

Study of Indigenous Plants and Non-Timber Products as Related to Traditional Medicine in the Nuba Mountains and Southern Blue Nile Region of South Sudan



Including
The Status of Plant Conservation, Traditional/Plant Medicine and
Collaboration Between Conventional and Traditional Medicine Systems in the
Provision of Primary and Preventive Health Care from a Regional and International
Perspective

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**International Agriculture Programs
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Cover Photo

Carica papaya (pawpaw/papaya) growing in Kauda, Nuba Mountains (November 2003)

It is written of the pawpaw/papaya tree that it is a “pharmacy in itself”¹ with every part of the plant containing medicinally active compounds. The unripe sap/latex is used in water to clean dirty wounds and the sap to treat intestinal worms; the leaf is used prophylactically against worms and amoeba and in the treatment thereof; its roots treat cough, jaundice, hepatitis and yellow fever; and its seeds are used to treat urinary tract infections.

Carica papaya belongs to the Caricaceae family. This is a family of shrubs or small trees. Pawpaw has one trunk with smooth bark; its leaves are deeply lobed with a long leaf stalk; the flowers have five lobed sepals almost united completely and the fruit is a fleshy berry with numerous seeds. Caricaceae is a small family with five genera, four of which are native to tropical and subtropical America with one genus and two species in tropical Africa. *Carica* originated in America.

It grows rapidly producing fruit within a year; is an evergreen and resistant to drought but does not tolerate waterlogged soil conditions. It can grow up to an altitude of 1,500m in a wide range of temperatures but is killed by frost. Plants are usually either female or male with the male producing no fruit.²

¹ ‘Natural Medicine in the Tropics,’ Dr Hans Martin Hirt & Bindanda M’Pia, ANAMED, 2001

² ‘Flowering Plant Families of East Africa’, John O. Kokwaro, 1994; & ‘Field Guide to Common Trees & Shrubs of East Africa,’ Najma Dharani, 2002

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Glossary

AFRO	WHO Regional Office for Africa
ANAMED	Action for Natural Medicine
ARIPO	African Regional Intellectual Property Organisation
AU	African Union
AU/STRC	African Union/ Scientific and Technical Research Commission
CBD	Convention on Biological Diversity
CEMETRA	Experimental Centre for Traditional Medicine
CHEPA	Kyangyenyi Community Health Service Provider Association
CHICC	Community Health Information and Care Centre
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EMRO	WHO Eastern Mediterranean Regional Office
FAO	Food and Agricultural Organisation
GATT	General Agreement on Trade and Tariffs
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome
IDRC	International Development Research Centre
IK	Indigenous Knowledge
IPPC	International Plant Protection Convention
IUCN	International Union for Conservation of Nature/World Conservation Union
KAP/KABP	Knowledge, Attitudes, Practices/ K A Belief P
KARI	Kenya Agricultural Research Institute
KEFRI	Kenya Forestry Research Institute
KEMRI	Kenya Medical Research Institute
MAPS	Medicinal and Aromatic Plant Species
MD	Medical Doctor
MDG	Millennium Development Goals
NBSAN	National Biostrategy and Action Plan
NCRL	National Chemotherapeutics Research Laboratory
NDP	National Drug Policy
NEC	National Environmental Policy
NEMC	National Environmental Management Council
NEPAD	The New Partnership for Africa's Development
NES	National Environment Secretariat
NM	Nuba Mountains
NRRDO	Nuba Relief and Rehabilitation Development Organisation
OAPI	Organisation Africaine de la Propriete Intellectuelle
OAU	Organisation for African Unity
PEAP	Poverty Eradication Action Plan
PROMETRA	Association for the Promotion of Traditional Medicine
ROOF	Rehabilitation Organisation of Fazugli
SBN	Southern Blue Nile
SEPASAL	Survey of Economic Plants for Arid and Semi-arid Lands
SPLM	Sudan People's Liberation Movement
SRRC	Sudan Relief and Rehabilitation Commission
STI/D	Sexually transmitted infection/disease
SUBPI	Sustainable Use of Biodiversity Program Initiative
TAWG	Tanga AIDS Working Group
TBA	Traditional Birth Attendant
TH	Traditional Healer
THETA	Traditional and Modern Health Practitioners Together Against AIDS and other diseases
TM/CAM	Traditional Medicine/Complementary or Alternative Medicine
TRIPS	Trade Related Aspect of Intellectual Property Rights
UNCED	United Nations Conference on the Environment and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Education and Scientific Cooperation Organisation
VP	Vice-President
WHO	World Health Organisation
WIPO	World Intellectual Property Organisation
WOFAK	Women Fighting AIDS in Kenya
WTO	World Trade Organisation
WWF	World Wildlife Fund

Introduction

The aim of this work, carried out between October 2003 and March 2004, was to conduct a study of indigenous plants and non-timber products in Nuba Mountains and Southern Blue Nile regions as they are related to traditional medicine and for the outcome of the following tasks to support the design of initiatives in the health administration of these regions.

Specific work tasks included:

- A literature review and collation of existing regional and international information on medicinal plants and their uses in traditional medicine; international and Africa policy/legislation on plant biodiversity and protection of traditional knowledge.
- Exploration of ongoing approaches to conservation and use of medicinal plant knowledge and healing practices in the region by visiting neighbouring countries such as Uganda, Kenya, Tanzania; use of these visits to investigate the potential for working agreements in analysis, investigation of dosage, efficacy and safety of plants in the current absence of such facilities in south Sudan.
- To conduct ethnobotanical/medical surveys in Southern Blue Nile and Nuba Mountains. During these surveys consultations with individual communities, groups of healers and local leaders were held to explore the use and conservation of medicinal plants, the safeguarding of traditional knowledge whilst sharing it; traditional healers associations, registration and training; steps towards traditional healers and conventional medical practitioners working together; home gardens and pharmacy gardens; the use of medicinal plants/trees as part of community conservation approaches such as reforestation.
- Documenting existing examples of traditional healers and conventional medical practitioners working together in the region to support development of possible approaches for south Sudan.

It is anticipated that the work carried out will contribute to the achievement, in the longer term, of the following objectives:

- Conservation and biodiversity of the agro-forestry sector in medicinal/veterinary plant usage
- Strengthening community health care provision through integrating traditional and conventional medicine practices
- Increasing local capacity to sustainably address treatment and reduction of endemic (human and livestock) diseases thereby improving the health of the region's workforce and its' resources
- Strengthening the community's ability to answer to area population changes and thereby the inherent nutrition, shelter, fuel and health needs including sanitation and provision of clean water
- Develop a design for improved health care management in (SPLM) Nuba Mountains and (SPLM) Southern Blue Nile/Funj Region.

Within the report's sections:

- (i) 'Biodiversity and plant conservation' includes commentary on the New Partnership for Africa (NEPAD), Convention of Biological Diversity (CBD), the Bonn Guidelines and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES);
- (ii) 'Protection of traditional knowledge and benefit sharing' includes discussion on Traded Related Aspects of Intellectual Property Rights (TRIPs) and the African Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders and for the Regulation of Access to Biological Resources;
- (iii) 'Traditional Medicine and Primary Health Care' includes the WHO headquarters and Regional Africa Strategies on Traditional Medicine;
- (iv) 'Ethnobotanical study in Rashad County, Nuba Mountains and Kurmuk County, Southern Blue Nile/Funj region' documents the findings of this initial work;
- (v) 'Toward the integration of traditional and conventional medicine in the provision of primary health care' includes notes on Applied Ethnobotany, courses/training, WHO protocols for evaluation of plant medicine;

- (vi) 'Status of protection of the environment/biodiversity, traditional and plant medicine in Uganda, Tanzania and Kenya' provides a basic overview of these issues; and
- (vii) 'Examples of collaboration between traditional and conventional health practitioners in Uganda, Tanzania and Kenya' includes experience from Traditional Healers and Modern Practitioners Together Against AIDS (THETA) and the Association for the Promotion of Traditional Medicine (PROMETRA), Tanga AIDS Working Group (TAWG) and Women Fighting AIDS in Kenya (WOFAK) and discussion on PROMETRA in Senegal and its experimental/pilot centre Centre Expérimental de Médecine Traditionnelle (CEMETRA).

Some Terminology...

(I) The terms 'traditional knowledge' and 'indigenous knowledge' are often used interchangeably.

- Traditional knowledge is defined as "that which is held by members of a distinct culture and/or sometimes acquired by means of inquiry peculiar to that culture, and concerning the culture itself or the local environment in which it exists."³ Traditional knowledge is "thus the totality of all knowledge and practices, whether explicit or implicit, used in the management of socio-economic and ecological facets of life...It is established on past experiences and observation... usually a collective property of society. Many members... contribute to it over time."⁴
- Indigenous knowledge of a people, as defined by the CBD Convention of Parties III (UNEP), is knowledge held by a people based on a "combination of cultural distinctiveness and prior territorial occupancy relative to a more recently arrived population with its own distinct and subsequently dominant culture". It thus falls within the definition of traditional knowledge but not vice versa.

(II) Traditional medicine, conventional/modern and complementary/alternative medicine.

- "Traditional medicine is based on the needs of individuals. Different people may receive different treatments even if, according to modern medicine, they suffer from the same disease. Traditional medicine is based on the belief that each individual has his or her own constitution and social circumstances which result in different reactions to "causes of disease and treatment."⁵

Traditional medicine is defined by WHO as "including diverse health practices, approaches, knowledge and exercises applied singly or in combination to maintain well-being, as well as to treat, diagnose or prevent illness".

- Conventional/modern/allopathic medicine includes the use of pharmaceutical products in treating patients as opposed to herbal remedies directly from medicinal plants parts used in traditional medicine by a traditional healer/health practitioner.
- Complementary and alternative (also called 'non-conventional') medicine (CAM) "refer to a broad set of health care practices that are not part of a country's own tradition, or not integrated into its dominant health care system". (These include naturopathy, osteopathy, homeopathy, chiropractic, ayurveda, Chinese, Unani...) Acupuncture is a traditional Chinese medicine therapy but in Europe it is also placed under the general heading of CAM".⁶

³ Convention on Biological Diversity (CBD), Convention of Parties (COP) III, United Nations Environment Programme (UNEP)

⁴ 'Intellectual Property and Traditional Knowledge' John Mugabe, African Centre for Technology Studies (ACTS), Nairobi, Kenya

⁵ World Health Organisation (WHO) Traditional Medicine Strategy 2002-2005

⁶ *ibid*

I. A Regional and International Review of Traditional Medicine Plants, Their Uses and Efforts to Conserve These Resources

1. Biodiversity and Plant Conservation

"People and Plants", the name of the 1992 partnership between the World Wildlife Fund (WWF), United Nations Education and Scientific Cooperation Organisation (UNESCO) and the Royal Botanic Gardens, Kew (England) and *"Saving Lives by Saving Plants"*, the title given to the 1988 International Consultation on Conservation of Medicinal Plants⁷ in Chiang Mai, Thailand, are but two examples of society's acknowledgement of the close link between man and plants and the need to consider their conservation. For man, they provide fuel, building materials, food, clothing and medicine and the trading thereof. Plants and plant products have a central place in not only enabling man and societies to exist and develop but ensure man's very survival.

In the last two decades in particular, sustaining the environment through bioconservation has thus been one of the central themes if not the theme of many declarations, conventions and legislation both at an international and regional level within Africa and is seen to be intricately linked with the sustainable development of Africa.

The New Partnership for Africa's Development (NEPAD) proposed by Algeria, Egypt, Nigeria, Senegal, South Africa and adopted at the OAU⁸ Summit in July 2001, is mandated to develop an integrated socio-economic development framework for Africa. It's primary objectives include eradicating poverty and placing African countries on a path of sustainable growth and development. Amongst its principles, it is noted that "the development of Africa" be anchored "on its resources and resourcefulness of its people".

The United Nations Millennium Development Goals (MDG), to be met by 2015, include ensuring "environmental sustainability" through integrating "the principles of sustainable development into country policies and programmes and "reverse loss of environmental resources".

In 1992 the Earth Summit –the United Nations Conference on Environment and Development (UNCED) Programme⁹ in Rio de Janeiro agreed on a comprehensive strategy for "sustainable development". It was also at this summit that the Convention on Biological Diversity (CBD)¹⁰ was created.

Article 2 of the Convention defines biological diversity or biodiversity as "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems".¹¹

The Convention (CBD) establishes three main goals: the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits from the use of genetic resources. This convention has 168 signatures with 188 parties. (Since October of 1992 Sudan has been a party to the convention which it signed on 9 June 1992).The convention of parties (COP) since 1992 serve to ensure implementation of the convention and review it's articles as appropriate.

The focus of the May 2003 Convention meeting, entitled '2010 – The Global Biodiversity Challenge' and coinciding with the annual International Day for Biological Diversity, 22 May, was to discuss the adopted 2002 Strategic Plan for the effective implementation of the Convention's three goals and to significantly reduce biodiversity loss by 2010.

⁷ Consultation convened by World Health Organisation (WHO), World Conservation Union (IUCN-International Union for the Conservation of Nature) and World Wildlife Fund (WWF)

⁸ Organisation for African Unity

⁹ Held at the recommendation of the World Commission on Environment and Development (WCED). WCED was established in 1982 by the United Nations General Assembly.

¹⁰ Convention on Biological Diversity (CBD) secretariat resides at the office of the United Nations Environment Programme (UNEP)

¹¹ CBD Article 2, UNEP 1992

Use of plants for medicinal purposes in traditional medical practices is an example of traditional knowledge¹² where community traditional systems of protection of such knowledge – an informal system of conservation – have existed for generations. Examples are community seed banks, home gardens and sacred groves. Many traditional practices, however, do not conserve the biological resource they are using such as the traditional healer/practitioner ring cutting the bark of a tree or uprooting a tree or shrub for the purposes of acquiring the root for preparation of a herbal remedy.

Article 8 of the CBD on in-situ conservation is particularly relevant where conservation of plants used in traditional medicine is concerned and pertinent to access and benefit sharing. It follows below:

- (a) "Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;
- (b) Develop, where necessary, guidelines for the selection, establishment and management of protected areas or areas where special measures need to be taken to conserve biological diversity;
- (c) Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use;
- (d) Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings;
- (e) Promote environmentally sound and sustainable development in areas adjacent to protected areas with a view to furthering protection of these areas;
- (f) Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, inter alia, through the development and implementation of plans or other management strategies;
- (g) Establish or maintain means to regulate, manage or control the risks associated with the use and release of living modified organisms resulting from biotechnology which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking also into account the risks to human health;
- (h) Prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species;
- (i) Endeavour to provide the conditions needed for compatibility between present uses and the conservation of biological diversity and the sustainable use of its components;
- (j) Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices;
- (k) Develop or maintain necessary legislation and/or other regulatory provisions for the protection of threatened species and populations;
- (l) Where a significant adverse effect on biological diversity has been determined pursuant to Article 7, regulate or manage the relevant processes and categories of activities; and
- (m) Cooperate in providing financial and other support for in-situ conservation outlined in subparagraphs (a) to (l) above, particularly to developing countries."¹³

Other conventions have been agreed upon focusing on other aspects of protection of plants such as the International Plant Protection Convention (IPPC) approved at the Food and Agriculture Organisation (FAO) conference in November 1997. This Convention was originally signed in 1951 and reviewed in 1979. It aims to avoid the introduction and spread of pests of plants and plant products with international cooperation.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international agreement drafted in 1963 at the World Conservation Union/International Union for the Conservation of Nature (IUCN) and came into force in 1975. As with the CBD, States that have agreed to the Convention are known as Parties and although the Convention is legally binding it does not replace national laws and each Party must adopt its own domestic legislation to ensure

¹² See footnotes 18 & 19

¹³ Article 8 of the Convention on Biological Diversity

implementation. CITES works by subjecting international trade in specimens of selected species to certain controls in an effort to safeguard certain species from over-exploitation through a licensing system whether they are traded as live specimens or dried herbs.

The species covered by CITES are divided into three appendices: Appendix III includes species threatened with extinction. Trade in specimens of these species is permitted only in exceptional circumstances. Appendix IV includes species in which trade must be controlled and Appendix V contains species that are protected in at least one country. It is estimated that over 5,000 species of animals and 28,000 species of plants are protected in this way. In 1994 IUCN went on to set up a Species Survival Commission (SSC) with a specific Medicinal Plants Specialist Group (MPSG).

In the early 1990s FAO and the United Nations Development Programme (UNDP) launched an initiative for institutional capacity building for biodiversity conservation in East Africa. *The People and Plants Initiative* which commenced in 1992 between WWF, UNESCO and Royal Botanical Gardens, Kew, included the development of People and Plants International, a new body to assist communities and organisations to adopt more effective strategies to manage plant resources sustainably for the benefits of local livelihoods and conservation.

2. Protection of Traditional Knowledge and Benefit Sharing

The protection of plants has thus been the subject of several conventions but how can traditional knowledge, including the use of plants in traditional medicine, be protected while being accessed, used and traded. How can the benefits of that use be shared and with whom? These are questions which are not new and have occupied the minds of many over more than an decade.

As noted earlier, Article 8 of the Convention on Biological Diversity, in-situ conservation, is pertinent to the conservation of plants providing herbal remedies or traditional medicine and point '8j' is particularly relevant as it links the conservation of plants and traditional knowledge – and therefore traditional plant medicine –, access to this knowledge, and benefit sharing. The latter touches on intellectual property rights, a subject much debated in both the African Union's (AU)¹⁴ Scientific and Technical Research Commission (STRC)¹⁵ with regard to the African Model Law¹⁶ and in the CBD's Conventions of Parties (COP) and whilst drawing up the Bonn Guidelines¹⁷ (discussed below).

Point 8j is as follows: "Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices".

The World Bank maintains a database of indigenous knowledge (IK) along with its 'IK Notes' as part of its Indigenous Knowledge Program which aims to mainstream traditional and indigenous knowledge into agriculture, health-care, education and natural resources.

At the sixth meeting of the convention of parties (COP) of the CBD, the Bonn Guidelines on Access and Benefit Sharing were adopted at The Hague in 2002. These are guidelines on access to genetic resources and the fair and equitable sharing of the benefits arising from their utilisation¹⁸. They provide guidance for development of national legislation on access and benefit sharing. This was emphasized at the World Summit on Sustainable Development in September 2002 where a new Plan of Implementation for achieving sustainable development objectives was approved. Prior informed consent, mutually agreed terms, benefit sharing, relation to traditional knowledge, role of intellectual property, and monitoring and enforcement measures are highly relevant sections to the Law in terms of ensuring that the gains from Africa's genetic resources remain in Africa. David Vivas, a former

¹⁴ AU – Organisation for African Unity (OAU) was renamed African Union in May 2002

¹⁵ STRC – AU Scientific and Technical Research Commission is based in Lagos, Nigeria

¹⁶ African Model Law – see page 14

¹⁷ Bonn Guidelines – see last paragraph this page

¹⁸ 'CBD and the Bonn Guidelines on Access and Benefit Sharing' D Vivas, South Bulletin

attorney at the Centre for International Environmental Law (CIEL) briefly reviews these sections as follows:

- *Prior Informed Consent*: The obligation to obtain prior informed consent as a condition for access has been interpreted broadly or restrictively by providers and users of genetic resources, respectively. According to the new guidelines, prior informed consent may include, among others, the following elements: consent of the national authority (including provincial and local authorities) and of indigenous and local communities; mechanisms for the involvement of relevant stakeholders; reasonable timing and deadlines; specification of the type of uses; direct linkage with mutually agreed terms; detailed procedures for obtaining the consent; and a description of the general process for access. These elements would provide greater clarity for both users and providers to identify the best way to ensure the fulfilment of the prior informed consent in the access process.
- *Mutually Agreed Terms*: The development of mutually agreed terms should be based on the principles of legal certainty and minimization of cost. These principles were included in the Guidelines to respond to the concerns of scientific researchers and users of genetic resources that national procedures for obtaining access could be too complex and burdensome. The Guidelines enumerate a detailed description of the type of provisions that could form part of a contractual arrangement. Some of the proposed provisions are quite innovative and include the specification of uses, the regulation of those uses in light of ethical concerns, the continuation of customary uses over genetic resources, the possibility of joint ownership of intellectual property rights according to contributions, and the existence of confidentiality clauses and sharing of benefits from commercial and other utilization of genetic resources including derivatives.
- *Benefit Sharing*: The Guidelines are also intended to assist governments to set fair and practical conditions for users seeking genetic resources, who, in return, must offer benefits derived from their use in the form of profits, royalties, scientific collaboration, or training. They also aim at improving the way researchers, collectors, foreign companies and other users gain access to valuable genetic resources in return for sharing the benefits with the countries of origin. The type of potential benefits that parties might expect from legal access includes both monetary and non-monetary benefits. A non-exhaustive list of these types of benefits has been also included in the Guidelines. The Guidelines therefore create a more predictable atmosphere for government, potential commercial or non-commercial users and stake holders when negotiating benefits in the context of an access contract.
- *Relation to Traditional Knowledge*: The CBD indirectly protects and promotes the traditional knowledge associated with genetic resources. In the Guidelines links between genetic resources and associated traditional knowledge are strengthened. The Guidelines respect the established legal rights of indigenous and other local communities where traditional knowledge is associated with genetic resources. In this sense, prior informed consent should be obtained in accordance with traditional practices, national access policies and domestic law. An indication of whether the traditional knowledge has been respected, preserved and maintained could also be included in the contractual arrangements.
- *Role of Intellectual Property*: The relation between genetic resources and intellectual property rights (IPRs) has also been included in several parts of the Guidelines. Certain elements of the Guidelines suggest a mutually supportive relationship between the CBD and IPR agreements, including: the possibility of mandating joint ownership over IPRs, the specification on the type of uses including commercial and other uses (open enough as to include IPRs); and the encouragement of the disclosure and certification of the origin of the genetic material and traditional knowledge in patent applications.
- *Monitoring and Enforcement Measures*: The new Guidelines include for the first time a set of measures designed to support compliance of prior informed consent and the existence of mutually agreed terms. Monitoring may include reporting of activities, follow up on whether the use is in line with the terms of the access contract, checking of research and development activities, and the applications of IPRs. Enforcement measures encouraged by the Guidelines include the disclosure of information, certification schemes and measures against unfair trade practices."

The World Trade Organisation (WTO) was established in 1994 from its predecessor GATT¹⁹. The Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs) was signed in April 1994²⁰. Both the WTO and the World Intellectual Property Organisation (WIPO) and the latter's legislation on patents and intellectual property rights, look at intellectual property as creations of human ingenuity such as inventions, trademark or artistic work.

TRIPs established an international standard for minimum intellectual property rights protection. Its objective is to "reduce distortions and impediments to international trade, and taking into account the need to promote effective and adequate protections of intellectual property rights, and to ensure that measures and procedures to enforce intellectual property rights do not themselves become barriers to legitimate trade".²¹ The agreement requires any Member to provide patent protection for "any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application"²² When this is applied to traditional knowledge it does not qualify for "new" as the very nature of this knowledge is that it is not new.

The World Intellectual Property Organisation (WIPO) at a regional level in Africa takes the form of two organisations: the African Regional Intellectual Property Organisation (ARIPO) with a treaty and protocol to the Treaty in the Anglophone countries and the Organisation Africaine de la Propriete Intellectuelle (OAPI) for the Francophone countries. The latter have a uniform patent law. A number of the Anglophone African countries have independent patent regimes including Kenya, Malawi, Sudan, Zambia and Zimbabwe.

Traditional knowledge does not fall into the category of human ingenuity. To address this issue WIPO established an Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional knowledge and Folklore in September 2000. Their work started in 2001 and focused on intellectual property questions raised by: access to genetic resources and benefit-sharing; protection of traditional knowledge, whether or not associated with those resources; protection of expressions of folklore.

The seventh meeting of the COP held in Kuala Lumpur, Malaysia in February 2004 is the latest venue on discussions on protection of traditional knowledge, innovations and practices. During this meeting non-intellectual property based sui generis forms of protection were considered.

"African customary law system recognizes communal ownership of knowledge and apportions little reward for individual innovations"²³. Intellectual property rights aim to turn knowledge into a marketable commodity not to conserve such knowledge as it is passed on from generation to generation. Use of a sui generis²⁴ system of protection offers a wide choice for doing this. Examples are contracts between users and custodians of the resource such as a material transfer agreement. Dr Gbodossou's, (founder of PROMETRA with headquarters in Senegal), book on this issue is worthy of note – *Protection des Droits de Propriete Intellectuelle' (Protection of Intellectual Property Rights)* – as a practical guide to such protection.

According to the Crucible Report²⁵ of 1994, a sui generis system would "include any arrangement for plant varieties that offers recognition to innovators – with or without monetary benefit or monopoly control". Referring back to the TRIPs agreement, countries are expected to establish comprehensive intellectual protection systems including trademarks and trade secrets. The latter system of protecting

¹⁹ General Agreement on Trade and Tariffs (GATT) formed in 1947, became World Trade Organisation (WTO) in 1994; headquarters remain in Geneva, Switzerland.

²⁰ TRIPs agreement is Annex 1C of the Marrakesh Agreement Establishing the World Trade Organisation signed April 1994 in Morocco. This was part of the Uruguay Round of world trade talks (1986-94) where intellectual property rules were introduced to the multilateral trading system for the first time

²¹ TRIPs agreement

²² Ibid

²³ Indigenous Knowledge Notes No 53, February 2003 'The Economics of African Indigenous Knowledge'

²⁴ sui generis = 'of its own kind; constituting a class alone'

²⁵ 'People, Plants and Patents', The Crucible Group, 1994, International Development Research Centre (IDRC), Ottawa, Canada

traditional knowledge is already informally in place with traditional healers and could be considered in a more formal manner at national legislation level for protection of this knowledge.

The AU Scientific and Technical Commission's work on access to and benefit sharing of biological resources and protection of traditional knowledge resulted in the drafting of the African Model Law.

The African Model Law for the Protection of the Rights of Local Communities, Farmers and Breeders and for the Regulation of Access to Biological Resources was adopted in 1998 by the then Organisation for African Unity (OAU). The International Undertaking (IU) on Plant Genetic Resources for Food and Agriculture subsequently recognised Farmers' Rights as those determined by each national law and these were then included as a subset of Community Rights in the Law originally adopted in Ouagadougou in 1998.

The Law has four thematic chapters – access to biological resources, community rights, farmers' rights and plant breeders' rights. The main objective of the Law "is the conservation and sustainable use of, and sharing the benefits accruing from, biological resources and community knowledge and technologies in order to sustain all life support systems"²⁶. Much of the Law is based on the CBD. For example, Article 9 prohibits the patenting of life forms and biological processes and is consistent with the CBD. Elements included within its scope are biological resources and their derivatives, community innovations, practices, knowledge and technologies, local and indigenous communities; plant breeders and benefit-sharing. Traditional systems of access, use and exchange of biological resources, knowledge and technologies are excluded in order to protect these practices from external interference.

3. Status of Protection of the Environment, Traditional and Plant Medicine in Uganda, Tanzania and Kenya

Despite generations of reliance on traditional medicine and the estimated use of traditional medicine by more than 80 percent of Africa's population, specific legislation for this field is only now being drafted or approved in East Africa. Below is a summary of the status of such work in Tanzania, Uganda and Kenya.

Tanzania

The Vice President's (VP) Office houses the Division of Environment and the Minister for the Environment answers to the VP. The National Environmental Management Council (NEMC) was established as a Parliamentary Act in 1983 to act in a technical advisory and coordinating body for the Division.

In 1997, a National Environmental Policy (NEP) was developed, but to date no comprehensive environmental law exists. The 'Sustainable Environmental Management Bill,' however, has been drafted and awaits approval.

The NEMC oversees environmental planning and research, provision of environmental information and communication, environmental impact assessment, and environmental compliance and enforcement.

Both traditional and conventional health services run in parallel and are recognised by the National Health Policy. There is a department of traditional medicine in the Ministry of Health and the National Institute of Medical Research is collaborating with traditional healer organisations to form a research network. The Traditional and Alternative Medicines Policy guidelines, approved in 2001 by the government, legally recognised traditional medicine as part of the health care system.

The Traditional and Alternative Medicines Act was passed in November 2002 by parliament with two objectives: to promote control and regulation of traditional medicine and alternative medicines and to regulate the conduct of practitioners and registration of practitioners. This Act provides for the establishment of the Traditional and Alternative Health Practices Council.

²⁶ African Model Law

This Council will be supported by three committees – professional and conduct, academic, research and development – and will be composed of nine members, most of whom will be traditional health practitioners. The Research and Development Committee role is to:

- “Promote science and technology of material aspects of traditional and alternative medicines;
- Coordinate research, utilization and information on medicinal plants and other material medica;
- Develop guidelines and standards for traditional and alternative medicines research;
- Recommend the production and utilization of useful traditional medicines and other materia medica;
- Set standards for remedies, alternative medicine equipment, instruments and machineries;
- Establish a data bank on researched and community-based medicinal plants and other materia medica;
- Promote conservation and sustainable management of medicinal plants, and other medicinal resources including animals, marine and aquatic resources;
- Liaise with local and international researchers on efficacy, safety and quality of medicinal plants and other materia medica; and
- Liaise with local and external industries on issues relating to the production of herbal medicines and other materia medica.”²⁷

The Institute of Traditional Medicine started as a research unit in 1974 and became an Institute in 1991 by an act of Parliament. It is part of Muhimbili University College of Health Sciences in Dar es Salaam and has sections of botany, chemistry, pharmacology, socio-anthropology and clinical evaluation; however, to date there is no traditional medicine module at the University. The October 2002 Law on Traditional Medicine provides for registration of practitioners and licensing of practices but does not provide for regulation of fees. The Institute now falls under the direction of the Ministry of Health, and no longer the Ministry of Culture and Education.

The sharing of knowledge by traditional medicine practitioners with each other and with the Institute is low as secrecy is viewed as a form of knowledge and livelihood protection; however, several Traditional Health Associations exist in Tanzania. A workshop in August 2003 brought together 33 traditional healers who all showed interest in training that would aim to standardise treatments and dosing regimes of frequently used plants and plant parts in traditional medicine.

Funding remains low for traditional medicine research. However, recent work with the National Institute for Medical Research on the variety of *Artemisia annua* tree growing in Tanzania has shown potency ten times that of the Asian variety. A Malaysian and Arusha company are collaborating on further work toward local commercial production of the dihydro-artemesinin for treatment of malaria.

The research activities at the institute follow three phases: ethnomedical; chemical and pharmacological; clinical trials and feasibility studies for the manufacturing of useful drugs. Its objectives are to conduct scientific investigations on plants, animal and mineral products used for medicinal purposes; evaluate and promote the use of natural products, beneficial customs and practices of traditional medicine; and to discourage those which are detrimental to health.

The Institute’s functions include collaboration with traditional healers and traditional birth attendants in the documentation of ethnomedical information and practices; maintenance of a herbarium of medicinal and aromatic plants – over 5000 voucher specimens and 1000 plant species; carrying out of chemical screening, pharmacological studies and bioassays/separation of the active substances of such plants used in traditional medicine. To date ethnobotanical studies have been carried out in 16 out of the 20 regions of Tanzania. This information is currently being entered into an electronic database from the individual study reports. A traditional medicine clinic in Mwanga, Kilimanjaro has been set up with the assistance of the Institute and runs in collaboration with the conventional health facilities in the area. The medicinal plant farms of the Institute are in Kibaha, Tanga, Arusha, and Kilimanjaro.

²⁷ Proceedings of the ‘Stakeholder workshop on the Sustainable, Safe and Effective Use of Medicinal Plants in Eastern Africa’ November 2003, Arusha, Tanzania convened by IDRC, Nairobi and co-sponsored by USAID

Uganda

In Uganda to date, the protection of the environment has no specific legislation, however, Sections XIII and XXVII and Article 237(2) of the 1995 Constitution of Uganda provide for the protection of natural resources by the state on behalf of the people. The Ugandan Law Reform Commission has produced a draft bill promoting the development and application of knowledge systems including traditional medicines. The Witchcraft Act of 1957 had made the practice of traditional medicine illegal and has yet to be revised, however, the above 1995 Constitution provided for rights to associate in cultural practices and therefore it remains to be revoked but is no longer implemented.

There is no regulatory or certification process governing traditional medicine practice, nor the use, preparation and prescribing of the herbal remedies. The Traditional Medicine Practice Bill, which at present is in draft form, however, seeks to establish a council to regulate the practice of traditional medicine including registration of practitioners and licensing of practices. The Indigenous Knowledge and Folklore Bill is also in draft form.

The National Health Policy and Strategic Plan of 2000 includes the use of traditional health practitioners as part of increasing accessibility to health care. The Uganda National Health Research Organisations Act of 2003 includes the research into traditional medicines while the 1993 National Drug Statute includes herbal drugs in its framework for regulation of drugs within the country. Traditional medicine remains the responsibility of the Culture Officer within the Ministry of Gender and Community Development.

The Poverty Eradication Action Plan (PEAP), which resides with the Office of the President, recognises the role of traditional medicine in health care provision. Traditional medicine is included within its definition of 'indigenous knowledge' in the section on enhancing the quality of life of the poor, by 'identifying complementary and alternative medicinal health care systems'²⁸ This 'IK framework' defines programmes for the integration of indigenous knowledge into the public/private sector including traditional/natural medicinal care products. The Plan's overall aim is to reduce the percentage of the population living in absolute poverty from 44 percent to 10 percent by 2017 and includes a plan for modernisation of agriculture (PMA) launched in July 2001. Conservation and sustainable management of medicinal plants is viewed from a farmer empowerment perspective and includes the establishment of a National Agriculture Advisory Service on matters such as natural resource management, agro-processing and rural finance access.

The National Biodiversity Strategy and Action Plan (NBSAP) provides national guidance on conservation of biodiversity including implementation of the Convention on Biological Diversity (CBD). National policies, including the National Forest Policy and Plan (2001), The Uganda Wildlife and the Uganda Wetlands Policies (1995), Forest Act (1962,1964), the Uganda Wildlife Statute (1996), have relevant points concerning either protection of or access to biological resources including plants and those used for medicinal purposes in the practice of traditional medicine.

The Natural Chemotherapeutics Research Laboratory (NCRL) is a department of the Ministry of Health established in 1963. Its main mission is to verify claims of efficacy and safety of herbal medicines, promote the use of herbal medicines and conservation of medicinal plants and natural resources. It's main activities are documentation of ethnobotanical and botanical information at the herbarium (holding information on 80 plant families, 150 genera and 2,000 species), with a plan to catalog electronically all existing research; research on herbal drugs for local industrial production; and participatory rural appraisal of claims of herbal medicine effectiveness for HIV/AIDS. There are three sections to the Laboratory – botany, chemistry and pharmacology. Prior consent of the informant or community for collection and investigation of a plant or plant part is included in the research practice of the Laboratory. In collaboration with the OAU's Scientific and Technical Research Commission, 'Traditional Medicine and Pharmacopoeia of Uganda' was published in 1993.

Fifteen rare and endangered plant species used in traditional medicine were investigated to understand local perceptions of these plants and their uses by working with the local communities (in four districts of Uganda), traditional healers and health practitioners. This was the first phase of a project headed by the Natural Chemotherapeutic Research Laboratory (NCRL) with Makerere University and Kawanda Agricultural Research Institute and funded by the International Development

²⁸ Ibid

Research Centre (IDRC), Nairobi. This programme is part of IDRC's Sustainable Use of Biodiversity Program Initiative (SUB PI). The second phase which is ongoing, investigates the safety and efficacy of their use and includes the use of medicinal gardens. These serve several purposes including training, conservation and sustainable use of the plant by raising nursery seedlings for the traditional healer.

The second phase used a short questionnaire to record the diseases treated or managed by traditional healers. Toxicology studies on two or three of the most used medicinal plants per district were carried out and the safety is being evaluated.

Kenya

In Kenya, the National Environment Secretariat (NES) was established in 1972 which was to address environmental policy formulation. In 1994, the National Environment Action Plan was released, but there was no coordinated plan for the sustainable use of medicinal plants for national socio-economic development. There is also no specific legislation for traditional medicine. It is mentioned, however, in the 1994 National Drug Policy (NDP) which states that "traditional medicines shall be encouraged." In 1977 the Medical Practitioners and Dentists Act was amended to reverse the exemption given to practitioners of traditional medicine from compulsory registration. The 1962 Witchcraft Act, which made traditional medicine illegal, remains current but by 1977 it was generally accepted that traditional medicine was no longer illegal. Currently, traditional medicine and its practitioners are the responsibility of the Ministry of Culture and Social Affairs.

In 2001, following a workshop whose theme was 'Towards the promotion of medicinal and other under-utilised plant species for socio-economic development'²⁹, a number of people working in research and interested in the development of medicinal and aromatic plant species (MAPS), including the Kenya Agricultural and Research Institute (KARI) and the Kenya Medical Research Institute (KEMRI), came together to develop the 'National Strategy and Action Plan for Medicinal and Aromatic Plant Species 2003-2008'. This aims with regard to MAPS to:

- Promote research;
- Conserve and propagate;
- Improve the knowledge base of scientists, policy-makers, traditional medical practitioners and the public;
- Enhance linkages to relevant institutions, market and industry, and the commercial production;
- Promote the formulation of appropriate policies and legislation;
- Improve the integration and legal recognition of traditional medical practice into the national human and animal health care systems; and
- Enhance bio-diversity and intellectual property rights for stakeholders and reduce biopiracy.

Indicators for each of the above outputs include:

- To have established inventory databases and three research projects funded by 2008
- Five plant gardens, 50 MAPS in gene banks and 5 production packages by December 2004
- Five commercial products on the market by 2008
- National representative association to be formed by 2005
- Draft policy on integration of traditional medical practitioners by 2005

The Kenya Medical Research Institute (KEMRI) houses the Centre for Traditional Medicine and Drug Research. As noted earlier, current research includes using standard protocols to carry out assays on plants showing activity against opportunistic infections in HIV/AIDS and malaria; pre-clinical evaluation on safety and standardisation of dosage; and clinical efficacy.

The Centre is receptive to regional collaboration and like the Natural Chemotherapeutics Research Laboratory in Kampala, Uganda and the Traditional Medicine Institute in Dar es Salaam, Tanzania are heading the work to be carried out under the umbrella of the recently launched Network on Medicinal Plants and Traditional Medicine (Eastern Africa) by IDRC Regional office in Nairobi (see Networks).

The Kenya Natural Resource Centre for Indigenous Knowledge (KENRIK) is housed on the grounds of the Museums of Kenya and includes the East African Herbarium, both of which have close links with

²⁹ First National Workshop on Medicinal, Aromatic and Other Under-Utilised Plant Species in Kenya, 2001, Navaisha, Kenya

the Royal Botanical Gardens in Kew, England. The People and Plants Initiative has established a node at the Herbarium linking electronic data between the two on East African plants and enabling KENRIK and Kew Gardens to share information and continue to build and update SEPASAL³⁰.

South Sudan

In South Sudan, it is estimated that more than 70 percent of health care is provided by the traditional medicine sector which includes herbalists, spiritualists/diviners and bone setters. The Health Policy of the New Sudan³¹ recognises the role traditional healers play and acknowledges this with the statement: "There is a need for research into traditional medicine and the need to make it available for the majority of the people of the New Sudan". It notes that "many types of alternative medicine ...are practised because they often relieve or satisfy the sufferer and because there may be no other form of treatment available". The Policy also notes the constraints facing the health and medical service are the "lack of use and research into traditional medicine". The communities of South Sudan are knowledgeable about the plants used for remedies for common ailments such as diarrhea, fever, headache, jaundice, intestinal worms and for local treatment of snakebites, infertility and bone setting.

In the 'Guidelines for the Implementation of the Health Policy of the New Sudan'³² under the Pharmaceutical Inspectorate, traditional medicine is referred to "an essential part of a new Sudan's culture and hence there is a need to harmonise it with the health care system. The Board (Pharmacy and Poisons Board) shall... provide specifications for the practice and utilization of the medicines". The Secretariat of Health's 'HIV/AIDS Policy and Control Strategies for the New Sudan' of April 2001 includes community participation in its strategy and awareness raising through community mobilisation.

Strategic Objective 7, 'Increased use of health, water and sanitation services and practices', of USAID Sudan Interim Strategic Plan's (2004-2006) notes that it is now "undertaking a major development investment in health transformation in southern Sudan ... Its primary health care programme will help strengthen the local health authorities' policies which prioritize community-based health care".³³ This could not only include traditional medicine and the use of plants for herbal remedies but an active programme of integration or collaboration between conventional medical and traditional health practices and care given to the community. Regional examples of training traditional healers and conventional medicine collaboration, primarily in the treatment of HIV/AIDS related illnesses, can be applied to primary health care in general. Traditional birth attendants (TBA) who are traditional health practitioners, have been included in conventional primary health programmes in recent years including collaboration with the clinic/hospital for training, referrals and provision of kits for home births.

³⁰ Survey of Economic plants for arid and semi-arid lands – SEPASAL –database at the Royal Botanical Gardens, Kew, England

³¹ 'Health Policy of the New Sudan, Sudan Peoples Liberation Movement, October 1998

³² 'Guidelines for the Implementation of the Health Policy of the New Sudan' May 1999

³³ 'Sudan Interim Strategic Plan 2004-2006', United States Agency for International Development (USAID), June 2003

II. Ethnobotanical Study in Rashad County, Nuba Mountains and Kurmuk County, Funj Region/Southern Blue Nile

1. Background

The Nuba Mountains in Southern Kordofan State, western Sudan are the home to over 50 tribes whose lives follow a similar pattern but they do not share a homogenous culture; language being one example with over 40 languages spoken within the region. These include Lira, Tabanya, Tira, Abul, Tulushi tribes and languages. The area includes four counties – Rashad, Kadugli, Lagawa and Dilling. The study area was in Rashad County which has four payams – Ildo, Kumbar, Irral, Kawalib with 76 villages and a current population estimated at 200,000. The land is fertile and rainfall plentiful while the terrain's rocky and inaccessible nature has provided its people with some protection through turbulent times in the history of Sudan. Population figures for the SPLM area of Nuba mountains vary according to the source but the 2003 figures from NRRDO³⁴ estimate is 500,000 with returnees.

The Funj region or Southern Blue Nile covers about one-third of the Blue Nile State, Eastern Sudan bordering on Ethiopia and has been under the control of the SPLM since the mid-1990s. It comprises two counties Geizan and Kurmuk with nine tribes and the Mabaan who have been displaced from Upper Nile state by the fighting. These are Barta, Urduk, Jumjum (Mayak area), Ngazina (Sale/Kayli), Regarik (Mayas area), Hamijj (Kayli area), Burunn (West Jorot to Mayak), Moopo (Mayak) and Ganza (Yabus). Geizan county payams are Amora, Fazugli, Bakori, Yakuro, Nazile-Hermura (displaced people from the fighting) and those of Kurmuk are Kayli, Kernkern, Yabus and Kurmuk. The population in Kurmuk county is over 100,000 and that of Southern Blue Nile is estimated at 250,000³⁵.

Throughout the civil war of the last two decades the population of the SPLM area of the Nuba Mountains and that of Funj region/Southern Blue Nile have been virtually self-reliant for provision of basic healthcare. Even today living in ceasefire conditions and ongoing negotiations for implementation of a peace agreement, most of the population relies on plants to provide herbal remedies, family knowledge which is handed down from generation to generation, or visits to the 'kujur' or traditional healer provide treatment for many ailments. The years of fighting have lost young men and women who would normally receive the knowledge of the plants from their elders. In Rashad County, healers are scattered and live at great distances from one another. In both Rashad and Kurmuk counties, many woman have taken the role of providing herbal remedies in the community in the absence of a formal traditional healer. There are no traditional healer associations in either Rashad or Kurmuk counties.

The following ethnobotanical study was carried out in the SPLM³⁶ held area of the Nuba Mountains and Funj Region/Southern Blue Nile, both accessed through northern Kenya by aircraft. The fieldwork was carried out during 10-day visits to each area in November 2003. The rainy season had ended in the Nuba Mountains but was ongoing in Southern Blue Nile. This proved a significant constraint on accessing the surrounding areas of Kurmuk town or further afield as the dirt roads and tracks were not passible with a vehicle either due to flooding or the black cotton soil. In the Nuba Mountains the rocky terrain and large distances over the mountains proved to be a constraint with regard to reaching different payams by vehicle as these belonged to ongoing programmes and were therefore not easily available for lengthy trips.

2. Purpose of Study

The field trips' objective to both the Nuba Mountains and Southern Blue Nile was to carry out an initial ethnobotanical study to gather information on, and document the use of, plants and non-timber products in traditional medicine; ways in which the healers sustain this use; the nature of the traditional medicine practised and to conduct initial discussions with the community, local authorities, conventional medical practitioners and healers on the concept of traditional healers working together or in collaboration with conventional medical workers in the provision of primary health care throughout the regions both at a curative and preventive level.

³⁴ NRRDO – Nuba Relief, Rehabilitation and Development Organisation, a Nuban non-governmental agency (NGO) working closely with SRRC (Sudan Relief and Rehabilitation Commission)

³⁵ SRRC Southern Blue Nile 2003

³⁶ SPLM – Sudanese Peoples Liberation Movement

The latter is based on the fact that the traditional healer and traditional medical practitioners (so as to include traditional birth attendants) are respected and trusted by the community; are accessible and the herbal treatments are affordable; and have been time-proven to be effective in treating many common illnesses/ailments.

Integration of traditional medicine and conventional medicine systems does not necessarily mean the two systems become one; the two may exist in parallel and use a cross referral system as appropriate. WHO defined three types of health systems according to the degree of integration of traditional/conventional medicine into the national health care system: integrative, inclusive and tolerant. Integrative is exemplified by China or Korea where there are "schools of traditional medicine and it is part of the national health and drug policy; providers and products are registered and regulated; therapies are available at hospital and clinics and treatment is reimbursed under the health insurances".³⁷

An earlier study carried out in Yambio County in Western Equatoria in 2002³⁸ observed the nature and extent of traditional medicine currently being practised in that area. The findings based on interviews with the community and traditional healers showed that the use of medicinal plants is widespread in the region and more than 40 illnesses are treated with traditional medicine. Some of the traditional healers used spiritual remedies in addition to herbal; others specialised in bone setting. Many healers are men while the women use traditional medicine for the family.

3. Methodology

In this study, interviews were also conducted with members of the community, local leaders, traditional healers based on a simple questionnaire and discussions held with conventional medical workers. Traditional birth attendants are practitioners of traditional medicine and were interviewed as part of the community meetings but 'traditional healer' in this study describes traditional practitioners other than these traditional midwives. It is noteworthy that most development programmes have provided training for traditional birth attendants in their mother and child care or primary health care programmes often including provision of kits for their deliveries.

The questionnaire followed a similar format to that used in the Yambio study. No consent form was used as the interviewees did not deem this necessary and in part was due to the oral tradition of many healers and community members. It was verbally agreed that any information shared would be acknowledged and any benefits shared with those (and/or the community) who provided the initial information.

With the help of an interpreter from the area, meetings were held following earlier discussion on the study and its objective with the area's authorities, with the local leaders, healers and community members. The purpose of the meetings and study was explained and in particular it was hoped that the results of the study would benefit their community and contribute towards improving the provision of health care to their areas in the long term. Everyone was receptive to the ideas behind carrying out the study, including documentation of plants used in traditional medicine remedies and its longer term objectives. Many people gave plant medicine information freely especially the community members and women's groups members. The traditional healers varied in their expectation of benefit they would receive in exchange for sharing this knowledge. This was discussed at the outset. It was emphasised that any money given was small gift as a token of appreciation for sharing the knowledge. One healer asked for money to slaughter a hen as it was customary to do so after such a meeting; another asked for a hand held grinder to help prepare his herbal remedies.

Samples of the plant parts used for the treatment of various ailments/illnesses/symptoms were collected along with the leaf if it was the root that was used to help with later botanical identification. At the time of the study most tree/shrubs were not in flower nor producing fruit/seeds. This made it difficult for some specimens to be identified by the Museums of Kenya Herbarium ethnobotanist and these remain unidentified until another specimen with either flower or fruit/seed can be collected during a future study in the area.

³⁷ World Health Organisation (WHO) Traditional Medicine Strategy 2002-5

³⁸ 'Preliminary Survey of Traditional Medicine Practices in Southern Sudan', Huda Abuzeid, 2002

The samples were pressed and dried using a basic plant press for further study and botanical identification. This identification was carried out by an ethnobotanist who offered to do this in her own time as time in Kenya was short after the field work. The Museums of Kenya Herbarium do offer a service of identification by their staff in addition to the normal work of the herbarium. It can take some time, a minimum of several weeks and cost is per specimen.

There were no chemical analyses nor toxicology tests run on any of the specimens – both fresh plant parts and some dried and powdered from a few healers – from this initial study as a review of existing information in these fields needed to be first carried out so as not to duplicate research results already existing. In addition, these initial findings need confirmation and reviewing of the use of any plants claimed to treat a particular illness in other areas of the region and South Sudan before any analysis is carried out. One plant can contain hundreds of natural constituents and therefore determining which has the therapeutic effect, or several if there is any synergy, can be a costly and lengthy process.

Further regional ethnobotanical studies could be carried out by locally trained teams per county or payam so that the large distances and the languages (an advantage with regard to the local names of the trees) would not be a constraint in gathering accurate information.

(i) Questionnaire

(a) Personal information

1. Date of meeting/interview/discussion
2. Name, Age, Gender.
3. Area of residence, Area of origin
4. Tribe, Religion

(b) Traditional healer/user of medicinal plants

5. Role within community – Do you hold another position in the community other than that of traditional healer?
6. Source of knowledge of medicinal plants/traditional medicine – How did you learn your knowledge?
7. Number of years practising as a healer – How many years have you been practising?
8. Areas of healing practised – What type of traditional medicine do you practise? (use of herbal remedies, bone setting, spiritual power..)

(c) Medicinal Plants

9. Source of herbal remedies and preparations – Do have a medicinal garden? Where are the plants found and collected and by whom? How and who prepares the remedies?
10. Sustainability of use of plants –How are the plants collected/harvested; are there any replacement planting
11. Illnesses/ailments/symptoms treated –What type do you treat? Are there some illnesses you do not treat?

(d) Knowledge sharing

12. Links with other healers – Are there any associations or do healers refer patients to each other? Would you be interested in forming a Traditional Healers Association to facilitate collaboration, sharing and comparison of knowledge and use of various plants with other healers?

(e) Patients

13. Do you treat any member of the community? What are the age groups, gender of patients?
14. Fees for treatment – How do patients pay for the consultation/treatment?

(f) Integration of tradition and conventional medical systems

15. Links to conventional medicine – Are any cross referrals made? Has there been any collaboration? Do both systems of health care exist only running in parallel?
16. Integration of traditional and conventional health systems - Would you like to see the two systems working together?

4. Findings

In the areas visited in both the Nuba Mountains and Southern Blue Nile, the community and its leaders explained that there were few 'official traditional healers'. In the former, large distances over difficult terrain and mountains often separate a village and its inhabitants from the residence of the healer. In the event of a person taking ill, the knowledge of the family, and collectively of the community close by, is called upon to decide the plant medicine to use for treatment. In Southern Blue Nile, access also played a part and many community members noted that there had been conventional clinics to visit in the past. Herbalists were trusted to provide treatments but some people were reluctant to attend a healer who included spiritual or a 'magic' component in their treatment.

Thus, in the group interviews the women in particular shared a large amount of plant medicine knowledge. In Southern Blue Nile, however it was the men who were the keepers of much plant medicine knowledge. In both regions though, both men and women of the community knew how to treat common ailments – which plants to use, what part of the plant, how much of the part and what preparation to use and the treatment regime. The common ailments described were diarrhea (bloody and non-bloody), intestinal worms, 'malaria', joint pains/joint stiffness, 'rheumatism', headache, fever and cough.

Personal Information

In both regions, meetings and interviews were carried out during October/November 2003.

In Rashad County 11 healers and in Southern Blue Nile eight healers discussed their work, knowledge and remedies during the meetings. Over 40 community members and local leaders in each region discussed their knowledge of plant medicine, the symptoms of different illnesses and the plants they prepare for home herbal remedies at different meetings during the study period. The healers' ages varied between 30-years-old to over 70. The majority of healers met during this study were men. All of the healers were residing in their areas of origin.

In Rashad County healers hailed from three tribes: Tira, Lira and Abul. In Southern Blue Nile, healers hailed from Barta, Urduk and Mabaan tribes. The majority of the healers are Muslim in both regions which are otherwise Christian.

Traditional Healer/User of Medicinal Plants

Role within Community

In both regions, the traditional healers were known for this role and did not hold another community position. As noted earlier there were few formally named as traditional healers, or 'kajour'³⁹, and many community members held extensive knowledge of herbal remedies. Some could also set bones. In a women's community meeting of 12 it was agreed about half of their healthcare was provided at the clinic/hospital – Save the Children and the German Emergency Doctors clinic/inpatient facility of Ildo Payam – but in Cloda in Kawalib Payam, in the absence of any clinic, all the people's health care was provided by plant medicine. Some women collect and prepare herbal remedies at home and either sell them in exchange for sorghum or provide them free of charge.

Those formally known to be healers were men in the majority. One woman healer lives in Kauda and is also known for being able to 'see into the past', will 'know who is putting bad energy on another person' and can interpret dreams. She has been a healer using herbal remedies for 20 years.

Another healer in the Nuba mountains who, with his first wife, suffered from leprosy were treated with conventional drugs at a treatment centre in northern Sudan for a year over two decades ago. He treats leprosy in his practice with the bark of mahogany, ablaile, alele, abdam and yet ⁴⁰ trees. The bark is crushed into a powder, water is added and the mixture is drunk twice daily for 20 days.

³⁹ Kajour – phonetic spelling of the Arabic name used in general to describe a healer but also denotes the use of spiritual powers that some healers use in their practice

⁴⁰ four tree names are the phonetic arabic name

Source of Knowledge of Medicinal Plants/Traditional Medicine

Most healers were taught by their fathers or grandfathers. One healer was given his knowledge by his elder brother and it is his belief that in compensation for holding and using this knowledge, his health and wellbeing is protected.

One healer received his knowledge on treatment of rabies in a dream and will only treat this one disease⁴¹. He tells that he was suffering from rabies – describing the disease as when a crazy dog bites a person – at the time of the dream. He treats with locally named mixture called kaudro, korlow tree bark together with breedi shrub. The bark is crushed into a powder, mixed with water and drunk twice a day for two days.

Number of Years Practising as a Healer

Most of the healers from both regions had been practising over 10 years. The range was from 10 to 25 years.

Areas of Healing Practised

All healers use plants for preparation of herbal remedies. Some use spiritual powers and 'grumble' to help with diagnosis; one uses the Koran for direction in diagnosis. One man makes 'protection' amulets. These are sewn leather within which is a mixture of herbs depending on the protection required is placed. The amulet is then worn around the neck or around the upper arm. Another healer uses a paper passed over a flame which brings up a brown pattern on the paper. This is then immersed and boiled in small gourd. From this the healer makes his diagnosis. He also provides herbal remedies based on the patient's description of symptoms. The same healer lifts curses from people who are paralysed or who have a twisted neck (torticollis) by making a drink concoction of skin of hippo, chameleon skin, tusk of elephant and parts of the hibib (local name) tree.

Medicinal Plants

Source of Herbal Remedies and Preparations

Most healers collected their own plants from the forest and surrounds, although an elderly healer has someone to collect those plants that are too far away for him to walk to. One healer would go to the forest for seven days and collect different plants during the course of the week at different times of the day. It is the belief of many healers that the same plant can have different healing properties according to how and when they are collected. This is in fact accurate in terms of plant properties being influenced by the time of plant collection and environmental conditions.

Certain healers grew certain plants within their home compound – a medicinal garden - but with many of the plant parts of remedies coming from large shrubs and trees collected from the wild. Any parts collected from a distance were dried and ground or cut into pieces as required. Many remedies use dried plant parts, however, if fresh roots are available these are often chewed as an alternative to powdered dried root.

Sustainable Use of Plants

Most users in both regions believe that the number of trees/shrubs far outweigh the users at this time so there is no active conservation taking place. The healers, however, agree that it is not good to ring cut the bark of a tree nor, when collecting roots, to uproot the shrub. The healers understand that it is better to dig and collect one root/part of the root system in order that the tree/shrub continues to grow and provide the medicine for the future. One particular threat to plant conservation is the practice of starting fires to burn the grass. These fires, which spread in any direction the wind takes them, destroys the young shoots of many shrubs and small trees in addition to burning the bark of the larger ones. This practice could in the future, threaten certain species used in plant medicine.

Illnesses/Ailments/Symptoms Treated

Children and adults are treated in both regions; the dose for children is often noted as half the adult dose of the plant part and for a baby, a quarter. Few healers would treat pregnant women for ailments associated with pregnancy and would leave this to the traditional birth attendant, however, they would

⁴¹ At the time of meeting it was not possible to ascertain whether he did not wish to share any further knowledge or whether in fact he did only treat people with symptoms of rabies. He was known to the payam leader but not having attended him, was unable to clarify.

provide herbal remedies for other illnesses. The trees or plants which are contra-indicated during pregnancy are widely known by the community. Side effects of these plants include miscarriage or severe vomiting.

Dosages are determined by hand measurements – base of the palm, a finger's length - or with a teacup, for example. Though not accurate nor ever exactly the same in terms of quantity, this method of measuring dosages has stood the test of time and generations for these herbal remedies. The size of the teacup, coffee cup or spoon is known in the region and is therefore a constant for that region in terms of amount of plant part or remedy taken using these items of measurement.

Treatment regimes often advise 'take until better' though many of the remedies discussed specify numbers of days, often no more than two or three days and rarely longer than one week.

People use a mixture of conventional medical terminology along with traditional beliefs such as someone putting bad energy on them to explain the source of weight loss or headache when attending healers. They will describe their symptoms – what a person complains of – and give signs – what can be seen/observed, heard/ auscultated and felt/palpated along with diagnoses when attending the traditional healer. The common symptoms described, and treated, are headache, stomach ache, feeling hot, body pains, skin itch, burning pain during urination, and flank pain. Signs included diarrhea, jaundice, body rash, fever and diagnoses such as malaria, rheumatism, hepatitis, gonorrhoea, syphilis, kidney infections, and dysentery were used. People are generally well informed about these illnesses and the symptoms and/or signs are in keeping with appropriate diagnoses of common illnesses/diseases.

Jaundice (seen as yellowing of the skin or whites of the eyes) is frequently treated by the healers in both regions using several trees (see table) and eating the meat of a small mountain rodent (ratlike animal with pointed nose but no tail) locally known as a 'keko' (as opposed to a gecko of the lizard variety). It is believed by much of the community in Nuba Mountains that if someone has jaundice, that they should not go to clinic/ hospital as there is no treatment there or the medicine given does not work and they will not recover. In Kubar Payam jaundice is treated with a mixture of the locally named qarqan, kawal, duzel and letrow trees and again with 'keko' meat. Other meat is avoided until the person recovers.

In Kauda the women's group from the community believe the plants treat malaria better than any conventional medicine. Another group in Serafanila will however attend a clinic/hospital for chest pain, diarrhea with blood and malaria. The al moor tree root treats malaria and is used to chew for post-delivery uterine pain. Mental illness is treated in the Nuba Mountains by one healer with a mixture of the roots of six trees locally called datur, ahmer, aswad, kok, and arkalaby taking one teaspoon of the powder as a drink once a day for three days.

The healers do not specifically treat animals but the community has knowledge of some remedies. In both regions most of the animals are chickens or goats. They are treated for cough or when generally not well with onion and hot chilli pepper – 'sheta' –ground into powder and mixed with the feed, also the leaves or roots of the amillala and nyemata trees⁴². Hens suffering from vomiting and diarrhea are treated with the bark of *Sclerocarya birrea* (or hemet tree in arabic or marula in English) and powdered hot chilli pepper mixed together in their feeds. In Cloda, Kwalib Payam, staggering hens are treated with the bark of the korodour tree and hot chilli pepper powder mixed in water. Mahogany tree leaves are applied to the wounds of animals.

A healer in Kurmuk Payam has a herbal remedy which is claimed to effectively treat kala azar or systemic leishmaniasis. The healer was not willing to name the contents of the liquid treatment but would be happy for a sample to be taken and analysed for its activity. The treatment regime is given once and is a rectal injection of liquid –10ml injected twice – which results in passing of a large amount of faeces. This is followed by drinking the fruit of the locally named crawling plant, kumo/chum which has been mashed and filtered.

⁴² Vernacular name –arabic -spelt phonetically

A Note on the 'Chili Pepper,' *Capsicum frutescens*

The pawpaw/papaya and the chili pepper are two of the most commonly exported plants to Europe for their medicinal properties. Chili pepper is used around the world to topically treat rheumatism. In Switzerland one can find six different types of ointments for rheumatoid arthritis containing the active compounds from the chili pepper, otherwise known as *Capsicum frutescens*.

It is part of the Solanaceae family (also the tomato and potato family). This is a large family of about 90 genera and more than 2,000 species, most originating from South and Central America. It grows as a shrub or small tree up to two metres. Well drained soil suits its growth in temperatures of 18 to 21 degrees Celcius. Leaves alternate with flower sepals united to form a cup and the fruit, a berry with seeds, which turns from green to red as it ripens.

One of the active compounds is the enzyme capsaicine which produces the therapeutic effect. Ground chili peppers are mixed with oil and massaged into the affected area. Extracts from its leaves and fruit show disinfectant activity and an anti- parasitic effect against *Schistosoma mansoni* which causes bilharzia/schistosomiasis.

Also of note is the fact the Thais consume large quantities of chili peppers and seldom suffer from a heart attack/myocardial infarction. This is attributed to capsaicine which has a clot dissolving/fibrinolytic action.

In addition to topical treatment of rheumatism it is used to treat flatulence and haemorrhoids indirectly by destroying any fungi in the bowel/intestines which aggravates the haemorrhoids – shingles/herpes zoster, diabetic feet (but not on open ulcers) and hair loss. The beneficial effect of the latter two is attributed to improvement of the blood circulation to the affected areas.

Some of the more unusual traditional medicine treatments described as effective include:

- the use of the root of a shrub, locally known in the Nuba Mountains as tamra ansucari, which is chewed with dates as a 'love potion'; a chicken is then slaughtered;
- in delayed labour the clothes of the husband are used to 'hit' the expectant mother and start labour;
- white or black 'ganga/gangawari (local name) plant bulb is ground with chili peppers and fatty meat and eaten for four days in the treatment of male impotency;
- earache is treated by pouring bile from a chicken's gallbladder into the affected ear.
- Another healer treats blindness with the blood of a yellow and red bird and both the community and healers were familiar with the treatment of a snakebite using a freshly killed chicken. This particular remedy calls for the neck of the chicken to be split and applied to the site of the bite and bound to it. It is presumed that the effect is one of osmotic and colloidal pressure drawing the poison out in a similar fashion to the action of the 'black stone'⁴³ which can be found in many a missionary's or humanitarian worker's baggage. Once the black stone has been used it is boiled in water, then milk or soap and again in clear water for 10 minutes. It can then be reused after drying.

⁴³ 'Black stone' is sold in many markets in Uganda but can be made easily as per reference of footnote 55. It is made from the middle third of a cow thigh bone – 4 x 1.5cm approximately; the bone is boiled in water followed by soap or sodium hydroxide (NaOH) to remove oils, followed by a second water boiling. Allow to dry in the sun for 5 days or in a solar oven for one. Handle carefully so as to keep the trabeculae/internal bone mesh intact. The outside appearance should be that of ivory at this stage. Wrap each piece in 2 layers of aluminium foil; place them in the centre of a fire –amongst the red glowing charcoal and cover with black charcoal. Check after 40 minutes. The pieces should be black and firm and stick to one's tongue (caution – once cooled).

The Abul and Tira tribe in the Nuba Mountains also use the tree ardiep, *Tamarind indicus*, for treatment of snakebites and in Southern Blue Nile the seeds of the crawling plant locally named irik d'abib's (*Ipomoea* species from the Convolvulaceae family) are swallowed to prevent being bitten by a snake and its fresh root used topically on the site of the bite.

Knowledge Sharing

Links with Other Healers

As noted earlier, there are no traditional healer associations currently and both the insecurity due to fighting and physical distances and terrain have not been conducive to meeting other healers. The healers expressed interest in forming an association to facilitate collaboration, sharing and comparison of knowledge and use of various plants with other healers. It was thought that documenting the plants to form an 'atlas' of plants of South Sudan was good so as to ensure that the knowledge is not lost, although concern was expressed about benefit sharing – how, who would benefit and what form would this take. Some healers felt that the plants are owned by noone and the community as a whole should share the benefits while any benefit from a specific treatments prepared or given by a particular healer should go to that healer.

Patients

All members of the community; all ages and both male and female are welcome at the healers' clinics/houses but some healers will only treat certain illnesses and a bone setter will often only set bones.

Fees for Treatment

Payment for treatment usually is known before treatment though sometimes a healer will stall on setting the fees for treatment until after it is complete. This may be in excess of the patient's ability to pay but can be paid in installments; there is no set fee for a particular treatment. Standardisation of fees charged is something that is being addressed in other countries in Eastern Africa along with other appropriate legislation. Payment varies from cash (Sudanese dinar and also Ethiopian birr in Southern Blue Nile) to grain or a chicken, for example.

Integration of Tradition and Conventional Medical Systems

Links to Conventional Medicine

There are no formal links as noted above, people in these regions use traditional medicine often exclusively. Sometimes, however, people will attend a conventional medical clinic if one is within walking distance and if no relief can be obtained from traditional medicine.

Integration of Traditional and Conventional Health Systems

Both the community and the individual healers expressed interest in working within the health system and with conventional medical practitioners; the latter expressed some concern over the lack of standardisation of dosages, study and knowledge of the safety and efficacy of the herbal remedies and traditional medical practices.

See Appendices for tabulated information on:

(i) Identification

- the vernacular and botanical – genus, species, family-names of the samples collected
- description of the plant
- location in Rashad and Kurmuk Counties
- distribution of the plant in Africa (source was SEPASAL database at the Royal Botanical Gardens, Kew, England)

(ii) Specific Use

- the plant part used in treatment of symptom/illness
- description of illness/symptom/sign
- body system/medical category into which the above description falls
- treatment regime

- medicinal use outside South Sudan (sources were primarily SEPASAL database and occasional use of *Medicinal Plants of East Africa* by J. Kokwaro and *Trees and Shrubs of East Africa* by N. Dharani)

(iii) General Use

- general use of the plant; for example: poisons, food, and any chemical analyses noted (source was also SEPASAL).

Those samples not identified by their botanical name are listed using the local name or, in its absence, another local language name (phonetically written).

5. Recommendations for Follow Up

As a preliminary study the findings support the view that traditional medicine serves the primary health care needs of the majority of the population in the region. The conventional medical clinics and hospitals, though providing both curative and preventive health services, are few in the regions and are supported by humanitarian organisations at the present. There is much general health knowledge held within the communities, both on diagnosis of symptoms of common illnesses and on the plants which provide effective treatment.

Recommended follow up to this study would be to:

- Confirm the findings, in particular where claims of a plant's action is that of treating serious disease such as malaria, hepatitis or kala aza with a view to perform chemical analysis of active compounds, toxicology and efficacy studies. It could be expected that a select few plants would then go on to be part of a clinical trial in the longer term.
- Identify the specimens that could not be identified without a sample of the flower, fruit or seed by re-visiting the areas and collection of said samples.
- Carry out further ethnobotanical studies in the other three counties in each payam; these being Saraf-Jamos, Ngorban, Dmama, West Kadugli in Kadugli County; Tulishi, Tima, Tabag, Kamda, Abu-Junuk in Lagawa County and Timien, Kiali, Julud, Kattla, Golfan, Nyimang in Dilling County in the Nuba Mountains. In addition, confirm the studies in the four payams of Rashad County and Kurmuk County. As noted earlier, the time in and around the rainy season makes access to some payams extremely difficult.
- Conduct further surveys using local teams with training in basic collection, drying and preservation of plant samples. Additionally, if the team members were well-versed in the purpose and objectives for collecting such data this would be an advantage from a language and trust perspective in particular. This would facilitate gathering of accurate information.

6. Contacts/Resources

Nuba Mountains

Abdel Aziz Adem el Hilo	Governor of SPLM area of Nuba Mountains
Commander Ismael Khamis	Deputising for Governor
Elijah Madawa	Kadugli County Health Supervisor
Adam Ali	Deputy Director of Health
Musa Abdulbagi	Director of Health
Majoub Ismael	Health Coordinator, NRRDO
Mohammed Musa	Deputy Health Coordinator, NRRDO
Ajoub Musa	Deputy Commissioner
Amna Al Shiyabul	Head of Women's Group, Kauda, Ildo payam
Hawa Albi	Traditional Healer, Ildo payam
Mariam	Traditional Healer, Ildo payam
Mazgoul	Traditional Healer, Ildo payam
Abdullah Chawri	Traditional Healer, Ildo payam
Del Dom	Traditional Healer, Ildo payam
Hussein Mudir	Payam leader, Kumbar payam
Daoud Osman	Payam administrator, Kumbar payam
Samuel Ismael	Rashad County Health Supervisor
Theresa Abdullah Amoda	Head of Women's group, Toura, Kumbar payam

Khamis Koko	Traditional Healer, Irral payam
Musa Ismael	Deputy Payam Leader, Kawalib payam
Abdullalai Saeed	Traditional Healer, Kawalib payam
Abdullah Kdrube	Traditional Healer, Kawalib payam
Ali Noor	Traditional Healer, Kumbar payam
Morege Cody	Traditional Healer, Kumbar payam

Southern Blue Nile/Funj Region

Malik Agar	Governor of Southern Blue Nile
Saddiqq Buba	Kurmuk payam leader
Ramadan Yassin	Yabus payam leader
Adil Khaffalh	Kayli payam leader
Rajib Atuta	Kernkern payam leader
Bala Nile	Gizan payam leader
Dr Atare	Health coordinator, Health Secretariat of Civil Authority of Funj
Abdullah Ali	Executive Director of SRRC
Mohammed Suleiman	Deputy Director of SRRC
Sheik Yousef	Traditional Healer, Kurmuk payam
Adulrahman	Traditional Healer, Jorot, Kurmuk payam
Mahjoub Harris	Traditional Healer, Kurmuk payam
Shadia Ismael	Chairwomen of Women, Gender and Child Welfare Secretariat
Martha	Traditional Healer, Kurmuk payam
Boutros	Traditional Healer, Kurmuk payam
Fathma	Traditional Healer, Kurmuk payam
Yacoub Bajil	Traditional Healer, Kurmuk payam
Gaffa Walbo	Traditional Healer, Kurmuk payam
Showne	Traditional Healer, Kayli payam

III. Integrating Traditional Medicine and Primary Health Care

1. Traditional Medicine and Primary Health Care

It was as early as 1968 that the AU Scientific and Technical Research Commission (STRC), which was set up in 1964, organised the Inter-African Symposium on the Development of African medicinal plants in recognition of the role of medicinal plants in provision of healthcare throughout Africa. The role of traditional medicine in primary health care in Africa was noted in the Alma Ata Declaration of 1978 at the International Conference on Primary Health Care.⁴⁴

Primary health care as defined at Alma Ata, “addresses the main health problems in the community, providing promotive, preventive, curative and rehabilitative services accordingly”. It describes health as a “state of complete physical, mental and social wellbeing and not merely absence of disease or infirmity”.

The Declaration focused on the key role of primary health care as a means for “attainment of all peoples of the world by the year 2000 of a level of health that will permit them to lead a socially and economically productive life.⁴⁵” When over 80 percent⁴⁶ of people in Africa attend traditional medical practitioners for their health needs, protection of the plants providing treatments and the knowledge of their uses is significant.

It notes that primary health care “relies, at the local and referral levels, on health workers, including physicians, nurses, midwives, auxiliaries, and community workers as applicable, as well as traditional practitioners as needed, suitably trained socially and technically to work as a health team and to respond to the expressed health needs of the community.”⁴⁷

Point VI notes that health care should be “..... accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford and maintain at every stage of their development in the spirit of self-reliance and self-determination”.

The last two decades have been witness however, to the fact that conventional medicine⁴⁸, as a vehicle for the provision of primary health care, is not accessible nor affordable to the majority of people living in the eastern Africa. The World Health Organisation (WHO) has described traditional medicine as “one of the surest means to achieve total health care coverage of the world’s population.”⁴⁹

At the 2000 Regional Strategy meeting of Ministers of Health, convened by the WHO Africa office, in Ouagadougou, Resolution AFR/RC50/R3 was passed on the African regional strategy titled ‘Promoting the role of Traditional Medicine in Health Systems’. In May 2001 the African WHO Expert Committee on Traditional Medicine was established. Since then a document produced by WHO’s regional office for Africa based in Brazzaville, Republic of Congo⁵⁰ outlines the implementation of this regional strategy under the regional Traditional Medicine Programme. This has the responsibility of promoting “the rational use of traditional medicine within sustainable health care systems, bearing in mind specific socio-cultural environments”⁵¹ and could serve as a framework for developing a healthcare system which integrates traditional and conventional medicine in the provision of primary and preventive health care in South Sudan⁵².

⁴⁴ Conference held at Alma Ata, USSR 6-12 September 1978 by World Health Organisation (WHO)

⁴⁵ Point V of Alma Ata Declaration

⁴⁶ WHO Traditional Medicine Programme Strategy

⁴⁷ Point VII, 7 of Alma Ata Declaration

⁴⁸ Conventional medicine /conventional medical/biomedical workers –includes the use of pharmaceutical products in treating patients as opposed to herbal remedies directly from medicinal plants parts used in traditional medicine by a traditional healer/health practitioner

⁴⁹ ‘Medicinal Plants and Traditional Medicine in Africa: Constraints and Challenges’; E. Rukangira, Conserve Africa International (CAI), Nairobi, Kenya

⁵⁰ Traditional Medicine Programme, Division of Health Systems and Services Development, WHO Regional Office for Africa (AFRO)

⁵¹ WHO AFRO Traditional Medicine Programme mission statement

⁵² SPLM areas of south Sudan also named New Sudan by SPLM

The Regional Strategy's priority interventions are as follows:

- "Policy Formulation and legal framework at country level and at a regional level – guidelines for the formulation and implementation of national traditional medicine policies; model legal framework for practice of traditional medicine; model code of ethics for traditional health practitioners; African traditional medicine day on 31 August each year.
- Capacity building- training modules for doctors, pharmacists, traditional health practitioners, nurses and traditional birth attendants with country level examples of institutes for such training – School of Alternative Medicine and Technology in Kenya, The Zimbabwe School of African Traditional Medicine, and courses -Diploma courses for medical doctors in Ghana, Bachelor of Science in Natural Medicine in Zimbabwe, Diploma courses for traditional mental health practice, for traditional bone setters, and traditional herbal medicine in Nigeria. At a regional level development of education objectives for African Traditional Medicine at the three levels of education; training manual on Primary Health Care for traditional health practitioners; training manual on traditional medicine for conventional health practitioners and health science students.
- Research Promotion at country level – evaluation of herbs for HIV/AIDS; establishment of a Task Force on Traditional Medicine and AIDS in East and Southern Africa including NGO's promoting Traditional Medicine such as PROMETRA in Senegal and THETA in Uganda; evaluation of antimalarials, sickle cell anaemia, hypertension and diabetes and at a regional level – model protocol for ethnomedical evidence and clinical evaluation of traditional medicines used for the treatment of people living with AIDS and of traditional medicines used for the treatment of uncomplicated malaria, sickle-cell anaemia, hypertension and diabetes.
- Development of local production at country level and at regional level action for local production of traditional medicines and regional framework for registration of traditional medicines.
- Intellectual property rights at country level , regional – ARIPO/OAPI and at regional level a tool for documenting African Traditional Medicine and a regulatory framework for the protection of traditional medical knowledge and equitable benefit sharing."

Recognition of the importance of traditional medicine for Africa was given at the OAU⁵³ Summit, July 2000 in Zambia, and following a proposal from Uganda, 2001-2010 was declared the 'Decade for African Traditional Medicine'. In May 2002, WHO's Regional Director for Africa, Ebrahim Samba, is quoted as saying: "About 80 percent of people in Africa use traditional medicine. It is for this reason that we must act quickly to evaluate its safety, efficacy, quality and standardization – to protect our heritage and to preserve our traditional knowledge. We must also institutionalize and integrate it into our national health systems". In 2003, The Director-General of the WHO nominated 31 August each year as Traditional Medicine Day.

Outside Africa, within the last two decades non-conventional or alternative/complementary medicine⁵⁴ has been recognised both at policy and legislation level. For example, the US Congress established an Office for Alternative Medicine in the National Institutes of Health in Bethesda, Maryland in 1992. This mandate was extended in 1999 and the Office became the National Centre for Complementary and Alternative Medicine (NCCAM). The year 2000 saw the setting up of the White House Commission on Alternative Medicine which is charged with developing a set of legislative and administrative recommendations to maximise the benefit of complementary and alternative medicine for the general public.

In the spirit of the above Decade for African Traditional Medicine, the WHO's Traditional Medicine Programme, which began work in 1976, developed a Traditional Medicine Strategy for the Years 2002-2005. The global strategy defines "traditional medicine (TM) as including diverse health practices, approaches, knowledge and exercises applied singly or in combination to maintain well-being, as well as to treat, diagnose or prevent illness".

The strategy's four objectives are as follows:

⁵³ Organisation for African Unity which was renamed May 2002 as African Union (AU)

⁵⁴ see page 17 for WHO definition

1. Policy – Integrate TM/CAM⁵⁵ with national health care systems, as appropriate, by developing and implementing national TM/CAM policies and programmes. (develop policies; protection and preservation of indigenous TM knowledge relating to health)
2. Safety, efficacy and quality – Promote the safety, efficacy and quality of TM/CAM by expanding the knowledge-base on TM/CAM, and by providing guidance on regulatory and quality assurance standards; increase access to and extent of knowledge, with emphasis on priority health problems such as malaria and HIV/AIDS; and regulation of herbal medicines.
3. Access – Increase the availability and affordability of TM/CAM, as appropriate, with an emphasis on access for poor populations; recognition of the role of TM practitioners in health care; encourage interaction and dialogue between TM and allopathic practitioners; and protection of medicinal plants.
4. Rational use – Promote therapeutically sound use of appropriate TM/CAM by providers and consumers.

2. Toward Integration of Traditional and Conventional Medicine in the Provision of Primary Health Care

The combination of ethnobotanical and ethnomedical studies can provide the basis from which collaboration between traditional and conventional/modern medical practitioners can ensue. In addition, Alan Hamilton proposes that *Applied Ethnobotany* can contribute to sustainable development in the following ways:

- Conservation of plants (including varieties of crops) and other forms of biological diversity.
- Botanical inventories and assessments of the conservation status of species.
- Sustainability in supplies of wild plant resources, including of non-timber products.
- Enhanced food security, nutrition and healthcare.
- Preservation, recovery and diffusion of local botanical knowledge and wisdom.
- Reinforcement of ethnic and national identity.
- Greater security of land tenure and resource ownership.
- Assertion of the rights of local and indigenous people.
- Agreements on the rights of communities in protected areas.
- Identification and development of new economic products from plants, for instance crafts, foods, herbal medicines and horticultural plants.
- Contributions to new drug development

He notes that emphasis should be made to develop undergraduate and postgraduate courses and programmes in Applied Ethnobotany throughout the East African region.

A survey carried out in 1997 confirmed there were very few ethnobotanical courses in Africa although 1,500 students were learning something about the subject⁵⁶. Since then Uganda has taken the lead in East Africa where the Department of Botany at Makerere and Mbarara University of Science and Technology both offer three year undergraduate programmes in Ethnobotany. The Kenyatta University Department of Botany in Kenya plans to start an MSc programme in Ethnobotany. Both Departments of Botany teach elements of ethnobotany as does the University of Dar es Salaam in Tanzania though there is no full course of Ethnobotany in Tanzania.

The aim of the *People and Plants Initiative*, a joint effort on the part of the World Wildlife Federation, UNESCO and Kew Gardens, has been to build the capacity in ethnobotany among individuals and institutions with activities which include training of ethnobotanists and support for development of networks and courses. Ethnobotany is closely related to other subjects including economic botany which concentrates on plant products and their uses and medical botany which used to be part of doctors' education in Europe and is still taught as part of integrated medicine in China at more than 30 universities and colleges teaching Traditional Chinese Medicine.

⁵⁵ Traditional Medicine/Complementary or Alternative Medicine

⁵⁶ Hoft & Hoft 1997

The Royal Botanical Gardens, Kew (England) is the home of the SEPASAL database of wild and semi-domesticated plants of tropical and subtropical drylands. This database was started with an initial grant from OXFAM in 1981 (see databases) and continues to build its information from ethnobotanists work in the drylands. It is developing a 'node' at the National Museums of Kenya (NMK) to increase the collaboration which has existed for many years between its East African Herbarium and Kew Gardens.

Ethnobotanical networks in Eastern Africa were established first in Uganda in 1997 with the Uganda Network of Ethnobotanists and Ethnoecologists (UGANEB) followed by the establishment of the Kenya Ethnoecological Society (KES) in 2000 and the Tanzanian Society of Ethnoscience in 2002. The goal of these networks is to share and collaborate on work in this field. Following the Harare XVth Conference of the Association for the Taxonomic Study of Tropical African Flora (AETAT), the African Ethnobotanical Network (AEN) was developed in 1997. The Network reviewed literature of ethnobotanical studies and placed these in the AETAT library. The Network recognises ethnobotany as a scientific discipline and an appropriate tool in the management of plant resources. The Natural Products Research Network for Eastern and Central Africa (NAPRECA) was established in 1997 to review phytochemical studies of African plant species in current literature.

In addition to development of such courses and networks, traditional medicine courses for medical schools and training for traditional medical practitioners such as noted in WHO's Regional Traditional Medicine Strategy could be part of the framework within which collaboration of the two health systems in provision of primary health care could be developed for South Sudan.

The WHO developed the curricula, '*Traditional Practitioners as Primary Healthcare Workers*,' in 1995⁵⁷ so that primary health workers from various countries could tailor their own specific courses according to the trainees' level of education and local conditions. The curricula was divided into the following sections: planning, content, method, training materials, training of trainers, and evaluating training. More recently the Regional WHO Office in Brazzaville, have produced a '*Training Manual of Traditional Medicine for Health Sciences Students and Conventional Health Practitioners*'. This was completed in draft form in June 2003 and is to be finalised following discussion at the November 2003 conference on traditional medicine and malaria, TB and HIV/AIDS in South Africa.

In addition, WHO-AFRO and CIDA have collaborated to develop training modules on primary health care and malaria for conventional health practitioners and traditional health practitioners which were completed in February 2003. Further modules, in keeping with the WHO Regional Traditional Medicine Strategy, on HIV/AIDS, sickle-cell anaemia, diabetes mellitus, and hypertension are being developed. In addition, collection of ethnomedical evidence and clinical evaluation of traditional medicines used for the management of uncomplicated malaria is ongoing.

As noted by many authors and authorities the lack of documented information on the source, chemical characteristics, efficacy and safety levels of traditional medicine made from plants is never as poignant as in South Sudan where any research and information on this has been lost over the last two decades.

A lot of information on ethnobotanical studies of plants of Sudan, in particular four regions, exists at the Medical and Aromatic Plants Research Institute (MAPRI) in Khartoum. This information, though at present not easily shared with South Sudan, would become accessible should a peace agreement be implemented. The flora of some of the studied regions is similar to that of South Sudan and therefore would be an excellent source of information for comparison and reference (in addition to other sources such as SEPASAL database) for ethnobotanical studies in South Sudan.

MAPRI was originally a research unit established in 1973 by the National Council for Research and became an Institute in 1983. In 1992 the Traditional Medicine Research Institute joined the Medicinal and Aromatic Plants Research Institute. The activities undertaken by MAPRI include the production of an Atlas of Medicinal Plants of Sudan (Materia Medica) which is a compilation of the following four regions: the Erkowit region in North-Eastern Sudan, Eastern Nuba Mountains, White Nile Provinces

⁵⁷ '*Traditional Practitioners as primary healthcare workers*' International Child Resource Institute, California, Wilbur Hoff, Dr PhD, Director, Traditional Health, 1995

and Northern Kordofan. Botanical information though dated, on the flora of Sudan can be found in Broun and Massey's 1929 book titled *Flora of the Sudan*, published in London by T. Murby.

The Center for Traditional Medicine and Drugs Research at Kenya Medical Research Institute (KEMRI) has been evaluating herbal medicine. In the absence of such a research laboratory facility in South Sudan, and after discussion with its Director, it would be open to collaboration based on a memorandum of understanding or a working agreement for evaluation of herbs that are used for medical treatments. This would include analysis of the active compounds, efficacy and safety levels of the plant.

The general methods used at the centre for establishing quality, safety and efficacy of herbal medicines are based on the WHO's 'General guidelines for methodologies on research and evaluation of traditional medicine' of 2001. Research has included antimalarial studies (e.g., activity against *Plasmodium falciparum* in assays using *Albizia gummifera* stem bark and *Azadirachta indica* leaves extracts), Anti-HIV reverse transcriptase inhibition (e.g., *Acacia mellifera* stem bark showed in vitro activity) and anti-herpes simplex type I.

The WHO scientific group of over 100 experts worldwide adopted a list of commonly used medicinal plants in July 1996 which includes the 28 monographs of medicinal plants originally prepared by the WHO collaborating centre for Traditional Medicine in Chicago, Illinois (USA). The African Regional office has developed protocols for evaluation of traditional medicines (in addition to the above 2001 Guidelines) and ethno-medical evidence studies for HIV/AIDS, malaria, hypertension, diabetes and sickle cell anaemia. These were adopted at the regional meeting on institutionalising traditional medicine in health systems in Harare, Zimbabwe in November 2001.

The 'General guidelines for methodologies on research and evaluation of traditional medicine' include an assessment of herbal medicines; an evaluation of the safety and efficacy of traditional medicine plants; levels and evidence to support claims for therapeutic goods; good clinical practice for trials on pharmaceutical products; and clinical trial protocol and protocol amendments.

WHO has 19 collaborating centres worldwide for Traditional Medicine., Three of these centres are in Africa: the Centre for Scientific Research in Plant Medicines, Mampong-Akwapim, Ghana; le Centre National d'Application des Recherches Pharmaceutiques (CNARP) , Antananaviro, Madagascar, and L'Institut National des Recherches en Sante Publique, Bamako, Mali. MAPRI had been a collaborating centre in the mid-1990s but at present is not.

3. Examples of Collaboration Between Traditional and Conventional Health Practitioners in Uganda, Tanzania and Kenya

Uganda

Out of the work of three people in late 1990, a clinical research study for the herbal treatment of AIDS related illnesses: chronic loss of appetite and wasting, chronic diarrhea and herpes zoster was carried out and Traditional and Modern Health Practitioners Together Against AIDS and Other Diseases (THETA) was established.

This organisation has not only carried out clinical research into the efficacy and safety of a group of plants used in herbal medicine for AIDS-related illnesses but has successfully worked with the traditional healers, as a means to inform, educate and counsel on HIV/AIDS as well as improve the herbal remedy treatment given to patients suffering from AIDS related illnesses. They are not only trusted and respected by the community but provide health care to its' majority.

Dr Sam Kalibala from TASO, (Uganda) an AIDS support member, Rachel King, a traditional medicine researcher from the University of California, USA and Dr Jacques Homsy an HIV researcher from Switzerland worked together to conduct this study in 1992 in collaboration with Mulago Hospital AIDS/TASO clinic. The results were very encouraging.

The first phase compared the treatment results of patients treated by the healers in their clinics with that of another group treated at the Mulago clinic with conventional medicine. For both chronic diarrhea and herpes zoster the herbal treatments were more effective than the biomedical/ pharmaceutical products used to treat these conventionally. The second phase then used a patient

group, to reduce bias, selected from Mulago clinic to be treated by the healers and again the herbal treatments results were better than those treated with conventional medicine.

The clinical research was carried out with a mutually (between traditional healers and conventional doctors) agreed set of criteria respecting the doctor's expectation of a minimum standard of efficacy and the healers ownership rights over the herbal treatment. The selection criteria for the healers participating in the study were: that the person was recognised by the community and local authority as a genuine healer; that they had patients regularly attending their practice; that they had a shrine/clinic to which patients went to be treated; and that they held knowledge of herbal remedy preparation.

Forty-seven chairmen and secretaries of Traditional Healers Associations in Uganda elected a 10-member sub-committee of healers, doctors and a cultural officer to prepare guidelines as a framework for traditional healers (TH) and medical doctors (MD) to carry out research. These included:⁵⁸

- The MD will visit the TH's clinic to carry out physical examination of the patient and take blood and/or other specimens for laboratory tests as agreed upon at the beginning of the research;
- THs may write their combinations of plants which make up specific remedies. These documents could be certified by a lawyer and then be used with regard to laws protecting discoveries as drafted by the National Council of Science and Technology;
- Recognition that many THs' discoveries are inspired by one form of spiritual power or another. Therefore, whether a herbalist practises spiritual healing or not, he/she may be involved in the AIDS treatment research on the basis of his/her herbal remedy alone;
- Understanding that the TH will sign an oath of ethical practice set up by the committee. The MD will sign an agreement to respect the TH regarding herbs used in the research, (i.e., not demand names of plants in a remedy);
- The THs and MDs must sign an agreement to keep all patient information confidential
- Associations will suggest two THs, each of whom has herbs for AIDS treatment and is capable of participating in the research. These THs will discuss with the MD the way to meet the cost of the herbs used for research. Associations may decide to support the costs of their chosen THs. Associations have to ensure that the research THs have his/her clinic in a reliable location and are always found there. Whatever arrangement is agreed it must be abided by throughout the research.

Since the 1992 clinical study THETA's mission statement has been: "towards improved health care and healing promotion in partnership with traditional healing systems, biomedicine and the larger community." This mission is embodied in their programmes of training traditional healers in HIV/AIDS diagnosis, counselling and prevention with appropriate use of selected herbal remedies. The methods of training used local languages and practical techniques such as role-play and drama.

In the first five years, work was carried out in five districts and 125 healers were certified, 44 were women; an information exchange resource centre was set up running seminars, maintaining a library and issuing a triannual newsletter. THETA's five-year evaluation in 1997 estimated that 50,000 people had benefited from the improved services of the traditional healers over the two previous years. Work on mass production and pre-packaging of proven herbal treatments has been underway since 2002 and development of a curricula for training healers on diagnosis of sexually transmitted infections (STI) based on the training carried out during previous years has been developed.

Out of the work carried out by THETA several traditional healers have established support groups for people living with AIDS or who are affected by family members with AIDS. For example, YAPESG uses music, drama and dance to provide counselling. Kyangyenyi Community Health Service Provider Association (CHEPA) was formed in 1998 as a charity association of herbalists and traditional birth attendants. Amongst its activities, it has established herb gardens in the community to ensure supply for treatments, trained herbalists on improved ways of drug preparation and runs a herbal clinic for the community.

⁵⁸ THETA Participatory Evaluation Report 'Innovation or Re-awakening? Roles of Traditional Healers in the Management and Prevention of HIV/AIDS in Uganda' October 1998

THETA's training programme began in 1993 with 25 healers in Kampala with the aim of sharing ideas and information between the two health systems. At the request of the Uganda AIDS Commission this was extended to other districts.

THETA's training programme is divided into 4 stages:

a) Site selection and community mobilisation.

Several districts are visited and one chosen according to the willingness of health workers to collaborate with traditional healers, the lack of similar HIV/AIDS services, and level of interest of district officials in supporting the programme as an exist strategy. Workshops for mobilisation lasting one day and including about 100 traditional healers, elders, community and religious leaders are used to introduce THETA and its objectives and to share AIDS and sexually transmitted infections (STI) information.

b) Baseline traditional healer knowledge, attitudes, beliefs and practices (KABP) survey and community assessment.

This is carried out by community interviewers to determine communities' KABP towards HIV/AIDS and traditional medicine. A KABP questionnaire is administered by the interviewers to 100 randomly selected healers in each subcounty.

c) Training of 40 traditional healers, biomedical health practitioners and community representatives.

This is initially carried out over three days a month for six months and is aimed at giving healers basic facts about STIs, collaboration, counselling and patient care and support. Workshops for biomedical/conventional health practitioners are held to promote collaboration between the healers and these workers. The Community Monitoring Committee (CMC) and Community Interviews (CI) are trained in community mobilisation and social research respectively.

d) Monitoring, evaluation and follow-up.

Process evaluation includes site visits to healers clinics; final assessment includes post training KABP survey and tests. Healers are then certified in community education and counselling. THETA follows up with visits every quarter. The training cycle thus lasts for two years with the first two stages taking three to six months and the training 18 months.

Training of trainers then follows. Ten of the 40 healers trained become trainers with an initial two-week training followed by three months of follow-up.

By 2002, 300 healers had been certified in AIDS prevention and care in eight districts and 200 other healers have been trained by traditional healers trained as trainers. Over 100 biomedical/conventional health workers have collaborated in this work. Over 1,000 healers in various districts have attended three-day STI/HIV/AIDS sessions run by THETA.

Tanzania

In Tanzania, the *Tanga AIDS Working Group (TAWG)* started its work in 1990 following collaboration between a traditional healer and the government hospital in Pangani for the treatment of a hospitalised AIDS patient. Its objectives are to provide treatment for people living with HIV/AIDS, minimize the spread of HIV in Tanga, and to collaborate with traditional healers. A Community Health Information and Care Centre (CHICC) was initiated by TAWG to facilitate provision of information on HIV/AIDS and STIs and HIV testing and counselling in Tanga town. CHICC and has about 8,000 visitors per month. It uses drama and music for HIV/AIDS education. TAWG is housed on the grounds of the Regional Hospital. People are able to become a member of TAWG and benefit from counselling, free treatment and home visits. Between 1999 and 2002, 4,300 home-care visits were carried out.

Three herbal remedies have proven to be effective in treating some of the opportunistic illnesses of AIDS and these are prescribed by TAWG at the doses given by the healer and distributed by the hospital. The patient is monitored by physicians and nurses. Most patients note an increase in appetite and weight gain, reduction of diarrhea, fever, oral thrush/fungal infections are relieved, skin rashes resolve and herpes zoster clears; all usually between seven to thirty days of treatment. The process by which the herbal remedies for a particular condition were collected and used in patient treatment was a simple one:

- Identification of disease/condition wanting to be treated using discussion with biomedical doctors;

- Discussion with healers about the disease/condition as to whether they treat it; use of pictures;
- Use of botanical collection form;
- Collect plant with healers, note dosage and pay for their time;
- Press specimen and give to botanist to identify plant (family, genus, species);
- Check that specimen is not endangered;
- Conduct literature review on use in other cultures, toxicity or biochemical analyses; and
- Recruit patients for observational study with healers; results are documented.

These herbal treatments names are not available for general public knowledge – often identified by numbers by the healer - and although they have not been tested using the gold standard of biomedicine – placebo controlled clinical trial or biochemical studies – the observational data and anecdotal information from patients and TAWG staff indicate that the herbs are effective with no apparent detrimental side effects.

The traditional healers working with TAWG are registered with the traditional healer association, CHAWATIATA, which itself is registered with the Regional Culture Officer. They are paid for the herbs provided to TAWG (about \$2 per month per person) but are not paid salaries. Traditional healers refer patients with complications to hospital. Training of healers on HIV/AIDS and primary health care is facilitated by biomedical health workers while TAWG staff, all of whom are either clinical officers or nurses, have trained 160 healers from 1994 to 2002 in counselling skills on HIV/AIDS or in community education.

The outcomes of traditional healers trainings as described by TAWG nurse included:⁵⁹

- Increased knowledge of HIV/AIDS, including modes of transmission and prevention;
- Increased referral to health centres, counsellors and other traditional healers;
- Improved record-keeping and reporting of their patients' cases; and
- Help identify other healers who have medicine for treating HIV/AIDS.

Women Fighting AIDS in Kenya (WOFAK), established in 1993, collaborates with traditional healers in providing counselling, education and home-based care training. At their drop-in centre traditional medical and conventional medical staff work side by side cross-referring as appropriate. Conventional testing is carried out before treatment begins by either conventional/biomedical health practitioner or traditional. This initiative of using herbal treatments for HIV-associated opportunistic infections was started in 1999.

WOFAK has worked with the Kenya Forestry Research Institute (KEFRI) for herbal processing and research, use of their database of traditional healers and their herbarium. WOFAK has a contract with two herbalists to provide herbal medicine for WOFAK patients. Members receive free treatment. It has also developed a data bank on Kenyan healers which includes their areas of expertise in addition to biographical information and a list of herbal remedies each uses. Protection of the names of the herbs is maintained through use of code names or numbers and agreements with healers on the quality of each herbal remedy are held.

The Association for the Promotion of Traditional Medicine (PROMETRA) has its headquarters in Senegal since 1976. Its president and founder, Dr Erick V.A. Gbodossou, a conventionally trained medical doctor, pharmacist and healer trained by his grandfather. PROMETRA's clinical centre, Experimental Centre for Traditional Medicine (CEMETRA), near Fatick, uses a herbal package named METRAFAIDS in the treatment of HIV patients. It has been trademarked and patented with the Organisation for Patents/Intellectual Property (OAPI). The herbal treatment was assessed in a clinical observational study⁶⁰ in 2002, using a modified protocol from the National Institutes of Health, USA. Laboratory analyses determined viral load and CD4 counts at admission and monthly thereafter. Patients were monitored for fungal and bacterial infections, dermatoses, weight, fever, diarrhea and depression.

⁵⁹ Ibid

⁶⁰ 'Efficacy of African Herbal Medicine (METRAFAIDS) in the treatment of HIV positive African populations' Report of Clinical Observational Study by E.V.A. Gbodossou, MD, PROMETRA 2002

The clinical and laboratory results were significant. Over half the patient population's viral load decreased by greater than 66 percent and clinical symptoms improved in over 85 percent of the patients with no documented adverse reaction.

CEMETRA has been open since 1989 starting with a study on the knowledge, attitudes and practices (KAP) of traditional healers in Senegal. Over the years has collaborated with the Morehouse School of Medicine and Tulane School of Public Health, USA. It is an exceptional example of traditional and conventional medical integration, although it remains an experimental centre. It also carries out research in the treatment of diabetes mellitus, viral hepatitis, and dermatosis in addition to the work described for treatment of HIV/AIDS. Studies are carried out under the supervision of the Scientific and Legal Advisory Committee, which is comprised of scientists, lawyers, patients and traditional practitioners.

Its health care units are dedicated to a district town comprising three to five rural communities with each having a traditional healers association of 40 healers. The rural associations set up their own rotating residence system for the health care units resulting in each unit having four healers resident at one time. In addition, two healers are always present at the annex units in towns. When a patient is admitted for treatment to CEMETRA, admissions opens a file and the patient pays 30 US cents for the consultation which includes a medical examination with laboratory tests, consultation with a medical doctor and consultation and treatment with a traditional healer.

A diagnosis is made by the medical doctor but the patient is under the care of the traditional healer for both his/her diagnosis and treatment. The conventional medical doctor follows up the patients' progress during and after treatment by the healer.

PROMETRA trains traditional healers using a curriculum based on the FAPEG method, which covers the topics of HIV/AIDS and maternal and child health as training material. Written by Dr Gbodossou in 2002, he includes other professionals and local authorities in being responsible for actions pre- and post-training.

"For education and behaviour change to occur, it takes both the right message and the right messenger... For the population of Africa, traditional healers are the right messenger". This foreword, of the FAPEG method book, aptly describes what has been illustrated in the examples of WOFAK, TAWG and THETA's work. The use of drama and music is very popular in community education and PROMETRA Uganda uses drama extensively and with effect in health promotion by traditional healers.

The curriculum is titled *'Healers' Self-Proficiency Training: for a better involvement of traditional healers in the fight against STDs, HIV/AIDS and for the survival of the mother and the child'*. As a teaching tool, the FAPEG method not only involves the traditional healers but a multidisciplinary team including an ethnologist, sociologist, educationist and a FAPEG trainer whose work includes carrying out a knowledge, attitudes and practices (KAP) study of the traditional healers and the community. Based on this, teaching aids are developed accordingly (including pictorial aids using local proverbs and stories) and involves the local authorities in facilitating the training and collaboration between conventional medical and traditional practitioners and setting up of traditional health care units.

On a smaller scale the University of Kenyatta's Centre for Complementary Medicine and Biotechnology operates a clinic for traditional healers, on a rotational basis, to diagnose and treat patients on an out-patient basis. The aim is also to encourage discussion and sharing of knowledge between healers from different areas and to take some initial steps toward analysis of herbal remedies for efficacy and safety in addition to standardising dosages.

This clinic is offered in addition to University courses in complementary medicine which include knowledge and preparation of herbal medicines and a unit of complementary medicine to be part of the medical degree course. The University of Maseno in Kisumu, headed by Dr Aduma also runs a course in complementary medicine and engages in cooperation with traditional healers through a memorandum of understanding with regard to benefit sharing of herbal medicines. The benefit is shared between the community from which the plant originates or is collected, the traditional healer and the researcher.

Action for Natural Medicine (ANAMED) has its headquarters in Winnenden, Germany and was started by Hans Martin Hirt, a pharmacist, following his work in Zaire from 1985-1994. ANAMED demonstrates in their seminars how to establish a medicinal garden which can serve as a demonstration plot for further seminars/training and for production of plants used for herbal medicines in a hospital garden as part of its pharmacy. It is recommended to plant three different tree species as a fence, using, for example, moringa, lemon grass and *Cassia spectabilis* initially and then plant the medicinal plants within the plot.

The seminar training gives information on storing seeds, tree nurseries, collecting, drying and preserving medicinal plants. It also includes instructions on how to build solar ovens/dryers and accurate weighing scales. In its seminar handbook "Natural Medicine in the Tropics: Treatments" the treatment of a number of ailments and illnesses (wounds, burns, boils and abscesses; skin disorders; diarrhea; malaria; AIDS related illnesses) are described and the uses of five medicinal plants – *Allium sativum* (garlic); *Artemisia annua* (sweet annie) (anamed (A3) a hybrid); *Azadirachta indica* (neem); *Carica papaya* (pawpaw); *Moringa oleifera* (drumstick or horseradish tree) are noted.

Another ANAMED publication "Tropical plants as a source of health care. Production of medicines and cosmetics" includes fuller detail of a possible training programme at village level; growing and processing plants for herbal medicines; soap and medicinal oils; and details of the uses and side-effects of 15 plants used in traditional medicine.

Apart from the Congo, ANAMED has been established in Tanzania, South and North Uganda and recently in South Sudan as ANAMED South Sudan (West) and ANAMED South Sudan (East).

IV. Concluding remarks and recommendations for follow-up

If it is taken as a given that in South Sudan:

- conventional health care costs are high;
 - that the price of training, setting up and supporting clinics and hospitals to serve the entire population of South Sudan is prohibitive and not sustainable in the foreseeable future;
 - conventional medical pharmaceutical products are not always the most effective treatment regime nor not always without unwanted side-effects and in some cases are both clinically and empirically less effective than plant parts used in a herbal preparations⁶¹
 - plant medicine, practised by both community members and traditional healers, has been time-proven to provide effective treatments for common illnesses in the regions; and
 - that in the near absence of conventional medical facilities due to the conflict of the last two decades traditional medicine has provided primary health care for the majority of its population,
- then it should be a matter of some importance to document this traditional knowledge, ensure the sustainability of the plants which provide such herbal remedies; consider ways of formally including traditional medical practitioners in the provision of the communities' healthcare while ensuring quality and standardised care through investigating the safety and efficacy of the medicinal plant part used in traditional medicine.

Following up on these initial ethnobotanical surveys and with the examples such as PROMETRA in Senegal and THETA, WOFAK and TAWG from the East African region, several short, medium and long term activities which could ultimately lead to the integration of traditional and conventional medical systems in providing primary and preventive health care to the people of South Sudan are suggested below.

Short Term

As noted in the concluding remarks of the ethnobotanical survey⁶², further ethnobotanical surveys of the the Nuba Mountains and Southern Blue Nile/Funj region would need to be carried out as a follow-up, with a view to documenting the plants used in the practice of traditional medicine throughout the two regions and, in the long term, to complete a record of these uses in South Sudan. These surveys could be conducted throughout the counties, in cooperation with local and health authorities, by small teams of local people who, in a one day workshop, have discussed the purpose and longer term objectives of documenting the plants and their medicinal uses and received training in conducting an ethnobotanical survey. The plant samples collected could then be identified by a botanist for their botanical names by way of a pre-arranged agreement with the East Africa Herbarium at the National Museums of Kenya, Nairobi, in the initial stage.

⁶¹ THETA (Uganda) clinical study on medicinal plants used to treat chronic diarrhoea and herpes zoster/shingles in AIDS patients; TAWG herbal treatments, after an observational study, used to treat opportunistic infections of AIDS patients and the clinical observational studies at the PROMETRA clinical centre, CEMTRA, in Senegal where METRAIDS herbal package is patented with OAPI (WIPO regional organisation for African francophone countries) for treatment of AIDS related illness/infections

⁶² (i) confirm the findings in particular where claims of a plant's action is that of treating serious disease such as malaria, hepatitis or Kala Aza with a view to then chemical analysis of active compounds, toxicology and efficacy studies. It could be expected that a select few plants would then go on to be part of a clinical trial in the longer term.

(ii) identify the specimens that could not be identified without a sample of the flower, fruit or seed by re-visiting the areas and collection of said samples

(iii) carry out further ethnobotanical studies in the other three counties in each payam; these being Saraf-Jamos, Ngorban, Dmama, West Kadugli in Kadugli County; Tulishi, Tima, Tabag, Kamda, Abu-Junuk in Lagawa County and Timien, Kiali, Julud, Kattla, Golfan, Nyimang in Dilling County in the Nuba Mountains and in addition to confirmation studies in the four payams of Rashad county and in Kurmuk county. As noted earlier, in and around the rainy season makes access extremely difficult to some payams.

(iv) conduct further surveys using local teams with training in basic collection, drying and preservation of plant samples, and well versed in the purpose and objectives for collecting such data would be an advantage from a language and trust perspective in particular. This would facilitate gathering of accurate information.

In this way the teams can explain to each community and their leaders and the local authorities the purpose of the work prior to conducting the surveys. This community mobilisation will facilitate communication and help to build trust between the team, the community and its healers. This will lend itself towards the sharing of their knowledge. It will give the opportunity for healers to be identified by the leaders and community as those who are trusted by, and actively treat, the people. In addition, it will also help to allay any fears that may exist within the community around the magic and spiritual powers of the healers.

In parallel to conducting ethnobotanical surveys in the two regions, which would be ongoing for several weeks, a workshop gathering the healers of each region could be held. In addition, community members who prepare remedies and provide treatments such as the women in Kauda, though not formally traditional healers, are important health care providers and should also attend the workshop. Discussion groups could first be held amongst the community members and healers separately and then together. This meeting would include traditional birth attendants who are traditional health practitioners but who, to date, have also been part of community health workers programmes in some areas and hence bridge the two health systems already.

The workshop would bring the healers together to meet each other, to share ideas on different symptoms and treatments and to discuss steps toward standardising the use of a set of plants for treatment of common ailments in the area. The set of plants and treatment regime (plant part, preparation, dosage, frequency and duration) would be decided by the healers after the earlier discussions in the workshop. In this way the starting point for standardising treatment and care is with the healers of the region who are the custodians of this traditional knowledge.

A workshop would also provide healers with the opportunity to discuss with other healers fee schedules for treatments and consultations. With healers gathered at the workshop, there would also be the possibility for them to registration with the Health Secretariat thus giving formal recognition to traditional healers within the region's health service. Finally, an association of traditional healers of South Sudan could be established. This approach provides reassurance that by sharing knowledge, the healers would not lose their roles and livelihoods but rather will benefit in status, knowledge and financially.

A discussion with the community group could be held in a similar way to that of the traditional healers. The outcome of these discussions could provide the basis for a compilation of community agreed home remedies. In the medium and longer term these discussions could provide a framework for training to be carried out for the wider community. This would be in the spirit of self-reliance for managing common health problems in the home which would ordinarily not require a visit to the traditional healer or conventional medical worker/clinic. Prevention of common illnesses such as diarrhea could also be included in the training using methods such as FAPEG (used by PROMETRA Uganda) or a similar participatory rural appraisal method.

The plant treatments agreed with the healers could form the basis of a herbal treatment book/ pharmacopeia for South Sudan following analysis/study on their safety and efficacy.

Either at this initial workshop or follow-up with the healers after the ethnobotanical studies results are compiled and trust and communication has been built up, the role of the traditional healer as an information, education and communication agent could be discussed for preventive health. The examples in Tanzania with TAWG, Uganda with THETA and Kenya with WOFAK are noted in Section 10. Their role as community health educators in the cause and prevention of HIV/AIDS⁶³ and in treating AIDS related illnesses such as chronic diarrhea and fungal infections, has proven to be effective, in particular in the programmes in Uganda.

Although HIV/AIDS is not deemed to be a major cause for illness in both regions to date, with the ensuing peace and movement of people there is a real need to act preemptively. Visits to THETA programmes or PROMETRA in Uganda to train trainers or simply to see the programme implementation would be an option for both healers, community/local leaders and staff of the health authority.

⁶³ Human immunodeficiency virus/Acquired immune deficiency syndrome

The forum for discussion on the wider role of the traditional healer in community health would provide the opportunity for conventional medical personnel – doctors and community health workers- to meet with the traditional healers and also to discuss, through a set of symptoms and common illnesses, their approaches to diagnosis and treatment. This would include discussion of the signs and symptoms of HIV infection and AIDS-related illnesses. It would be hoped that this would set the platform for collaboration leading to cross-referral of patients in the medium term. The use of the medicinal plants would require laboratory analyses and clinical observational studies such as the example at CEMETRA by PROMETRA in Senegal.

Other topics for discussion at the workshop(s) could include:

- (a) The establishment of medicinal gardens both at the individual and community levels which would enable the herbal remedies to be produced at low cost, if not free for certain people with chronic illnesses or for those unable to pay; encourage tree planting in communities and individual homes for the longer term especially of those trees frequently used for remedies; and, at a county level, would provide gardens for threatened species.
- (b) Training in standardising herbal preparations including drying of plant parts and making a solar oven.

Literacy is low amongst both community health workers and tradition healers in both regions, but an unconventional literacy method, such as REFLECT – Regenerative, Freirean⁶⁴ Literacy through empowering Community Techniques could be used to develop their reading and writing skills. Participatory rural appraisals (PRA) define the subject matter for a people-centred learning environment with members of each group actively working together to learn. A group facilitator rather than a teacher would help the learners develop ideas from pictorial to the written word. In order to increase literacy and medicinal knowledge at the same time, the subject matter for reading and writing could be plant medicine and its uses; and/or signs and symptoms of illness and disease; or processes of the conventional medical system. Action Aid in Uganda has had good experience in this method which has proven to be very effective, as does GOAL with the southern displaced people on the outskirts of Khartoum. Both agencies could be called upon for direction and/or training of facilitators and in implementing this unconventional literacy learning programme.

Medium Term

The plans for establishing a Department of Traditional Medicine within the Health Secretariat are likely to take place in the medium term. Its strategy for South Sudan could be guided by the WHO Regional Traditional Medicine Programme Strategy and the headquarters of the Traditional Medicine Strategy 2002-2005 referred to in Section 6.

The latter Strategy's four objectives are Policy; Safety, Efficacy and Quality; Access; and Rational Use. The priority interventions in the Regional Strategy are: policy and legislation formulation; capacity building including training modules and a manual on Primary Health Care for Traditional Health Practitioners and one on Traditional Medicine for Conventional Health Practitioners and Health Science Students; research promotion; development of local production and a regulatory framework for protection of traditional knowledge and benefit sharing.

An atlas of medicinal plants of South Sudan could be compiled from the findings of the ethnobotanical studies (and use of information from MAPRI's atlas should peace agreements be implemented); the illustrations could be drawn by a Sudanese artist trained in botanical illustration or arrangements made with a botanical artist in Kenya or through collaboration with KENRIK.

The workshop(s)' recommendations could be actioned, such as:

- establishment of Association (s) of Traditional Healers for example by county
- registration of traditional healers and their practices
- benefit sharing agreements- material benefits such as patents and percentage of profits on commercialisation of a medicinal plant and non-material benefits such as acknowledgements/name in published research or plant analyses results being shared with the community/healers
- standard consultation fees

⁶⁴ Paulo Friere was a Brazilian educationalist who, through his technique REFLECT enabled the rural communities to successfully develop reading and writing skills

- training modules and/or visits/training of trainers to regional facilities, e.g., THETA Uganda
- medicinal gardens where, for example, the community plots could be run as a business initiative by the women's group

It would be in the medium term that linking up with the medicinal plant networks could take place, and include maintaining the link established by the four representatives from South Sudan with the recently established Network on Medicinal Plants and Traditional Medicine (Eastern Africa) and in the long term to become part of the nine eastern African members.

This would also facilitate more formal links with other institutes such as NCRL in Uganda or the Traditional Medicine Institute in Tanzania, and enable establishment of working relationships with, for example, THETA in Uganda and TAWG in Tanzania to share the knowledge of their herbal packages and/or exchange information on other plant medicine.

In the medium to longer term a plan to set up an experimental centre such as CEMETRA in Senegal, as a pilot project, whereby traditional and conventional health practitioners work together/side by side, could be envisaged.

Another approach could be one of running the two systems in parallel at a pilot clinic/hospital with a triage system where the patient is seen by a conventionally trained medical nurse and herbalist/traditional healer for history and signs and symptoms of the illness/complaint. A pre-agreed set of symptoms/signs/illness between the traditional and conventional practitioners could be treated with herbal remedies. These would then be used according to the consultation at triage otherwise the patient would be referred onto a conventionally trained medical practitioner for further consultation and management. This would have the added advantage of reducing the patient numbers to be seen by conventional health practitioners each day at the larger clinics.

Long Term

- (i) Establishing policy and legislation for traditional medicine including regulation of traditional healing practices, and conservation of biodiversity while drawing on the experiences of Tanzania, Kenya and Uganda.
- (ii) Identification of a small number of plants to be investigated for active compounds, safety and efficacy under a memorandum of understanding with KEMRI/Traditional Medicine Centre in Kenya for example while being guided by the WHO evaluation guidelines and protocols.
- (iii) Publication of a South Sudan pharmacopoeia.
- (iv) Establishment of a Herbarium, Ethnobotanical Society; Laboratory for plant analysis using gold-standard protocols and evaluation methods
- (v) Conducting clinical observational studies on promising new plant medicine using a protocol of clinical observational study such as the one used at CEMETRA
- (vi) Send personnel for training in ethnobotany to Makerere University, Uganda and ultimately plan for offering such courses within South Sudan; and use the above-mentioned curricula, developed by WHO, for training healers as community workers and modules for conventionally trained medical practitioners, in traditional medicine.
- (vii) Commercialisation of those plants well known for their medicinal/nutritional (reference to earlier work on wild foods in 2001) properties and already investigated at regional and/or international level such as the marula tree (*Sclerocarya birrea*). The oil of the kernel of this tree's fruit is 60 percent oleic oil and is used in the manufacture of baby food not to mention the fermented fruit is used to produce the liquor popular in Europe. Chilli pepper and pawpaw have a well established European market as noted earlier in the text, that commercialisation could be tapped into. The frankincense tree (*Boswellia papyifera*) or the Neem tree (*Azadirachta indica*), 'the tree of 40 cures', are additional two examples.

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Leonard, L. Kenneth	2001,	'African Traditional Healers: The Economics of no 32 Healing'	IK Notes, World Bank
Mugabe, John	1999	Intellectual Property Protection and Traditional Knowledge	African Centre for Technology Studies, Biopolicy International Series no. 21
Nwokeabia, Hilary	2003,	'The Economics of African Indigenous Knowledge' no 53	IK Notes, World Bank
Prakash, Siddhartha	2000,	'Indigenous Knowledge and Intellectual Propoerty no 19 Rights'	IK Notes, World Bank
R. Hoft & M Hoft	1997	'A Profile of Ethnobotany in Africa-results of Africa-wide survey'	People & Plants, WWF
Rukangira, Ernest	2000	'Medicinal Plants and Traditional Medicine in Africa:	Sustainable Development

Scheinman, David	2002,	Constraints and Challenges' 'Traditional Medicine in Tanga Today' no 51	International Indigenous Knowledge (IK) Notes, World Bank
Secretariat of Health	1998	Health Policy of the New Sudan	Sudan Peoples' Liberation Movement (SPLM)
Secretariat of Health	1999	Guidelines for the Implementation of the Health Policy of the New Sudan	Sudan Peoples' Liberation Movement (SPLM)
Secretariat of Health	2001	HIV/AIDS Policy and Control Strategies for the New Sudan	Sudan Peoples' Liberation Movement (SPLM)
Sindiga, Issac et al, (ed)	1995	Traditional Medicine in Africa	East African Educational Publishers
Sudan Transition & Recovery Database	2003	Report on Southern Blue Nile Area-STARBASE	United Nations
Traditional & Modern Health Practitioners Together against AIDS (THETA)	1998	THETA participatory evaluation report: Innovation or re- awakening? - Roles of Traditional Healers in the management and prevention of HIV/AIDS in Uganda	THETA
Traditional Medicine Programme (TRM)	2000	TRM, Mission and Functions	World Health Organisation (WHO) Regional Office for Africa (AFRO)
Traditional Medicine Programme (TRM)	1995	Implementation of Regional Strategy on Promoting the Role of Traditional Medicine for Health Systems	WHO Regional Office for Africa
Traditional Medicine Programme (TRM)	2000	General guidelines for methodologies on research and evaluation of traditional medicine	WHO
UNAIDS	2002	Ancient Remedies, New Disease: Involving traditional healers in increasing access to AIDS care & prevention in East Africa	UNAIDS Case Study
USAID	2001	Traditional Medicine Practices in East Africa with Lessons for Southern Sudan- workshop proceedings, 14-19 April 2002	USAID
USAID	2003	Interim Strategic Plan for Sudan 2004-2006	USAID
Weisheit, Anke	2003,	'Traditional Medicine Practice in Contemporary Uganda' no 54	Indigenous Knowledge (IK) Notes, World Bank
WHO	2002	WHO Traditional Medicine Strategy 2002-2005	WHO
WHO Policy Perspectives on Medicines	2002,	'Traditional Medicine-Growing Needs and Potential' no 2	WHO Geneva
Zayid, J.E., Dr et al	2003	Comprehensive Development Strategy for the Funj region, New Sudan	USAID

Appendix I. Databases and Networks

As noted so far, the last decade has seen a considerable proliferation worldwide of organisations, networks, databases, declarations, conventions, proposed strategies, and publications with regard to traditional and plant medicine, traditional and indigenous knowledge, ethnobotany and conservation of biodiversity. Below is a list of some of these databases and networks.

Databases

- (i) 'ePIC – *Electronic Plant Information Centre*' of the Royal Botanic Gardens, Kew (England) enables the user, after registration online, to search 10 databases.

www.kew.org/epic

These are:

- (a) International Plant Names Index (IPNI) stores 1.4 million scientific plant names through collaboration between Kew Gardens, Harvard Herbaria and the Australian National Herbarium. (www.ipin.org)
- (b) Kew Website (www.kew.org)
- (c) Kew Record of Taxonomic Literature holds a bibliography of over 200,000 publications since 1971. (www.kew.org/bibliographies)
- (d) Plant Micromorphology Bibliography holds over 100,000 references
- (e) Herbarium Catalogue of about 77,000 digitisation specimens (September 2003)
- (f) Economic Botany Collections contains over 78,000 plant specimens/products dating back to its establishment in 1847. (www.rbgekew.org.uk/collections/ecbot.html)
- (g) Living collection contains 70,000 specimens from 30,000 different taxa.
- (h) Survey of Economic Plants for Arid and Semi-Arid Lands (SEPASAL) database contains more than 6,200 species of useful wild and semi-domesticated plants of tropical and sub-tropical drylands. ('Useful' describes plants which humans eat, use as medicine, feed to animals, make things from, and use as fuel.) The National Museums of Kenya has a node link with SEPASAL. Their websites are: www.kew.org/ceb/sepasal and www.rbgekew.org.uk/servlets/sepaweb
- (i) Seed information covering about 22,000 species (www.kew.org/data/sid/)
- (j) Flora Zambesiaca is a descriptive account of flowering plants and ferns native and naturalised in Zambia, Malawi, Mozambique, Zimbabwe, Botswana and Caprivi Strip. (www.kew.org/efloras/)
- (ii) NAPRALERT (Natural Products ALERT) contains bibliographic and factual data from 1650 to the present, on natural products, including information on the pharmacology, biological activity, taxonomic distribution, ethno-medicine and chemistry of plant, microbial and animal extracts. More than 169,405 bibliographic records containing information on over 142,750 natural products and 168,820 organisms were available on the database as of October 2002. Access to the database is through The Scientific and Technical Information Network (STN)⁶⁵. STN Easy accesses a large group of databases in addition to NAPRALERT including MEDLINE (<http://stneasy.fiz-karlsruhe.de> (Europe) and <http://stneasy.cas.org> (world-wide except Japan which can be access through <http://stneasy-japan.cas.org>) after registration.
- (iii) African Laboratory for Natural Products (ALNAP) is based at the chemistry department of Addis Ababa University, Ethiopia and studies the chemistry of African plants for potential medicinal, commercial and industrial importance with an emphasis on essential oils. Its database entries of nearly 13,000 draw information on biology, chemistry, ethnobotany and pharmacology of African plants from natural products journals such as *Phytochemistry*, *Journal of Natural Products*, *Planta*

⁶⁵ STN website – www.stn-international.de - for Europe

Medica. Since September 2001 the database has been managed by the National Information Services Corporation (NISC-USA) through its branch in Grahamstown, South Africa. Access is through www.nisc.com

Networks

- (i) The East African Plant Specialist Group (EAPSG) is a network focusing on strengthening the potential for plant conservation and research in the region. It has produced a number of directories including one of experts in plant research; a directory of plant conservation projects; of taxonomic research projects and of publications.
- (ii) Natural Products Research Network for Eastern and Central Africa (NAPRECA) is based at the chemistry department of the University of Dar es Salaam and at its inception in 1984 called for a sharing of existing facilities and resources in the sub-region and initially concentrated on dissemination of information and exchange of ideas through publications and a biannual newsletter. It reviews phytochemical studies of African plant species in current literature. (website: <http://napreca.udsm.ac.tz/napreca/index.html>)
- (iii) MedPlant is a global network supporting regional initiatives, partnerships and collaboration on the sustainable use and conservation of medicinal plants and where regional networks can link into. It is found at the Canadian office of the International Development Research Centre (IDRC) with information contacts at their South Asia Regional Office in India.
- (iv) Network on Medicinal Plants and Traditional Medicine (Eastern Africa) was launched November 2003 at the Arusha, Tanzania 'Stakeholders Workshop on the Sustainable, Safe and Effective Use of Medicinal Plants in Eastern Africa'. This falls under the International Development Research Centre's (IDRC) work in Environmental and Natural Resources Management and specifically within the Sustainable Use of Biodiversity programme initiative (SUB-PI). The network's objective is to 'promote the conservation and sustainable use of medicinal plants and herbal products and the integration of traditional medicine in the health services. Its specific objectives are the following:
 - To assess current research activities, policy and legal frameworks on medicinal plants and traditional medicine in Eastern Africa in order to identify gaps and determine sub-regional research priorities;
 - To enhance research capacity and harmonization of research approaches and methodologies for sustainable management of medicinal plants and their use in traditional medicine;
 - To promote the development of collaborative projects on herbal remedies, conservation of medicinal plants and sustainable livelihoods in Eastern Africa;
 - To strengthen the capacity of traditional health practitioner associations and the collaboration between them and health workers, and researchers and policy/decision makers in order to support integration of traditional medicine in public health care;
 - To contribute to the development and implementation of appropriate policies and legal frameworks pertaining to medicinal biodiversity conservation, traditional medicine, and access and benefit sharing, at national, regional and international levels; and
 - To develop partnerships with mass media, national governments and regional and international organizations for dissemination and scaling-up of research results on medicinal plants.

To achieve the following objectives in the initial stages, the Steering Committee and the Technical Advisory Committee including a representative of the National Museums of Kenya, the Institute of Traditional Medicine, Tanzania and the Natural Chemotherapeutics Research Laboratory, Uganda will spearhead a baseline study on assessing the research and development activities and the policy and legislative frameworks to date in each of the three countries. This study will be followed by a regional workshop to determine priority areas and collaborative projects at a regional level. As noted earlier, Kenya's MAPS group has already developed the 'National Strategy and Action Plan for Medicinal and Aromatic Plant Species 2003-2008' which will directly link into the above activities of the Network.

Appendix II. List of Contacts/Resources

Dr Grace Nambatya Kyeyune Ag Director of Research	Natural Chemotherapeutics Research Laboratory, Ministry of Health, Kampala, Uganda	Gnkyeyune@yahoo.com Tel: +256-41- 250488/344042
Dr Geoffrey Rukunga Director	Centre for Traditional Medicine & Drug Research at Kenya Medical Research Institute (KEMRI), Nairobi, Kenya	Grukunga@nairobi.mimco m.net Grukunga@yahoo.com Tel: +254-20-722541
Corn Alele Amai Senior Research Officer & Leader of Medicinal Plants and Biodiversity project; Project leader, Uganda for Network on Medicinal Plants & Traditional Medicine (Eastern Africa)	Natural Chemotherapeutics Research Laboratory, Ministry of Health, Kampala, Uganda	Cornamai@hotmail.com Tel: 256-41- 250488/344042
Professor Rogasian Mahunnah Associate Research Professor & Project leader, Tanzania for Network on Medicinal Plants & Traditional Medicine (Eastern Africa)	Institute of Traditional Medicine, Muhimbili University College of Health Sciences, Dar es Salaam, Tanzania	Mahunnah@yahoo.co.uk Tel:+255-2-2150096 /21500302
Dr Pius V. Subek Executive Director	SUHA, Sudan Health Association, Nairobi, Kenya	Suha@africaonline.co.ke Tel: +254-20- 562256/574302 Mobile: 0722-766468
Patrick M. Maundu Ethnobotanist, Coordinator of African Leafy Vegetable Programme (Sub-Saharan Africa Group) of International Plant Genetics Resources Institute (IPGRI) c/o (ICRAF)	Kenya Resource Centre for Indigenous Knowledge (KENRIK) & Kenya Society of Ethnoecology (KSE) at National Museums of Kenya, Nairobi (CGIAR = an Institute of the Consultative Group on International Agricultural Research)	Maundu@eudoramail.com KENRIK Tel: + 254-20- 3742131/3741673 ICRAF Tel: +254-20- 524520 p.maundu@cgiar.org
Dr Mainen J. Moshi Director	Institute of Traditional Medicine, Muhimbili University College of Health Sciences, Dar es Salaam, Tanzania	Tel:+255-2-2150096 /21500302 Ditm@muchs.ac.tz
Dr Alex Chono Head of Clinical Research	Traditional and Modern Health Practitioners Together Against AIDS and other Diseases (THETA), Kampala, Uganda	Alchono@yahoo.com Theta@imul.com Tel: +256-41-530619 Mobile: +256-77-861261
Grace Ngugi Ethnobotanist	East African Herbarium, National Museums of Kenya, Nairobi	Grace.ngugi@operamail.c om Tel: +254-20-374216 Mobile: 0722-634522
Stella Simiyu Research Scientist; Program officer CBD/Global Strategy for Plant Conservation & Project Leader, Kenya for Network on Medicinal Plants & Traditional Medicine (Eastern Africa)	National Museums of Kenya, Nairobi	Stella.simiyu@biodiv.org Tel: 254-20-577433
Professor Alloys Orago Director	Centre for Complementary Medicine and Biotechnology, Kenyatta University, Nairobi, Kenya	Orago@avu.org Tel: +254-20-813460 Mobile: 0733-598904
Dr Francois Gasengayire Program Officer & Project Coordinator of Network on Medicinal Plants & Traditional Medicine (Eastern Africa)	International Development Research Centre (IDRC), Eastern and Southern Africa Regional Office, Nairobi, Kenya	Fgasengayire@idrc.or.ke Tel: +254-20 2713160 Mobile: 0722-807851

Naroun Philip Director	Nuba Relief, Rehabilitation and Development Organisation (NRRDO), Nairobi, Kenya	Tel: +254-20-2730895
David Shand Director	GOAL South Sudan, Nairobi, Kenya	Tel:+254-2721999 Mobile: 0722-952-652
Hastin Yokwe Director	Relief and Rehabilitation Organisation of Fazugli (ROOF), Southern Blue Nile, Nairobi, Kenya	Tel: +254-20-2574484 Mobile: 0721-347374
Dr Bellario Ahoy Ngong Director General	SPLM Secretariat of Health Nairobi, Kenya	Mobile: 0734-779879/785146
Professor Titus Mukiyama Chairman of Kenya Working Group on Medicinal and Aromatic Plants	Dept of Botany, University of Nairobi, Kenya	Trukiama@yahoo.com Mobile: 0734-729470
Dr Doris Mutta Ag Director	Kenya Forestry Research Institute (KEFRI), Gede regional research centre, Malindi, Kenya	Doris_mutta@yahoo.com Tel: +254-42-32022 Mobile: 0722-732759
	Kenya Agricultural Research Institute (KARI)	
	Centre for Indigenous Knowledge Systems and Products(CIKSAP)	Tel: +254-20-448150/444424
	African Center for Technology Studies (ACTS), Nairobi, Kenya	
Dr Erick V.A. Gbodossou Director, Founder	Association for the Promotion of Traditional Medicine (PROMETRA), Dakar, Senegal	www.prometra.org
	People and Plants Initiative, WWF, UNESCO and Kew Gardens	www.kew.org/peopleplants
Dr Sakagya Yahaya Director	PROMETRA Uganda Kampala, Uganda	Uganda@prometra.org Sakagya@softhome.org Tel: +256-41-566762 Mobile:077-403900
Dr Ossy Kasilo Regional Adviser	World Health Organisation (WHO) AFRO (African Regional Office)	Kasiloo@whoafr.org
Mr Peter Graaff Regional Adviser	WHO EMRO (Eastern Mediterrean Regional Office)	graaffp@emro.who.int
Dr Xiaorui Zhang, Acting Coordinator	World Health Organisation (WHO) Headquarters, Geneva, Traditional Medicine Programme, Essential Drugs and Medicine Policy (EDM)	Trm@who.int Zhangx@who.int www.who.int/medicines/organisation/trm
Dr Othwonh Thabo Upper Nile Health Coordinator	SPLM Secretariat of Health, Nairobi, Kenya	Othwonhthabo@yahoo.com Mobile: 0734-779879
Kornelio Mawien Tonj County Medical Officer	SPLM Secretariat of Health, Nairobi, Kenya	Mawienus@yahoo.com Mobile: 0734-807743
	World Bank- Indigenous Knowledge (IK) Notes	www.worldbank.org/afr/ik/default.htm
	World Intellectual Property Organisation (WIPO) Geneva, Switzerland	www.wipo.org
	World Trade Organisation (WTO), Geneva, Switzerland	www.wto.org

Note: The above tables of resources (databases, networks, contacts are certainly not exhaustive and the reader is also referred to the participant listings of the: 'Workshop on Traditional Medicine Practices in East Africa with Lessons for Southern Sudan' of 14-19 April 2002 held in Mombassa, Kenya by USAID and the 'Stakeholders' Workshop on the Sustainable, Safe and Effective Use of Medicinal Plants in Eastern Africa' of 24-27 November 2003 held in Arusha, Tanzania by IDRC and co-sponsored by USAID.