frequently used for curing diseases

Table 3: Common plants, parts used, frequency of use and level of availability

No.	**Local name of species**	***Scientific name***	**Parts used**	**Frequency of use**	**Level of availability**
1	Mahogany*	*Khaya spp*	Bark, root, whole plant, leaves	83	Unavailable/scarce Dormaa West, Ejisu-Juaben, Tain, Nkoranza and Wassa Amenfi West Districts
2	Nyamedua*	*Alstonia boonei*	Bark, root, leaves, whole plant	48	Abundant in Dormaa West but scarce/unavailable in Asuogyaman, Gomoa West, Nkoranza, Mampong, Tain, Yilo Krobo and Ejisu Juabeng
3	Kakapenpen	*Rawolfia vomitoria*	Root, bark, whole plant, leaves, fruit	47	Scarce/unavailable in Tain, Dormaa West, Ejisu-Juaben and Nkoranza Districts
4	Odii	*Okoubaka aubrevillei*	Seeds, roots, leaves, whole plant, bark, fruit	36	Scarce/unavailable, but available in Tain
5	Ahomakyem	*Spiropetalum heterophyllum*	Stem, root, bark, whole plant, leaves	27	Scarce/unavailable, but may be available in some parts of Tain
6	Nufuten	*Kigelia africana*	Bark, root, whole plant, fruit. leaves, seed	25	Scarce/unavailable
7	Tuantini	*Paullinia pinnata*	Root, leaves, whole plant	23	Abundant in Nkoranza and Tain but Scarce or unavailable in Gomoa West, Ejisu-Juaben, Wassa Amenfi West and Dormaa West
8	Akuakuanesuo	*Spathodea campanulata*	Bark, root,	20	Abundant but scarce in parts of Mampong and

			leaves, whole plant		Ahafo Ano South
9	Otie*	*Pycnanthus angolensis*	Bark, root, leaves	18	Available in Dormaa West and some parts of Ejisu-Juaben but scarce/unavailable in Wassa Amenfi West, Nkoranza and Ahafo Ano South
10	Gyama	*Alchornea cordifolia*	Root, leaves, bark	17	Sacrce/unavailable but found in Tain and Nkoranza
11	Tanuro	*Trichilia monadelpha*	Bark, root, leaves	16	Scarce/unavailable
12	Konkroma	*Morinda lucida*	Root, leaves, bark, whole plant	15	Available but scarce in some Nkoranza and Dorma West
13	Odum*	*Milletia excelsa*	Bark, root, whole plant, fruit	15	Scarce/unavailable
14	Prekese	*Tetrapleura tetraptera*	Bark, fruit, whole plant	14	Abundant in Dormaa West but unavailable in Gomoa West, Nkoranza and Ejisu-Juaben
15	Wama	*Ricinodendron heudelotii*	Bark, root, leaves, whole plant, seed	13	Sacrce/unavailable found in some parts of Dormaa West
16	Akonkodie*	*Bombax buonopozense*	Bark, root, leaves	12	Scarce/unavailable in Asuogyaman, Mampong and Ahafo Ano south but abundant in Nkoranza, Dormaa West and some parts of Tain
17	Emire*	*Teminalia ivorensis*	Bark, root	12	Scarce/unavailable
18	Fetefere	*Discoglypremna caloneura*	-	12	
19	Ankaatware	*Citrus aurantiifolia*	Fruit, leaves, root, seed,	11	Scarce/unavailable

			whole plant, juice		
20	Oyaa	*Zanthoxylum leprieurii*	Bark, root, whole plant	11	Scarce/unavailable
21	ahomabosom	*Dalbergia oblongifolia*	-	10	Scarce/unavailable
22	Nunum	*Ocimum gratissimum*	Leaves, whole plant	10	Available but becoming scarce in Gomoa West, Mampong and Tain
23	pawpaw tree	*Carica papaya*	Leaves, root, fruit, bark, whole plant, seed	10	Abundant
24	Afono	-	Root, leaves, whole plant	9	Abundant scarce in Nkoranza and Ejisu-Juaben
25	Ahomabere	*Friesodielsia engliana*	Stem, whole plant	9	Scarce/unavailable but found in Tain and Dormaa West
26	Mango	*Mangifera indica*	Bark, leaves, root, fruit	9	Abundant in Dormaa West, Nkoranza and Ejisu-Juaben but scarce in Tain
27	Awudefokete	*Anthocleista nobilis*	Bark, root, leaves, whole plant	8	Scarce/unavailable
28	Jatropha (Nkrandedua)	*Jatropha curcass*	Root, leaves, fruit	8	Abundant
29	Kukudenkum	*Anthocleista nobilis*	Root, bark, whole plant	8	Available in Tain but scarce in Nkoranza and Dormaa West
30	kumanii	*Lannea welwitschii*	Bark, leaves, root	8	Scarce/unavailable
31	Okure	*Trilepisium madagascariense*	Root, bark	8	Scarce/unavailable
32	Ngo ne nkyene*	*Cleistopholis patens*	Bark, root, leaves	8	Scarce/unavailable but found in Ejisu-Juaben and Dormaa West

33	Sesemasa	*Newbouldia laevis*	Leaves, bark, whole plant	8	Scarce/unavailable but abundant in Ejisu-Juaben
34	Osonontokwakofo	*Stereospermum acuminatissimum*	Root, bark, whole plant	8	Abundant in Tain and Nkoranza
35	Akomfemtikoro	*Heliotropium indicum*	Leaves, root, whole plant	7	Abundant in Nkoranza
36	Dunsinkro	*Euadenia eminens*	Root, leaves, bark	7	Scarce/unavailable but available in Tain and Dormaa West
37	Nkwadaankwadaa bodea	*Cassia occidentalis*	Leaves, root, fruit, whole plant	7	Scarce/unavailable but available in Dormaa West and Nkoranza
38	ofuruma	*voacanga africana*		7	Scarce/unavailable
39	Paapao	*Afzelia africana*		7	
40	Paya (Pear)	*Persia americana*	Leaves, bark	7	Abundant but unavailable in Asuogyaman and Gomoa West

*Plants marked in asteriks are important commercial timber species in Ghana

5.3.2. Sources of acquisition of medicinal plants species

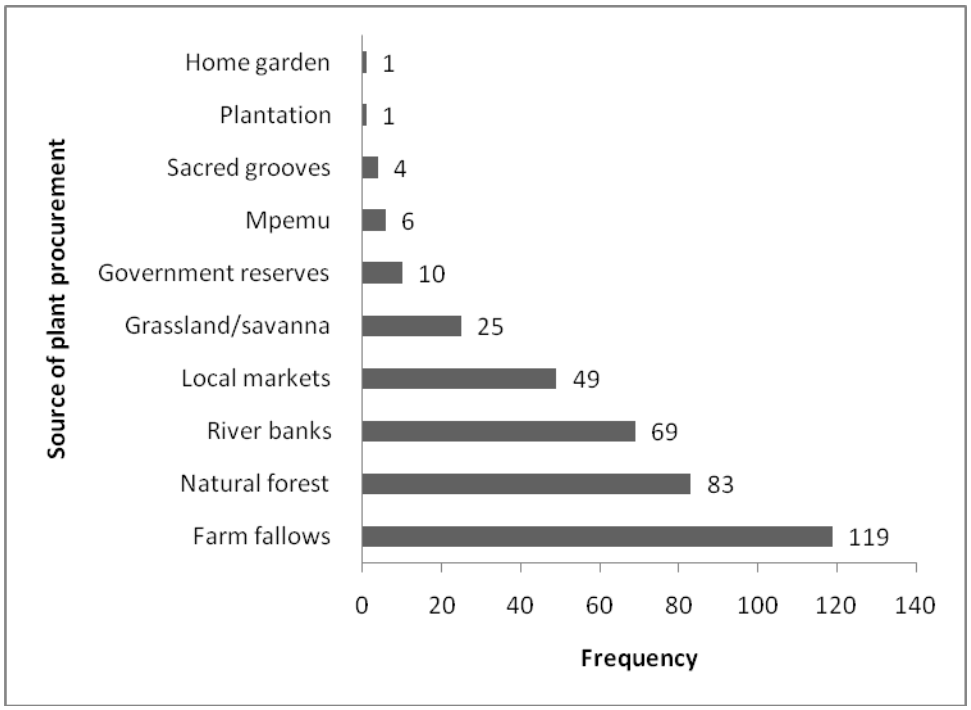

Figure 10: Sources where traditional medical practitioners obtain plants for use

All the traditional healers interviewed obtain plant materials from more than one source for treatment. Generally, plant materials are harvested from farm fallows, natural forests, river banks and buy from the local markets in all districts with the farm fallow being the most frequent place for collection. The savanna region (Guinea and Sudan savannas) is an important place for collection of medicinal plants for herbal medical practitioners in Tain, Nokranza, Ejisu-Juaben, Asuogyaman and Ahafo Ano South. Herbal practitioners in Tain, Ahafo Ano South and Dormaa West may collect from existing sacred groves. Traditional healers in Dormaa West and Ejisu-Juaben also collect plant materials from designated forest reserves. Plants may also be collected from the home garden in Ejisu-Juaben for treatment. Traditional healers in Asuogyaman also collected plant materials from established plantations.

5.4 Knowledge on plant cultivation

Generally, traditional healers collect plant materials from the wild for curing various ailments. Many do not cultivate the medicinal plants species they use (Table 4). The major reasons for not cultivating plants were that; they lack knowledge on the appropriate silvicultural techniques for propagation, others thought cultivating plants was not profitable venture, some plants species will always be available for collection from the wild while others believe that it is cheaper to purchase what they required from the market rather than to plant them (Figure 11). However, 21% of those interviewed cultivate some of the species they need (Tabe 5).

Table 4: State of plant cultivation among traditional healers

District	State of plant cultivation (No. of healers)		
	Yes	**No**	**Total**
Nkoranza	4	23	27
Tain	4	10	14
Dormaa West	4	7	11
Ejisu-Juaben Municipal Assembly	5	6	11
Ahafo Ano South	2	3	5
Mampong Municipal Assembly	1	5	6
Asuogyaman	4	17	21
Wassa Amenfi West	1	10	11
Yilo Krobo	2	1	3
Upper Denkyira	0	2	2
Gomoa West	3	32	35
Total	**30**	**116**	**146**
% Healers	**21%**	**79%**	

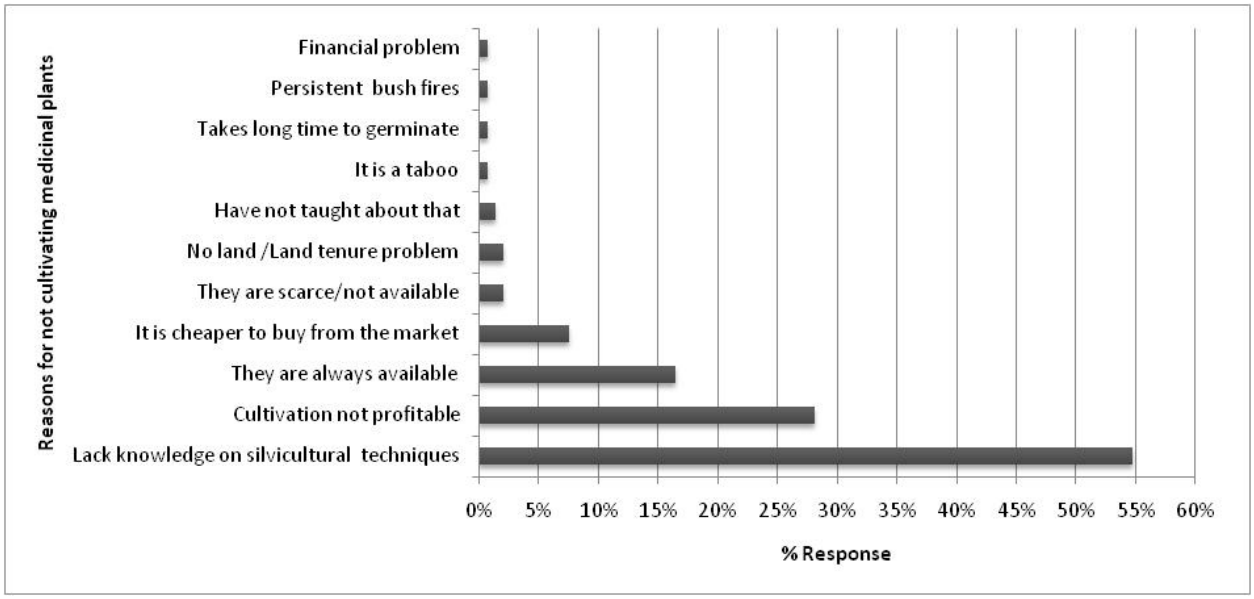

Figure 11: Reasons for not cultivating medicinal plants

Table 5: Medicinal plants cultivated by practitioners and the propagule used in the districts

Region	District	Local name of species cultivated	Botanical name	Description/ life form	Part used/ propagule
Ashanti	Ahafo Ano South	Nkwadaakwadaa bodea	*Cassia occidentalis*	Shrub	Seedling
	Ahafo Ano South	Odwankyene	*Abrus precatorius*	Climber	Seedling
	Ahafo Ano South	Pea	*Persea americana*	Fruit tree	Seeds
	Ahafo Ano South	Taameawuo	-		seedlings
	Ahafo Ano South	Tafamea	-		seeds
	Ejisu-Juaben	Abe	*Elaeis guineensis*	Tree	Seedlings
	Ejisu-Juaben	Abeduro			Seedlings
	Ejisu-Juaben	Asawadua	*Gossypium arboreum*	Shrub	Seeds
	Ejisu-Juaben	Cocoyam leaves		Corm	Stem cutting
	Ejisu-Juaben	Kakaduro(Ginger)	*Zingiber officinale*	Rhizome	Fruit
	Ejisu-Juaben	Mango	*Mangifera indica*	Fruit tree	Seeds
	Ejisu-Juaben	Orange	*Citrus spp.*	Fruit tree	Seeds
	Ejisu-Juaben	Pawpaw	*Carica papaya*	Fruit tree	Seeds
	Ejisu-Juaben	Pear	*Persea americana*	Fruit tree	Seeds
	Ejisu-Juaben	Pineapple	*Ananas comosus*	Sucker/fruit	Sucker
	Mampong Municipal Assembly	Pusiga	-	-	seeds
Brong Ahafo	Dormaa West	Amadze			Stem cutting
	Dormaa West	Dusinkro	*Euadenia eminens*		Stem cutting
	Dormaa West	Okure	*Trilepisium madagascariense*	Tree	Stem cutting
	Dormaa West	Nunum	*Ocimum gratissimum*	Shrub	Seeds
	Dormaa West	Nyanya	*Momordica charantia*	Herb	Seeds
	Dormaa West	Pear(Peya)	*Persea americana*	Fruit tree	Seeds
	Dormaa West	Sesemasa	*Newbouldia laevis*	Tree	Stem cutting
	Nkoranza	Ntum	*Eclipta alba*	Herb	Seedling
	Nkoranza	Nunum	*Ocimum gratissimum*	Shrub	Seeds
	Nkoranza	Pear(Peya)	*Persea americana*	Fruit tree	Seeds
	Nkoranza	Sorokaso			Stem cutting
	Tain	Akokobesa	*Asystasia calycina*	Shrub	Seeds
	Tain	Asawadua	*Gossypium arboreum*	Shrub	Seeds
	Tain	Asuha			Seeds
	Tain	Nkrandedua	*Jatropha curcass*	Tree	Seeds, stem cutting
	Tain	Nkwadaakwadaab odea	*Cassia occidentalis*	Shrub	Seedling
	Tain	Nunum	*Ocimum gratissimum*	Shrub	Seeds
	Tain	Nyamedua	*Alstonea boonei*	Tree	

Table 5: cont'd

Region	District	Local name of species cultivated	Botanical name	Description/ life form	Part used/ propagule
Central	Gomoa West	Bese (Cola nut)	*Cola nitida*	Tree	
	Gomoa West	Emee			
	Gomoa West	Moringa	*Moringa oleifera*	Tree	
	Gomoa West	Nunum	*Ocimum gratissimum*	Shrub	Seeds
	Gomoa West	*Ofuruma*	*Voacanga africana*	Tree	
Eastern	Asuogyaman	Aduwodzi			
	Asuogyaman	Dzogbesoli			
	Asuogyaman	Gbelele			
	Asuogyaman	Kotame dzopotsi			
	Asuogyaman	Kponkeke			
	Asuogyaman	Moringa	*Moringa oleifera*	Tree	
	Asuogyaman	Nnsekonu			
	Asuogyaman	Pear	*Persea americana*	Fruit tree	Seeds
	Asuogyaman	Yokuti			
	Yilo Krobo	Mahogany	*Khaya spp*	Tree	
	Yilo Krobo	Moringa	*Moringa oleifera*	Tree	seeds
	Yilo Krobo	Nufotene	*Kigelia africana*	Tree	
	Yilo Krobo	Prekese	*Tetrapleura tetraptera*	Fruit tree	
Western	Wassa Amenfi West	Edinam/Tamatama	*Entandrophragma angolense*	Timber tree	
	Wassa Amenfi West	Nufutene	*Kigelia africana*	Tree	
	Wassa Amenfi West	Otie	*Pycnanthus angolensis*	Tree	

5.5 Prospects of plant cultivation

About 99% of the traditional healers interviewed were willing to cultivate plants they require for their operation in curing diseases. This may probably be due to the initial sensitization by the project. However, they agreed that it was necessary to domesticate medicinal plants mainly to make them easily available and the fact that such plant are essentially required for the health delivery. Others have acknowledged that some speceis are endangered and becoming scarce and may be unavailable or become extinct within a short time. Majortiy indicated that cultivating plants species of their choice would be a preferred option. They also suggested that planting materials be made available to them (Figure 12).

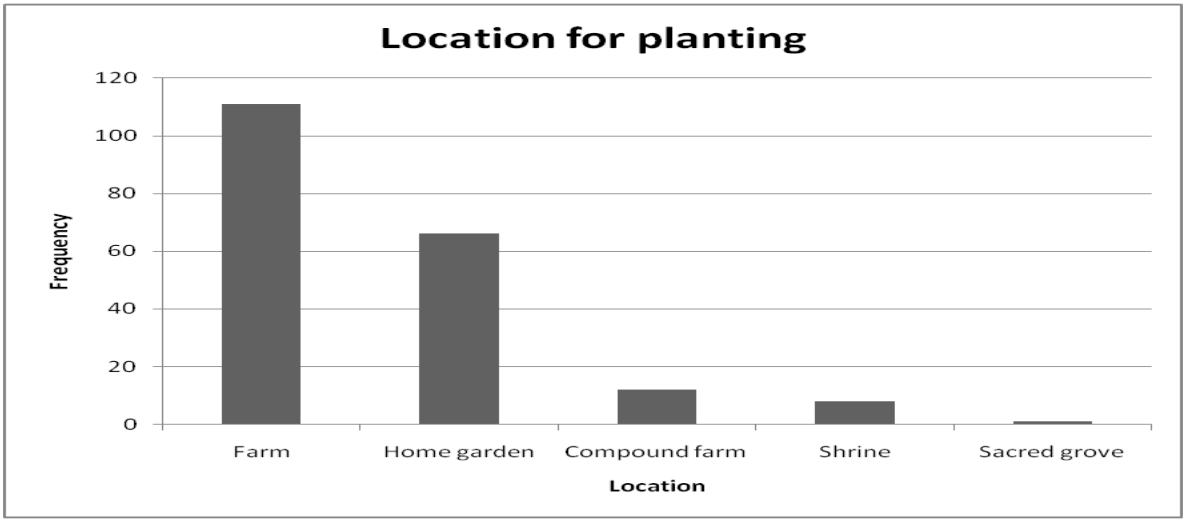

Figure 12: Areas/Locations where medicina; plants species are cultivated or protected

5.6 Priority species for conservation

Generally, species in high demand and/or are scarce or unavailable are those that can be considered as priority species for conservation. All the species listed in Table 3 are. The candidate species for conservation presented in Table 3 could be emphasised for conservation measures. The fruit trees trees (i.e. Mango, pawpaw and avocado/pear) may be excluded as they are available in all the districts (Table 6).

Table 6: Priority medicinal plant species to be considered for conservation

No.	Local name of species	Scientific name
1	Mahogany	*Khaya spp*
2	Nyamedua	*Alstonia boonei*
3	Kakapenpen	*Rawolfia vomitoria*
4	Odii	*Okoubaka aubrevillei*
5	Ahomakyem	*Spiropetalum heterophyllum*
6	Nufuten	*Kigelia Africana*
7	Tuantini	*Paullinia pinnata*
8	Akuakuanesuo	*Spathodea campanulata*
9	Otie	*Pycnanthus angolensis*
10	Gyama	*Alchornea cordifolia*
11	Tanuro	*Trichilia monadelpha*
12	Konkroma	*Morinda lucida*
13	Odum	*Milletia excels*
14	Prekese	*Tetrapleura tetraptera*
15	Wama	*Ricinodendron heudelotii*
16	Akonkodie	*Bombax buonopozense*
17	Emire	*Teminalia ivorensis*
18	Fetefere	*Discoglypremna caloneura*
19	Ankaatware	*Citrus aurantiifolia*
20	Oyaa	*Zanthoxylum leprieurii*
21	Ahomabosom	*Dalbergia oblongifolia*

22	Nunum	*Ocimum gratissimum*
23	Afono	-
24	Ahomabere	*Friesodielsia engliana*
25	Awudefokete	*Anthocleista nobilis*
26	Nkrandedua	*Jatropha carcass*
27	Kukudenkum	*Anthocleista nobilis*
28	kumanii	*Lannea welwitschii*
29	Maatwe	*Trilepisium madagascariense*
30	Ngo ne nkyene	*Cleistopholis patens*
31	Sesemasa	*Newbouldia laevis*
32	Osonontokwakofo	*Stereospermum acuminatissimum*
33	Akomfemtikoro	*Heliutropium indicum*
34	Dusinkro	*Euadenia eminens*
37	Nkwadaakwadaabodea	*Cassia occidentalis*
35	Ofuruma	*Voacanga Africana*
36	Paapao	*Afzelia africana*

6.0 CONCLUSION

Traditional herbal medicines are vital in sustenance of lives particularly in rural areas. In the phase of advancement in orthodox health delivery system, herbal medicines have equally become globally essential in primary healthcare especially in developing countries. This study documented over 90 diseases being cured by almost 400 different plant species. The fact that over 90% of the frequently used species in curing are not readily available emphasizes the need for their domestication. Individual traditional healers have preferences for specific species they will plant. Although there is a wide range of species to be considered, it may be necessary to determine a final list of species for planting in specific districts in consultation with the traditional medical practitioners in all the districts. Although, many of the traditional healers are predominantly farmers and some cultivate medicinal plant species, all of them are keen to plant desirable species on their farms and home gardens. This will contribute immensely to enriching tree and plant resources on the landscapes of homesteads and farms. However, experiences from previous projects with local people indicate that a thorough dialoguing with project collaborators in the communities during planning and establishment of fields as well as intensive monitoring thereafter will be necessary to ensure successfull establishment of the herbal farms and gardens.

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APPENDICES

Appendix 1: Distribution of herbalists in Districts and Towns

No	Name of town	Herbalist	District					
			Nkoranza	Tain	Dormaa West	Ejisu-Juaben	Ahafo Ano South	Mampong MA
1	Nkrankwata	Kwadwo Yeboah			1			
	Nkrankwata	Adama Sehu			1			
	Nkrankwata	Adom Gilbert			1			
	Nkrankwata	Charles K Addo			1			
	Nkrankwata	Mr. M.K. Tagborloh			1			
2	Diabaa	Adama Seidu			1			
	Diabaa	Kwaku Ansu			1			
3	Krakrom	Helena Agyeiwaa			1			
	Krakrom	Osei Nyantakyi			1			
	Krakrom	Syvester Abrefa			1			
4	Brodi	Atta Kwasi (Atta Komfo)		1				
	Brodi	Nana Sei Kwadwo		1				
	Brodi	Okomfo Yaw Aamkwaah		1				
	Brodi	Sayaw Okomfo		1				
	Brodi	Seth E. K Kumah		1				
	Brodi	Timothy Sah Kwame		1				
	Brodi	kwasi Kru		1				
5	Nkoranza	Adjei Daniel	1					
	Nkoranza	Agya Bofo (Henry Kuma)	1					
	Nkoranza	Akua Afriyie	1					
	Nkoranza	Francis Adjei Donyina	1					
	Nkoranza	Iddrisu Fosu	1					
	Nkoranza	Kofi Fofie	1					
	Nkoranza	Kramo Sieka	1					
	Nkoranza	Morgan Gyasi	1					
	Nkoranza	Mr. Moses Abeam Danso	1					
	Nkoranza	Nana Osei Worae	1					
	Nkoranza	Okomfo Akosua Manu	1					
	Nkoranza	Osei Kwabena	1					
6	Nkwabeng	Komfo Kwame Baah	1					
	Nkwabeng	Nana Gyan	1					
	Nkwabeng	Okomfo Kwame Poku	1					
7	Akuma	Komfo Donyina	1					
	Akuma	Emmanuel Opoku(SDA)	1					
	Akuma	Komfo Kwame Baah	1					
	Akuma	Kwaku Antwi	1					
	Akuma	Maame Ama Dapaa	1					
	Akuma	Nana Asare Bediako	1					
	Akuma	Nana Baah Bediako	1					
	Akuma	Nana Komfo Anokye	1					

	Akuma	Nana Okomfo Duodo	1					
	Akuma	Okomfo Nana Yaw	1					
	Akuma	Samuel Kwaku Opoku	1					
	Akuma	Samuze Boye	1					
8	Nsakaw	Akwasi Oduro(Opanin)		1				
	Nsakaw	Kofi Bronsam		1				
	Nsakaw	Nana Yaw Barimah		1				
	Nsakaw	Yaw Kamoro		1				
9	Tanoso	Kwabena Appiah (Okomfo)		1				
	Tanoso	Nana Awuru		1				
10	Nkwakwagya	Bosomfoo Kwame Kyerem		1				
11	Dormaa	Dr. Oboafo Ohene-Bubu Snr			1			
12	Ejisu-Juaben	Ahmed Adams Yeboah				1		
	Ejisu-Juaben	Akosua Dufie				1		
	Ejisu-Juaben	Appiah Kwasi Sarpong				1		
	Ejisu-Juaben	Issa Addai Owusu				1		
	Ejisu-Juaben	James Kofi Agyei				1		
	Ejisu-Juaben	Karmar Agyapong				1		
	Ejisu-Juaben	Lordson Ackom				1		
	Ejisu-Juaben	Moses K Boateng				1		
	Ejisu-Juaben	Theresa Nyantakyiwaa				1		
	Ejisu-Juaben	Veronica Sackey				1		
	Ejisu-Juaben	Yaw Aboagye				1		
13	Abesewa	Mallam Abudu Sallam					1	
	Abesewa	Mallam Sumaila					1	
14	Domeabra	Nana Kwaku Dua(Komfo Akuo)					1	
	Domeabra	Okomfo Kwarteng					1	
15	Yonso	Kofi Boakye(Kofi Kone)						1
	Yonso	Kwaku Fokuo(Agya Fokuo)						1
	Yonso	Kyerikomfo Afua Buaah						1
	Yonso	Nana Akosua Addae						1
16	Penteng	Nana Obeng Gyasi						1
17	Jetiase	Nana Antoa Onyina						1
		Total	**27**	**14**	**11**	**11**	**4**	**6**

Appendix 2: Distribution of herbalists in the Regions, communities and Districts

A: Ashanti Region

No	Name of respondent	Status	Community	District
1	Maame Samata	Herbalist	Abesewa	Ahafo Ano South
2	Mallam Abudu Sallam	Herbalist	Abesewa	Ahafo Ano South
3	Mallam Sumaila	Herbalist	Abesewa	Ahafo Ano South
4	Nana Kwaku Dua (Komfo Akuo)	Traditional Priest	Domeabra	Ahafo Ano South
5	Okomfo Kwarteng	Traditional Priest	Domeabra	Ahafo Ano South
6	Ahmed Adams Yeboah	Herbalist	Ejisu-Juaben	Ejisu-Juaben
7	Akosua Dufie	Herbalist	Ejisu-Juaben	Ejisu-Juaben
8	Appiah Kwasi Sarpong	Herbalist	Ejisu-Juaben	Ejisu-Juaben
9	Issa Addai Owusu	Herbalist	Ejisu-Juaben	Ejisu-Juaben
10	James Kofi Agyei	Herbalist	Ejisu-Juaben	Ejisu-Juaben
11	Karmar Agyapong	Herbalist	Ejisu-Juaben	Ejisu-Juaben
12	Lordson Ackom	Herbalist	Ejisu-Juaben	Ejisu-Juaben
13	Moses K Boateng	Herbalist	Ejisu-Juaben	Ejisu-Juaben
14	Theresa Nyantakyiwaa	Herbalist	Ejisu-Juaben	Ejisu-Juaben
15	Veronica Sackey	Herbalist	Ejisu-Juaben	Ejisu-Juaben
16	Yaw Aboagye	Herbalist	Ejisu-Juaben	Ejisu-Juaben
17	Nana Antoa Onyina	Traditional Priest	Jetiase	Mampong M. Assembly
18	Nana Obeng Gyasi	Traditional Priest	Penteng	Mampong M. Assembly
19	Kofi Boakye (Kofi Kune)	Traditional Priest	Yonso	Mampong M. Assembly
20	Kwaku Fokuo (Agya Fokuo)	Traditional Priest	Yonso	Mampong M. Assembly
21	Kyerikomfo Afua Buaah	Traditional Priest	Yonso	Mampong M. Assembly
22	Nana Akosua Addae	Traditional Priest	Yonso	Mampong M. Assembly

B: Brong Ahafo Region

No	Name of respondent	Status	Community	District
1	Adama Seidu	Herbalist	Diabaa	Dormaa West
2	Kwaku Ansu	Herbalist	Diabaa	Dormaa West
3	Dr. Oboafo Ohene-Bubu Snr	Herbalist	Dormaa	Dormaa West
4	Helena Agyeiwaa	Herbalist	Krakrom	Dormaa West
5	Osei Nyantakyi	Herbalist	Krakrom	Dormaa West
6	Sylvester Abrefa	Herbalist	Krakrom	Dormaa West
7	Kwadwo Yeboah	Herbalist	Nkrankwata	Dormaa West
8	Adama Sehu	Herbalist	Nkrankwata	Dormaa West
9	Adom Gilbert	Herbalist	Nkrankwata	Dormaa West
10	Charles K. Addo	Herbalist	Nkrankwata	Dormaa West

11	Mr. M. K. Tagborloh	Herbalist	Nkrankwata	Dormaa West
12	Komfo Donyina	Traditional Priest	Akuma	Nkoranza
13	Emmanuel Opoku (SDA)	Herbalist	Akuma	Nkoranza
14	Kwaku Antwi	Traditional Priest	Akuma	Nkoranza
15	Maame Ama Dapaa	Herbalist	Akuma	Nkoranza
16	Nana Asare Bediako	Traditional Priest	Akuma	Nkoranza
17	Nana Baah Bediako	Traditional Priest	Akuma	Nkoranza
18	Nana Komfo Anokye	Traditional Priest	Akuma	Nkoranza
19	Nana Okomfo Duodo	Traditional Priest	Akuma	Nkoranza
20	Okomfo Nana Yaw	Traditional Priest	Akuma	Nkoranza
21	Samuel Kwaku Opoku	Herbalist	Akuma	Nkoranza
22	Samuze Boye	Herbalist	Akuma	Nkoranza
23	Adjei Daniel	Herbalist	Nkoranza	Nkoranza
24	Agya Bofo (Henry Kuma)	Traditional Priest	Nkoranza	Nkoranza
25	Akua Afriyie	Herbalist	Nkoranza	Nkoranza
26	Francis Adjei Donyina	Traditional Priest	Nkoranza	Nkoranza
27	Iddrisu Fosu	Herbalist	Nkoranza	Nkoranza
28	Kofi Fofie	Herbalist	Nkoranza	Nkoranza
29	Kramo Sieka	Herbalist	Nkoranza	Nkoranza
30	Morgan Gyasi	Herbalist	Nkoranza	Nkoranza
31	Mr. Moses Abeam Danso	Herbalist	Nkoranza	Nkoranza
32	Nana Osei Worae	Herbalist	Nkoranza	Nkoranza
33	Okomfo Akosua Manu	Traditional Priest	Nkoranza	Nkoranza
34	Osei Kwabena	Herbalist	Nkoranza	Nkoranza
35	Komfo Kwame Baah	Traditional Priest	Nkwabeng	Nkoranza
36	Nana Gyan	Traditional Priest	Nkwabeng	Nkoranza
37	Okomfo Kwame Poku	Traditional Priest	Nkwabeng	Nkoranza
38	Atta Kwasi (Atta Komfo)	Traditional Priest	Brodi	Tain
39	Nana Sei Kwadwo	Traditional Priest	Brodi	Tain
40	Okomfo Yaw Aamkwaah	Traditional Priest	Brodi	Tain
41	Sayaw Okomfo	Traditional Priest	Brodi	Tain
42	Seth E. K Kumah	Herbalist	Brodi	Tain
43	Timothy Sah Kwame	Herbalist	Brodi	Tain
44	Kwasi Kru	Herbalist	Brodi	Tain
45	Bosomfoo Kwame Kyerem	Traditional Priest	Nkwakwagya	Tain
46	Akwasi Oduro (Opanin)	Traditional Priest	Nsakaw	Tain
47	Kofi Bronsam	Herbalist	Nsakaw	Tain
48	Nana Yaw Barimah	Traditional Priest	Nsakaw	Tain
49	Yaw Kamoro	Herbalist	Nsakaw	Tain
50	Kwabena Appiah (Okomfo)	Traditional Priest	Tanoso	Tain
51	Nana Awuru (Taa Kwasi Grove)	Traditional Priest	Tanoso	Tain

C: Central Region

No	**Name of respondent**	**Status**	**Community**	**District**
1	Adwoa Poomu	Herbalist	Dwama (Manford)	Gomoa West
2	Dorcas Ansah	Herbalist	Dwama (Manford)	Gomoa West
3	Dr. Mohammed K N Aihoon	Herbalist	Dwama (Manford)	Gomoa West

4	Komfo Comfort Essel	Herbalist	Dwama (Manford)	Gomoa West
5	Komfo Maanan	Herbalist	Dwama (Manford)	Gomoa West
6	Kow Krampa	Herbalist	Dwama (Manford)	Gomoa West
7	Nicholas A Quaye (Osofo Kofi)	Herbalist	Dwama (Manford)	Gomoa West
8	Okomfo Ama	Traditional Priest	Dwama (Manford)	Gomoa West
9	Okomfo Ayaa	Traditional Priest	Dwama (Manford)	Gomoa West
10	Sophia Aggrey/Marian Afful	Herbalist	Dwama (Manford)	Gomoa West
11	Adwoa Asirefowaa	Herbalist	Gomoa Dago	Gomoa West
12	Kofi Gari	Herbalist	Gomoa Dago	Gomoa West
13	Komfo Ama Kokoa	Traditional Priest	Gomoa Dago	Gomoa West
14	Komfo Efua Kwentiwa	Traditional Priest	Gomoa Dago	Gomoa West
15	Komfo Esi Afariba	Traditional Priest	Gomoa Dago	Gomoa West
16	Kwafin	Herbalist	Gomoa Dago	Gomoa West
17	Mary Forson	Herbalist	Gomoa Dago	Gomoa West
18	Okomfo Adwoa Tikagri	Traditional Priest	Gomoa Dago	Gomoa West
19	Abena Akua	Herbalist	Gomoa Nduem	Gomoa West
20	Abena Mossi	Herbalist	Gomoa Nduem	Gomoa West
21	Adwoa Adwoaba	Herbalist	Gomoa Nduem	Gomoa West
22	Afua Atta	Herbalist	Gomoa Nduem	Gomoa West
23	Akua Boabema	Herbalist	Gomoa Nduem	Gomoa West
24	Comfort Adjei	Herbalist	Gomoa Nduem	Gomoa West
25	Esi Ahema	Herbalist	Gomoa Nduem	Gomoa West
26	Kofi Ahuru	Herbalist	Gomoa Nduem	Gomoa West
27	Kojo Edu	Herbalist	Gomoa Nduem	Gomoa West
28	Kwaku Asen	Herbalist	Gomoa Nduem	Gomoa West
29	Nana Kwame Arhin	Herbalist	Gomoa Nduem	Gomoa West
30	Okomfo Afua Baawa	Traditional Priest	Gomoa Nduem	Gomoa West
31	Somaila Kweku	Herbalist	Gomoa Nduem	Gomoa West
32	Suleman Amoako	Herbalist	Gomoa Nduem	Gomoa West
33	Akua Alata (Komfo Alata)	Traditional Priest	Mankoadze	Gomoa West
34	Komfo Esi Fenewa	Traditional Priest	Mankoadze	Gomoa West
35	Kwabena Amoase	Herbalist	Mankoadze	Gomoa West
36	Nana Abena Serwaa	Traditional Priest	Abuakwa Buabinso	Upper Denkyira
37	Nana Yaa Amponsem	Traditional Priest	Asikuma	Upper Denkyira

D: Eastern Region

No	**Name of respondent**	**Status**	**Community**	**District**
1	Anthony Zor Nunana	Herbalist	Frankadua	Asuogyaman
2	Miheso Gbemu	Herbalist	Frankadua	Asuogyaman
3	Samuel Akpameku	Herbalist	Frankadua	Asuogyaman
4	Wisdom Kyokyebe	Herbalist	Frankadua	Asuogyaman
5	Nana Kwaku Yegbe	Traditional Priest	Maame Water	Asuogyaman
6	Ahialege Agbayeza	Traditional Priest	South Senchi	Asuogyaman
7	Ahoma Agbordzor	Traditional Priest	South Senchi	Asuogyaman
8	B. O. Asiedu	Herbalist	South Senchi	Asuogyaman
9	Bahe Michel	Herbalist	South Senchi	Asuogyaman
10	Beatrice Batakari (Osofo Maame)	Herbalist	South Senchi	Asuogyaman

11	Bismark Diaba	Herbalist	South Senchi	Asuogyaman
12	Bosomfo Koli	Traditional Priest	South Senchi	Asuogyaman
13	Dziwone Zogo	Herbalist	South Senchi	Asuogyaman
14	G.K. Freeman	Herbalist	South Senchi	Asuogyaman
15	Gomey K. Ahiamo	Herbalist	South Senchi	Asuogyaman
16	Kudjo Gotah	Herbalist	South Senchi	Asuogyaman
17	Kwame Nyemi	Herbalist	South Senchi	Asuogyaman
18	Kwame Veba	Herbalist	South Senchi	Asuogyaman
19	Kwasi Amekpleame	Herbalist	South Senchi	Asuogyaman
20	Kwasi Zodzi Baba	Herbalist	South Senchi	Asuogyaman
21	Mr. Agbelengo Fredak	Herbalist	South Senchi	Asuogyaman
22	Togbui Sebewu	Herbalist	South Senchi	Asuogyaman
23	Dr. Asare	Herbalist	Abokobi	Yilo Krobo
24	Ibrahim Donkor Djonorbuah	Herbalist	Abokobi	Yilo Krobo
25	John K Amoah	Herbalist	Abokobi	Yilo Krobo

E: Western Region

No	**Name of respondent**	**Status**	**Community**	**District**
1	Mary Dapaah	Herbalist	Akyekyedea	Wassa Amenfi West
2	Nana Adwoa Asaba	Herbalist	Akyekyedea	Wassa Amenfi West
3	Peter Nti	Herbalist	Akyekyedea	Wassa Amenfi West
4	Cecilia Kwayie	Herbalist	Obing	Wassa Amenfi West
5	Emmanuel A.Sackey	Herbalist	Obing	Wassa Amenfi West
6	Isaac Anyimah	Herbalist	Obing	Wassa Amenfi West
7	Kwabena Ampong	Herbalist	Obing	Wassa Amenfi West
8	Kwame Afari	Herbalist	Obing	Wassa Amenfi West
9	Mohammed Ali	Herbalist	Obing	Wassa Amenfi West
10	Sampson Amponsah	Herbalist	Obing	Wassa Amenfi West
11	Isaac Dapaah	Herbalist	Pensanom	Wassa Amenfi West

Appendix 2: Questionnaire

ITTO - Forestry Research Institute of Ghana: Medicinal plants project

Research Topic: Ethno-botany and Conservation of Medicinal Plants in Selected Ghanaian forest fringe communities

Dear Sir/Madam,

This questionnaire is designed to solicit your opinion on indigenous knowledge of medicinal plants for identification of priority species for conservation in Ghana. Your responses will be treated with utmost confidentiality.

Thanks for your cooperation.

Questionnaire for Traditional Medical Practitioners

Interview No: _____ Date:_____

Section A: Background of respondents:

1. Nationality: _____ State/Region/Province_____
   Local Government area/Division/District_____

2. Name of Respondent (optional) _____

3. Occupation:
   (a) Farming (b) Hunting (c) Native Doctor
   (d) Traditional birth attendant (e) Others (please specify) _____

4. Age _____ (years)

5. Sex: Male [ ] Female [ ]

6. Marital Status:
   (a) Married (b) Single (c) Separated (d) Divorced
   (e) Widowed

7. Educational Background:
   (a) No formal Education (b) Adult Literacy School
   (c) First School Leaving Certificate (d) Secondary School Certificate
   (e) Higher School Certificate (f) National Diploma/National Certificate of Education
   (g) University degree/Higher National Diploma.
   (h) Others (please specify) _____

Section B: Information on Medicinal Plant Utilization

8. How did you get into the practice of traditional medicine?
   (a) By inheritance (b) by training (c) by spiritual impartation
   (d) Others (please specify) _____

9. What diseases do you heal or take care of or cure?
   a) …… …….
   b) …… ……..
   c) …… ……..
   d) …… ……..
   e) …… ……..

10. Which of the diseases is your specialty? Rank Them
   a) …… …….
   b) …… ……..
   c) …… ……..
   d) …… ……..
   e) …… ……..

11. Do you use plant materials in your healing process? Yes [ ] No [ ]

12. If yes, list the species you use in their order of importance

Species	Rank 1-10 (1 most important and 10 least important)

13. Please comment on the level of availability of the species listed above in the last ten years

Species No.	Name of Species	Part used	Level of Availability		
			Abundant	Rare/Scarce	Unavailable (extinct)
1					
2					
3					
4					
5					
6					
7					
8					

9					
10					
11					
12					
13					
14					
15					

14. Where do you source your plant materials from?
    (a) Natural forest
    (b Farm fallows
    (c) Plantation
    (d) Government Reserves
    (e) Sacred grooves
    (f) River banks
    (g) Local markets
    (h) Others (please specify) _____

15. Do you cultivate some of these medicinal plants? Yes [ ] No [ ]

16. If yes, please list the ones you cultivate _____

17. Kindly indicate the method of propagation for each species in the table below (e.g. stem cutting; seeds, etc)

Species No.	Name of species	Propagation Method
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

18. If No, to question 14, why don't you cultivate them?
    (a) Cultivation not profitable (b) It is a taboo
    (c) It is cheaper to buy from the market
    (d) Don't know the necessary silvicultural technique
    (e) Other reasons (please state) _____

19. Given the necessary planting stock would you be willing to plant some of these species. Yes [ ] No [ ] If yes underline where below

1. Farm. 2. Home garden. 3. Compound farm. 4. Shrine. 5 Sacred grove 6. Flower bed?

20. If No, please give reason(s) _____

---

21. Do you consider it necessary to cultivate/domesticate any of these plants?
Yes [ ] No [ ]

22. Please give reason(s) for your answer
_____

_____

23. Please give general advice for the continued availability of these plants
_____

_____

_____

_____

_____

Thank you.

Appendix 3: Diseases treated by traditional herbal practitioners

No.	Disease	Brong Ahafo	Ashanti	Eastern	Western	Central	Frequency
1	Infertility	30	14	20	9	25	98
2	Pile (Kooko)	33	8	11	9	11	72
3	Epilepsy (fit)	18	10	8	1	16	53
4	Stomachache	17	2	6	4	22	51
5	Stroke	18	9	13	4	6	50
6	Rheumatism	17	7	8	6	12	50
7	Convulsion	19	4	5	3	18	49
8	Madness	19	10	13	1	5	48
9	Headache	12	9	7	4	15	47
10	Importency	8	8	14	7	9	46
11	Gonorrhea	27	6	4	2	4	43
12	Menstrual disorder (Anidane)	23	4	6	2	5	40
13	Sexual weakness	18	6	4	1	11	40
14	Hernia	10	6	3	7	8	34
15	Hypertension	4	11	10	1	6	32
16	Boils	17	2	2	1	5	27
17	Typhoid	7	11	5	2	1	26
18	Diabetes	4	8	6	1	4	23
19	Spiritual illness	6	3	6	1	4	20
20	Phybriod	3	4	2	2	9	20
21	Fever	5	3	4	0	5	17
22	Asthma	8	3	4	1	1	17
23	Bone fracture	7	3	0	1	6	17
24	Malaria	5	8	1	1	2	17
25	Waist pain	8	4	2	1	1	16
26	Ulcer	4	6	3	1	1	15
27	Chronic sore	2	4	7	1	1	15
28	Snake bite	9	0	2	1	1	13
29	Skin rashes	6	2	3	1	0	12
30	Candidiasis (White)	4	2	3	0	2	11
31	Cough	1	0	0	4	5	10
32	Kaka	6	0	1	0	3	10
33	Leg fracture	2	0	0	2	5	9
34	Breast cancer	4	1	3	0	1	9
35	Asram	7	1	0	0	1	9
36	Kokobo	4	1	1	0	2	8
37	Heart beat	2	1	2	0	3	8
38	Jaundice	3	3	1	1	0	8
39	Birth complication	4	1	1	0	1	7
40	Eye problem	1	2	1	2	1	7
41	Aduroto	4	0	2	0	0	6
42	Heart problem	3	3	0	0	0	6

43	Goitre	1	1	2	2	0	6
44	Anemia	2	1	1	1	0	5
45	Prostate cancer	1	4	0	0	0	5
46	Body pains	0	0	1	0	4	5
47	Urinary retention	3	0	1	0	0	4
48	Ear problem	4	0	0	0	0	4
49	Kwashiokwor	2	1	1	0	0	4
50	Diarrhoea	2	2	0	0	0	4
51	Blindness	2	1	1	0	0	4
52	HIV/AIDS	0	3	1	0	0	4
53	Swollen body	0	0	3	1	0	4
54	Brihizzia	1	0	1	0	1	3
55	Vomiting	2	0	0	0	1	3
56	Alcoholics	2	1	0	0	0	3
57	Catarrh	1	0	1	1	0	3
58	Buruli Ulcer	0	0	3	0	0	3
59	Measles	0	0	1	1	1	3
60	Tuberculosis	0	0	1	0	2	3
61	Early child diseases	2	0	0	0	0	2
62	Ahonohono	1	0	0	0	1	2
63	Kwata	2	0	0	0	0	2
64	Backbone problem	1	0	1	0	0	2
65	Ete(Cataract)	1	1	0	0	0	2
66	Blindness	0	0	1	1	0	2
67	Joint pains	0	0	1	1	0	2
68	Child walking problem	1	0	0	0	0	1
69	Witchcraft	1	0	0	0	0	1
70	Samiye	1	0	0	0	0	1
71	Asabra	1	0	0	0	0	1
72	Itching	1	0	0	0	0	1
73	Loss of apetite	1	0	0	0	0	1
74	Chicken pox	1	0	0	0	0	1
75	Bullet &object removal	1	0	0	0	0	1
76	Fatigue(tireness)	1	0	0	0	0	1
77	Rheumatoid	1	0	0	0	0	1
78	Halitosis	1	0	0	0	0	1
79	Hepatitis	0	1	0	0	0	1
80	Leucamia	0	1	0	0	0	1
81	Kidney	0	1	0	0	0	1
82	Ananse	0	0	1	0	0	1
83	Elephantiasis	0	0	1	0	0	1
84	Chest pains	0	0	1	0	0	1
85	Obesity	0	0	1	0	0	1
86	Deaf	0	0	1	0	0	1
87	Leprosy	0	0	1	0	0	1
88	Tetanus	0	0	1	0	0	1

89	Amnesia	0	0	1	0	0	1
90	Low sperm count	0	0	0	0	1	1
91	Skin cancer	0	0	0	0	1	1

Appendix 4: Plants used in traditional herbal cure

No.	Local name of plant	Scientific Name	Frequency of use
1	Mahogany		83
2	Nyamedua		48
3	Kakapenpen		47
4	Odii		36
5	Ahomakyem		27
6	Nufuten		25
7	Tuantini		23
8	Akuakuanesuo		20
9	Otie		18
10	Gyama		17
11	Tanuro		16
12	Konkroma		15
13	Odum		15
14	Prekese		14
15	Wama		13
16	Akonkodie		12
17	Emire		12
18	Fetefere		12
19	Ankaatware		11
20	Oyaa		11
21	Ahomabosom		10
22	Nunum		10
23	Pawpaw tree		10
24	Afono		9
25	Ahomabere		9
26	Mango		9
27	Awudefokete		8
28	Jatropha curcass		8
29	Kukudenkum		8
30	Kumanii		8
31	Maatwe		8
32	Ngo ne kyene		8
33	Sesemasa		8
34	Sonontokwakofo		8
35	Akomfemtikoro		7
36	Dusinkro		7
37	Nkwadaakwadaabodea		7

38	Ofuruma(*Voacanga Africana)*		7
39	Paapa		7
40	Peya		7
41	Akyea		6
42	Duakokowa		6
43	Esiea		6
44	Hwentia		6
45	Hywtehyete		6
46	Kotereamfo		6
47	Mee		6
48	Namprane		6
49	Sabrabise		6
50	Samannobi		6
51	Ahomakyereben		5
52	Ahunyakwa		5
53	Asankrotia		5
54	Bese(colanut)		5
55	Bontodea		5
56	Brebretem		5
57	dahoma		5
58	Doma		5
59	Duahwenesi		5
60	Fefe		5
61	Kyenkyen		5
62	Nyakyerenee		5
63	Okro		5
64	Tsritu		5
65	Abisa		4
66	Ahom ne aham		4
67	Bosamduro		4
68	Ceiba/onyina		4
69	Dawadawa tree		4
70	Duamako		4
71	Ginger		4
72	Kankano		4
73	Kanto		4
74	Kyirebente		4
75	Nyakpekpe		4
76	Odoegbugblor		4
77	Ofram		4
78	Sanya		4
79	Sorowisa		4
80	Sukam		4
81	Tetiadupon		4
82	Wawae		4
83	Abakambo		3

84	Akokoneyidem		3
85	Asaawadua		3
86	Awiemfoosemina		3
87	Awobe		3
88	Bansimakoma		3
89	Bowomaguwakyi		3
90	Dokure		3
91	Dubrafo		3
92	Edinam		3
93	Eduropanin		3
94	Esa		3
95	Feliwe		3
96	Fom wisa		3
97	Frafraha		3
98	Futum		3
99	Gbega		3
100	Guarea		3
101	Kane		3
102	Kotobataa		3
103	Kwabenatweta		3
104	Kwabohoro		3
105	Mmoro(atoa dua)		3
106	Moringa		3
107	Nim tree		3
108	Nkrapan		3
109	Nyanya		3
110	Odwuma(pusiga		3
111	Pea		3
112	Potrodum		3
113	Sesea		3
114	Tafamea		3
115	Yevotsri		3
116	Abe (palm tree		2
117	Abebrewa		2
118	Abeduro		2
119	Abesatea		2
120	Abubutope		2
121	Afena		2
122	Agyamaa		2
123	Ahabayere		2
124	Akobowere		2
125	Amanhoma		2
126	Apree		2
127	Asereasere		2
128	Atiforza		2
129	Avotsri		2

130	Awienadea		2
131	Batapua		2
132	Bembwo		2
133	Beme (local apple		2
134	Boloba		2
135	Breprono		2
136	Buakro		2
137	Cassia		2
138	Ceda		2
139	Cedrella		2
140	Duabire		2
141	Duampompo		2
142	Fofoaamo		2
143	Garlic		2
144	Gbelele		2
145	Guaseto		2
146	Kakle		2
147	Kokrosabia		2
148	Kotogyeben		2
149	Kponkeke		2
150	Kramankote		2
151	Kumenam		2
152	Kwakuobese		2
153	Kwantumrasea		2
154	Lopongokotokuo		2
155	Memeadoo		2
156	Nsamandua		2
157	Nsedua nsa ahoma		2
158	Ntum		2
159	Nukporte		2
160	Nyame atuduro		2
161	Ogyapramtete(tetiadupon		2
162	Okuo		2
163	Okuobetee		2
164	Onwoma		2
165	Owoo		2
166	Pampenama		2
167	Pear		2
168	Pintinwo		2
169	Sabrakyi		2
170	Sampe		2
171	Sese		2
172	Shea butter tree		2
173	Susuadua		2
174	Taframetaframe		2
175	Tanogya		2

176	Teak		2
177	Tomatoes		2
178	Tomatoma		2
179	aboaduro/duahoma		1
180	Aboboma		1
181	Abodwe		1
182	Abrebrewa		1
183	Abrekyire		1
184	Abrofodanta		1
185	Aburo ne nkatie		1
186	Abutubutu		1
187	Acheampong		1
188	Adeike		1
189	Adekyegwe		1
190	Adifo		1
191	Adobe		1
192	Aduwodzi		1
193	Afodoo		1
194	Afodwo		1
195	Aforo		1
196	Agyaman (aman)		1
197	Ahabankankan		1
198	Ahame		1
199	Aheraa		1
200	Ahomatere		1
201	Akesekese		1
202	Akotsoma		1
203	Akukor		1
204	Akwano		1
205	Aloe vera		1
206	Amadze		1
207	Amaja		1
208	Amovie		1
209	Anikla		1
210	Anya		1
211	Aprokuma		1
212	Asampremu		1
213	Asegerewa		1
214	Asonoasono		1
215	Asresrewo		1
216	Atakui		1
217	Ataprai		1
218	Atiamesa		1
219	Atootoo		1
220	Atro		1
221	Avlivlati		1

222	Awenare		1
223	Awuamfoopanee		1
224	Awuo		1
225	Ayetroanto		1
226	Babadua		1
227	Badie/ayemhyehyewo		1
228	Bagarowa		1
229	Bamboo/mpampro		1
230	Batafrewo		1
231	Bega		1
232	Beveve		1
233	Bofogyina		1
234	Bogyamtia		1
235	Bonyono		1
236	Bosopologo		1
237	Cetro		1
238	Chickweed		1
239	Citronella		1
240	Cocoyam leaves		1
241	Damelejogo		1
242	Danta		1
243	Deli		1
244	Djobwenekere		1
245	Duaboafowa		1
246	Duabodea		1
247	Duabronii		1
248	Duafofie		1
249	Duakakabo		1
250	Duakokote		1
251	Duakro		1
252	Duakyekyedua		1
253	Duanyono		1
254	Dube kenyanya		1
255	Dundun		1
256	Dwareewaa		1
257	Dweno		1
258	Dzogbela		1
259	Dzogbesoli		1
260	Ederee		1
261	Efla		1
262	Emamee		1
263	Eme		1
264	Entoma		1
265	Enugbe		1
266	Etweta		1
267	Evi/avee		1

268	Exe		1
269	Fiagro		1
270	Fiaviaviagwor		1
271	Fofonobankye		1
272	Fratoga		1
273	Fufuo/adankoaduane		1
274	Gbera		1
275	Gbofe		1
276	Gboti		1
277	Gogbekataba		1
278	Gorgorliagoe		1
279	Granbgo		1
280	Guakro		1
281	Guava leaves		1
282	Guaza		1
283	Gusikonu		1
284	Gwena		1
285	Hanaha		1
286	Hankoto		1
287	Heherabete		1
288	Homakasafo		1
289	Hwehwei		1
290	Hwoho		1
291	Hwramoase		1
292	Hyedua		1
293	Jyapam		1
294	Kaakaadukro (KKDK)		1
295	Kanden		1
296	Kasante		1
297	Kedake		1
298	Kodjomanumanu		1
299	Kokoto		1
300	Kontan		1
301	Kooko ahoma		1
302	Kotame dzopotsi		1
303	Kotereko		1
304	Kpokpokyo/dadase		1
305	Kporfe		1
306	Krafotee		1
307	Kraherea		1
308	Krayea		1
309	Kube		1
310	Kusietoma		1
311	Kwantemaa		1
312	Kwatadua		1
313	Kweakenkaa		1

314	Kyerebene		1
315	Kyeretuo		1
316	Keafiche		1
317	Lemon grass		1
318	Mekyeretu		1
319	Motroni		1
320	Mpentenwa		1
321	Nakwa		1
322	Neti		1
323	Ngoo		1
324	Nimor		1
325	Nkaseikasei		1
326	Nkongyame		1
327	Nkutodua		1
328	Nnsokonu		1
329	Nsamame		1
330	Nsansono		1
331	Ntakrasa		1
332	Nugwe		1
333	Nunumnini		1
334	Nyati		1
335	Nyinyui		1
336	Obohum		1
337	Obonyono		1
338	Odegbor		1
339	Odongyawa		1
340	Ofena		1
341	Ofowa		1
342	Okure		1
343	Olekpa/doremakpowe		1
344	Olekpekpe		1
345	Olikpekpe		1
346	Ope		1
347	Opro		1
348	Orange/ankaa		1
349	Osiesie		1
350	Ototem		1
351	Owoakrubi		1
352	Oampena		1
353	Oaninwie		1
354	Oenkyekye (kotogyepen		1
355	Oepediawuo		1
356	Pepper		1
357	Petebin		1
358	Petepataa		1
359	Pineapple		1

360	Plantain		1
361	Police abaa		1
362	Sagroo		1
363	Sahoma		1
364	Sakrabremu		1
365	Sakramategye		1
366	Sakuma		1
367	Salelefege		1
368	Samea ti (tamerantus)		1
369	Sanbramu		1
370	Sankade		1
371	Saprako		1
372	Saproko		1
373	Segerea		1
374	Sengosebare		1
375	Sesemewe		1
376	Shehwie		1
377	Sitege		1
378	Sronoo		1
379	Supuah		1
380	Tafameree		1
381	Tantasuo		1
382	Tasedua		1
383	Tebenee		1
384	Tokpo		1
385	Tonkala		1
386	Twepia		1
387	Wagawaga		1
388	Wagyawagya		1
389	Wawa		1
390	Wedeaba		1
391	Woti		1
392	Yokuti		1
393	Yoroofenge		1
394	Zetete		1