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REGIONAL OVERVIEW ON THE INDUSTRIAL UTILISATION
OF MEDICINAL PLANTS FOR HEALTHCARE SYSTEMS IN AFRICA

Discussion paper

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and the World Health Organization (WHO), Regional Office for Africa.

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1. BACKGROUND

Before the advent of synthetically produced medicines, plants had long been used for their healing qualities. As far back as 300 BC the ancient Egyptians were using oils such as myrrh, frankincense and juniper for their medicinal properties as well as to perfume themselves. They also believed that herbs were made from the flesh of God!

Despite the advances of modern medicine, the vast majority of the World's population still depends on herbal remedies to cure its ills.

In some parts of the world such as Africa, these remedies may be prescribed by a village medicine man or woman or by a local shaman. In other places such as China and India, there are centuries - old formal traditions of skilled herbal healing to call on. In the West, until 1930s most medicines dispensed in high street pharmacies were herbal and in many parts of Europe they are still the norm.

Although large pharmaceutical industries continue to thrive, there has recently been a renewed interest in all branches of alternative therapies such as homeopathy, reflexology, acupuncture and of course aromatherapy. This is mainly due to the increasing evidence that many of these modern "miracle cures" have undesirable side effects which are only just beginning to show themselves. In turn the very people who once shunned these old fashioned remedies are choosing to turn back to them as a mere natural way to ensure good health.

Arotherapy which utilizes essential oils produced from plants has now established its own place as part of the wave of complementary therapies and has experienced a massive gain in popularity over the last few years.

With special reference to Africa, traditional medicine constitutes the only source of medical care for the majority of Africans especially those who live in the rural areas and who in fact form 70-80% of the population in many African countries. To this end any development of the health delivery systems in African countries which does not take account of the improvement of natural medicine cannot therefore be considered adequate and yet Africa is currently losing a lot of medicinal plants through environmental degradation, resettlement schemes and animal overstocking. Furthermore many traditional healers with valuable knowledge in medicinal plants are dying. It is therefore imperative that Africa must as a matter of urgency embark on large scale conservation and research and development programmes on medicinal plants if the World Health Organisation's objective of supplying health services to all by the year 2000 has to be achieved.

1.1 Objective

1.1.1 The objective of this project is to assist UNIDO in providing industry, governments and other interested parties in African countries with assessed updated information as well as action-oriented recommendations and proposals on a

systematic and integrated approach towards developing medicinal plant-based industries in Africa and ensuring sustainable growth of this subsector.

1.1.2 To provide a regional overview on the industrial utilization of medicinal plants for health care systems in Africa covering the assessment of the current situation and development potential of medicinal plant-based industries and to assess the role of national research institutions, identification of research areas and areas of cooperation, constraints to development of plant-based medicines, action-orientated recommendations on processing technologies and regulatory requirements and proposals for cooperation and partnerships.

2. METHODOLOGY

Visits were made to selected centres in Africa to collect information and hold discussions with relevant authorities and institutions. The information obtained will be used to assist bilateral discussions among participants at the Expert Group Meeting on the Promotion and Development of Industrial Utilization of Traditional Plants in Africa in Brazzaville, Congo in November 1995.

3. COUNTRIES VISITED

3.1 CONGO

3.1.1 Production

Congo produces decoctions from *Psidium guajava*, infusions from *Zea mays*, tinctures from *Aurantium citrus*, oil from *Ricinus communis* seeds, essential oil from *Cymbopogon citratus*, powders from *Cala nitrida* and syrups from *Aurantium citrus* flower. The country is contemplating making medicinal plant products. The Congolese Traditional Healers National Union initiated a pilot project to make creams for treating dermatitis, suppositories to treat hemorrhoids or piles. The project is supposed to be funded by the European Fund for Development. Many traditional therapists have initiated many projects to produce medicines originating from medicinal plants.

Plant derived products already available in the country are: Tetra used to treat pain, aches and inflammation; Tsetsedose used to treat typanosomiasis, Baaquine used to treat malaria; Hemorasa used to treat piles; Vitavie used to treat sterility; Kiravie used to treat sexual asthenia; Pharmaoka used to treat diarrhoea; Hyperthesol used to treat hypertension and high blood pressure; Blerniol used to treat gonorrhoea and Nazariet used to treat madness.

3.1.2 Manufacturers

Medicinal plant products are produced mainly by traditional therapists and pharmacists. People involved in such production are: Mr Demba Ousseyni, Mr Jeremie Solemia Kibangou, Mr Gilbert Mounda, Mr Antoinette Mbikani, Mr Charles Mbemba, Mr Marcel Mondila and Mr Daniel Dany Mouyi-Cikasso. The medicinal products are generally sold at reasonable prices compared to pharmaceutical products sold in Congo. There is great possibility of developing industries based on local medicinal plants in Congo provided the constraints outlined in section 3.1.5 below are addressed to since the plant resources and the need for medicinal plant products do exist in Congo.

Plants that can be so used in production are: *Acacia pinnata* Willd used to treat dermatitis, *Cajanus cajan* Millsp used to treat diarrhoea, *Chenopodium ambrosiodes* used as an anti-helminthic, *Abrus precatorius* used to treat coughs, *Ziziphus mucronata* Willd used to treat urinary infections, *Chrysantellum indicum* used to treat renal and bile stones, *Cassia occidentalis* used as a laxative and purgative, and *Pertea americana* Mil used as a diuretic and a hypertension remedy.

3.1.3 Markets/Outlets

The market survey carried out in 1977 by Professor Farnsworth and Bingel confirmed the viability of such a commercial venture. The local markets and outlets for these medicinal products are essentially: pharmaceutical depots, dispensaries, hospitals,

patients and supermarkets. The devaluation of the CFA Franc resulted in the soaring of drug prices to about 2 and half times in one year.

The irregularities in the payment of salaries of civil servants (constituting nearly 80% of the salaried people in Congo) have forced many people to resort to traditional medicine. This shows how large the market is for medicinal plant products in Congo.

The Government and some individuals are well aware of the potential of international buyers of products derived from medicinal plants if produced in Congo. This is why the Congolese Council of Health Professions and Social Affairs mentions in its article 148 the importance of movement and sale of traditional remedies beyond national boundaries.

3.1.4 Research Institutions and Collaboration

The following institutions are engaged in research and Development (R&D) work on medicinal plants in Congo:

3.1.4.1 The Service for Traditional Medicine

This institute is headed by Dr Felix Ounounou. It does research in ethnopharmacognosy, and taxonomy of medicinal plants. It also carries out research in phytochemistry, clinical trials, cultivation of medicinal plants as well as the manufacture of galenicals.

3.1.4.2 Congolese National Union For Traditional Therapeutics

This union does research in ethnopharmacognosy, herbal drugs, processing of galenicals and medicinal plant propagation. The president of the union is Mr Demba Ousseyni.

3.1.4.3 Faculty of Science, Marien Ngouabi University

Dr Donatien Bioka researches in the botany, phytochemistry, and pharmacology of medicinal plants.

3.1.4.4. Faculty of Medical Sciences, Marien Ngouabi University

Dr Antoine Ange Abena spearheads research in the pharmacology and Toxicology of medicinal plants.

3.1.4.5 Centre for Studies for Plant Resources

The director of the Centre is Professor Laurent Tchissambou. The centre is involved in the phytochemistry, pharmacology and taxonomy of Congolese medicinal plants.

From the research work done so far these institutions, the only patentable medicine is probably the popular "TETRA" which is a Congolese traditional therapeutic. Collaboration within Congo between several research institutions is continuing. This has resulted in the production of cream and suppositories at the

National Centre for Traditional Medicine of Brazzaville. The project is supposed to be funded by the European Fund for Development.

The money has not yet been released. This is a major drawback. However, so far some progress has been made in the chemical and botanical identification of medicinal plants as traditional medicines studies in the project.

3.1.5 Constraints

Constraints to the local development of medicines derived from plants are essentially:

- 3.1.5.1 Lack of financial support
- 3.1.5.2 Insufficient equipment and logistical support
- 3.1.5.3 Bias against medicines derived from plants in particular and traditional medicine in general on the part of certain political decision makers and health personnel.
- 3.1.5.4 Insufficient number of specialists interested in this development.
- 3.1.5.5 The lack of interest on the part of industrialised countries and International Organisations in projects

initiated by researchers in countries which are less developed.

- 3.1.5.6 Absence of central administration responsible for the development and coordination of traditional medicine research activities.

3.1.6 Exports and Imports

At one time individuals exported the following medicinal plant: *Cannabis sativa*, *Cymbopogon citratus*, *Zingiber officinalis*, *Hibiscus esculentus*, *Cola nitrida*, *Abrus precatorius*, *Ricinus communis* beans, *Nicotiana tobacum* and *Rauwolfia vomitoria*. All these plants were exported to Europe. The trade has been scaled down significantly because of the 23rd May 1988 article 148 of the Health and Social Affairs Professions which restricts the exportation of these products. Because the exportation is done by individuals, it is difficult to get an estimate of foreign earnings by Government or individuals on this export trade. Congo imports finished products from Europe, for example, the extract of *Centella asiatica* prescribed against traumatic ailments, wounds or operations; extract mixtures of Pavot, Belladonna, Jusquiame prescribed against pelvic pains and aches; a mixture of extracts of Marron of India, Passiflora and Aubepine prescribed against veinous problems. Mr Marcel Moudila imports products such as Pissenlit (*Taraxacum-dens-leonis*) used to treat hepatic and gall bladder infections, jaundice, haemorrhoids (piles) digestive problems, gastro-intestinal problem, catarrh, parasitic diseases, circuiatory problems, renal problems especially artery

hypertension, and Preledes champs (*Equisetum arvense*) which is prescribed against renal deficiency and eczemas (bains). *Allium ursinum* products prescribed against diarrhoea, constipation, pulmonary and bronchitis, catarrh, hypertension, atherosclerosis, gall bladder, hepatic infections and digestive parasites.

3.1.7 Utilisation of Medicinal Plant Products

Medicines derived from plants are prescribed and utilised in hospitals in Congo. Essential oils of VEGEBOM of Dr Miot are popular in Congo for the treatment of many pathological conditions.

3.1.8 Regulations

There are no regulation in Congo concerning the industrialisation of medicinal plants. However with regards to the production of medicines in general which may also affect medicinal plants, it is the French regulations that are in operation in Congo. New medicines are registered after satisfying the French regulations in Congo.

3.1.9 Agreements

Congo signed a bilateral agreement with France on drug procurement. The country does not have any existing specific agreements with other countries relating to the development of medicinal plants grown locally. Congo is ready to go into

partnership with another country (TCDC or other basis) on drug production from plants grown locally.

3.1.10 Cultivation and Conservation of Medicinal Plants

There are no projects on large scale cultivation of medicinal plants in Congo. However some limited cultivation trials have been carried out at CERVE and AGRI-CONGO. The trials have now been concluded. There are no projects on the conservation of medicinal plants in Congo although many researchers or traditional medical practitioners realise the need for conserving medicinal plants. Lack of financial support in this respect is a deterrent factor. Furthermore, in the framework of the project GEF-CONGO which administers all the protected land of Congo, the conservation dimension safeguarding medicinal plants is taken into account and the researchers of CERVE are working on it.

3.1.11 Traditional Medicine Preparations

Traditional medicine preparations are numerous in Congo, but perhaps "TETRA" made by Charles Mbemba is the most popular one. The details on ingredients, composition and mode of preparation remains a secret in the interest of the proprietor. There is no research data to prove the efficacy and lack of toxicity of such traditional medicines.

3.1.12 Assistance from UNIDO

In order to develop a plant based industry Congo needs virtually all the equipment required for phytochemical analysis, biological tests and formulation of extracts or powders. The country needs equipment such as HPLC, GC, GC/MS, NMR, MS, Organ Baths, Encapsulating machines, Tableting machines, Rota vapours, freeze dryers to name a few. Congo would appreciate UNIDO's help with advice and procurement in respect of equipment.

The country does not have plans to train people neither is it training people for processing plants at industrial scale. In this regard Congo would like UNIDO to offer help in the identification of centres for training or to organise on-the-job training in the country. Furthermore the country needs information and advice on available technology for plant-based industries applicable to Congo.

3.1.13 Additional Information

The possibility of developing industries based on local medicinal plants in Congo does exist. This is so because the country has vast plant resources. Professor Laurent Tchissambou of CERVE proposed a project entitled "Installation of a Pilot Plant on the Extraction of Plants with Biological Activities. But this project has not been funded yet.

3.1.14 Recommendations

- 3.1.14.1 That there should be a study of the internal and external markets of medicinal plant products for Congo.
- 3.1.14.2 That the Pilot Plant proposed be funded as soon as possible.
- 3.1.14.3 That a small local expertise nucleus in medicinal plant product manufacture be created charged with the sensitization of Congolese entrepreneurs willing to invest in this field.
- 3.1.14.4 That African countries must endeavour to find necessary funds for the promotion and development of traditional medicine.
- 3.1.14.5 That the WHO Regional office in Brazzaville spearheads awareness to African Governments on the importance of developing medicinal plant industries.
- 3.1.14.6 That all the constraints outlined above be addressed to soon.
- 3.1.14.7 That a training centre in the processing of plants at industrial scale be established in Africa since the UNIDO one in Turkey has proved totally ineffective for

African needs. The training programme should include natural medicine practice.

- 3.1.14.8 That there should be an ethnobotanical, processing protocols, propagation, phytochemical, pharmacological and formulation data bank of African as well as other medicinal plants established in Africa. The NAPRALERT Databank at Illinois, Chicago has proved ineffective in promoting research in African medicinal plants.

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3.2 GHANA

3.2.1 Production

Ghana has a small-scale medicinal plant based drug production. The plants used in this production are: *Lippia multiflora*, *Alstonia bonei*, *Rauwolfia varictorium*, *Khaya Africana*, *Kigelia Africana*, *Aloe vera*, *Paulliniaa pinnata*, *Zingibarium officinalis*, *Fagara xathoxylium*, *Dichapetalum madagascariensis*, *Milletia thoningii*, *Thoningia sanguines* and *Cymbopogon citratus*.

This country has already started making medicinal plant products locally. This is manifested by the establishment of the Centre for Scientific Research into Plant Medicine; extensive research into medicinal plants by the Department of Chemistry at the University of Ghana, Legon, Accra and the establishment of the post of Deputy Director of Herbal medicine in the Ministry of Health.

The plant derived products already available in Ghana are: Rheubalm-A, Lippia teas, two anti-malarial preparation, two preparations for hypertension, one preparation for diabetes (currently on clinical trials), one preparation for antibacterial and antifungal treatment (for topical use only), one mixture for the treatment hemorrhoids (combined with an ointment also made from a plant source), alteratives and preparations for inflammatory diseases.

3.2.2. Manufacturers

The bulk of the said products are manufactured by the Government owned Centre for Scientific Research into Plant Medicine but the alteratives and anti-inflammatory preparations by the Complex Hospital of Research Institute of Tropical Diseases and Herbal Medicine in Nsawam. The plant derived products are considered reasonable in price relative to synthetic medicines.

In Ghana, there is great potential in developing industries based on local medicinal plants since there is trained manpower already and the climate and soils are ideal for large scale cultivation of medicinal plants. The plants that can be used in the production of medicinal plant products are: *Lippia metiflora* used for combating stress, *Cryptolepis sanguinolenta* with anti-malarial activity, *Alstonia bonei* for febril conditions and as an alterative, *Rauwolfia vanitorium* for hypertension, *Khaya African* used as a tonic and rejuvenant, *Kigelia african* for expectant mothers, *Aloe vera* used as an alterative and for the improvement of liver function, *Paullinia pinnata* used for inflammatory conditions, *Dichapetalum madagascariensis* used to treat jaundice, *Milletia thoningii* used as a blood tonic, *Thoningia sanguines* for diabetes, *Fagara xanthoxylium* for treating sickle cell disease, *Zingiber officinalis* for colds and chills and as a circulatory stimulant and nausea and *Cymbopogon citratus* for

3.2.3 Markets/Outlets

A market survey was carried out under the auspices of UNIDO in 1993 when UNIDO proposed to establish a pilot plant at the Centre for Scientific Research into Plant Medicine. This confirmed the viability of such a commercial venture. The markets/outlets for the products in Ghana are: pharmacy shops, supermarkets, patients themselves, clinics, hospitals and private surgeries. Furthermore, medicinal Plant Research Institution, individuals involved in plant medicines research and Development and Governments are well aware of the potential international buyers of medicinal plant based products if made in Ghana are:

3.2.4 Research Institutions and Collaboration

The research institutions involved in research and development (R & D) work on medicinal plants in Ghana:

3.2.4.1 The Centre for Scientific Research into Plant Medicine.

The Government of Ghana established this centre in November 1973 to perform the following functions:

- (a) To conduct and promote scientific research relating to the improvement of plant medicine;
- (b) To ensure the purity of drugs extracted from plants;

- (c) To cooperate and liaise with the Ghana Psychic and Traditional Healers' Association, research institutions and commercial organisations in any part of the world in matters of plant medicine;
- (d) To undertake or collaborate in the collation, publication and the dissemination of the results of research and other useful technical information;
- (e) To establish where necessary, botanical gardens for medicinal plants and
- (f) To perform such other functions as the government may assign from time to time.

Currently the institute is conducting research on plant extracts prescribed by herbalists on diseases such as asthma, bacterial skin conditions; epilepsy, fungal skin conditions, sickle cell disease, arthritis, diabetes, malaria, piles, hypertension, stress, hemorrhoids and rheumatoid arthritis. There is some patentable information from the research that has already been carried out. This needs protection before disclosure. This explains why no names of plants were mentioned in some sections of 3.2.1 above on plant derived products already available in Ghana. In fact Professor Tackie, head of the Centre has patented one plant *Cryptolepis sanguinolenta* used as a malaria remedy. The general areas that need protection are: the anti-malaria, anti-hypertension, anti-diabetes, anti-bacterial, anti-fungal and

anti-hemorrhoidal preparations. The director of the centre, Professor Tackie declined to give further information on these preparations for fear of disclosing classified information on these preparations before protection. The centre collaborates with Gihoc Pharmaceuticals in the formulation of their products such as tablets. They also collaborate with Dr Appiah an orthopaedic surgeon at Korbe Bu Teaching Hospital in the clinical trials of medicinal plant preparations on rheumatoid arthritis. The collaboration is still underway. The director of the Centre collaborates with Dr Paul Schiff of the University of Pittsburg in anti-malarial activities of plants. In fact as a sign of tremendous progress, the two collaborators have together patented the anti-malarial active plant extract from *Cryptolepis sanguinolenta*. Furthermore the Centre for Scientific Research into Plant medicine collaborates with many traditional healers in Ghana. Problems encountered are mainly lack of ethnobotanical data-bank of plants to be researched on or brought by traditional healers. NAPRALERT at Illinois, Chicago, USA and the WHO office in Brazzaville appears to be not helpful in this regard. The Centre combines both orthodox and traditional medicine practice. It employs doctors and nurses trained in orthodox medicine as well as herbalists to run the surgery and dispensary which is a unique set up. The centre charges US\$3.60 per patient including medicines and it examines about 100 patients a day.

3.2.4.2 Department of Chemistry, University of Ghana

The department does a lot of research into plants with anti-diabetic, anti-jaundice and anti-hypertension activity. The

research team is headed by Professor I Addae-Mensah. Professor I. Addae-Mensah collaborates with Professor Mwangi of the Department of Pharmacognosy at the University of Nairobi. They have published a few papers on repellancy and larvicidal activity of essential oils of *Lippia* species in Kenya and the chemical composition of these oils.

3.2.4.3 Noguchi Memorial Institute for Medical Research, University of Ghana

The Noguchi Memorial Institute for Medical Research (NMIMR) was formally established by the University Council as a semi-autonomous institute of the University of Ghana, Legon in November 1974,. The objectives of the institute are:

- (a) To research into the problems of communicable diseases and nutrition;
- (b) To provide training opportunities for post-graduate students in medical research.
- (c) To provide specialised laboratory diagnostic and monitoring services in support of public health programmes. Among other research activities and of relevance to medicinal plant research, they research on toxicity of plants used by traditional healers and aflatoxins, anti-anaphylactic agents in *Thoningia sanaguinea*, and anti-hyperglycaemic activity of *Indigofera arrecta*. The institute is headed by Professor F.K. Nkrumah. The people engaged

in plant medicine research are Dr Usei-Kwesi, Dr Mubarak, Dr A. Nyarko, Dr N. Ayisi and Dr N.A. Ankrah. These workers collaborate in the treatment of sickle cell disease and malaria with Professor Kofi of Kenya Medical Research Institute, Nairobi, Kenya. The institute also collaborates with the Zambia Medical School in the same field. The institute also collaborates with the University of Copenhagen, Denmark in Malaria research using natural medicine. Some Ghanaians have been trained in this field at the University of Copenhagen.

3.2.4.4. The Complex Hospital of Research Institute of Tropical Diseases and Herbal Medicine, Nsawan.

This herbal hospital specialises in anti-hypertensive, rejuvenant, alterative, anti-inflammatory and anti-stress remedies from medicinal plants among other activities. The director of the hospital is Dr Christian Beaston Nartey. This hospital collaborates with Professor K. Sarpong of Kumasi University in the afore-mentioned fields of study. Dr Nartey also collaborates in the same fields of study with the Centre for Scientific Research into Plant Medicine. Though progress has been made, financial constraints restrict further collaboration. Between 15-20 patients are examined on average everyday. The charges range between US\$1,50 and US\$7,00. The hospital desperately needs a radionic machine.

3.2.5 Constraints

The constraints facing Ghana in its endeavour to promote the utilisation of medicinal plants are:

- (a) Lack of finance;
- (b) Lack of necessary scale up equipment;
- (c) No trained personnel in industrial production of medicinal plant products;
- (d) Lack of know-how;
- (e) Prejudice against plant medicine (although this is dying down) and
- (f) Lack of ethnobotanical databank.

In order to start a local industry on medicinal plants in Ghana, the constraints mentioned above must be addressed to first.

3.2.6 Exports and Imports

Ghana exports medicinal plants as raw materials although many farmers are not aware that some of the plants they export have medicinal properties. They export them as spices and food crops. These include black pepper, ginger, shea butter, cocoa, coconut oil, xylopia species. These products are exported to Europe, USA and the Middle East. Shea butter is exported to Body Shop International and the USA. It was not possible to get figures on quantities and value of medicinal plant products exported. On the other hand Ghana imports raw materials such as *Aloe vera* from

the USA as well as finished products from the European Community countries and the USA.

3.2.7. Utilization of Medicinal Plant Products

Many plant derived medicines are either prescribed or used in hospitals, clinics and private surgeries. Almost all available plant derived medicinal products are extensively utilized in Ghana. This is envisaged to increase steadily with time as some orthodox doctors are increasingly recognising the benefits to the patient of plant derived medicines.

3.2.8 Regulations

There are no regulations that discourage the industrialisation of medicinal plants. In fact according to the Director of Pharmacy Board, Mr T.C. Corguage, as long as medicines that alleviate human suffering are manufactured and comply with basic minimum standards based on WHO guidelines, then they can be registered. In fact the Pharmacy Board use the WHO guidelines for registration. The new law, namely the Food and Drugs Law has provision for registration of medicinal plant products. The Director pointed out that the problem with Ghanaian traditional healers is that they are divided. There are so many associations on Traditional Medicine. However the Ministry of Health is trying to put them together so that they can speak with one voice and can be represented on the Pharmacy Board. There are however regulations in Ghana concerning drug production generally but these may not affect registration of medicinal plant

products for as long as they meet basic WHO minimum standards for registration.

3.2.9 Agreements

There are no existing bilateral agreements on cooperation between Ghana and another country on drug procurement or production, neither are there existing specific agreements with other countries relating to the development of medicinal plants in Ghana. The country is more than ready to go into partnership with another country (TCDC or other basis) on duty production from plants grown locally.

3.2.10 Cultivation and Conservation of Medicinal Plants

There are no large scale projects on cultivation of medicinal plants in Ghana. However, there are small scale projects on cultivation of medicinal plants such as *Cymbopogon citratus* scattered throughout the country, *Xylopi*a species, black pepper, ginger, carica papaya, *Vitellaria paradoxa* (shea nut) grown in the Northern Savanna zone, *Amaranthus* species and *Jatropha curcas*. These are grown in many scattered areas in the country. In addition the following medicinal plants are grown at various locations in the country, *Spathodea* species, *Halarrhena* species, Neem tree and *Vernonia amygdalina*. The centre for Scientific Research into Plant Medicine have got a plot of 10 hectares and 4 other small plots on which they grow plants that they use in their medicinal plant products. The potential for cultivation of plant

medicines on a large scale exists since the country is endowed with good climate and fertile soils.

There are no projects on the conservation of medicinal plants in Ghana although there is the realisation that this should be done as soon as possible.

3.2.111 Traditional Medicine Preparations

There are several traditional medicine preparations that should be produced on a large scale such as those produced by Dr Nartey of the Complex Hospital for Research Institute of Tropical Disease and Herbal Medicine such as the *Rauwulfia vomitorium*, *Khaya Africana*, *Kigelia Africana*, *Aloe vera* and *Paullinia pinnata* preparations. These products are mainly decoctions, infusions and powders. Research work to prove efficacy and lack of toxicity is still underway and is not completed yet but many patients come back to report the efficacy and safety of the medications.

3.2.12 Assistance from UNIDO

For Ghana to develop a plant-based industry, they need the following equipment:

- (a) Nuclear Magnetic Resonance (NMR)
- (b) Mass Spectroscopy (MS)
- (c) High Pressure Liquid Chromatography (HPLC)
- (d) Various Biological Screening Equipment.

In addition to the basic equipment listed above, Ghana would like UNIDO to help with advice and procurement in respect of appropriate items of other equipment necessary for the successful establishment of a plant based medicinal plant industry.

Ghana is training personnel in the extraction analysis and biological testing of plant medicines. The country does not have specific training in the processing of plants at industrial scale. However the potential in this regard exists. It is difficult to give an accurate figure on the personnel already trained since they are scattered throughout the country and many more are working in other countries.

Furthermore Ghana would like UNIDO to offer assistance in identifying centres for training or to organise on-the-job training in the country. The country also needs information and advice on available technology for plant-based industries applicable in Ghana.

3.2.13 Additional Information

3.2.13.1 Government Policy on Traditional Medicine

The Government of Ghana has always had a positive policy on the promotion and development of industrial utilisation of medicinal plants in Ghana since 1962, when President Kwame Nkrumah came into power. He supported the promotion of traditional medicine. In support of this principle, a post of Deputy

Director of Herbal Medicine in the Ministry of Health currently held by Reverend Augustine Quarm and the establishment of the centre for Scientific Research into Plant Medicine at Mampong - Akwapim. The Pharmacy Board directed by Mr. T.C. Corquage is willing to help in the registration of herbal medicines provided they satisfy the basic minimum guidelines of WHO standards for registration.

3.2.13.2 Dr Naomesi Herbal Products

Dr Naomesi of Hohoe, Volta, Ghana produces various herbal products and he administers them himself.

3.2.13.3 Pilot Plant at the Centre for Scientific Research into Plant Medicine

The centre has just completed building the pilot plant proposed by UNIDO in March 1993 on the Processing of Herbal Pharmaceutical Materials Based on Traditional Ghanaian Therapies. This is supposed to be a 3 year programme. The centre is still patiently waiting for funding from UNIDO. Financial assistance needed is US\$1,762,500.00.

3.2.13.4 The United Nations University

The United Nations University Institute for Natural Resources in Africa has medicinal plants research training and dissemination of information as a component of a programme priority area of indigenous African food crops and useful plants. It collaborates

with African universities and research institutes mainly in regional field surveys on medicinal plants as a basis for planning and project development. It does not deal with Ghanaian institutes alone. It has so far published the following books in this field:

- (a) Indigenous African Food Crops and Useful Plants, their Preparations for Food and Home Gardens in Ghana and.
- (b) Evaluation of the Status of Medicinal Plants and other Useful Plants, Research, Development and Utilization for Sustainable Development.

3.2.14 Recommendations

For Ghana to establish a viable industry in the promotion and utilisation of medicinal plants the following recommendations must be met as a matter of urgency:

- (a) That all or some of the constraints stated in section 3.2.5 be fulfilled.
- (b) That training in the processing of medicinal plants be initiated soon and this training be done in Africa and not in Turkey since this has proved ineffective in advancing the promotion and utilisation of medicinal plants in Africa.
- (c) That Africa must have its own ethnobotanical data bank since the WHO office in Brazzaville (plant medicines

section) and NAPRALERT at Illinois, Chicago have provided little assistance in this field in Africa.

- (d) That banks or financial houses be informed of the viability of medicinal plant-based industry for they seem to be sceptical about the venture and hence would not fund such projects.

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3.3 KENYA

3.3.1 Production

Kenya does not have an on-going significant medicinal plant based drug production. However there is production of pyrethrum based products. This is produced by the Pyrethrum Board of Kenya, a government owned enterprise. The Pyrethrum Board produces herbal soaps apart from anti-mosquito coils based on pyrethrum extracts. Didy Pharmaceuticals produces gripe water and liniments. Attempts to get more information about their products was turned down by the directors. There is also some production of herbal products by traditional healers but these products are not standardised.

The country is considering making medicinal plant products locally as is manifested by the setting up of the Traditional Medicines and Drugs Research Centre at the Kenya Medical Research Institute under the Ministry of Health.

Products currently produced on a small scale are gripe water, liniments, anti-mosquito coils, herbal soaps, vicks and pyrethrum products.

3.3.2 Manufacturers

Didy Pharmaceuticals in Nairobi and the Pyrethrum Board in Nakuru manufacture the aforementioned plant based medicinal products. The plant derived products are considered rather

expensive considering the ordinary poor person. There exists a high possibility of developing industries based on local medicinal plants in the country as the Kenya Medical Research Institute hopes to achieve. Plants that can be used in production are *Eucalyptus* species for vicks, *Gadenia jovis-tonantis*, a bronchodilator, *Ocimum kilimandscharium*, which can be used for the production of camphor since its composition of camphor is 70%. It can also be used as an analgesic. *Lippia ukambensis* can be used in aromatherapy. *Oxalis comicalata* has analgesic activity in addition to antispasmodic activity. *Ageratum conzyoides* has very potent neuromuscular blocking activity as well as analgesic activity. *Vernonia glabra* has potent analgesic activity. It is however important to point out that research has not been fully concluded yet on the above-mentioned plants such as toxicity studies.

3.3.3 Markets/Outlets

Kenya has not yet embarked on any market survey to confirm the viability of such a commercial venture. The available markets/outlets for the products in Kenya are patients themselves, pharmacy shops, general dealer shops, supermarkets and traditional healers. Many individuals as well as Government is not fully aware of potential international buyers for medicinal plant based products if made in Kenya.

3.3.4 Research Institutions and Collaboration

There are at least three institutes engaged in research and development (R&D) work on medicinal plants in Kenya.

3.3.4.1 The Department of Pharmacology and Pharmacognosy at the University of Kenya.

The research into medicinal plants is being spearheaded by Professor J.W. Mwangi and Dr K.J. Achiola. The university collaborates with Dr L. Lwande of ICIPE on insect repellent activity of essential oils and Dr P.K. Gathumbi of the Faculty of Veterinary Sciences on *Prunus Africana* used in the treatment of prostate gland disease. In the past the university used to collaborate with Dr Roberter SA of France in essential oil research.

3.3.4.2 Kenya Medical Research Institute (KEMRI)

Research into medicinal plants is being conducted by Professor Kofi and Dr Deborah Wainmu Kioy. KEMRI collaborates with the East African Herbarium in plant taxonomy as well as the Kenyan Trypanosomiasis Institute (KETRI) in typanosomiasis research.

3.3.4.3 ICIPE

This institute is involved in entomological research in which they also deal with insecticidal and insect repellent products from

plants. They do collaborate with the Department of Pharmacology at the University of Kenya as well as with KEMRI in entomological studies concerned with plants with insecticidal or insect repellent activities.

To date there is no patentable information from these institutes that need some protection before disclosure.

3.3.5 Constraints

The constraints facing Kenya on the development of medicinal plant medicines locally include:

- (a) Lack of financial support;
- (b) Lack of necessary scale up equipment;
- (c) No trained personnel;
- (d) Lack of know-how;
- (e) Prejudice against plant medicines;
- (f) Bureaucracy;
- (g) Herbal medicine practice is regulated by the Ministry of Culture and Social Services. Many scientists feel this is an inappropriate ministry to run the affairs of herbal medicine practice. They feel this should be under the Ministry of Health since herbal medicine is a medical field.

3.3.6 Exports and Imports

Kenya exports Pyrethrum, coffee, tea, castor seeds, Cinchona bark (grown privately by Brooke Bond), chilis and *Prunus*

africana. These are exported officially as agricultural products but not officially as medicinal plants. These plants are exported mainly to Europe and America. Kenya imports umbelliferae seeds from India for spices, cinamon bark, chamomille and Bronchicum from Germany which is a very popular coffee mixture in Kenya; gingseng capsules and artermissin from China. Artermissin is an extract of *artermisia annua*.

It was not possible to get an estimate of foreign earnings by Government and/or individuals on this export trade.

3.3.7 Utilisation of Medicinal Plant Products

Indeed there are many plants derived medicines that are either being prescribed or used in hospitals in Kenya. There is also a steady increase of imported plant derived medicines. These find use in hospitals, private surgeries as well as utilisation by patients.

3.3.8 Regulations

There are no regulations in Kenya concerning industrialisation of medicinal plants. Indeed there are regulations in Kenya for drug production generally and these may affect medicinal plants also. In fact there is the Pharmacy and Posions Act that may affect registration of medicinal plant products. If the plant derived drug is pure, then it comes under the registration of drug act but if the plant material is crude, then there is no law restricting its use.

Discussions at Government level on crude plant drug registration have been held. It was decided to include them in the National Drug Policy but has since been not implemented.

3.3.9 Agreements

There are no existing bilateral agreements on cooperation between Kenya and another country on drug procurement or production. Kenya is ready to go into partnership with another country (TCDC or other basis) on drug production from plants grown locally.

3.3.10 Cultivation and Conservation of Medicinal Plants

There are projects such as the pyrethrum cultivation at Nakuru Meru and the Rift Valley areas, Cinchona in Kericho District and chamomille as a pilot plant at Kubwezi and Herbal Gardens at KEMRI (Research based only at present).

There are no projects as such on the conservation of medicinal plants. However there has been discussions on this issue at official levels and plans to do so have been worked out.

In addition plants such as Aloes and *Warburgia ugandensis* are protected plants and hence cannot be exported.

3.3.11 Traditional Medicine Preparations

There are traditional medicine preparations that can be produced on a large scale in Kenya but there is lack of information on ingredients, composition and mode of preparations since herbalists themselves are not prepared to disclose their commercial secrets at present. There is limited research data to prove the efficacy only but toxicity studies have not been done yet on these traditional preparations.

3.3.12 Assistance From UNIDO

In order for Kenya to develop a plant-based industry constraints stated in section 3.3.5 above must be addressed to first. Kenya would need NMR, MS, GC, GC/MS and freeze-dryers in order to develop a plant based industry. The country would like UNIDO to help with advice and procurement in respect of appropriate items of equipment. There are no plans to train people neither is there already people in training for processing plants at industrial scale. To this end the country would like UNIDO to help in identifying centres for training or to organise on-the-job training in this country. Kenya would like information and advice on available technology for plant-based industries applicable to Kenya.

3.3.13 Additional information

At present Kenya is capable of carrying out the following activities in natural medicine research and development.

- (a) Essential Oil Extraction;
- (b) Formulations;
- (c) Anti-microbial testing;
- (d) Anti-parasitic (protozoa) testing;
- (e) Anti-viral testing;
- (f) Anti-malarial testing.

In Kenya there is no coherent professional Association of Traditional Medicine.

3.3.14 Recommendations

- (a) That constraints stated in section 3.3.5 be addressed to;
- (b) That an ethnobotanical databank be establishment for Africa;
- (c) That a training centre in the processing and industrialisation of medicinal plants be identified or established for Africa;
- (d) That easy registration of medicinal plant products be facilitated in Kenya.

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3.4. MALAWI

3.4.1 Production

Malawi does not have medicinal plant based drug production going on at the moment except by traditional healers. Malawi recognises the production of medicinal plants locally as a lucrative opportunity through the African Development Bank funded industrial sector study of January 1995. There are no plant derived products already available in the country since there is no company or individuals manufacturing such products.

3.4.2 Manufacturers

There are neither government owned nor private companies manufacturing plant derived medicinal products. There is a possibility of developing industries based on local medicinal plants such as the neem tree currently grown and commercialised by traditional healers.

3.4.3 Markets/Outlets

There hasn't been any market survey carried out to confirm the viability of such a commercial venture. The outlets/markets are not defined yet but could be initiated once the industry is established. Besides 70-80% of Malawians consult traditional healers for medication. Individuals especially in Blantyre are aware of potential international buyers of medicinal plant-based products if made in Malawi since many foreigners from overseas

come to this region to buy and collect on their own plant materials for medicinal use in their own countries. On the other hand, government is not aware of potential international buyers of medicinal plant based products if made in Malawi. Available markets/outlets for the medicinal products are pharmacy shops, supermarkets, patients, private practitioners and private clinics.

3.4.4 Research Institutions and Collaboration

Professor Jerome Msonthi now at the University of Swaziland in collaboration with Professor Kurt Hostettmann of the University of Lausanne, Switzerland carried out a lot of research work on Malawian medicinal plants while he was at the University of Malawi. Dr N.C. Chokotho of the same university is currently engaged in research work on medicinal plants in collaboration with Dr Seyani of the National Herbarium and Botanic Gardens of Malawi. Some of the work done by Professor Msonthi on *Hypericum* species may need protection before disclosure.

3.4.5 Constraints

Constraints to the development of medicinal plant medicines in Malawi are:

- (a) Lack of financial assistance;
- (b) Lack of necessary scale up equipment;
- (c) No trained personnel;
- (d) Lack of know-how;
- (e) Prejudice against plant medicines;

- (f) Bureaucracy;
- (g) Lack of ethnobotanical knowledge on Malawian medicinal plants.

3.4.6 Exports and Imports

Malawi exports spices such as chilis but not as medicinal products. Apart from this there is no tangible export of medicinal plants as raw materials. There is no information available on the estimate of foreign earnings by individuals or Government since the industry is not yet developed. The country however imports medicinal plants as finished products from Zimbabwe, South Africa and some European countries.

3.4.7 Utilisation of Medicinal Plant Products

Plant derived medicines are prescribed and used in hospitals in Malawi.

3.4.8 Regulations

There are no regulations in this country concerning industrialisation of medicinal plants. There are however regulations in Malawi governing drug production generally and these may affect medicinal plants as well especially if a claim is made on the medicinal product.

3.4.9 Agreements

There are no existing bilateral agreements on cooperation between Malawi and another country on drug procurement or production. Malawi is more than willing to go into partnership with another country (TCDC or other basis) on drug production from plants grown locally.

3.4.10 Cultivation and Conservation of Medicinal Plants

There are no projects on large scale cultivation of medicinal plants in Malawi. With regards to conservation of medicinal plants, there is a general conservation policy under the National Environment Plan at the Ministry of Research and Environmental Affairs but is not specific for medicinal plants.

3.4.11 Traditional Medicine Preparations

Malawian traditional healers produce various traditional medicine preparations for their own use in their clinics. They are mainly decoctions and infusions. Ingredients in these medicinal preparations are not known. In addition there is no research data to prove the efficacy and lack of toxicity of such traditional medicines.

3.4.12 Assistance from UNIDO

Malawi needs the constraints stated in section 3.4.5 addressed to in order to develop a plant-based industry in the country. The

country needs practically all types of equipment necessary to develop a plant-based industry such as HPLC, GC, GC/MS, MS, Rotar Vapours to name a few. Malawi would like UNIDO to help with advice and procurement in respect of appropriate items of equipment. Malawi does not have plans to train people neither is it training people for processing plants at industrial scale. To this end the country would like UNIDO to help identify centres for training or to organise on-the-job training in the country. Malawi needs information and advice on available technology for plant-based industries applicable in Malawi.

3.4.13 Additional Information

- (a) There will be a research master plan incorporating horticulture which will include medicinal plants. This will be submitted to the government by mid October 1995.
- (b) Societies on natural products are
 - (i) Malawi Association of Spices and Herbs. This Association mainly concentrates on chilis especially the bird's eye type.
 - (ii) International Traditional Healers Council based in Likuni, Lilongwe.
 - (iii) There is a chipataia clinic in Likuni, Lilongwe led by Dr S.D. Youni. This clinic treats many patients using traditional medicinal preparations.

3.4.14 Recommendations

- (a) Many people in Malawi need more information on what has been researched on in this field in Malawi. This information should be made available to relevant ministries for liaison purposes.
- (b) Constraints stated in section 3.4.5 above should be addressed to as a matter of urgency.
- (c) That an ethnobotanical databak on medicinal plants be established in Africa since NAPRALERT and WHO office in Brazzaville have proved ineffective.
- (d) That a centre for training people in the propagation, processing and formulation of medicinal plants be established in Africa since there has been no benefit from the UNIDO training programmes in Turkey.

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3.5 SOUTH AFRICA

3.5.1 Production

South Africa has a large on-going medicinal plant based drug production. There are a wide variety of plants used (see appendix I). A few examples are Cape aloes (*Aloe vbarbadensis*), almost all types of essential oils, lycopodium species, equisetum species etc. This list is too long to include in this report but one can find more details in appendix I. Many medicinal plant products are being manufactured locally already, in fact, the medicinal plant industry produces almost all plant remedies used to treat almost all ailments that beset mankind. Plant products available in South Africa are anti-asthmatic products such as Kofbron 2 from *Drosera*, *Sticta pulmonaria* and *Caprum aceticum* for more details see appendix I.

3.5.2 Manufacturers

Most of these products are manufactured by the following companies: Natura Homeopathic Laboratory, Pharma Natura, Weleda, Herbal Force, Vita Force, Beta Way, Pharma Germana and Bioharmony to name a few. There are also numerous small scale producers in South Africa. However there are no Government establishments that manufacture drugs from medicinal plants.

The plant derived products are reasonable in price relative to the synthetic medicines. The people find them far much cheaper than

synthetic drugs. However the country imports a lot of plant raw materials from America, Europe and the East. The potential for using some indigenous plants is very high. Plants that can be used as raw materials are *Kigelia africana* for ulcers and skin diseases, *Aloe excelsa* for diabetes, wound healing creams and ulcers. *Cassia abbreviata* for antimicrobial products and various indigenous essential oils such as *Heteropyxis natalensis* oil, *Ocimum canum* *Lippia javanica* etc. These can be used in the ever expanding aromatherapy programmes in South Africa.

3.5.3 Markets/Outlets

Several market surveys have been carried out to confirm the viability of such commercial ventures as is indicated by the blossoming of small scale enterprises in the country. The vast majority of South Africans use herbal medicines as alternative remedies thus creating a large market for natural medicine. There are so many outlets of medicinal plant products in the form of herbal shops, health clinics, pharmacy shops and supermarkets. Both Government and the private sector are well aware of potential international buyers of medicinal plant based products if produced locally.

3.5.4 Research Institutions and Collaboration

Research and Development into medicinal plants is mainly carried out at Universities such as the University of Cape Town, Fort Hare University, and Stellenbosch University. Because of apartheid in the past collaboration research work is not that

significant yet but there is great move in the direction of collaboration work with other institutions in Africa and other countries outside Africa. However most of the research and development work is done by private companies who are making tremendous strides in this field.

There is already patentable information from researches currently going on in the country. For commercial reasons companies did not want to disclose a lot of information in this regard.

3.5.5 Constraints

The constraints to the development of medicinal plant medicines locally in a rigorous way is mainly prejudice against plant medicines by allopathic doctors. This is however rapidly changing since there are now a number of allopathic doctors who practice both natural medicine and orthodox medicine. Lack of know-how on indigenous medicinal plants is also a constraint in the sense that this hampers medicinal evaluation of local plants, an endeavour that can create a lot of employment in South Africa as well as improving the quality of life of many rural people in this vast country. South Africa still needs a lot of trained people in the processing of medicinal plant products although the companies involved in this venture have highly qualified people in this trade.

3.5.6 Exports and Imports

The country exports medicinal plants such as Buchu, Cape aloes etc as raw material. South Africa exports a lot of finished products to SADC countries. Many medicinal plant products from South Africa find their way to many SADC countries especially Zimbabwe, Botswana, Namibia, Malawi, Mozambique, Lesotho and Swaziland. It was difficult to get an estimate of earnings in foreign currency since South Africa has just started trading with its neighbours in medicinal plant products.

South Africa imports a lot of medicinal plant products as raw materials or finished products for re-packing for sale. South Africa imports these products from France, Germany, America, India and the far East. This trade is a result of the fact that local plants have not been extensively evaluated for their medicinal properties.

3.5.7 Utilization of Medicinal Plant Products

There are numerous plant derived medicines used in Pharmacy shops, Herbal and Health clinics in South Africa. This underlines the extensive use of medicinal plant products in South Africa. Almost every town in South Africa has a fair share of Health Shops and Herbal clinics that mainly use or sell plant medicines.

3.5.8 Regulations

There are positive regulations in South Africa concerning industrialisation of medicinal plants as is manifested by the large number of companies manufacturing or dealing in medicinal plant medicines. However if a claim is made on a pure medicinal plant product and registration is required, then general regulations for drug production, distribution and registration will apply. These regulations are as strict as FDA regulations. There are however no specific regulations concerning the registration of new plant derived medicines in South Africa. Serious discussions on incorporating natural medicine into the South African Health care system are underway.

3.5.9 Agreements

South Africa itself produces a lot of conventional drugs as well as numerous drugs of medicinal plant origin. To this end South Africa does not have existing bilateral agreements on cooperation between itself and another country on drug procurement or production except where South African companies are producing drugs under franchise. There are no existing specific agreements with other countries relating to development of medicinal plants in South Africa. South Africa is ready to go into partnership with another country (TCDC or other basis) on drug production from African indigenous plants especially those available in South Africa although others from other countries can be introduced into South Africa.

3.5.10 Cultivation and Conservation of Medicinal Plants

There are large scale cultivation of Aloes in the Cape Region and many small scale herbal gardens such as Joan Lawrence Symmon's magnificent herb garden in East Court near Durban and Back to Eden Farm in Louis Trichardt to name a few. Many more farms are being converted to medicinal plant farming enterprises. There is no specific projects on the conservation of medicinal plants in South Africa but the country has firm policies on conservation of its wild life in general, this in many ways covers the conservation of medicinal plants as well.

3.5.11 Traditional Medicine Preparations

There are many traditional medicine preparations whose ingredients, chemical composition, efficacy and toxicity have not yet been analysed.

3.5.12 Assistance from UNIDO

South Africa has equipment necessary to develop a plant based industry but the problem is finance to purchase the equipment. The country would like UNIDO to help with advice and procurement in respect of appropriate items of equipment. The Southern African Herbs Society trains people at diploma level in natural medicine. However, the courses given do not cover the processing of plants at industrial scale. The course coordinator is Mrs Joan Lawrence Symmons based in Estcourt near Durban. South Africa would like UNIDO to help it in identifying centres

for training or to organise on-the-job training in the country. The country needs information and advice on available technology for plant-based industries applicable in South Africa.

3.5.13 Additional Information

Practically every major town in South Africa has a number of herbal or health clinics. The extent to which South Africa has gone in promoting natural medicine can be observed in appendix I.

3.5.14 Recommendations

- 3.5.14.1 That South Africa embarks on a large scale evaluation of indigenous medicinal plants.
- 3.5.14.2 That training centres in natural medicine be identified or established as soon as possible.
- 3.5.14.3 That there should be an ethnobotanical, chemical and medicinal data-bank situated in an African country in addition to other plants from other continents.
- 3.5.14.4 That medicinal plant products that satisfy the WHO basic minimum requirements for registration be registered by African medical authorities.

3.5.14.5 That there should be at least one annual symposium/conference on natural medicine to be attended by people from all over Africa.

3.5.14.6 That a journal on African natural medicine be established as soon as possible.

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3.6 UGANDA

3.6.1 Production

Uganda has an on-going medicinal plant based drug production by private companies. Wild medicinal plants such as *Ocimum* species, *Rauwolfia* species, *Cinnamon* species, *Eucalyptus* species, ginger, *Aspilla mossambicensis*, *Vernonia amygdalina*, *Conyza vaukensis* and *Nigitarica scalarum* are being processed into herbal remedies.

The Health Services Review Commission set up in 1987 recommended to the Government of Uganda that production of medicinal plant based drugs be undertaken to compliment Primary Health Care Services in the country. Government is in support of the view.

Plant derived products already available in Uganda are medicated soaps, cosmetics, cough mixtures, antimalarials and anti-diarrhoea remedies (see appendix 2).

3.6.2 Manufacturers

Manufacturers of such products are private registered commercial companies and small scale industrial associations such as Bull's General Agencies, Chapambalasi and Egyere's Herbal Services. All these enterprises are based in the capital, Kampala. The medicinal products are generally expensive (considering the income of local people) but they are still far much

cheaper than allopathic drugs. The other advantage is that they are readily available. Uganda has great potential in developing industries based on local medicinal plants since it has both fertile soils and good rains for the propagation of medicinal plants.

The plants that can be used in production are: Ocimum, Warburgia, Cinnamon, Rauwolfia, Eucalyptus and Xanthoxylum, Endod and *Solanum taminale* species.

3.6.3 Markets/Outlets

There has been a market survey by Bull's General Agency Ltd. They found that the market is quite big. At present they are unable to supply enough medicinal plant medicines to the public. The company is only able to supply 10% of the market at present. In addition, the Department of Pharmacology and Therapeutics at the University of Makerere carried out a general survey on about 200 plants that can be used to treat various ailments such as AIDS and diarrhoea between 1973 and 1975. This information is available in the Department of Pharmacology and Therapeutics at the University of Makerere.

Local available markets/outlets are herbal clinics, patients, class "C" drug shops, pharmacies and supermarkets. The majority of Ugandans today still consult herbalists for medical treatment and hence this market from medicinal plant products is very big. Bull's General Agency Ltd confirmed that there are also lucrative external markets in neighbouring states such as Kenya, Tanzania and Rwanda.

Both the Government, some private companies and individuals are aware of potential international buyers of medicinal plant based products if made in Uganda. This is manifested by the export of *Primus africana* products through a company called MAGRIC (U) Ltd, vanilla by Urvan Ltd, Ginger, chilis, coffee and soya by various growers and papain products by Reco Industries Ltd. All these products are exported to Europe, America and the Middle East.

3.6.4 Research Institutions and Collaboration

Research institutes engaged in research and development (R&D) work on medicinal plants in Uganda are:

3.6.4.1 The Natural Chemotherapeutic Laboratories (NCL)

This institute was established in 1963 as a department of the Ministry of Health with the following objective: To establish validity of claims made by traditional healers on herbal treatment and other methods used in traditional medicine. This institute will be independent from government to become Uganda National Health Research Organisation comprising of several institutes namely: the Cancer Research Institute based in Kampala and the Virus Research Institute based in Entebbe. This institute has been carrying research into anti-AIDS and anti-diarrhoea plant remedies. The NCL collaborates with Bull's General Agency Ltd, the Joint Clinical Research Centre and the Department of Pharmacology and Therapeutics in the aforementioned fields of

study. The NCL worked on the medicinal plants and Biodiversity Project with financial assistance from IDRC of Canada. The Entebbe Botanic Gardens was also involved in this project. The NCL assisted by the Department of Pharmacology and Therapeutics of the Makerere University carried out an ethno-medical botanic survey project in many districts of Uganda. All the information from these projects is kept at the JCL headquarters.

3.6.4.2 The Joint Clinical Research Centre (JCRC).

With respect to plant medicines research this institute is involved in anti-AIDS and anti-diarrhoea activity of Ugandan medicinal plants. The JCRC collaborates with all other research institutions involved in medicinal plant research and development in Uganda. In addition JCRC used to collaborate with Dr Linda Fellows of Kew Gardens when she was still working for Kew Gardens in taxonomy of and medicinal properties of Uganda medicinal plants. Currently JCRC collaborates with Dr Monique Simmonds of the Royal Botanic Gardens, Kew, UK in the same field.

3.6.4.3 Department of Pharmacology and Therapeutics, University of Makerere.

The department has carried out a lot of research in anti-diarrhoea remedies of plant origin in collaboration with the NCL. The medicinal plants studied have been mentioned in section 3.6.1 above.

3.6.4.4 Bull's General Agency Ltd

This company does research in almost all types of diseases prevailing in Uganda. The company feels they need protection for some of their products since they believe they are effective and unique. Apart from this claim, there are no products as yet that need patenting from other institutions. Bull's General Agency Ltd did not indicate which of their products need patenting. The company collaborates with the above mentioned research institutions.

These institutions have made commendable progress in ethnobotanical surveys in 22 out of 39 districts of Uganda. Documented applications of medicinal plants, animal and mineral materials used in traditional medicines have been compiled for each district surveyed so far. The medicinal plants have been taxonomically identified and a herbarium established.

3.6.5 Constraints

Constraints to the development of medicinal plant medicine in Uganda are:

3.6.5.1 Lack of Finance

3.6.5.2 Lack of necessary scale up equipment.

3.6.5.3 No trained personnel in plant medicine manufacturing

- 3.6.5.4 Lack of literature and databank on ethnobotany
- 3.6.5.5 Lack of equipment for chemical analysis
- 3.6.5.6 Lack of agronomical/horticultural practice and knowledge on post harvest treatment of medicinal plants.
- 3.6.5.7 Inadequate financial support and lack of staff motivation.
- 3.6.5.8 Prejudice by some doctors and pharmacists. However this is dying down since natural medicine has been incorporated into the medicine and pharmacy curricula.
- 3.6.5.9 Low staff remuneration and lack of incentives
- 3.6.5.10 Poor packaging and quality control of plant medicines.
- 3.6.6. Exports and Imports

Uganda exports the following medicinal plants as raw materials.

<u>Product</u>	<u>Country (ies)</u>
<i>Capsicum putescens</i>	Europe & Middle East
<i>Sesamum indica</i>	Europe
<u>Zingiber officinalis</u>	Europe & Kenya
Soya	Europe

Vanilla

USA

Coffee

Europe

Foreign Currency Earnings

<u>Product</u>	<u>Year</u>	<u>Tonnage</u>	<u>Earnings US\$</u>
Ginger	1993	290	130,000
	1994	16	11,000
Chilis	1993	333	350,000
	1994	290	350,000
Soya	1993	7076	2,056,000
	1994	1450	689,000
Vanilla	1993	4731 kg	328,000
	1994	8040 kg	369,000
Coffee	1993	114169	106,775,000
	1994	194824	342,668,000

Papain export figures were not available.

Uganda imports herbal medicines and other plant derived medicines from the Far Eastern countries such as China, India and Pakistan.

3.6.7 Utilization of Medicinal plant Products

Herbal medicines are neither prescribed nor dispensed in hospitals. However, plant derived medicinal products are prescribed and used in hospitals and clinics. Many Ugandans consider herbal medicines to be extremely helpful and hence the markets for these products is quite significant.

3.6.8 Regulations

The domestication of wild plants would have to be researched and approved by the National Agricultural Research Organisation (NARO). The Government of Uganda through the Ministry of Trade and Industry could promote herbal products under the non-traditional cash crop programme.

The National Drug Authority has guidelines for the registration of pharmacies, drug shops and specific drug products. It restricts the cultivation of certain alkaloid producing plants (narcotics). However, the National Drug Authority has invited one herbalist to represent natural medical practitioners, a gesture regarded by herbalists as a recognition by Government of the importance of incorporating Natural Medicines into the health services of the country. In fact President Museveni himself is in solid support of natural medicine practice in Uganda.

3.6.9 Agreements

Uganda and Cuba have bilateral agreement on cooperation on drug procurement and production.

DANIDA and Ugand has a 5 year agreement on procurement and distribution of drugs.

There are discussions going on with Egypt on the same issue. However there are no existing specific agreements with other countries relating to the development of medicinal plants in Uganda.

Futhermore Uganda is more than ready to go into partnership with another country (TCDC or other basis) on drug production from plants grown locally.

3.6.10 Cultivation and Conservation of Medicinal Plants

To date there is no project on large scale cultivation of medicinal plants in Uganda. With regards to conservation of medicinal plants, the only project on the conservation of medicinal plants in Uganda is the Medicinal Plants (Biodiversity Project) at the Natural Chemotherapeutics Laboratories. There has been a bill passed recently, The National Environment Management meant to oversee all activities in the country relating to the environment. This is meant to avoid or minimise environmental degradation.

3.6.11 Traditional Medicine Preparations

Bull's General Agency produces a variety of traditional medicine preparations they consider should be produced in large quantities. However, they declined to disclose the ingredients and composition. They are however powders, decoctions and infusions. Their monthly turnover from the sales of these plant medicines amount to US\$25-30,000. They claim this can go up to US\$50 000 a month if better manufacturing equipment is made available. Some of their products are Aspilla for appetite, Vernonia for fever, Digitaria for infection and a few concoctions for High Blood Pressure (see appendix 2 for details). There is no research data as yet to prove the efficacy and lack of toxicity of such traditional medicines.

3.6.12 Assistance from UNIDO

Uganda needs almost all the equipment necessary to develop a plant based industry such as HPLC, NMR, GC, GC/MS, Thin layer chromatography, UV, Rota Vapour and Freeze-dryer. The country would like UNIDO to help with advice and procurement in respect of appropriate items of equipment.

There are no plans to train nor has the country trained people already for processing plants at industrial scale. Uganda would like UNIDO to help in the identification of centres for training or to organise on-the-job training in the country. The country also

needs information and advice on available technology for plant-based industries applicable in Uganda.

3.6.13 Additional Information

The Ugandans feel that *Wurbargia ugandensis* has very potent antifungal and antibacterial activity and hence must be domesticated and cultivated on a large scale. Furthermore, Uganda produces a lot of avocados at Nsimbe and they are seeking technology to express avocado oil which is widely used in aromatherapy and massage oils.

3.6.14 Recommendations

- 3.6.14.1 That the NCL should be considered by UNIDO to act as a plant medicine reference institute for the East, Central and Southern African Region.
- 3.6.14.2 That donor agencies should liaise with the government of Uganda through NCL to set up a Pilot Production Plant for herbal medicines in Uganda.
- 3.6.14.3 That Governments should come up with clear cut policies on conservation, exploitation and exportation of medicinal plants.
- 3.6.14.4 That African Governments be serious about natural medicines and that they should support scientists involved in this work.

- 3.6.14.5 That there should be incorporation of natural medicine into their pharmacy and medicine curriculum.
- 3.6.14.6 That there should be a databank on medicinal plants for all institutions involved in this type of work. The WHO data bank at Illinois, Chicago has not served Africa well, it is in fact useless to Africa.
- 3.6.14.7 That WHO office in Brazzaville, Congo dealing with medicinal plants need to be re-vamped to make it more useful to African scientists engaged in this Research and Development of medicinal plants in Africa. This office must be more outward looking.
- 3.6.14.8 That there should be staff exchange especially with Zimbabwe and South Africa for short periods.
- 3.6.14.9 Establish agronomy databank of plants used in the manufacture of medicinal products in Africa and abroad.

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3.7 ZAMBIA

3.7.1 Production

Zambia has no medicinal plant based drug production going on at the moment. However, the country through the private sector is contemplating making medicinal plant products locally. Some companies are contemplating to produce oleoresin from paprika and marigold, castor oil from castor beans, *Jatrophia curcas* oil and tinctures, decoctions and various essential oils. There are as yet no plant derived products already available in the country that are locally manufactured. The country has great potential for developing industries based on local medicinal plants such as *Tagetes minuta* used as an insect repellent, aloes for constipation and wound healing, castor oil as a purgative, *Jatriopha curcas* for herbal soaps. The country envisages to propagate a variety of common essential oils.

3.7.2 Manufacturers

There are no manufacturers of medicinal plant products at present in Zambia although the potential exists.

3.7.3 Markets/outlets

There hasn't been any extensive market survey already done country-wide to confirm the viability of such a commercial venture except on a small scale for essential oils done by Professor Mazuru Gundidza of Zimbabwe for Herbs, Spices and Essential

oil Association of Zambia and for Mumbo International Trading Company. The short survey indicated that the local market is quite large as well as the external markets. The available markets/outlets for the products in the country are pharmacy shops, natural medicine practitioners and the public at large. Some companies and individuals are aware of potential international potential buyers of medicinal plant based products but Government is not aware of this.

3.7.4 Research Institutions and Collaboration

There is basically one research institute engaged in research and Development (R&D) work on medicinal plants but on a small scale. This is the National Council for Scientific Research. The research areas on medicinal plants are the propagation and processing of *Phytolacca dodecandra* at the Tree Improvement Research Centre in Kitwe. Field trials have been carried out and this proved to be very effective against snails and tse-tse flies.

Six hectares are currently under cultivation and the NCSR is seeking more land to grow the plant from Kitwe City Council. The NCSR is also currently propagating by tissue culture geranium plants for the Herbs, Spices and Essential Oils Association of Zambia. 800 plants are already ready for planting. The NCSR has the capability to clone many essential oil plants. In addition they have a plantation of Eucalyptus species. They also envisage to multiply lemongrass for the Herbs, Spices and Essential Oil association of Zambia. The NCSR has also been approached by the Refined Oil Products (ROP) on the possibility

of propagating *Jatropha curcas*. To this end, they have already propagated 4 hectares of the plant for demonstration and for agro-botanical studies. The NCSR at one time did extensive studies on *Ricinodendron rautenii* (Mungongo) oil for hair products, cooking oil and engine oil. The oil has great potential for such uses. There is yet no patentable information from any research activities in the country.

With regards to collaboration, there has been some collaboration with Ethiopia and Swaziland on *Phytolacca dodecandra*.

3.7.5 Constraints

The constraints to the development of medicinal plant medicines locally are:

- 3.7.5.1 Lack of financial assistance;
- 3.7.5.2 Lack of necessary scale up equipment;
- 3.7.5.3 No trained personnel
- 3.7.5.4 Lack of know-how;
- 3.7.5.5 Prejudice against plant medicines;
- 3.7.5.6 Bureaucracy;
- 3.7.5.7 Lack of agronomical and ethnobotanical information on Zambian medicinal plants.

3.7.6 Exports and Imports

The country is going to export castor beans as raw materials to Zimbabwe this year. Since the exports of these beans will be in the

next few months, there is no estimate of foreign earnings yet by Mumbo International Trading Ltd in conjunction with other small-scale castor bean produces such as Castor Oil Extraction Enterprises Ltd.

The country imports only finished medicinal plant products mainly from Zimbabwe and South Africa. These plant derived medicines are prescribed and used in hospitals.

3.7.7 Utilisation of Medicinal Plant Products

As mentioned before, Zambia imports a lot of plant derived medicines. These are prescribed or used in hospitals or by the public. It is estimated that many more plant derived products will be used as Zambians themselves begin to produce local medicinal products. Currently many of the medicinal plant products consumed in Zambia are imported from abroad.

3.7.8 Regulations

There are no regulations on the industrialisation of medicinal plants. But there are regulations for drug production generally which may affect the registration of medicinal plant products especially some regulations relating to drugs and toxic compounds, for example, the Investment Act of 1993. There are also no regulations governing the registration of new plant derived medicines as such but those applying to synthetic drugs may also apply to plant derived medicines.

3.7.9 Agreements

There are currently no existing bilateral agreements on cooperation between Zambia and another country on drug procurement or production neither is there existing specific agreements with other countries relating to development of medicinal plants in the country.

Zambia is willing to go into partnership with another country (TCDC or other basis) on drug production from plants grown locally.

3.7.10 Cultivation and Conservation of Medicinal Plants

There are no large scale cultivation of medicinal plants in the country. However there is a small scale production of geranium, castor beans, lemongras, *Phytolaca dodecandra*, eucalyptus and *Jatropha curcas* in Kitwe and Lusaka as has been mentioned above.

There is no distinct policy nor projects on conservation of medicinal plants in Zambia. There is however, laws of conservation in general terms such as those against indiscriminate cutting of trees and veld fires.

3.7.11 Traditional Medicine Preparation

There are a few traditional medicine preparations sold at Soweto market Lusaka and many more prepared by local herbalists.

Unfortunately the herbalists refused to disclose the ingredients, composition and mode of preparation although they are basically powders, infusions herbal teas and decoctions. There is no research data to prove the efficacy and lack of toxicity of these products.

3.7.12 Assistance from UNIDO

Zambia needs almost all the equipment needed to develop a plant based industry such as HPLC, Rota vapours, GC, GC/MS, NMR, MS, chromatography (column & flash chromatography) freeze-dryers as well as basic equipment for biological tests. The country would like UNIDO to help with advice and procurement in respect of appropriate items of equipment.

There are no plans to train people neither are people being trained for processing plants at industrial scale. To this end the country wants UNIDO to help identify centres for training or to organise on-the-job training in the country. Zambia needs information and advice on available technology for plant-based industries applicable in Zambia.

3.7.13 Additional Information

Zambia has formed its own national Herbs, Spices and Essential oils Association with the mandate to coordinate and spearhead Research and Development into medicinal plants as well as to gather information on the ethnobotanical, agronomical and medicinal properties of Zambian medicinal plants. Dr Vong,

Chairman of Zambia Traditional Healers Association grows, processes and sells local medicinal plants and can be contacted through Mr A Sallah of COMESA.

3.7.14 Recommendations

- 3.7.14.1 That there should be networking on African medicinal plants throughout Africa.
- 3.7.14.2 That there should be centralised data-bank on the ethnobotanical, agronomical and medicinal properties of African plants since NAPRALERT at Illinois, Chicago, USA has not been effective in disseminating information to African countries on medicinal plants neither has the WHO office in Brazzaville, Congo on traditional medicine been effective in this regard.
- 3.7.14.3 That there should be regular workshops, seminars, or conferences at both the local and international levels on this subject in Africa.
- 3.7.14.4 That there should be a training centre for processing medicinal plants at industrial scale.

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3.8 ZIMBABWE

3.8.1 Production

Zimbabwe has an expanding on-going medicinal plant based drug production. The plants used in this production are *Melaleuca alternifolia* (Tea tree), *Eucalyptus citriodora*, *Eucalyptus smithii*, *Tagetes minuta*, *Jasminum grandiflorum*, *Cymbopogon citratus*, *Cymbopogon nardus*, *Lavandula officinalis*, *Aloe excelsa*, *Kigelia africana* to name a few. Zimbabwe is making a variety of medicinal plant products already but is contemplating expanding the industry to include those medicinal plant drugs that are not currently on the market. Plant derived products already available in Zimbabwe are *Aloe excelsa* juice and powder, *Cassia abbreviata* powder, tea tree oil and soaps, insect repellent vaseline, mosquito repellent candles, 37 different herbal teas, green blood (mixture of liquified fruits and vegetables), lavender oil, jasmine oil, citronella oil, orange oil, lemon oil, lime oil, *Lippia javanica* oil, castor oil, melon oil, pumpkin oil and Happy Hound Dog shampoo.

3.8.2 Manufacturers

Manufacturers of such plant products are mainly private companies as well as the University of Zimbabwe's Department of Pharmacy and Africa University in Mutare. Essen oil (Pvt) Ltd is the largest producer of tea tree oil in Africa. It also produces Eucalyptus oil, *Lippia javanica* oil and *Tagetes minuta* oil. Aroma Chemicals (Ptv) Ltd produces raw materials such as *Aloe excelsa*

powder and juice, *Kigelia africana* extracts, skin diseases remedy, natural dyes, and virgin-essential oils such as *Heteropyxis natalensis* oil etc.

The Department of Pharmacy at the University of Zimbabwe produces jasmine oil, lavender oil, citronella oil and *Cymbopogon nardus* oil. The Essential Oil Plants Extract Company (Pvt) Ltd produces Healing Balm from *Kigelia Africana*, *Aloe exelsa* and *Heteropyxis natater.sis* oil. It also produces Happy Hound which is a dog shampoo. Four Seasons (Pvt) Ltd produces the largest variety of essential oils and spices. Tinidad Asphalt (Pvt) Ltd produces castor oil. Zimbabwe Foundation of Education with Production produces jasmine oil, peppermint oil, *Cymbopogon nardus* oil and Lavender oil. Musitwe Flowers (Pvt) Ltd cultivates Echinacea for export purposes.

The plant derived products are reasonable in price relative to synthetic medicines.

3.8.3 Markets/Outlets

Zimbabwe through the help of UNIDO, IDRC and private companies carried out four extensive market surveys since independence. All the market surveys confirmed the viability of such a commercial venture. Market surveys were carried out in Zimbabwe itself by Professor Nitya Anand and Professor Finsunberg and by IDRC Aided project on essential oils and in the SADC Region and other African countries. The country has very valuable information on global trade in medicinal plant products.

Local available markets/outlets are pharmacy shops, herb shops, health clinics, supermarkets and patients themselves. Private companies, individuals and Government are well aware of potential international buyers of medicinal plant based products if made in Zimbabwe.

3.8.4 Research Institutions and collaboration

The main institution engaged in Research and Development (R&D) work on medicinal plants in Zimbabwe is the University of Zimbabwe's Departments of Pharmacy, Chemistry, Physiology, Pharmacology, Biochemistry and the Chemistry Department in the Faculty of Education. These departments do research on the antimicrobial, anti-diabetic, anti-malarial, anti-AIDS, anti-diarrhoea and toxicity of Zimbabwean medicinal plants just to mention a few areas. Blair Research which is a medical research institute under the Ministry of Health concentrates its efforts on Zimbabwean plants active against bilharzia-carrying snails especially *Endod* (*Phytolacca dodecandra*). The Research and Specialist Services Institute which comes under the Ministry of Agriculture specialises in the general agronomical and ethnobotanical aspects of food crops as well as new or introduced plants which include medicinal plants. Companies such as Aroma Chemical, (Pvt) Ltd, Essen Oil (Pvt) Ltd, Four Seasons (Pvt) Ltd and Maggie's Herbs do carry out their own Research and Development on medicinal plants in their localities. Some areas of Aids, cardiovascular (BP etc) and diabetes need serious look with the view of patenting some of the findings so far. The Companies and Departments at the University of Zimbabwe

mentioned above collaborate closely in the field of natural products research. The Department of Pharmacy has a research project in collaboration with Dr J.R.J Pare of the River Road Environment Technology Centre, Ottawa Canada on the Microwave Extraction of Flavours and Fragrances in Zimbabwe. Five hectares of jasmine, lavender, citronella and *Heteropyxis natalensis* are under cultivation at the University of Zimbabwe Farm. The only problems encountered are water (need 2 boreholes) and labourers' houses. The same Department has just signed an agreement with Professor Kurt Hostettmann of the University of Lausanne, Switzerland on the evaluation of Zimbabwean plants for medicinal properties. The Department of Chemistry got a grant worth about USS\$54 million for equipment. The Department of Science Education collaborates with the National Cancer Institute, USA in the anti-AIDS and anti-cancer activities of Zimbabwean medicinal plants.

3.8.5 Constraints

- 3.8.5.1 Lack of financial assistance for expansion;
- 3.8.5.2 Lack of necessary industrial scale up equipment;
- 3.8.5.3 Prejudice against plant medicines by allopathic doctors and pharmacists.

3.8.6 Exports and Imports

Zimbabwe exports *aloe excelsa* powder and juice to South Africa, *Tagetes minuta* oil to France and the USA, a wide variety of spices to Europe, Echinacea to the USA, Herbal soaps to Australia, lemon, orange and lime oils to Europe. The export trade in this field is rapidly expanding. Since this trade has only started, it is not possible yet to get a full picture on the foreign earnings by companies.

Zimbabwe imports finished medicinal plant products mainly from South Africa, America, Europe and the Far East.

3.8.7 Utilisation of Medicinal Plant Products

A lot of plant derived products are prescribed or used in hospitals. The Zimbabwe Essential Drug List contains a lot of drugs derived from plants. In addition all health shops, herbal shops, supermarkets and many pharmacy shops sell finished medicinal plant products.

3.8.8 Regulations

There are no regulations as such concerning industrialisation of medicinal plants. There are regulations in Zimbabwe for drug production generally and these may affect medicinal plants also if a claim is made on pure extracts. Pure new plant derived medicine on which a claim has been made fall under the same regulations as synthetic drugs for registration.

3.8.9 Agreements

There are no existing bilateral agreements on cooperation between Zimbabwe and other countries on drug procurement or production. The IDRC project on flavours and fragrances in the Department of Pharmacy at the University of Zimbabwe mentioned above in section 3.8.4 had a Government to Government approval.

3.8.10 Cultivation and Conservation of Medicinal Plants

Cultivation and conservation of medicinal plants is underway and is expanding rapidly. Musitwe Flowers (Pvt) Ltd in Masasa, Harare cultivates a lot of Echinacea for export as well as for use as a herbal tea and tablet making. Essen oil (Pvt) Ltd has put 40 hectares under tea trees and by the end of 1995 1 million more tea trees will have been planted. On the same farm, there are about 5 hectares under *Lippia javanica* as well as a large plantations of *Eucalyptus smithii* and *Eucalyptus citriodora*. Four Seasons has about 10 hectares under a variety of essential oil plants such as lemongrass, rosemary, lemon verbena etc. Maggie's Herbs propagates about 37 different herbs on 5 hectares for herbal teas. The Department of Pharmacy at the University of Zimbabwe currently propagates 1 hectare of jasmine, 1 hectare of lemongrass and cymbopogon, 1 hectare of lavender, and an acre of indigenous plants. *Heteropyxis natalensis* and *Heteromorpha tripholiata*. Zimbabwe Foundation of Education with Production (ZIMFEP) propagates jasmine (1 hectare), peppermint and

Cymbopogon nardus at Mupfure, Chegutu. Africa University in Mutare has commenced the propagation of essential oils. *Tagetes minuta* proliferates in the wild. It is in fact considered a troublesome weed by many Zimbabwean farmers. There is no need therefore of cultivating it since it is so abundant in the wild throughout the country. In addition Zimbabwe has many nurseries that grow a wide variety of medicinal plants from which farmers can obtain seedlings when needed. Fambidzanai Training Centre near Mount Hampden, 20 kilometers West of Harare propagates a variety of indigenous and common medicinal plants organically in their nursery. Many farmers obtain many medicinal plants from this centre. Zimbabwe produces a lot of castor beans in region I of the country.

3.8.11 Traditional Medicine Preparations

There are many traditional preparations on the market. These traditional preparations have not been scientifically studied to ascertain their efficacy nor lack of toxicity. However some of the plants used in the preparations have proven efficacy such as aloes for constipation. Scientific studies on these traditional preparations hence just commenced.

3.8.12 Assistance from UNIDO

Zimbabwe needs equipment for biological tests and very few on phytochemical analysis. The country would like UNIDO to help it with advice and procurement in respect of appropriate items of

equipment. The country has plans to train people for processing plants at industrial scale. In fact hitherto, the Department of Pharmacy has so far trained 10 Zimbabweans in the propagation, extraction and formulation of essential oils. In addition it has trained 6 students in natural medicine at certificate level (4 from South Africa - are already in practice, 2 from Zimbabwe and another one from Kenya). The next intake is in February 1996.

However the country still needs UNIDO to help identify centres for training or to organise on-the-job training in Zimbabwe. Furthermore, training for current lecturers in natural medicine will be greatly appreciated. Zimbabwe still needs information and advice on available technology for plant-based industries in the country.

3.8.13 Additional Information

3.8.13.1 Training

Zimbabwe has the capability to train people for processing plants at industrial scale since it has very sophisticated phytochemical equipment and some biological equipment (need more sophisticated ones). Medicinal plant product manufacturers have agreed to help train students in medicinal plant product processing through industrial attachments.

3.8.13.2 Expansion

There are many women organisations, companies and individuals contemplating embarking on medicinal plant industrialisation. The country has the technology and infrastructure to expand the industry.

3.8.13.3 Associations

Zimbabwe has the following associations dealing with Medicinal plant products:

- 3.8.13.2.1 Zimbabwe Traditional Healers Association (ZINATHA). The association is registered through an Act of Parliament and this enables its members to practice natural medicine without harassment from Government medical authorities.
- 3.8.13.2.2 Natural Products Association of Zimbabwe (NAPRAZ). This association spearheads standardisation of medicinal plant products.
- 3.8.13.2.3 Plant Oil Producers Association (POPA): This association spearheads research and marketing of all types of plant oils in Zimbabwe.
- 3.8.13.2.4 Essential Oil Producers Association (EOPA). This association spearheads research and development and marketing of essential oils.

3.8.14 Recommendations

- 3.8.14.1 That the Department of Pharmacy be supported for its training programmes financially.
- 3.8.14.2 That an ethnobotanical, agronomical, phytochemical and databank for African medical plants be established as soon as possible.
- 3.8.14.3 That traditional medicine products that satisfy the basic minimum WHO standards for registration be registered.
- 3.8.14.4 That financial institutions be educated on the viability of medicinal plant products so that they can finance these enterprises.

3.8.15 Addresses

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4. OVERALL RECOMMENDATIONS

This regional overview on the industrial utilization of medicinal plants for health care systems in Africa has revealed the dire need for African countries to develop their own medicinal plant-based industries to complement their health care systems. It is apparent that in order to develop these industries the following recommendations must be implemented by African Governments.

4.1 Financial Assistance

This regional overview on the industrial utilisation of medicinal plants has revealed that there is very limited financial assistance for developing plant medicines by almost all African Governments, financial institutions and NGO's. It is therefore hereby being recommended that African Governments, financial institutions and NGO's fund Research and Development of plant-based medicines as a matter of urgency.

4.2 Training

During the survey, it was apparent that many African countries do not have trained personnel in the processing of medicinal plants at industrial scale neither do they have plans to do so. They do not have qualified people in scientific herbal medicine practice either. Training has been in orthodox phytochemistry, biological screening and taxonomy mainly at European or American universities. The training is or was not oriented towards plant medicine production nor natural medicine practice.

Recommendations from countries visited in this respect were towards identification of centres for training or organisation of on-the-job training in each country by UNIDO. To this end, it is recommended that training be done in Africa itself in the long run. The training programme in natural medicine being offered in the Department of Pharmacy at the University of Zimbabwe, therefore, must be supported by UNIDO. The training can be done at four levels, that is, at certificate level where people with O-level certificates or have been in traditional medicine practice for sometime can be registered for the course; at diploma level where people with degrees in biological sciences or those holding certificates in natural medicine can be registered, at masters level where holders of degrees in medicine, pharmacy and biological sciences can be accepted and at PhD or MPhil level where holders of masters degrees in medicine, natural medicine, pharmacy and biological sciences can register. A first degree in natural medicine is also being considered. In order to implement this programme fully, it is hereby being recommended that UNIDO organise further short training programmes for the current lecturers in the Department of Pharmacy in this field.

It must be emphasised that after training, the students go straight into the practice of natural medicine alongside allopathic doctors. This has proved highly successful for students who have already taken the certificate course in the Department. For the topics to be covered in the said courses see appendix 3. Many people interviewed believe the course in plant medicines offered in Turkey under the auspices of UNIDO has not been effective in Africa in the promotion and implementation of natural medicine

practice due to the criteria of selection and the course content. Many African scientists want courses to be run in Africa itself.

4.3 Scale Up Equipment

Many African countries do not have even rudimentary equipment in order to enable them to scale up production of medicinal plant products, neither do they have the infrastructure and technology to manufacture some of the equipment except South Africa and Zimbabwe. It is therefore being recommended that each country with the help of UNIDO procure appropriate items of equipment such as stills, freeze-dryers etc. Many items of equipment can be obtained or made in such countries like South Africa and Zimbabwe. Sophisticated equipment such as NMR, HPLC, GC, GC/MS etc can be installed at one or two institutions in Africa where samples can be sent for analysis. The University of Zimbabwe does have very sophisticated equipment mentioned above. Therefore samples from other countries can be sent there for analysis if prior arrangements can be made with the University of Zimbabwe authorities and the Departments of Chemistry, Pharmacy, Physiology, Biochemistry, Chemical Pathology and Clinical Pharmacology.

4.4. Promotion and Development of Industrial Utilisation of Medicinal Plants in Africa.

In many African countries, there is rife prejudice against plant medicines by some government officials, allopathic doctors and pharmacists. There is also bureaucratic impediments to the

development of this industry. The reasons for prejudice and bureaucracy is mainly ignorance about the commercial value of plant medicines or even the economical potential of agro-industries in general. In order to overcome these constraints, the following recommendations must be implemented for Africa.

4.4.1 Education

There must be educational programmes on television, radio and other forums on the importance and economic value of medicinal plant products in all African countries. The teaching of natural medicine must be incorporated into the syllabuses of medicine and pharmacy degrees. This can be easily incorporated into the current syllabuses of pharmacognosy at all pharmacy schools throughout Africa as well as through introduction of a course in natural medicine in the medical degree course.

4.4.2 Registration

Because of prejudice against medicinal plant products, registration of such products with medical authorities have been difficult if not impossible. It is therefore being recommended that medicinal plant products that satisfy basic minimum WHO standards for registration be registered with the medical authorities in all African countries. It is also recommended that trained people in natural medicine be registered with the Health Professional Councils of all African countries so that they can practice natural medicine openly and without prejudice. This should not be a problem since I believe African ministers of Health

agreed in 1990, in Brazzaville, Congo to incorporate natural medicine in their health care systems. What is left is to implement the principles.

4.4.3 Creation of National, Regional and Continental Associations of Natural Medicine.

Though many countries have associations concerned with natural medicine in one way or another, they are fragmented, divided and lack financial resources to spearhead research and development of medicinal plant products and promotion of natural medicine practice. It is therefore hereby being recommended that serious, non-fragmented but well-coordinated associations in natural medicine be formed at national, regional and continental levels in various fields of natural medicines with the following objectives:

4.4.3.1 Information access:

The associations will collate information for their members on; market characteristics and product requirements; commodity and pricing statistics from target markets; provide agronomical data, technology and equipment sources, new market opportunities and case studies and commercialisation models.

4.4.3.2 Market Access and Development

The associations will provide information or logistics on: market distribution channels, market niche identification, buyer/venture

partner location, market entry and penetration strategies, target market identification and export assistance programmes.

4.4.3.3 Research and Development

The associations will be responsible for instigating vibrant University programmes in the R&D of medicinal plant products, promote regional/worldwide university networks involved in the R&D of plant medicines; organise training course opportunities, experimental, demonstration and on-farm training programmes on propagation and post harvest treatment of medicinal plants, identify laboratory and test facilities, solicit support from ministries of agriculture and agricultural research institutes.

4.4.3.4 Quality Assurance and Certification

The associations will help identify quality control facilities and procedures, enlist bureau of standards involvement, provide information on production and grading standards, organise quality seal and organic certification programmes.

4.4.3.5 Agronomics and Business Support Service.

The associations will be responsible for providing information on the following: number and description of growers, outgrower and contact grower strategies and mechanisms, propagation and practices and techniques, seed production and access, commercial grower practices, planting and harvesting technologies and techniques, processing options and technologies, pre- and post-

harvest processing facilities, value-added strategies, organic farming and permaculture practices, integrated pest management, organic farming supplies, general equipment supplies, packing for transport, packing for export, technical assistance, environmental and conservation practices, venture packaging, feasibility studies and business planning, new venture identification, value-added business development strategies, competitive costing and pricing approaches.

4.4.3.5 Business Involvement and Support:

The associations should encourage, involve and promote strong private sector participation, business support organisations and instigate associations/agricultural/horticultural commodity exchanges.

4.4.3.6 Support Facilities and Infrastructure

The associations should involve or facilitate the following: packaging industry, financing facilities, bulk-processing facilities, transport system, land, sea and Air communications, telecommunications and computerisation, industry EDI utilities.

4.4.3.7 Other Development Considerations Within A Global Market Perspective

The associations will also have to focuss attention on the following issues: smallholder and emerging farmer development, job opportunities for women, small business development,

conservation of natural resources, conservation through commercialisation programmes and creation of national data banks on ethnobotany, phytochemistry, formulation and pharmacological activities of African medicinal plants.

The Southern African Federation of Herbs, Spices and Essential Oils (SAFHSO) is currently in the process of establishing a secretariat in the Department of Pharmacy at the University of Zimbabwe to implement the above-mentioned proposals for the Southern and Central African region. This can be expanded to include other African countries. The secretariat will probably be funded by USAID.

4.4 Databank

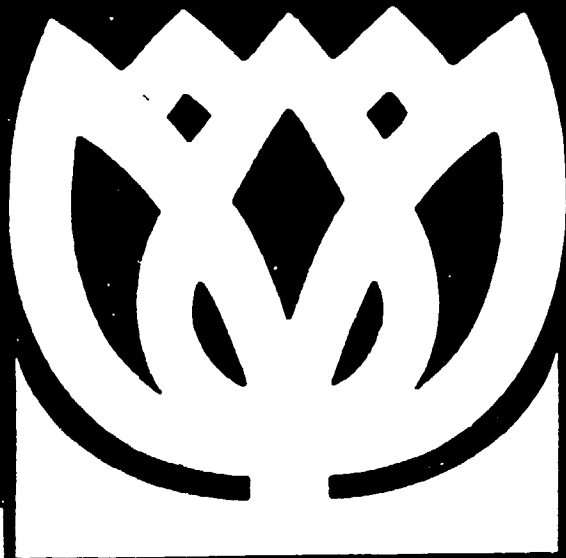
Many African scientists involved in medicinal plant research expressed the feelings that NAPRALERT based in Illinois, Chicago has not served the interests of African scientists in this field adequately. NAPRALERT takes a long time to reply African scientists's enquiries on medicinal plants from Africa. It is therefore recommended that an African Databank be created to serve the interests of African scientists. Location of the said databank can be in any African country but with excellent communication system from which all African scientists can draw information on medicinal plants very quickly. The national associations can be linked to the databank by satellite or resort to the use of faxes.

4.5 Workshops/Seminars/Symposia/Conferences

In order to share new ideas and latest information on medicinal plants or products, conferences etc should be organised at national, regional, continental and international levels at least once a year. The proceedings of conferences etc should then be sent to the databank centre for dissemination to national associations.

4.6 Literature

It is hereby being recommended that there should be a journal of African Natural Medicine, focussing attention mainly on Research and Development of African Medicinal Plants.



NATURA

**Homoeopathic Laboratory
Homeopatische Laboratorium**

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DIARRHOEA	Diarrho, Cesranol, Acidoflora, Sedaped.

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EXCITABILITY	Nervuton 2, Nerva 1, Nervuton 1. Cerbo.
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FEAR of FALLING & STAIRS	Nerva 1.
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FEET: HEELS PAINFUL	Thuja Tablets.
FEET: SOLES BURNING	Ruma 1. External: Ruma Plus.
FEET: SOLES THICKENING	Thuja Tablets. External: Thuja Lotion Plus.
FEVER	Fever.
FEVERBLISTERS	External: All Heal Plus.
FLATULENCE	Magen, Febro 1, Segiro.
FLUSHES	Phytol Plus, Sepia Tablets, Congestivo.
FRACTURES	Osto.
FRECKLES & BLOTCHES	Thuja Tablets. External: Thuja Lotion Plus.
FRIGIDITY	Landi F, Feminon.
GALL. BLADDER DISORDERS	Gallen, Febro 1, Pro-Cholin.
GALLSTONES	Gallen.
GANGLION	Gichtin, Osto.
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GASTRIC INFLUENZA	Gripless 1, Cesranol.
GASTRITIS	Magen, Cesranol.
GENITAL INFECTIONS	Utero, Venera, Carno 1, Carno 2.
GLANDULAR INDURA- TIONS	Carno 1, Carno 2, Carno 3.
GLAUCOMA	Eyebright.
GOUT	Gichtin, Ruma 1, Ruma 2, Ruma 3.
GRAVEL	Urina, Nieren.
GRIEF	Rescue, Nerva 3.
GUMBOILS	Odon.
GUMS SPONGY	Odon, Buso, Organo 1.

MENOPAUSAL SYNDROME	Phytol Plus, Sepia Tablets.
MENOPAUSAL TENSION	Sepia Tablets, Phytol Plus, Nervuton 2, Nervuton 1.
MENTRUAL PAINS	Utero, Pein, Feminon.
MENSTRUAL REGULATION	Feminon, Utero, Landi F, Sepia Tablets.
MENSTRUAL TENSION	Sepia Tablets, Nervuton 2, Nervuton 1, Nerva 3, Congestivo.
MENORRHAGIA & METRORRHAGIA	Sango.
MIGRAINE	Pein, Nerva 2, Scutellaria.
MINERAL ASSIMILATION	Kalmag.
MOUTH ULCERS	Odon, Buso, Pharyna, Organo 1.
MUSCULAR PAIN & STIFFNESS	Injura, Gichtin, Ruma 2. External: Ruma Plus.
MUSCULAR STRAIN	Injura. External: Arnica Plus, Ruma Plus.
NAEVUS or MOESIE	Thuja Tablets. External: Thuja Lotion Plus.
NAIL AFFECTIONS	Kalmag.
NAPPY RASH	External: All Heal Plus, Calendula Plus.
NASAL CONGESTION	Nasenöl.
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NERVE DEBILITY	Cerbo.
NERVOUS FATIGUE	Stressless, Nervuton 2, Nerva 1, Nerva 3.
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NOSE BLEED	Sango.
NUMBNESS EXTREMITIES	Procordal Plus, Kalmag.
OEDEMA	Diureta.
OTITIS	Otitis, Organo 1.
OVER-INDULGENCE	Febro 1, Segiro.
OVERWEIGHT or OBESITY	Corp, Struma 2, Natura Slim.
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PALPITATIONS	Chronocard Plus.
PARASTHESIA	Procordal Plus, Hemorrhho 2, Pro-Dorsin.
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PERSPIRATION OFFENSIVE	Lympha.
PHARYNGITIS	Pharyna, Cataro.
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PIGMENTATION	Pigment.
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POLYPI	Carno 1, Carno 2.
POST OPERATIVE SHOCK	Procordal Plus, Stressless, Nervuton 1.
PREGNANCY NAUSEA	Magen.
PROLAPSED BLADDER	Enur.
PROSTATE ENLARGED	Prostata, Carno 1, Carno 2.
PROSTATITIS	Prostata, Urina.
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PRURITUS SKIN	Herpin 1, Nerva 1. External: Acne Plus.
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PYELITIS	Urina, Nephro, Lympha.
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RHEUMATIC FEVER	Koro, Solaurit.
RHEUMATISM	Ruma 1, Gichtin, Ruma 2, Ruma 3, Pein. External: Ruma Plus.
SCIATICA	Ruma 1, Gichtin, Ruma 2, Ruma 3, Pein. External: Ruma Plus.
SENILITY TONIC	Seniovita.
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SEXUAL DEBILITY FEMALE	Nervorta, Landi F, Feminon.
SEXUAL DEBILITY MALE	Nervorta, Landi M, Prostata.
SHOCK	Rescue, Nerva 3.
SINUSITIS	Nasosinus, Sinfrontal, Cataro. External: Nasenöl.
SKIN: ALLERGIES	Herpin 1. See specific Allergins under DESENSITISATION
ANTISEPTIC & HEALING	External: All Heal Plus.
DISCOLORATION	Pigment.
DRY, SCALY or INDURATED	Herpin 2. External: Acne Plus.
THICKENING	Thuja Tablets. External: Thuja Lotion Plus.
IRRITATIONS & ITCHY ERUPTIONS	Herpin 1. External: All Heal Plus.
SLEEPLESSNESS	Nervuton 2, Sedasleep, Nerva 3, Rescue.
SMELL LOSS	Cataro, Nasosinus.
SNEEZING	Hay F, Sinfrontal, Cataro.
SNUFFLES	Cataro, Hay F.

SOMNAMBULANCE	Nerva 1.
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SORES	External: All Heal Plus, Comfrey Plus.
SORE THROAT	Pharyna, Tonsilla, Organo 1.
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SPASMS NERVOUS	Sedaped, Nerva 2, Rescue.
SPLEEN DISORDERS	Febro 1, Gallen.
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STERILITY	Feminon.
STOMATITIS	Odon, Pharyna, Buso.
STRESS	Sedasleep, Nervuton 2, Nervuton 1, Rescue, Scutellaria.
STUTTERING	Cerbo.
SUN SENSITIVITY	External: Thuja Lotion Plus.
SUNSTROKE	Cerbo.
STYES	Buso.
TACHYCARDIA	Solaurit.
TASTE: ALTERATION or LOSS	Odon.
TEARFULNESS	Nerva 3.
TEETHING	Odon, Sedaped, Cesranol, Kalmag.
THROAT IRRITATION	Tonsilla, Cataro.
THRUSH	Buso.
THYROID DISORDERS	Struma 1.
TINNITUS	Tinnitus, Pro-Sclerin, Otitis.
TOBACCO HABIT	Anti Tobacco, Smokeless Plus. Cigarette Ailergin.
TONSILLITIS	Tonsilla, Pharyna, Buso, Organo 1.
TOOTHACHE	Odon, Pein.
TRAVEL SICKNESS	Magen, Acidoflora.
TWITCHING	Cerbo, Nerva 2, Sedaped, Pro-Dorsin.
ULCERS: GASTRIC & DUODENAL	Magen.
URTICARIA	Herpin 1, Gichtin. External: All Heal Plus.
UTERINE TONIC	Utero.
VARICOSE ULCERS	Hemorrhho 1, Organo 1, Procordal Plus. External: Varicose Plus.
VARICOSE VEINS	Hemorrhho 1, Sango, Procordal Plus. External: Varicose Plus.
VENOUS CONGESTION & STASIS	Hemorrhho 1, Sango, Procordal Plus. External: Varicose Plus.
VERRUCAS	Thuja Tablets. External: Thuja Lotion Plus.
VERTIGO	Tinnitus, Seniovita, Pro Sclerin.
VITILIGO	Pigment.
VOICE LOSS	See APHONIA.

VOMITING

WARTS

WATER RETENTION

WEAKNESS IN AGED

WHOOPIING COUGH

WOUNDS

Magen, Febro 1, Sedaped.

Thuja Tablets. External: Thuja Lotion Plus.

Diureta, Corp, Natura Slim.

Seniovita.

Kofbron 2, Croupbron, Tussisana.

External: Calendula Plus.

BIOHARMONY cc WHOLESALE PRICELIST
All prices excluding VAT

18.4.95

CAPSULES

TAHEEBO (PAU D'ARCO)	Large container	220	R	58.00
	Bulk per	1000	R	220.00

HERBS

Chamomile, Lemon Balm,	80g per pack	R	6.00
Peppermint, Urtica	80g per pack	R	6.00
Ginkgo	80g per pack	R	8.00

HERBAL TEA MIXTURES (100g)

No 20	Fairyland		
No 21	Heart and Circulation		
No 22	Digestive / Laxative		
No 23	Bladder / Kidney		
No 24	Diuretic		
No 25	Rheumatism, Arthritis, Gout		
No 26	Cough / Bronchitis		
No 27	Woman's Tea		
No 28	Liver / Gall Bladder		
No 29	Good Night Tea	R	10.00

YOGI TEA	100g	R	10.00
Pumpkin Seed	1000g	R	68.00
	200g	R	15.00

DR LOTZE'S RANGE

Dr Lotze's	99-HERB-OIL	20ml	R	15.00
Dr Lotze's	STEROSIN	10ml	R	14.00
Dr Lotze's	ARNICA Cream	25g	R	8.00
Dr Lotze's	ECZEMA Cream	50g	R	12.00
Dr Lotze's	VENUS Cream	50g	R	25.00

TEA TREE Oil (100% pure)	20ml	R	15.00
(Australian first grade)	10ml	R	9.00
	100ml	R	72.00
	1000ml	R	635.00

Eucalyptus Oil (100% pure)	20ml	R	8.00
(Australian first grade)	10ml	R	5.00
	100ml	R	32.00
	1000ml	R	280.00

GUARMEEL	120g Tub	R	24.00
	300g Cellohaq	R	48.00

SIGNARMONY cc WHOLESALE PRICELIST
All prices excluding VAT

18.4.95

HERBAL TABLETS

AMARA	Small container	120 tbl	R 20.00
	Large container	300 tbl	R 40.00
	Bulk per	1000 tbl	R 110.00
CASCARA	Small container	120 tbl	R 20.00
	Bulk per	1000 tbl	R 110.00
DAMIANA	Small container	60 tbl	R 30.00
	Large container	140 tbl	R 60.00
	Bulk per	1000 tbl	R 360.00
FEMINA	Large container	300 tbl	R 40.00
	Bulk per	1000 tbl	R 110.00
GUARAN	Small container	70 tbl	R 24.00
	Bulk per	1000 tbl	R 290.00
GINKGO	Large container	160 tbl	R 45.00
	Bulk per	1000 tbl	R 240.00
GINSENG + SPIRULINA	Large container	160 tbl	R 58.00
	Bulk per	1000 tbl	R 308.00
HARPAGA	Small container	120 tbl	R 20.00
	Large container	300 tbl	R 40.00
	Bulk per	1000 tbl	R 110.00
IMMUNA	Small container	120 tbl	R 23.00
	Large container	300 tbl	R 48.00
	Bulk per	1000 tbl	R 136.00
KAVA-KAVA	Small container	120 tbl	R 22.00
	Large container	300 tbl	R 45.00
	Bulk per	1000 tbl	R 127.00
PARILLA	Small container	120 tbl	R 20.00
	Large container	300 tbl	R 40.00
	Bulk per	1000 tbl	R 110.00
PASSIFLORA	Small container	120 tbl	R 22.00
	Large container	300 tbl	R 44.00
PUMA	Small container	120 tbl	R 28.00
SILICA	Large container	160 tbl	R 40.00



AROMATHERAPY OILS OF SOUTH AFRICA

Omagh Investments (Pty) Ltd

Reg No 91/0466/07

Suite 204 • Second Floor • Benmore Gardens Shopping Centre • Benmore • Sandton
P.O. Box 651874 • Benmore • 2010 • Tel: (011) 784-0032/3 • Fax: (011) 784-0122

NAME: _____ A/C _____

ADDRESS: _____

Tel No: _____

ESSENTIAL OILS	Amount	11ml	Amount	22ml	Total	ESSENTIAL OILS	Amount	11ml	Amount	22ml	Total
ANISEED		R 17.05		R 25.30		MARIGOLD		R 66.35		R 123.90	
BASIL		R 34.19		R 63.38		MARJORAM		R 24.31		R 39.82	
BAY		R 22.68		R 41.11		MARJORAM SPANISH		R 65.20		R 124.83	
BENZOIN		R 16.21		R 26.92		MELISSA		R 17.57		R 30.96	
BERGAMOT		R 24.59		R 41.41		MUGWORT		R 30.69		R 56.91	
BIRCH		R 19.72		R 34.91		MYRISTICA		R 21.07		R 37.46	
BLACK PEPPER		R 45.16		R 85.45		MYRRH		R 53.53		R 101.38	
CAJEPUT		R 11.33		R 13.86		MYRTLE		R 19.15		R 34.11	
CAMOMILE		R 54.46		R 98.54		NEROLI		R 20.36		R 36.57	
CAMOMILE (GERMAN)		R 81.50		R 110.70		NIAOULI		R 12.54		R 16.54	
CAMOMILE (ROMAN)		R 194.46		R 339.15		NUTMEG		R 16.76		R 28.08	
CAMPHOR		R 11.48		R 17.40		ORANGE (BITTER)		R 16.46		R 24.64	
CARAWAY		R 22.46		R 38.70		ORANGE (SWEET)		R 9.97		R 11.11	
CARDOMON		R 68.06		R 130.50		ORIGANUM		R 16.96		R 25.12	
CEDARWOOD		R 14.26		R 20.21		PALMAROSA		R 30.70		R 56.91	
CELERY		R 50.87		R 91.65		PATCHOULI		R 16.56		R 29.06	
CINNAMON		R 22.92		R 37.07		PARSLEY		R 79.04		R 148.74	
CITRONELLA		R 12.14		R 15.51		PENNYROYAL		R 26.74		R 49.13	
CLARY SAGE		R 50.40		R 95.68		PEPPERMINT		R 17.10		R 24.23	
CLOVE		R 11.15		R 13.53		PETTITGRAIN		R 16.98		R 25.19	
CORIANDER		R 29.68		R 50.56		PINE		R 19.25		R 29.70	
CUMIN		R 63.53		R 120.68		PINE NEEDLE		R 11.89		R 16.16	
CYPRESS		R 25.78		R 45.10		ROSE BULGARIAN		R 46.27		R 87.61	
DILL		R 26.18		R 43.56		ROSE BLEND		R 22.22		R 40.21	
ELEMI		R 19.17		R 34.16		ROSEMARY		R 15.85		R 20.98	
EUCALYPTUS		R 14.24		R 18.71		ROSEWOOD		R 20.13		R 31.46	
FENNEL		R 17.07		R 29.43		SAGE		R 22.30		R 35.85	
FRANKINCENSE		R 59.58		R 106.70		SANDALWOOD (MYS)		R 87.16		R 168.16	
GARLIC		R 68.38		R 127.26		SANDALWOOD (WI)		R 22.55		R 38.77	
GERANIUM		R 44.04		R 79.31		SASSAFRAS		R 12.30		R 15.55	
GALBANUM		R 128.08		R 234.37		SAVORY		R 17.71		R 27.74	
GINGER		R 65.26		R 124.94		SPEARMINT		R 17.51		R 28.17	
GRAPEFRUIT		R 18.90		R 23.31		SPIKE LAVENDER		R 17.71		R 31.10	
HYSSOP		R 155.56		R 302.90		TANGERINE		R 13.01		R 17.49	
JASMIN ABSOLUTE		Request		Request		TARRAGON		R 59.80		R 114.26	
JASMIN BLEND		R 17.12		R 30.06		TEA TREE		R 34.13		R 63.72	
JUNIPER		R 28.36		R 52.21		TEREBINTH		R 10.57		R 12.40	
LAVANDIN		R 8.04		R 12.17		THYME		R 17.86		R 27.82	
LAVENDER		R 19.83		R 33.66		THYME RED		R 23.17		R 42.10	
LEMON		R 13.35		R 22.70		VALERIAN		R 65.81		R 106.85	
LEMON GRASS		R 15.27		R 23.41		VETIVER		R 27.93		R 51.49	
LEMON VERBENA		R 20.81		R 37.39		WINTER GREEN		R 13.55		R 16.87	
LIME		R 17.51		R 30.28		YARROW					
LITSEA CUBEBA		R 14.12		R 19.47		YLANG YLANG		R 27.70		R 51.18	
MANDARINE		R 27.34		R 50.20							

VEGETABLE OILS	Amount	22ml	Amount	50ml	Amount	100ml	TOTAL
Almond		R 10.12		R 13.79		R 16.68	
Aloe Vera		R 11.78		R 17.18		R 25.46	
Apricot Kernel				R 16.86		R 24.01	
Amica				R 13.95		R 23.98	
Avocado (Nat)		R 11.62		R 16.80		R 24.70	
Borage		R 26.33		R 50.49		R 96.65	
Calendula				R 12.27		R 22.99	
Carrot		R 23.23		R 51.97		R 99.11	
Evening Primrose		R 23.31		R 52.16		R 99.50	
Grapeseed		R 9.95		R 13.54		R 18.18	
Hazelnut		R 17.18		R 28.84		R 51.89	
Jojoba		R 12.62		R 25.83		R 32.98	
Peanut		R 10.67		R 12.54		R 16.28	
Peach Kernel				R 16.86		R 24.01	
Sesame		R 10.41		R 14.42		R 19.94	
Wheatgerm		R 11.96		R 17.56		R 26.21	

All carrier oils are available in 500ml and 1 litre containers

		QTY	PRICE	TOTAL
1Kg Clear Neutral Gel	An Aqueous base gel		R 43.15	
Burner (Assorted)	Hand painted pottery burners		From R34.95	
Pot-Pouri Packs	A wide variety in plastic containers or cellophane bags		On Request	
Candles	Per Pack Of 10 In Foil Containers		R 12.75	
Wooden Storage Stands	Storage space for 6 to 72 bottles in sturdy varnished wood		From R 15.00	
Tea Pot Stands	Variety of exquisite fabrics, fragranced with lemon grass essential oil.		R 18.25	
Burner rings	Terracotta, assorted colours, and hand painted		From R 5.20	
Aromatherapy Soap	With pure essential oils Camomile, Lavender, Neroli, Peppermint, Rose, Sandalwood, Tea tree & Ylang Ylang		From R 5.40	
Moisturising Cream	Deep penetrating cream - Light in texture - Ideal for hands & body		R 35.25	
Thigh Gone 125 ml	An effective treatment for unsightly prominent thighs & legs		R 40.95	
Starter Packs	6 Essential oils with 100ml carrier oil in a PVC container pack.		R 187.40	
Bottles	Assorted bottles 5ml - 500ml in amber glass		On Request	
Feet	A pair of Reflexology feet, artfully detailed with organ placement		R 195.00	
Charts:				
Reflexology	Is a detailed chart indicating the specified zones to the body's reflexes	Small Large	R 50.00 R 53.50	
Meridian	Indicates the body's meridian points	Small Large	R 42.50 R 53.50	
Energy Flows	Indicates the body's energy flows		R 42.50	
Aromatherapy	This indicator chart informs the user of the Essential Oils in a simple method: ie: bath, inhalation, gargle, compresses etc.		R 79.80	
Psycho Aromatherapy	Is an informative chart explaining how the oils effect the brain and our emotions		per set	
Aromatic Herbs	Beautiful colour illustrated chart on Aromatic Herbs		R 53.50	
Medicinal Plants	With the latin names of each plant in full colour		R 53.50	
Flower Garden	A colourful chart on flowers		R 53.50	
The Human Body	Illustrating the muscular structure of the body, the skeletal system and diagram of the skin		R 53.50	
Life Forces And Energy Centres	Full colour illustrates the life and energy centres		R 53.50	
Aromatherapy candles	Floating - pottery - and champagne glass.		On Request	
Beautiful hand made Aromatherapy sand candles (Very different)	Neroli, Rose, Jasmine, Citronella, Ylang Ylang & Sandalwood	Small Medium Large	R 22.50 R 44.50 R 77.50	
Aromatherapy bath crystals in presentation bottles	Impregnated with Neroli - Lavender - Rose Bulgarian - Lemon - Peppermint & Ylang Ylang		From R 14.95	
Measuring beakers	Sized glass or plastic measuring beakers & Jars		On Request	
Decoders	An easy guide to Aromatherapy, Reflexology and various other Health Alternatives		R 26.99	
Multi coloured fragranced candles	For all occasions.		On Request	

VEGETABLE OILS	Amount	22ml	Amount	50ml	Amount	100ml	TOTAL
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Decoders	An easy guide to Aromatherapy, Reflexology and various other Health Alternatives		R 26.99	
Multi coloured fragranced candles	For all occasions		On Request	

SHS: 10,000

SALONPAS

**BULLS GENERAL
AGENCIES LTD**

**P.O. BOX 1989
TEL: 233740
CABLE BULLS - KAMPALA**

BULL'S GENERAL AGENCIES LTD. (SALONPAS)DISEASES OF THE DIGESTIVE TRACTTREATMENTENDWADDE EZIKWATA MU KKUBO
LYEMMEREOBUIJIANJABI

TOOTH ABSCESS
AMANNYO AGALUMA, AGANYEENYA,
AGALI, IU EBITULI, AGAKABOOLE ETC.

Tooth Powder, Tooth Solution,
H010, 019

CANKER SORES
ECZEMA, OBUBWA BWOMU KAMWA,
OBUBWA BWOKU LULIMI ETC.

H010, Potassium Permanganent, Mponye
Cream, Clear Water, Blood Tonic,
H057 H019, H050, SK Mix, Victor.

COATED TONGUE/GLOSSITIS
OKUGEGERA OLULIMI NGATE LUWUNYISA
AKAMWA NGA KULIKO AMABWA

H019, Mponye Cream, Clear Water,
Blood Tonic, SK Mix, Victor,
H050, H057, H021

GINGIVITIS
EKIBUNO NGA KIRIKO AMABWA

Mponye Cream, Potassium Permang,
G. Borax, Clear Water, Blood Tonic, SK,
Victor. H050. H019. H030.

MUMPS
AMAMBULUGGA

Blood Tonic, Clear Water, SK
Mix, Victor, Liniment, Fungyou,
(ESS Balm), 001, H010, H054, 004.

STOMATITIS
OKUYIKA AKAMWA

H019, Mponye Cream, Clear Water,
Blood Tonic, Victor, H001.

THRUSH
EKKONGE ERYERU ERIKWATA KU LULIMI
NE MU KAMWA

H019, 039, 032, Mponye Cream,
Clear water, Blood Tonic, SK Mix, Victor

HEART BURN
EKIKEETO

H001, H018, H038, Clear Water,
Blood Tonic, Strong Ulcer, SK Mix.

DYSPEPSIA
EMPIIM, OKUTOKOTA, OKUGULUMBAGULUMBA
MU LUBUTO

001, H010, H012, Cexite 024.
Clear Water, Blood Tonic, Strong
Ulcer Mix, Victor.

PEPTIC ULCER
AMABWA GOMU LUBUTO

006, H018, H019, H038, Clear Water,
Strong Ulcer Mix, Blood Tonic, Victor Mix

COLITIS
ENNYNABO

H019, H010, H01, H021, H020, Clear Water,
Blood Tonic, SK, Victor.

CONSTIPATION
OBUTAFULUMA

Clear Water, Blood Tonic, SK, Fever
Mix, H012, H024, Cexite.

DIARRHOEA
OKUDDUKANA

H054, 008, H019, 001, H010, Nabbe
Mix, Blood Tonic, Victor, SK Mix.

FLATULENCE
OKWEPIKA OMUKA MU LUBUTO

Clear Water, Strong Ulcer Mix, Nabbe
Mix, H012, H024, Cexite.

HEMORRHOIDS (PILES)
EMMEEME EYEMABEGA (NAMABWA AGASANGIBWA
EMABEGA)

H019, H032, Mponye Cream, Clear Water,
SK Mix, Blood Tonic, Victor Mix, H050, H021

HERNIA (RUPTURE)
HANIYA

002, H019, H010, H01, Clear Water,
Victor Mix, SK Mix, Blood Tonic.

DISEASES OF THE SKIN (ENDWADDE)

TREATMENT - (ENZIJANJABA)

ACNE
ACNE VULGARIS
EMBALABE, NE 9ISUKKO

H019, H032, Zinc Coalter, Blood
Tonic, Clear Water.

BOILS
(CARBUNCLES - FURUNCLES)
AMAYUTE

H019, Mponye Cream, SK Mix, Blood Tonic,
Clear Water, Victor, Ho50, H021, H057

CHANCRE (HARD CHANCRE) HUNTERI
ANSORE)
EBINYAANYA

H019, 032, Mponye Cream, Tetra, SK
Mix, Victor, Clear Water, H021, H057

FELON (WHILOW)
ENTUNUKA

H019, 032, Fungyou-Liniment, Mponye,
Clear Water, Blood Tonic, Victor, H021,
H020, H050.

IMPETIGO
EKWO

H019, H027, 032, Mponye Cream, Zinc
Tetra, SK Mix, Victor, Clear Water,
Blood Tonic, H011, H013, H050.

ATHLETE'S FOOT (DERMATOPHYTOSIS,
TINEAPEDIS) EBIGERE EBIVUNDA,
EBISALIKA, EBIWUNYA

H019, 032, Zinc Coalter, Mest Cream,
Clear Water, Blood Tonic, SK Mix,
Victor, H050, 021, H057.

RING WORM OF THE BODY (TENEA-CORPODIS)
(CIRCINATA) OLUWUMU

H019; 032, Clear Water, Blood Tonic,
Victor, SK Mix, Mest Cream, Zinc Coalter.

RING WORM OF THE GROIN (CROCKH ITCH,
JOCK ITCH)
OLUWUMU LWOMU MBALAKASO OBA OLUKUKU
LWOMU MBALAKASO

H019, 032, Mest Cream, Coalter, Clear
Water, Blood Tonic, SK Mix, Victor,
H050, H021, H020.

RINGWORM OF THE NAILS
EBIGALOGALO

H019, 032, Mest Cream, Coalter, Spot
Remover, SK Mix, Clear Water, Blood
Tonic, H020, H021.

TROPICAL ECZEMA (TROPICAL DERMATITIS)
EBIYOBYO NGA BISIIWA NEBYO EBITASIIWA

H019, 032, Eczema Cream, Mest Cream,
Clear Water, Blood Tonic, SK Mix
Victor Mix.

SEBORRHETIC DERMATITIS (DANDRUFF)
SITUKA, OLUKUKU, AMABWA G'OMU MUTWE NGA
MUMU OLUKUKU, OBUWUUKU

H019, 032, Mest Cream, Coalter, H050,
H057, H021, H010

ALOPECIA
KYEMWA
Omusujja Kabootongo
Ebiwuka mu lubuto
Situka

H019, 032, Mest Cream, Coalter, SK Mix
Clear Water, Blood Tonic, Fever.

CORN (CLAVUS)
ENNUNGU

H019, 032, Fungyou, Liniment, Med
Plaster, Mponye, SK Mix, Victor,
Clear Water, Blood Tonic.

PRURITUS ANI (ITCHING IN THE
ANAL REGION)
OKUSIYIWA EMABEGA WANSI EYITA (BBI)

H019, Mponye Cream, Clear Water,
Blood Tonic, SK Mix, H010, 001,
H021.

MIXTURES

BKN Cough Mix	Coughing, Fever, Vomiting, Messels, Hiccup. Okukolola, Omusujja, Okusesema, Olukensense, Kasikonda.
BLOOD TONIC	Loss of Appetite, Dizziness, Numbeness, Anaemia. Obutalya, Kontoloze, Obutaba namanyi, Nakanyama.
CLEAR WATER	Constipation, Fever, Worms, Obutifuluma bulungi, Omusujja.
VICTOR	Antibiotics Embuto eziruma, Okulumwa mundira, Okubundula.
NABBE	Diarrhoea, Vomiting, Fever. Okuddukana, Okusesema, Omusujja.
STRONG ULCER	Ulcers. Amabwa gomu lubuto.
PROCOMIL	Sexual Weakness
SK	Antibiotic Gnorhoea, Syphilis. Enziku, Ka'xootongo
PRESSURE	Pressure - Hypertansion. Entunnunsi ezowagulu.
DIABETE	Diabetis, Sukaali.
FLUOTHANE	Cough, Flue, Allergy, lack of sleep, Okukolola, Sennyiga, Ebirogologo, Obuteebaka.
ASTHMA	Cough, Asthma, Allergy, Okukolola, Okuziyira, Ebirogologo
BEE HONEY	Malnutrition, Loss of appetite. Obwosi, N'obutayagala kulya.
NAMIGE	Cancer, (AIDS) Chronic Illness Kookolo, Liyamba ku mukenenya, ne ndwadde Ezolukonvuba.
CALAMINE	Itching Skin, Rash, Herpes Zoster, Okwetakula, Kisiipi.
MESTACAR CREAM	Fungal Skin Diseases, Endwadde ezolukuku nolupepe.
MEST-SPIRIT	Cleans Septic Wounds Okunaaza Amabwa aga leenya.

PETROLEUM JELLY	Skin diseases Endwadde ez'ensusu.
ZINC TETRA	Syphillis Rash, Septic Rash Amabwa ga kabootongo. Amabwa agalenya, Nensusu ze Nkuku.
ECZEMA	Weeping Skin Rash Ebisente, Ebikwera no'lukuku
MPONYE	Septic Skin Diseases, Burns, Omuliro, Amabwa, Embale.
LINIMENT	Joint Pain, Dislocations Okulumwa, mu nnyingo, Obuvune, Omugongo.
TOOTH SOLUTION	Toothache, Decay, Amannyo agaluma, n'agavunda.
SPORT REMOVER	Fungal Diseases (Waits) Ensundo, Enkovu ezizimba, Ebigalo ebivaamu enjala.
TOOTH POWDER	Dental problem, Tooth Decay Okulumwa amannyo, Agasannyalala, Aganyenyeera, agalimu ebituli, nago agavunda.
FEVER MIX	All types of Fever. Omusujja ogw'ensiri, Omusujja ogw'enkaka Omusujja ogw'omulubito.
FLOWER CREAM	Broken Skin, Pimples, Dry Skin and for general Beauty. Enkanyanya, Namakula, Embalabe, Okusiwuuka, okufuna Olususu olulungi.
IODINE	Scar's, Scalds, Backache, Wounds, Cuts Enkovu okuzimba, Omuliro, Omugongo oguluma, Amabwa, Embale.
M/EMULSON	Skin fungal Diseases. Olususu, Ebiguuna, Ebikwera, Obuwere, Ebisente.
POTASSIUM P.	Cleaving Wounds, Okwoza amabwa, Okuta obuwuka obwokumabwa.
BLACK STONE	Anti Venom Omusota, Sigga, Embwa, Nabuli kyonna ekiruma ng'akirina obusagwa
COALICS	Odema Skin Diseases Okuzimba, n'endwadde z'ensusu.

NAME OF DRUG	INDICATION	USE
001	Ebigalanga, Enkaka, Ensanuusi; Ekibejjagalo, Kamunguluze	Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere bwe liwola nnywa x 1. Olunaku.
002	Enjoka, Omusujja, Hernia.	Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku
003	Ettalo, Obusukko, Kisipi	Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku
004	Obutalya, Okusannyalala, Mammunguluze	Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere . Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku
005	Ekiyongobero, Okusannyalala, Okuzzamu omusaayi	Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku
006	Olubuto, Enjoka Amabwa mu lubuto (Ulcers)	Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere . Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku
007	Ensenke ku Liiso	Eddagala lino 10gms lisse mu mazzi agenkana 250mls. Fumba lyesere lisengejje bulungi n'olugoye oluyonjo. tonnyeza ku maaso amatondo 3 x 3 olunaku.
008	Omugongo, Ekifuba Ekyomunda, Okulumwa mu nnyigo	Saanusa Ebizigo 100gms. Tabulamu Eddagala lino 100gms. Siiga awalwadde x 4 olunaku.

Ensimbu	<p>Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku</p>
Amannyo agebiwuka, Enfaana Enkaka	<p>Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 6-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku</p>
Ekikufukuto eky'amazzi agookya, Enjoka, Okusesema	<p>Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku</p>
Okulumwa Omutwe Obutafulumu (Enjoka)	<p>Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku</p>
Ebizimba mu lubuto Okuddingana mu Nsonga	<p>Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku</p>
Polio, Okusannyalala Ekiyongobero, Omugongo, Endira	<p>Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 20mls x 2 olunaku Omuwere 5mls x 2 olunaku</p>
Eddalu	<p>(i) Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-5ms 5mls x 2 olunaku (i) Teeka mu Bizigo osaabe wenna.</p>

- 017 Amaanyi g'Ekisajja
Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba iyeseere. Bwe liwola nnywa.
Dose: 100mls x 2 olunaku.
- 018 Ulcer - Obutalya
Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba iyeseere. Bwe liwola nnywa.
Omukulu 100mls x 2 olunaku
Omuto 5-13yrs 20mls x 2 olunaku
Omuwera 1-4ms 5mls x 2 olunaku
- 019 Obulwadde Bw'olusu
Sanuusa Ebizigo 100gms tabulamu
Eddagala lino 10gms siiga awalwadde x 2 olunaku.
- 020 Abojjedwa Omusota,
Omusajja ateesobola
Eddagala lino 10gms lisse mu mazzi ageezeze otabuule - Bwe liwola nnywa.
Omukulu 100mls x 2 olunaku
Omuto 5-13yrs 20mls x 2 olunaku
Omuwera 1-4ms 5mls x 2 olunaku
- Ettalo, Obusuko
Teeka mu Bizigo nga obisanuusizza 100gms.
Teekamu 10gms. Siiga awakuluma.
- 021 Enziku
Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba iyeseere. Bwe liwola nnywa.
Omukulu 100mls x 2 olunaku
Omuto 5-13yrs 20mls x 2 olunaku
Omuwera 1-4ms 5mls x 2 olunaku
- 022 Ekifuba ekirumira munda
Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba iyeseere. Bwe liwola nnywa.
Omukulu 100mls x 2 olunaku
Omuto 5-13yrs 20mls x 2 olunaku
Omuwera 1-4ms 5mls x 2 olunaku
- 023 Omusujja
Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba iyeseere. Bwe liwola nnywa.
Omukulu 100mls x 2 olunaku
Omuto 5-13yrs 20mls x 2 olunaku
Omuwera 1-4ms 5mls x 2 olunaku
- 024 Enjoka, Olubuto okwesiba
Eddagala lino senako Ekijiiko 5gms (Teaspoonful) lisse mu mazzi 250mls Fumba iyeseere. Bwe liwola nnywa.
100mls omulundi gumu - omala kulya (Toliwa wa lubuto)

- 025 Amaanyi g'ekisajja Eddagala lino lisse 250mls .Fumba lyesere. Tabulamu Hhaawa eyenkana 5mls (Teaspoon) Ngalikyabuguma nnywa 100mls x 2 olunaku. Owa Pressure atabula mu majaane.
- 026 Atalya Nnyama, Birogologo Yokya Enyama ekale nnyo nga omaze okusigako Powder w'eddagala lino. Tandika okulyako katono. Endala gifumbe owuute ku Suupu katono.
- 027 Abalongo gw'ebayookya Teeka mu Muzigo Omuganda oosaabe. (Eczema) oba saanusa omuzigo omuganda oteekemu 10gms ez'eddagala lino oosaabe.
- 028 Alumwa Omugongo Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku
- 029 Ekifuba nga kikuzitowa
Ebibegabega nga bikuluma
Ensingo nga ekuzitowa Eddagala lino 10gms lisse mu mazzi agenkana 250mls. Fumba lyesere bwe liwola nnywa.
- 030 Okuzimbazimba, Ekiyongobero Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku
- 032 Amabwa (Ebisale) Ebiwundu
Okwetakulatakula Saanusa Ebizigo 10gms. Tabulamu Eddagala lino 100gms siiga awalwadde.
- 033 Akabengo, Olubuto okwesiba
Ekiyongobero Eddagala lino 10gms lisse mu mazzi agenkana 250mls. Fumba lyesere. Lisengejje n'olugoye oluyonjo gattamu omubisi gw'enjoki 60mls tabula onywe. Omukulu 2 x 3 Tablespoon Omuto 6-13yrs 1 x 2 olunaku Omuwere 2-5ms 5mls 1 x 3 olunaku
- 034 Olumbe olutambula mu mubiri Tabula 10gms mu Bizigo bya 20gms osiimule nnyo buli awakuluma emirundi 2 olunaku.
- 035 Ow'olubuto okuzaala obulungi Tabula 50gms mu 150gms ez' Entungo esekuddwa olyengako ebijiiko 2 x 2 olunaku

- 036 Amabwa mu Bulago, Okulumizibwa mu Kifuba. Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. 100mls bwomala owummule edaakikka 15.
- 037 Amabwa g'omukamwa ne mu Bulago. Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Tabula mu muzigo g'wente 50gms nnywa. Omukulu 100mls x 3 olunaku Omuto 6-13yrs 20mls x 3 olunaku Omuwere 1-5ms 5mls x 3 olunaku
- 038 Ulcers/Oluwewowewo Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Bwe liwola nnywa. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-5ms 5mls x 2 olunaku
- ii) Oluwewowewo
Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere. Nga libuguma wéesiimule omubiri gwonna. Omukulu 100mls x 2 olunaku Omuto 5-13yrs 20mls x 2 olunaku Omuwere 1-4ms 5mls x 2 olunaku
- 039 Omukazi ateeyagala mu bulamu Eddagala lino 10gms lisse mu mazzi agenkana 500mls. Fumba lyesere onaabeyo x 2 olunaku.
- 041 Okulumizibwa mu nnyingo Okwetakula, Ebikaata, Fungus Saanuusa Ebizigo ebya bulijjo 50gms tabulamu Eddagala 10gms. Bwe liwola wesiige awalwadde x 3 olunaku.
- 042 Omutwe, Lubuto, Busuko, Kukolola Eddagala lino 10gms. Lisse mu mazzi agenkana 250mls. Fumba lyesere nnyo Tabulamu akajjiiko ka Sukaali 10gms. Bwe liwola nnywa.
- Enkozesa
Omukulu 2 x 3 ebijiiko ebinene (TableSp)
Omwana 6-13yrs 1 x 3 ebinene (TableSp)
Omuwere 1-5yrs 1 x 3 obugiiko obutono (Teaspoon)
- 043 Omukazi ateyagala mu bulamu bwe Eddagala lino 10gms lisse mu mazzi agenkana 250mls. Fumba lyesere. Tabula akajjiiko ka Sukaali 10gms. Bwe liwola nnywa
- Enkozesa
Omukyala 100mls x 2 olunaku
Omwami 100mls x 2 olunaku

- 044 Omutima ogw'ewuuba, Asthma
Ekyalaalo okufwa mu nsonga, T.B.
Eddagala lino 10gms. Lisse mu mazzi
agenkana 500mls. Fumba lyesere nnyo
Enkozesa: Nnywa
Omukulu 4 x 3 Tablespoon
Omuto 6-13yrs 2 x 3 Tablespoon
Omuwera 1-5ms 1 x 3 Tablespoon
- 045 Amaaso ag'obutwa
Eddagala lino 10gms lisse mu mazzi
agenkana 250mls. Fumba lyesere. Lisengejje
n'olugoye oluyonjo. "Filtration".
Enkozesa
Tonyeza ku maaso amatondo 2 x 3 olunaku.
- 046 Kamunguluze, Mayute
Ebizimba, Omusujja
Eddagala lino 10gms lisse mu mazzi
amabisi agenkana 500mls. Wayitewo
essaawa mukaaga.
Enkozesa:
Onaabe. Siiga awalwadde x 3 olunaku.
- 047 Olubuto Oluluma, Omugongo
oguluma nga guva ku Nsingo
Eddagala lino 10gms. Lisse mu mazzi
agenkana 500mls. Fumba lyesere nnyo. Bwe
liwola nnywa.
Omukulu 20mls x 4 olunaku
Omuto 6-13yrs 10mls x 3 olunaku
Omuwera 1-5ms 5mls x 3 olunaku
- 048 Olukusense, Amawuggwe
Ow'olukusense
Eddagala lino 10gms lisse mu mazzi
agenkana 500mls - Omuzigo omuganda
100gms. Fumba lyesere nnyo. Bwe liwola
nywa.
Omukulu 20mls x 4 olunaku
Omuto 6-13yrs 10mls x 3 olunaku
Omuwera 1-5ms 5mls x 3 olunaku
- 049 Okukolola okwamaanyi
Eddagala lino 10gms lisse mu mazzi
agenkana 500mls. Fumba lyesere nnyo.
Bwe liwola litabule n'omubisi gw'enjuki
ogwenkana 100mls.
Omukulu 100mls x 2 olunaku
Omuto 6-13yrs 50mls x 2 olunaku
Omuwera 1-5ms 10mls x 2 olunaku
- 050 Amaanyi g'Ekisajja
Eddagala lino 10gms lisse mu mazzi
agenkana 500mls. Fumba lyesere nnyo.
Atalina Pressure enkozesa:
Ddira eddagala eryeseze olitabule ne kaawa
5mls (Teaspoon)
Alina Pressure enkozesa:
Ddira eddagala eryeseze olitabule n'amajaani
matono 5mls (Teaspoon)

- 051 Okuzzaamu Omusaayi
Okusannyalala, Eddagala lino 10gms lisse mu mazzi
agenkana 500mls. Fumba lyesere. Bwe
liwola nnywa.
Omukulu 100mls x 2 olunaku
Omuto 6-13yrs 50mls x 2 olunaku
Omuwera 1-5yrs 10mls x 2 olunaku
- 052 Nga olina olumbe olukutambula
mubiri Eddagala lino 10gms lisse mu mazzi
agenkana 500mls. Fumba lyesere. Bwe
liwola nnywa.
Omukulu 100mls x 2 olunaku
Omuto 6-13yrs 20mls x 2 olunaku
Omuwera 1-5yrs 10mls x 2 olunaku
- 053 Ettalo, Obusukk. Eddagala lino 10gms tabula amafuta
10mls (Teaspoon)
Siiga ekitundu kyonna eky'omubiri
ekirumizibwa.
- 055 Okusannyalala, Bitambuz
Okumeketa mu mubiri Eddagala lino 10gms lisse mu mazzi
agenkana 500mls. Fumba lyesere.
Omukulu 100mls x 2 olunaku
Omuto 6-13yrs 50mls x 2 olunaku
Omuwera 1-5yrs 10mls x 2 olunaku
- 056 Amaanyi g'ekisajja Eddagala lino 10gms lisse mu mazzi
agenkana 500mls. Fumba lyesere. Tabulamu
amajaani 5gms (Teaspoon)
Enkozesa:
Omukulu 100mls x 2 olunaku
Omuto 50mls x 2 olunaku
- 057 Okulumwa Olubuto nga
Omukyala ali mu Nsonga
Ebigalanga oba Okulemera mu
nsonga. Eddagala lino 10gms. Lisse mu mazzi
ofumbe lyesere. Oba liteeke mu mata
otabule onnywe.
Enkozesa:
Omukulu 100mls x 2 olunaku
Omuto 6-13yrs 50mls x 2 olunaku
Omuwera 1-5yrs 10mls x 2 olunaku
- 058 Ekifuta, Enseke, Ekigalanga Eddagala lino 10gms lisse mu mazzi
agenkana 500mls. Fumba lyesere.
Enkozesa:
Omukulu 100mls x 2 olunaku
Omuto 6-13yrs 50mls x 3 olunaku
Omuwera 1-5yrs 10mls x 2 olunaku
- 059 Enjoka, Enseke, Ebigalanga Eddagala lino 10gms lisse mu mazzi
agenkana 500mls. Fumba lyesere.
Omukulu 100mls x 2 olunaku
Omuto 6-13yrs 50mls x 3 olunaku
Omuwera 1-5yrs 10mls x 2 olunaku

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Essential Plants Extract Company

Development of Exports

We have met with and tasked agents in South Africa to promote our products - The "Kigelia Extract" and "Happy Hound" dog snamoo. To date we have exported increasing amounts of units to South Africa.

We have a representative who has recently moved to Australia. He will be promoting our "Kigelia Extract" and we are awaiting the results of his enquiries.

New Products

The final trial samples have been for a range of new products under the Essential Plants label.

These are :

"Fly Smear" - a petroleum based jelly products that has a combination of essential oils to repel flies. This gel will also disinfect and heal.

" Mosquito Repellent" - an aqueous gel based product that combines mosquito repelling essential oils to repel mosquitoes and other insects. It will also help relieve the pain and irritation of insect bites.

" Arnica Cream" - a cream based product that is used as a first aid treatment for bruising and stiff muscles

Problems in Development of Products.

The main hindrance to the development of products has been in the high costs of packaging materials : the creation and printing of labels. It has taken us nearly a year to position ourselves to begin tentatively to create new product lines. We are still paying out on our initial products.

We have not considered borrowing money for new product development as lending rates/interest from local Banks make it unviable.

The Future

We have established a reputation with our customers that our products work, we have customer loyalty and the promotion of our products has mainly being through word of mouth with little media advertising.

The expansion of product range and the purchase of machinery, vehicles and promotion traveling are hampered by not having the input of capital investment and relying on a slow build up through reinvestment of profits.

However, we feel that our export orders will allow a quicker growth especially once the Australian sector comes on line.

THE HEALING HERB CENTRE.

The Healing Herb Centre was started very many years ago. Treating both human and animal patients by herbs, mainly indigenous ones which have been used in all parts of Africa for thousands of years, using the roots, bark, leaves, flowers, and fruit. Extracts from the plants can be made up homoeopathically which is oft-times better as many of the plants are very bitter.

Animals respond far quicker than some of their human counterparts and show their thanks with their eyes and a wag of their tails. Horses respond very quickly as well if the remedies are made up in apple cider vinegar.

J. D. PARKER, D. H. M.
Healing Herb Centre,
48 Horro Drive
Marlborough
Horse
Telephone 300475

MAGGIE'S HERBS PRODUCTSHERBAL TEAS

- BASIL** For nausea, sip a cup of this tea and to prevent travel sickness, drink it half an hour before a journey. It is a tonic, stimulant and nerve remedy.
- BERGAMOT** Soothing and relaxing. Mix a few leaves with your favourite tea and call it Earl Grey tea. Used as a gargle the pure Bergamot tea for sore throats. Steep in warm milk for a sedative.
- BORAGE** Will reduce fevers and increase that flow of milk in nursing mothers. It is slightly 'laxative'.
- CALENDULA** Improves circulation, strengthens veins and arteries. Use externally for eczema and other irritating skin problems.
- CATNIP** A mild sedative especially for children. It expels wind and relieves pain of all kinds. Calms the nerves in young and old. Half catnip and half marjoram taken at night will help bed-wetters.
- CHAMOMILE** Induces sleep, soothes the stomach, reduces fevers, lifts depression, cures cramp and ulcers. Good for children.
- COMFREY** Good for wounds that won't heal (in animals too). For the common cold, arthritis, rheumatism, bronchitis, stomach ulcers and just about everything. Bruises, sprains, strained ligaments and broken bones which need the extra help of a cold compress of tea bandaged over the injury.
- DANDELION** Purifies the blood, tones up the liver and kidneys. Dandelion coffee is a must for all complaints.
- DILL** Aids digestion, cures colic in babies. Use either seeds or leaf.
- ELDERBERRY** A tea of the flowers for bronchitis, anaemia, convulsions, A tea of leaves for all skin complaints, (acne, eczema, etc.). Dab on some cold tea externally for good measure.)
- FENNEL** This tea is diuretic and slimming. Chew a few seeds to allay hunger or digest a rich meal.
- FENUGREEK** To relieve sinusitis and all catarrhal conditions. To increase body weight and give strength.
- FEVERFEW** Reduces fever, strengthens ovaries and uterus, prevents miscarriage. Also a confirmed prophylactic for migrains sufferers - one cup daily.
- GOLDEN ROD** Juliette Levy writes of it being good for digestion, jaundice, kidney and bladder ailments: also to promote sweating in fevers. The dosage for these is two tablespoons morning and night. Externally, use the tea to staunch bleeding wounds and cleanse infections.
- HORSEHOOND** This vitamin-rich tea will relieve sore throats, coughs, asthma and all chest and lung complaints. A spoon of honey is a must as it is very bitter.

- LAVERNA** A tea of the flowers to treat shock and all nervous complaints. It is also an antiseptic mouthwash and gargle as well as a deodorant.
- LEMON BALM** A fever remedy; it promotes sweating, cures dysentery, soothes the gripes and all nervous disorders. Calms and induces sleep.
- LEMON GRASS** A refreshing drink, hot or cold. West Africans believe it wards off malaria.
- LEMON VERBENA** A sedative and renowned nerve remedy. It both stimulates and calms
- MARJORAM** Increases the flow of bile, helps to cure colic and diarrhoea. Good for rheumatism, jaundice and bed-wetting. (N.B. Not for nursing mothers).
- MINT** Will stimulate the appetite. Promotes digestion and fertility.
- PEPPERMINT** Relieves flatulence and cramps. Use externally as a cure for skin rashes of a nervous origin.
- NETTLE** An excellent tonic, laxative and diuretic. Reduces excessive menstrual flow and tones up the muscles. A weak tea to treat the scalp and cure falling hair, dandruff; also for eczema and other skin ailments. Fresh leaves for anaemia, ~~rheumatism, arthritis, sciatica, gout and infertility.~~
- PARSLEY** Full of vitamins. Good for all kidney and bladder complaints. For rheumatism, diabetes, digestion and lack of virility. It is a MUST for anyone whose family is prone to cancer, says Juliette Levy.
- RASBERRY** To strengthen uterus and ovaries and so facilitate child-birth.
- ROSEMARY** Will sweeten the breath and reduce high blood pressure. It will improve circulation and tone up the whole body, including the heart. It will prevent miscarriage and cure cramps. Apply externally as a hair conditioner.
- ROSE GERANIUM** Will cure vomiting and diarrhoea. A pleasant drink.
- SAGE** The Chinese vow that this tea will improve memory and quicken the senses. It will relieve rheumatism, fevers, colds, ulcers in the mouth, nervous ailments and constipation.
- SAVORY** Relieves flatulence, good for digestion. Steeped in white wine it makes a refreshing tonic. Useful in the treatment of frigidity, colds, fevers, nerves and constipation.
- TANSY** Full of minerals and of great medicinal value. A tea made from HALF a teaspoon of dried herb to one cup of boiling water will cure disorders of kidney and liver, high blood pressure, morning sickness, correct faulty menstruation, strengthen the heart, veins and arteries. Use externally for inflammation, bruises varicose veins. Dosage - only one tablespoon of the tea thrice daily.

- THYME** Take a cup at bedtime to cure colds and sore throats. Useful for headaches, indigestion, whooping cough, nightmares and even cramps.
- VERVAIN** Beneficial for all ills of mankind, especially fevers, bladder complaints, nervous disorders and paralysis. Also for mental stress, pneumonia, asthma, tuberculosis and whooping cough, take a wineglass of the tea morning and night. Externally, use the tea for ulcers of the mouth, sore throats and to bathe sore eyes and piles.
- WILDE ALS** Cures vomiting, diarrhoea, coughs, colds, croup and gout. Keeps moths from cupboards.
- WORMWOOD** Reduces fevers, cures diarrhoea, obesity and undue loss of hair. Use sparingly as it is a very potent herb (one SMALL teaspoon to a cup of boiling water) and sweeten with honey. Take only two tablespoons morning and night until symptoms disappear but certainly no longer than a month. NOT TO BE TAKEN DURING PREGNANCY
- YARROW** To cure a cold, sip a cup of Yarrow tea just before retiring for the night (for two nights running). It reduces fevers prevents debilitating illness.
- ZUMBANI** An indigenous herb to cure coughs and colds. (And malaria a worker told me).

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MEASUREMENTS: One large handful of fresh herb is equal to one teaspoon of dried herb.

Herbal remedies are not overnight miracles. Persevere with treatment for one, two, three weeks to effect a permanent cure. But first consult your doctor for correct diagnosis and suitable dosage.

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TOPICS COVERED IN THE NATURAL MEDICINE COURSES IN THE DEPARTMENT OF PHARMACY

1. The history of pharmacy and medicine
2. Orders and families of plants
3. Plant nomenclature, taxonomy and preparation of plant specimens.
4. The living plant and mammalian cells
5. Human physiology and anatomy
6. Techniques and technology of extraction, separation and isolation of chemical constituents from medicinal plants.
7. Distillation and extraction of essential oils and their quality control.
8. Pharmacological screening of medicinal plants.
10. Disease diagnosis
11. Disease and diet
12. Diseases and their natural medicine remedy

13. Diagnostic clinical chemistry
14. Diagnostic clinical biochemistry
15. Pharmacopeial methods
16. Toxicological testing procedures
17. Fixed oils, fats, gums, essential oils, mucilages and waxes of medicinal importance.
18. Medicinal marine products
19. The medicinal importance of the algae
20. The medicinal importance of the fungi
21. Drugs of animal origin
22. Antibacterial and antifungal activity of African plants.
23. Molluscicidal activities of African plants.
24. Natural toxins
25. Snakes and medicine
26. Plants/animal products with immunoregulatory activities

27. Conservation of medicinal plants and animals.
28. Zoopharmacognosy
29. Carbohydrates
30. Flavonoids, tannins and related phenols of medicinal importance.
31. Medicinal alkaloids and their sources
32. Medicinal glycosides and their sources
33. Medicinal terpenoids and steroids and their sources
34. Iridoids
35. Medicinal resins
36. Vitamins
37. Venomous animals and plants and their treatment
38. Characteristics and reactions of fibres used in surgical dressings.
39. Anti-tumor compounds from plants

40. Anti-helmintic, insecticidal and insect-repellant activities of African plants.
41. Introduction to allopathic medicines and their uses
42. Powdered drugs
43. Use of plant extracts in medicinal cosmetic formulations
44. Quality control implications
45. Massage
46. Reflexology
47. Homeopathy
48. Aromatheraphy
49. Holistic medicine
50. Introduction to Chinese natural medicine
51. Principles of Spirogyric medicine
52. Principles of Ayuverdic medicine
53. Formulation of plant extracts into dosage forms, tablets, granules and capsules.

54. Post-harvest treatment of plant medicines
55. Standardisation - raw materials and plant-based medicines
56. Medicinal coumarins
57. Propagation procedures for indigenous and introduced plants.
58. Industrial processing of medicinal plants
59. Packaging of medicinal products
60. Medicinal crystallography
61. Industrial attachments
62. Preparation and management of R and D projects
63. Natural medicine pharmacy practice
64. Clinical practice in natural medicine
65. Clinical attachments
66. Business practice and management
67. Setting up a health shop

68. Setting up a health clinic
69. Antimalarial, antiviral (AIDS included) and anti-inflammation of African plants.
70. FIRST AID
71. Community Medicine Practice

N.B. The above courses are not arranged in order of importance.