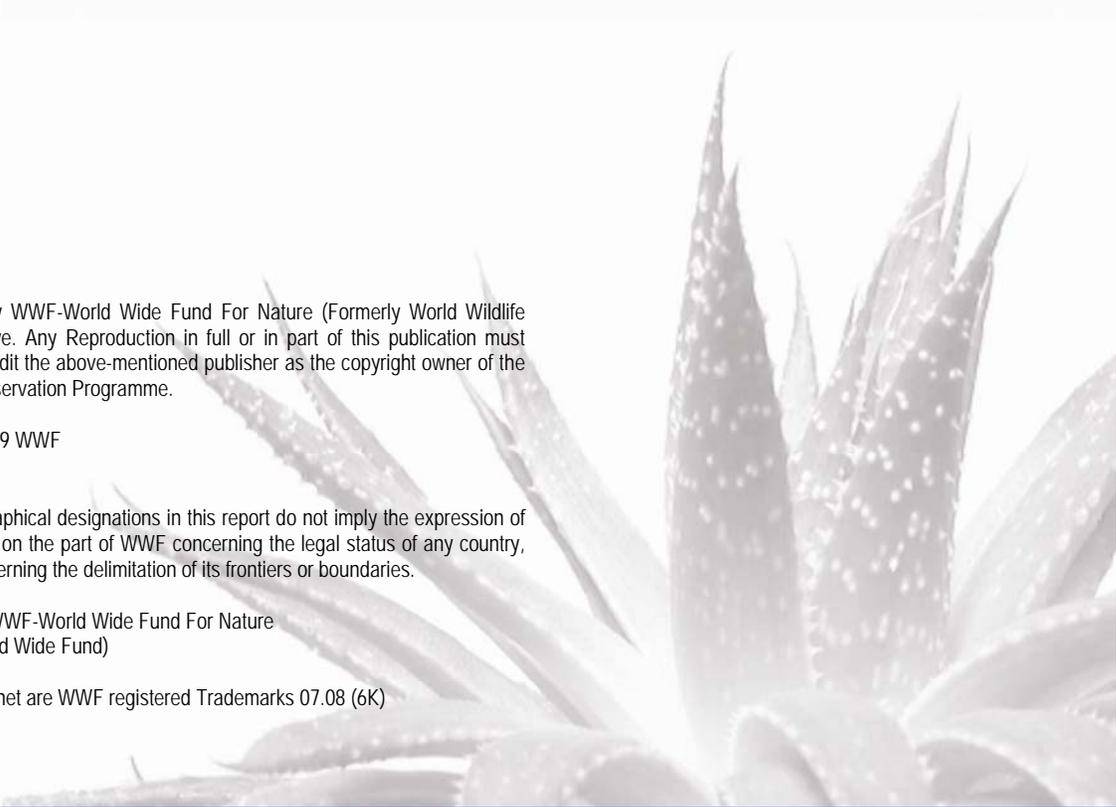




Traditional Medicinal Plant Practice in Southern Africa:

*A Situation Analysis in
Zambia and Zimbabwe*

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A photograph of an aloe vera plant, showing its characteristic thick, pointed leaves with small white spots. The plant is positioned in the lower right quadrant of the page, partially overlapping the text area.

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ACRONYMS

CSIR	South African Council for Scientific and Industrial Research
NEMA	National Environmental Management Act
TMPC	Traditional Medicinal Practitioners Council
THPAZ	Traditional Health Practitioners Association of Zambia
MCZ	Medical Council of Zambia
STD	Sexually Transmitted Disease
SI	Statutory Instrument
THPAZ	Traditional Health Practitioners Association of Zambia
TB	Tuberculosis
ZINATHA	Zimbabwe National Traditional Healers Association

EXECUTIVE SUMMARY

Southern Africa is a globally recognized centre of biodiversity richness and endemism. It has 66 888 plant species (including medicinals) of which 3 666 are endemic. About 80% of the region's population relies on medicinal plants for its primary health care needs. However, medicinal plant diversity is in decline due to a variety of reasons.

Recognizing the importance of traditional medicine in their national health care systems, governments of Southern Africa are collecting information on medicinal plant species and their traditional uses; championing the incorporation of traditional medicine into the national health care system; and providing enabling administrative and governance structures for traditional medicinal practice. The objectives of this Study were to gain a better understanding of the status of traditional medicinal plant practice in Zambia and Zimbabwe and to identify opportunities for its sustained growth.

Key findings and recommendations from the study are as follows:

Organizational framework

Traditional medicinal practitioners in Zambia and Zimbabwe have formed associations to regulate their practice and to engage government. They still face the following challenges:

- The Traditional Health Practitioners Association of Zambia (THPAZ) and its members are not yet fully recognized by government statutory bodies (viz. Medical Council of Zambia-MCZ and the National AIDS Council) that deal with traditional medicine; and,
- Traditional medicine in Zimbabwe is still largely viewed as inferior to modern medicine despite the creation of the Traditional Medicinal Practitioners Council (TMPC) by government.

To address the foregoing, there is need to:

- Facilitate the recognition of THPAZ and its members by relevant government institutions and provide the necessary political and financial support to them; and,
- Support the integration of traditional and modern medicinal practice into Zimbabwe's health care system by strengthening and capacitating existing institutions (i.e. TMPC and traditional healer associations) so that they fulfill their mandated functions.

Medicinal plant use, harvesting and processing

The following observations and recommendations are made on the above:

First, some medicinal plant species are being overharvested and are threatened with extinction. There is need for national assessments on the degree of threat to such plants using internationally recognized procedures. In addition, their sustainable supply should be ensured by domesticating and cultivating them at a commercial scale.

Second, medicinal plants are mostly used and/or exported in their raw form with little to no value addition. This limits the financial benefit that accrues to beneficiaries and reflects on the limited bio-prospecting work being carried out on the plants.

Bio-prospecting research on medicinal plants

The limited private and public sector bio-prospecting research carried out in the study countries has demonstrated the existence of activity in some tested herbals. However, there is limited capacity to add value to this work due to lack of appropriate research facilities and funding. It is recommended that:

- Study countries should mobilize resources and capacitate relevant institutions to carry out bio-prospecting research through public-private sector partnerships; and,
- Financial and other resources should be mobilized to enable the conclusion of stalled but promising research such as that on plant DMT005 which showed some activity in TB treatment.

The legal framework

Traditional health practitioners harbour a wealth of knowledge on medicinal plant species and their uses. Unfortunately, study countries lack the technical, financial, legal and institutional capacity to further develop, patent and commercialize such knowledge which is sometimes bio-pirated. Until recently, legislation in both countries had no provision on access to this knowledge and on benefit sharing with its holders (ABS). In the case of Zimbabwe, the new Environmental Management Act provides for ABS. Statutory Instrument 61 of 2009 of the Act focuses on traditional medicinal plants and their associated traditional knowledge. However, the Instrument has yet to be implemented. There is therefore need to urgently support and facilitate the implementation of the Instrument so that lessons learnt can be shared with other Southern African countries including Zambia.

INTRODUCTION

About 80% of the world's population relies on medicinal plants for its primary health care needs because modern medicine is either unobtainable or prohibitively expensive (Groombridge, 1982). The trend is likely to continue despite advances in modern medicine and the establishment of state of the art health institutions (Gelfand et al, 1986).

The history of traditional medicinal plant practice in Southern Africa is as old as the people who first settled in the region. However, there are no records of remedies that were used at the time. Some form of documentation only started with the arrival of white settlers who, despite considering the practice as primitive and inferior to modern medicine, recognized its existence and acknowledged its effectiveness in some instances (King and King, 1992). It is from these humble beginnings that the popularity of traditional medicinal plant practice in primary health care and in the pharmaceutical industry has grown. Some of the plants have found their way into the formal national and international health care systems through bio prospecting, value addition and bio trade. In 2003, international trade in medicinal plants was worth \$60 million and \$4.4 million in South Africa and Zambia respectively (FAO, 2003).

Southern Africa is a globally recognized centre of biodiversity richness and endemism, with the Miombo woodlands, the Western Cape and the Karoo being of particular significance (Burgess, et al, 2004). The region has a total of 66 888 plant species (including medicinal) of which 3 666 are endemic (Krug et al, 2002). However, part of this biodiversity is in decline. Reasons for this include the harsh economic environment, high population growth, rise in incurable diseases such as HIV/AIDS, and increased international interest and trade. Consequently, the natural stock of medicinal plants is failing to meet demand leading to the overexploitation of certain species. For example, there is over-harvesting of *Walburgia salutaris* in Swaziland and Zimbabwe; and *Albizia brevifolia* in Namibia (SADC, 2006).

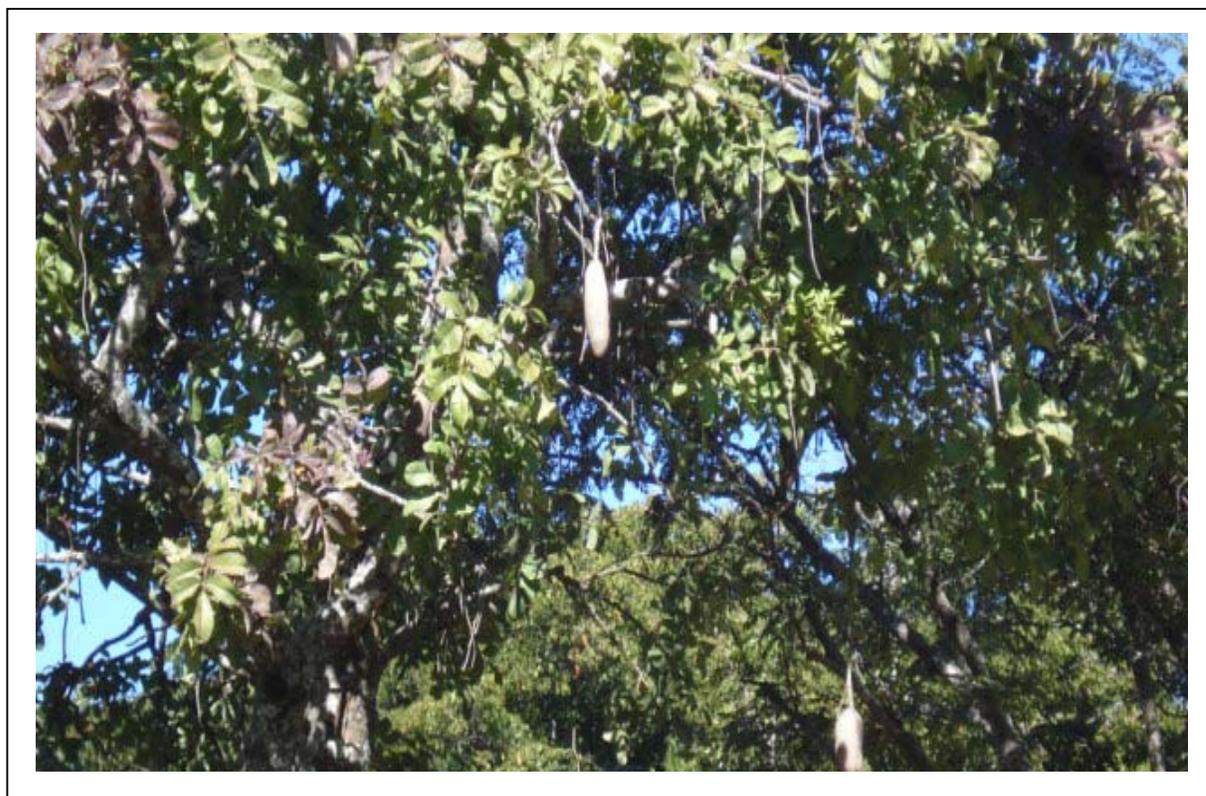
Recognizing the importance of traditional medicine in their national health care systems, governments of Southern Africa are collecting information on medicinal plant species and their traditional uses; championing the incorporation of traditional medicine into the national health care system; and providing enabling administrative and governance structure for the practice. The objectives of this Study were therefore to gain a better understanding of the status of traditional medicinal plant practice in Zambia and Zimbabwe and to identify opportunities for its sustained growth. It focused on: the evolution of medicinal plant practice; medicinal plant uses, harvesting and processing; bio-prospecting in medicinal plants; and the legal framework for medicinal plant practice.

METHODOLOGY USED

The Study was carried out in Zambia and Zimbabwe. The countries were selected for the following reasons:

- Over 75% of their people benefit from traditional medicinal plant practice;
- They have large populations of traditional healers (diviners and herbalists) whose livelihood considerably depend on the practice;
- They fall within the miombo eco-region (one of the 35 priority eco-regions for WWF's conservation work worldwide) and have large pools of plant species with medicinal properties; and,
- Zambia has 4 600 flowering plant species of which 211 are endemic; and Zimbabwe has about 6 000 species of which 96 are endemic (Cumming, 1999). Some of the medicinal plant species are threatened by overharvesting and land clearing for agricultural purposes.

A national consultant was engaged to undertake the study in each country. The study largely consisted of literature reviews; and key informant face to face or telephone interviews. The World Wide Fund for Nature (WWF)'s Miombo Ecoregion Conservation Programme pulled together key findings and recommendations from the two national consultancy reports and produced this regional synthesis document.



Kigelia Africana, one of the plant species with multiple medicinal uses

KEY FINDINGS AND RECOMMENDATIONS

Evolution of Traditional Medicinal Plant Practice

The Origins

Traditional medicinal practice in Zambia and Zimbabwe has evolved over the years from a household and village activity to a commercial enterprise (Duri, 2009 and Mwitwa, 2009). Before the colonial era, households followed traditions of their ancestors of using medicinal plants to treat various ailments. Prescriptions were either self administered; administered by somebody within the household and tribe; and in some special cases with assistance from specialists outside the tribe. From this humble yet complex system has emerged an industry that governments of the study countries have yet to fully capitalize on.

Traditional medicinal plant practice is widely accepted as an alternative to modern medicine in rural, peri-urban and urban areas. Beneficiaries of the practice cut across the gender, age, education and social status divide. Over 75% of all Zambians and about 80% of all Zimbabweans have benefited from traditional medicinal plant practice voluntarily or involuntarily (Duri, 2009 and Mwitwa, 2009). The needs of patients range from receiving simple herbal preparations to casting evil spirits (Duri, 2009). Remedies are taken orally; through steaming; by anal insertion for powders and liquids; by inhalation of smoke and fumes; by wearing and carrying on the body; by rubbing on the affected part; and by taking in a drink, porridge and solid food. With respect to marketing the practice, herbal remedies are displayed in various markets and people freely consult and purchase them from herbalists and in a few cases pharmacies. Practitioners also advertise their merchandise along roadsides and in the press.



Traditional healers advertising their trade along the roadside

The Practice

In the olden days, traditional medical practice was rurally based as a full time job and a healer would personally collect and process his/her remedies following certain principles of sustainable use. Today, the practice has infiltrated urban areas where healers operate from their houses and from market places and obtain medications through herbal vendors. Practitioners include men and women; the youth and elderly; the educated and uneducated; and the rich and poor and can be broadly grouped into Diviners and Herbalists.

Diviners

Diviners, popularly known as spirit mediums or “N’anga”, use their spiritual or magical powers to establish the cause of illness and prescribe medication to a patient. Their divine traditional knowledge is highly integrated into the social and ethnic fabric of the people. Within a rural setting, such knowledge was a means of survival and education about livelihoods, family, conflict resolution, and relationships with other ethnic groups was embodied within it (Mwitwa, 2009). The respect and fear that went with the practice guarded against abuse of medicinal plants and intellectual property rights.

Herbalists

Herbalists do not practice divination (have no spiritual touch). Their diagnosis is similar to that by modern medicinal practitioners whereby a client narrates a medical problem and they prescribe medication. They are normally trained by diviners through apprenticeship arrangements. This is sometimes done by carefully selecting individuals who show potential to master the practice.

Organizational Framework

Traditional medicinal practitioners in Zambia and Zimbabwe have formed Associations to help them regulate their practice and to engage government. The major and well known associations have been the Traditional Health Practitioners Association of Zambia (THPAZ) and the Zimbabwe National Traditional Healers Association (ZINATHA).



Sample of membership certificate for traditional medical practitioners in Zimbabwe

Traditional Health Practitioners Association of Zambia

Membership of the Traditional Health Practitioners Association of Zambia (THPAZ) is open to all traditional healers in the country. The Association is a legally recognized non-governmental organization established in 1978 and had about 35 000 members in 2005 (WHO, 2005). It regulates traditional medicinal practice; provides guidelines for handling medicinal plants; and advocates for the rights of healers and their recognition by the country's health care system. However, THPAZ is still not yet fully recognized by relevant government institutions under the Ministry of Health such as the Medical Council of Zambia (MCZ) and the National AIDS Council. MCZ is the custodian of the National Health Policy (Box 1) and does not recognize traditional medical practitioners as "medical professionals" (Mwitwa, 2009).

The National AIDS Council implements the National HIV/AIDS policy. The latter recognizes the use of traditional and/or alternative remedies in the treatment of HIV/AIDS, STD and TB. However, the National AIDS Council has indicated that claims on the potency of traditional/alternative remedies in curing HIV/AIDS have not been substantiated and therefore concluded that "—in the meantime, there is no collaboration between practitioners of formal and traditional medicines" (Mwitwa, 2009).

Zimbabwe National Traditional Healers Association and the Traditional Medical Practitioners Council

Following the attainment of national independence in 1980, the Government of Zimbabwe showed a favourable attitude towards traditional medical practice and undertook to assist in its development. The then Minister of Health convened a national meeting attended by about 100 healers. The meeting agreed to form an umbrella national association called the Zimbabwe National Traditional Healers Association (ZINATHA). The Association was established in 1981 and absorbed eight traditional healer associations that existed at the time. They were: African N'anga's Association; Rhodesia Herbalist Association; African Chiremba Council; Zimbabwe N'angas Association; True African N'angas Association; United N'angas Association; Central African Chiremba Association; and Mabwedziva Association. The mandate of ZINATHA

was to advance the interests of its members. In 2005, some traditional healers broke away from ZINATHA and formed their own associations. Some eight associations emerged from this development and became affiliates of the Traditional Medical Practitioners Council.

The Traditional Medical Practitioners Council (TMPC) was established under the Traditional Medical Practitioners Act of 1981 (revised in 1996). Its functions are to supervise, regulate and control traditional medical and faith healing activities. Its membership is drawn from traditional healers and is administered by the Ministry of Health. It registers and licenses all traditional and faith healers in the country and its structure and functions are given in Box 1. Between 1981 and 2005, TMPC licenses were issued through ZINATHA. The Council now operates independently although it has no Secretariat and offices of its own.

Despite its noble intentions, the TMPC has not been able to bring traditional medicine into mainstream medical practice in the country. Reasons for this include the following (Duri, 2009):

- The Council reports to individuals and technocrats who are alleged to have limited appreciation of the practice and who look down on it at the Ministry of Health;
- Infighting between Council members from rival Associations. Members of the Council come from all traditional healer associations that broke from ZINATHA in 2005;
- Lack of formal institutional linkages between the TMPC and the Health Professions Council (that caters for modern medical practice). It was envisaged that dialogue and engagement between the two Councils would be through joint seminars and workshops. This has not worked out well to date; and,
- Inadequate financial and human resources to implement Council's well thought out and ambitious agenda.

The following observations can be made from the foregoing analysis:

- In Zambia, THPAZ and its members are not yet fully recognized by relevant government bodies (viz. MCZ and National AIDS Council) that deal with traditional medicine; and,
- In Zimbabwe, traditional medicine is still largely viewed as inferior to modern medicine despite the creation of TMPC.

To address the foregoing, there is need to:

- Facilitate the recognition of THPAZ and its members by relevant government institutions and provide the necessary political and financial support to them; and,
- Support the integration of traditional and modern medical practice into Zimbabwe's health care system by strengthening and capacitating existing institutions (i.e. TMPC and traditional healer associations) so that they fulfill their mandated functions. This will also require that all affiliates of TMPC work together and not against each other. In addition, functional mechanisms should be put in place to facilitate and buttress dialogue and cooperation between TMPC and the Health Professions Council.

Box 1: Brief on the Medical Council of Zambia and the Traditional Medical Practitioners Council of Zimbabwe

Medical Council of Zambia

The Medical Council of Zambia (MCZ) is a statutory body established under the Medical and Allied Professionals Act of Zambia. Its mandate is to protect, promote and safeguard the health and safety of the public by ensuring that appropriate standards are maintained. It also regulates the ethical and professional standards of practice of health professionals.

Traditional Medical Practitioners Council-Zimbabwe

The Traditional Medical Practitioners Council (TMPC) was established under an Act of Parliament. Its objectives are to:

- Coordinate traditional medicinal practice and open cooperation between traditional healers and modern health workers;
- Improve on the knowledge of traditional health practice through research on both the practice and the medicines such that traditional medicine can be utilized in the delivery of primary health care;
- Obviate the continued application of practices that place patients at proven unnecessary risk. This involves the regulation of continued use of medicines shown to have narrow LD50/ED50 ratios;
- Produce written records on traditional medical practice, including flora and fauna, and other materials used therein. The data will be compiled into the Pharmacopoeia of Zimbabwe Traditional Medicine; and,
- Establish a Research Institute on Traditional Medicine. The institute should be responsible for the scientific evaluation of medicinal flora, fauna and other materials used therein before such medicines are recommended for wide scale utilization.

The Council has 12 members constituted as follows:

- A chairperson appointed by the Minister in consultation with traditional healer associations;
- A deputy chairperson (a practicing and registered healer) appointed by the Minister;
- Five registered traditional healers appointed by the Minister; and,
- Five registered traditional healers elected by registered traditional medical practitioners.

Source: Duri (2009) and Mwitwa (2009)

Medicinal Plant Uses, Harvesting and Processing

“Being a practicing herbalist myself, I always come back from my herbal collections disappointed. You get to your usual site and now it is someone else’s field and everything has been cleared for other agricultural purposes. You get to another, the plants and trees have been cut for firewood or for fencing purposes”. Duri, 2009.

Plant Uses and Harvesting Procedures

The study countries are home to a wide range of important medicinal plant species. Uses of the plants sometimes vary with location and ethnic group of the user (Mwitwa, 2009). For example, an ethnic group may consider the root of a plant species as the main part to treat a particular illness while another may consider the leaves for that purpose. Similarly, the

same plant species might treat a number of ailments singly or in combination with others. Information on the plant part used and ailment treated by selected medicinal plant species in the study countries is presented in Annex I.

Box 2 highlights the uses and practices used to harvest some medical plant species in Zambia and Zimbabwe. The plants have multiple uses, the bulk of which remain unexplored and unexploited. However, some of them are being lost at an alarming rate. Reasons for this include:

- High population growth, a hostile economic environment, limited access to modern medicines and the emergence of incurable disease such as HIV/AIDS that have raised the demand for traditional medicine;
- Limited information on the concentration of the active ingredient in various plant parts at different times of the year. This contributes to the overharvesting of some species;
- Plant loss through land clearing. It is estimated that Zimbabwe and Zambia lose about 300 000 ha and 280 000 ha of forests/woodlands each year respectively (Masinja, 2009; Sangarwe and Zhakata 2009); and,
- Disregard for certain conservation sensitive traditional norms and taboos. For example, it was believed that a remedy would work best if the bark used to prepare it was harvested from the east and west sides of a tree trunk only. In addition, roots of certain plant species were believed to work best when used fresh. This forced healers to collect just enough material for the task at hand. Furthermore, collecting a plant part from a source where another practitioner had just harvested from was said to render the remedy ineffective. Unfortunately, such norms are no longer observed by the new generation of healers, especially herbalists, who usually lack spiritual guidance in their practice.



Ring barked Warburgia salutaris with shoots coming out

Despite the foregoing realities, the degree of threat to key medicinal plant species has not been established although a preliminary categorization of such species (by threat category) has been done for four districts in Zimbabwe (MET, 2008). There is therefore need for national assessments of threats to medicinal plant species using internationally recognized

procedures. Mitigation measures for threatened species can then be proposed and implemented. In the case of *Hoodia gordonii*, the Convention on International Trade in Endangered Species (CITES) placed the plant on Appendix II to regulate its trade at the behest of Botswana, Namibia and South Africa in 2004. However, the success of such efforts depends on the adoption of a regional approach given the trans-boundary nature of some medicinal plant species.

Box 2: Uses and Harvesting Practices for Selected Medicinal Plant Species

Warburgia salutaris

The stem, bark and roots of *Warburgia salutaris* are used to treat a number of ailments such as heart problems, STDs, headaches and chest pains. The species is heavily harvested and widely traded in Southern Africa. Traditional healers and herbal vendors ring back the trees and in some cases uproot the plant to get as much bark and root as possible. The plant bears seed that is difficult to germinate and hence it is not easy to propagate from seed.

Cassia abbreviata

Cassia abbreviata's roots are believed to help in cases of high blood pressure, malaria, STDs and impotence. The plant is in high demand in view of the HIV/AIDS pandemic. Many practitioners believe that it is more effective when fresh. This tends to limit the amount of material dug at any given time. In addition, the fact that the plant species grows into a big tree makes it difficult to uproot. The species propagates well from seed and root extensions.

Aloe species

The *Aloe* species is extensively harvested and used in various ways in traditional Zambian and Zimbabwean societies. Its uses range from medicinal to preparing young girls for marriage. The above ground portion is the most widely used part and is harvested by removing the whole plant. It is sliced open and the gelatinous juice is applied to wounds, rashes, irritant skin and burns. It can also be sliced, boiled and drunk as a cough remedy. The Aloe flourishes during the rainy season. Its growth is affected by the dry season and frequent fires.

Pterocarpus angolensis

Pterocarpus angolensis is widely used in Zambia and Zimbabwe as a source of timber and a medicinal plant. Plant parts used for medicinal purposes are the bark and root. The bark is either harvested or pierced to allow the red resin to coagulate and then collected for medicinal use. This results in extensively debarked trees near foot paths or residential areas. Such trees are usually killed by late dry season bush fires that burn the exposed wood. In extreme cases the tree is completely ring barked and it senesces due to lack of connecting cambium tissue.

Source: Duri (2009) and Mwitwa (2009)



Traditional harvesting of the Aloe species involves removing of the whole plant

Other attempts to reduce threats to medicinal plants by study countries include the following:

- The government of Zimbabwe, through its Ministry of Environment, recently developed guidelines on the sustainable harvesting of traditional medicinal plants in the country. Issues covered by the guidelines include: when, what and how to harvest; equipment to use; and post harvest handling of material including processing, drying and storage (MET, 2008). The impact of the guidelines remains to be seen. However, they might be difficult to enforce due to issues surrounding tree and land tenure and the secrecy that shrouds the profession; and,
- Some limited, sporadic and opportunistic attempts to plant medicinal plants are being made by individuals (as single plants around homes and gardens) and organizations (such as Tree Africa and Commercial Bank of Zimbabwe). Tree Africa is promoting Rotarian business and values in Zimbabwean schools whilst the Commercial Bank of Zimbabwe is promoting soccer. Alongside these activities, the two organizations decided to include plant cultivation. They started with one school each and have since invited botanists to introduce medicinal plant species into the programme and to catalogue plants already planted by the schools (Duri, 2009). Unfortunately, such piecemeal efforts are not sustainable as they depend on interests of individuals at the helm of participating institutions at the time.

The foregoing analysis shows that very little effort has gone into the cultivation of medicinal plant species. There is therefore need for mechanisms that will ensure the sustainable supply of threatened species by domesticating and cultivating them at a commercial scale. This only becomes economically viable when there is guaranteed, sizeable and consistent demand.



Propagation of Warbugia salutaris

Preparation of Medicinal Plant Remedies

The preparation of medicinal plant remedies in the study countries takes various forms. They include cutting plant parts (viz, leaves, roots and bark) into smaller pieces; or crushing/grinding them into powder; or burning them to an ash that is ground into a powdered substance before they are ready for use. The remedies can be administered singly or in combination depending on the ailment. Traditionally the remedies had no special packaging and were usually sold as is. There is, however, a trend towards improved processing and packaging of medicinal plants, especially by some traditional healers operating from urban centres. Their herbals are cleaned, ground, sieved and packaged in plastic containers or paper envelopes with labels that describe their use.

Traditional medicinal plant remedies are usually sold from the practitioner's residence or laboratory; on the roadside; and at local and urban markets. Drug stores/pharmacies do not normally carry sizable amounts of locally produced herbal drugs. Rather, they stock value added and well packaged herbals from countries such as India, China and South Africa.

The foregoing analysis shows that medicinal plants are mostly used and/or exported in their raw form with little to no value addition. This limits the financial benefit that accrues to traditional healers and to study countries and reflects on the limited bio-prospecting work being done on medicinal plants. There is therefore need to facilitate bio-prospecting research on selected species through private-public sector partnerships.



Presentation of traditional remedies with no special packaging



There is a trend towards improved processing and packaging of traditional medicinal plants

Bio-Prospecting in Medicinal Plants

Some limited bio-prospecting work (i.e. phyto-chemical and pharmacological research-see Annex II) on traditional medicinal plants is being done in the study countries. It is carried out by private and public sector institutions but remains shrouded in secrecy largely due to intellectual property rights concerns.

Private Sector Research

As indicated earlier, researchers are not keen to share results of their work on traditional medicinal plants due to bio-piracy concerns. However, Dr James Duri of the Chemistry Department at the University of Zimbabwe volunteered the following research work: Dr Duri and Prof L. Gwanzura personally funded research on a traditional medicinal plant species code named DMT005 that is claimed to treat tuberculosis (TB). They worked with a female traditional healer who uses the plant for that purpose. Details on the methodology used are given in Box 3. The medication killed all 37 TB strains on which it was tested. Unfortunately, no follow up was done to establish the active ingredient in the medication due to lack of appropriate research facilities and funding.

Box 3: Methodology Followed in the Research on Medicinal Plant DMT005.

Dr J. Duri and Prof L. Gwanzura harvested the DMT005 plant from a forest, cleaned, dried and burnt it into ash. The ash was ground into fine powder and extracted with water. The water extract was evaporated under vacuo and freeze dried. This gave clear crystals that were screened using an X-ray fluorescence scanner. The researchers were then able to pick all anions and cations present in the crystals. The crystals were placed in an ethanol media and tested for their activity on 37 TB strains at the National TB Reference Laboratory in Bulawayo, Zimbabwe.

Source: Duri (2009)

Public Sector Research

In 2005, Zambia's Ministry of Health announced the commencement of clinical trials on the efficacy of three traditional medicines on 25 HIV positive patients. During the same year, the National Aids Council announced that it was collaborating with the Ministry of Health to facilitate the analysis of 18 herbal formulations prepared by traditional healers for their anti HIV-1 activity. The Ministry also initiated an observational clinical study on the safety and efficacy of five herbal medicines. By 2007, two of the formulations showed some anti HIV-1 activity. However, the experiments were not conclusive and further analysis was reported to be in progress. In 2004, the government also established the Zambia Institute of Natural Research whose mandate is to carry out research on medicinal plants and to promote naturopathic medicine. However, the Institute has had very limited activity to date.

In the case of Zimbabwe, the Research Institute on Medicinal Plants proposed under the auspices of the Traditional Medical Practitioners Council has not yet been established.

The foregoing analysis shows that there is activity in some tested herbals. However there is little capacity to add value to these results due to lack of appropriate research facilities and funding. There is therefore need to:

- Mobilize resources to establish and/or operationalize relevant institutions such as the Research Institute on Traditional Medicine in Zimbabwe and the Zambia Institute of Natural Research through public-private sector partnership arrangements;
- Seek financial and other resources to facilitate the conclusion of stalled but promising research such as that on plant DMT005 which showed some activity in TB treatment; and,

- Ensure that results of bio-prospecting work benefit traditional knowledge holders and the study countries through the enactment and enforcement of appropriate access and benefit sharing legislation.



Research facilities at the University of Zimbabwe

The Legal Framework for Medicinal Plant Practice

Traditional Knowledge on Medicinal Plants and its Commercial Use

Traditional medical practitioners harbour a wealth of knowledge on valuable medicinal plant species and their uses. The information is orally handed down from one generation to the next. However, their nations lack the technical, financial, legal and institutional capacity to further develop, patent/protect and commercialize such knowledge. It is against this background that the issue of bio-piracy has been raised. Bio-piracy is the acquisition of biodiversity (i.e. biological material) or of traditional knowledge related to that biodiversity without the prior informed consent of those whose biodiversity or traditional knowledge has been taken. It is usually fueled by the inadequacy and ineffective enforcement of appropriate regulatory and institutional frameworks. Unfortunately, cases of bio-piracy are usually difficult to prove, especially in situations where the knowledge in question is already in the public domain.

Legal Framework for Traditional Medical Practice

Zambia and Zimbabwe have a number of sectoral laws that deal with the environment and have relevance to medicinal plants. They include the Forest Act, the Parks and Wildlife Act, the Natural Resources Act and the Environmental Protection and Pollution Act. In their current form, these pieces of legislation have no provision for access to traditional knowledge and benefit sharing (ABS) and are fragmented. Attempts to streamline and coordinate environmental legislation in some Southern African countries such as Zimbabwe have been made through the promulgation of the National Environmental Management Act –NEMA (SADC, 2007). Zimbabwe's NEMA provides a broad legal framework for the sustainable use of all natural resources, including land and water and has ABS provisions. The latter include:

- Protection of intellectual rights of local communities in respect of biological diversity; and,

- Equitable sharing of benefits arising from the technological exploitation of germplasm originating from the country.

Zimbabwe's statutory Instrument (SI) 61 of 2009 is based on the foregoing provisions of the Act. The Act is entitled "Environmental Management (Access to genetic resources and indigenous genetic resource based knowledge)". Areas covered by the Instrument are given in Box 4. However the Instrument has not yet been implemented. There is need to support and facilitate its implementation so that lessons learnt can be shared with other Southern African countries.

Box 4: Areas Covered by Statutory Instrument 61 of 2009 of Zimbabwe's National Environmental Management Act

Areas covered by the Instrument include:

- Genetic resources and indigenous genetic resource based knowledge protection;
- Community rights over genetic resources and indigenous resources and indigenous genetic resource based knowledge;
- Rights and access to genetic resources and indigenous genetic resource based knowledge;
- Rights of traditional medicinal practitioners and communities to traditional medicines and traditional medical knowledge and access thereto;
- Block bio-prospecting and block general licenses;
- Communal rights claims; and,
- Public hearings,



Ziziphus mucronata can treat a wide range of ailments based traditional knowledge

WAY FORWARD

The following actions are proposed in order to take recommendations of the study forward:

- Facilitate the full recognition of THPAZ and traditional medicinal practice by relevant government institutions;
- Support the integration of traditional and modern medicinal practice into Zimbabwe's health care system by strengthening and capacitating existing institutions to fulfill their mandated functions;
- Carry out national assessments on threats to medicinal plant species using internationally recognized procedures;
- Ensure the sustainable supply of key medicinal plant species through their domestication and commercial cultivation;
- Mobilize resources to carry out bio-prospecting research on selected medicinal plant species through private-public sector partnerships;
- Seek financial and other resources to facilitate the conclusion of stalled but promising research such as that on plant DMT005 that showed some activity in TB treatment;
- Ensure that results of bio-prospecting work benefit traditional knowledge holders and study countries by facilitating the creation and implementation of a conducive legal framework; and,
- Support and facilitate the implementation of Statutory Instrument 61 of 2009 on "Access to genetic resources and indigenous genetic resource based knowledge" by the Government of Zimbabwe so that lessons learnt can be shared with other Southern African countries.

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ANNEXES

Annex I: Information on Plant Part Used and Ailment Treated by Selected Medicinal Plant Species

Plant species	Plant part	Ailment treated
<i>Azelia quanzensis</i>	Bark	Gum breeding & toothache
	Root	Bilharzia & gonorrhoea
<i>Anisophyllea boehmii</i>	Bark	Stomach ache, tooth ache & malaria
	Root	Snake bite.
<i>Annona senegalensis</i>	Leaf	Snake bite
	Bark	Dysentery
	Root	Dizziness, mental illness, rash & sleeping sickness
<i>Baikiaea plurijuga</i>	Bark	Syphilis
<i>Brachystegia speciformis</i>	Bark	Stomach pains & cough
	Root	Dysentery, diarrhea, gonorrhoea & stomach ache.
<i>Carissa edulis</i>	Root	Stomach ache, gonorrhoea & abortion induction.
<i>Clerodendrum myricoides</i>	Bark	Snake bite & pneumonia
<i>Commiphora edulis</i>	Root	Gonorrhoea & pneumonia
<i>Cordia goetzei</i>	Leaf	Sores
	Root	Aphrodisiac
<i>Commiphora africana</i>	Bark	Fever, abdominal pain & snake bite
	Fruit	Stomach pain
<i>Cyperus rotundus</i>	Tuber	Liver & heart diseases & head ache
<i>Dalbergia nitidula</i>	Bark	Woods & pneumonia
	Root	Gonorrhoea, eye sores & stomach ache.
<i>Erythrophleum africanum</i>	Bark	Pneumonia
	Root	Syphilis & pneumonia
<i>Flacourtia indica</i>	Leaf	Asthma
	Bark	Throat infections & rheumatism
	Root	Pneumonia & fits
<i>Hymenocardia acida</i>	Leaf	Head ache
	Bark	Ulcers, sores & tooth ache

Plant species	Plant part	Ailment treated
	Root	Ulcers, sore throat & mouth infections
<i>Julbernardia paniculata</i>	Bark	Common cold, sores, trachoma, syphilis & sneezing
<i>Kigelia africana</i>	Leaf	Sores & cuts
	Roots	Venereal diseases & dysentery
	Fruit	Syphilis, rheumatism, skin disease, ulcers, wounds & sores, gynecological conditions & dysentery.
<i>Parinari curatellifolia</i>	Bark	Pneumonia
<i>Pterocarpus angolensis</i>	Bark	Nose bleeding, mouth ulcers, malaria & gonorrhoea
	Root	Corneal ulcers.
<i>Sclerocarya birrea</i>	Bark	Dysentery, diarrhea, malaria, fever & used to determine sex of a child.

Annex II: Description of Phyto-Chemical and Pharmacological Research

Phyto-chemical studies involve the following (Duri, 2009):

- Ethnobotanical work/field work (normally done with traditional healers);
- Sample collection including a voucher specimen normally deposited with the National Botanical Garden;
- Plant material preparation, i.e. cleaning, drying (if it is used dry) grinding and sieving to the right particle size;
- Extraction of the phyto-constituents using different solvents; concentrating the extracts; and freeze drying them;
- Thin layer chromatography to determine the number of compounds in the extracts;
- Chromatographical work (column chromatography, preparative chromatography, rotational liquid-liquid chromatography, high pressure liquid chromatography, etc.) which separates the compounds from extracts into individual (hopefully) pure compounds; and,
- Pure compounds then undergo structural elucidation using nuclear magnetic resonance spectroscopy, infrared spectroscopy, mass spectrometry, ultra-violet spectroscopy and X-ray crystallography. Data from the foregoing techniques allows one to deduce the chemical structure of a compound.

Pharmacological studies involve biological tests on the extracts and purified compounds. For example, if a plant is known to have anti-bacterial activity then the extracts will be screened on a number of bacteria species to confirm and see its range of activity.



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