

Perspectives on Biodiversity, Traditional Medicine and Public Health Care in Eastern and Southern Africa

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Abstract

The paper provides examples from the two African regions on biodiversity as a source of traditional medicines and health care with emphasis on the role of traditional medicine in male reproductive health care and on the threats to biodiversity and traditional medicines as well as policy implications. It uses cases from Eastern and Southern Africa to demonstrate the symbiotic relationship between biodiversity, traditional medicines and public health care. It advances the argument that industrialization, urbanization and western medicine impact on African indigenous medical and knowledge systems. Secondary sources reveal that more than 80 per cent of the livelihood needs of the African poor, including health care, depend on biological resources. The findings demonstrated that traditional medicines were culturally acceptable and would continue to be used in future because of limited resource for conventional health practices.

Keywords: Medicinal plants, Reproductive Healthcare, Gender, Indigenous Knowledge

Introduction

It is well known that biodiversity is a source of traditional medicines and health care. The World Health Organization (WHO) (2013) indicates that like in other regions of the world, medicinal plants have been used since times immemorial in all cultures in Eastern and Southern Africa. The widespread use of these herbal remedies and healthcare preparations are linked to the occurrence of natural products with medicinal properties. The World Health Organization (WHO), (2015) defines traditional medicine as the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness. Allen (2003) looks at the biological diversity or biodiversity in the context of traditional medicine as the variety within and between all species of plants, animals and micro-organisms and the ecosystems within which they live and interact. In this discussion, public health refers to all organized measures (whether public or private) to

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prevent disease, promote health, and prolong life among the population as a whole (Brownson et al., 2003).

WHO (2005) reveals that the current growing interest in medicinal plants and associated indigenous knowledge systems as a re-emerging public health care has been motivated by costs of prescription drugs in the maintenance of personal health and well-being, including the bio-prospecting of new plant-derived drugs. African Union (2008) shows that between 70-80% of the people in Eastern and Southern Africa depends on traditional medicine for primary health care because access to affordable modern health care is generally unavailable for the average person. The situation is exacerbated by the generally low food security and supply of nutritious sources of food. Within this context, links to readily available, effective, and low cost health care has become extremely important, especially in light of high population growth rates. Traditional Herbal Medicine (THM) is increasingly filling this health care niche. This is attributed to its wide availability and low cost. Herbal medicine has for centuries been regarded as the primary health care provider.

In his discussion on the challenges of bio-diversity and traditional medicine, Abdullahi, (2011) indicates that competition between herbal harvesters has increased as wild habitats and herbal populations have decreased. This has not only significantly driven up prices of raw herbal species but also led to the increasing use of unsustainable harvesting techniques. The latter reduces the supply of herbal medicines, diminishing natural resources, threatening wildlife habitats, deforestation and disappearing indigenous knowledge that threatens the very foundation of traditional medicine as the primary health care provider in these countries. The paper advances the argument that although the implications of biodiversity loss for the global environment have been widely discussed, it only recently that attention has been given to its direct effects on human health. This is attributed to the increasing realization that health risks are no longer merely a result of localized exposures to "traditional" forms of pollution. They are also a result of broader pressures on ecosystems, which range from depletion and degradation of freshwater resources, to the impacts of global climate change on natural disasters and agricultural production. The harmful effects of the degradation of ecosystem, especially poverty and diseases are borne disproportionately by the poor (African Union, 2007).

The interrelationships between society and nature, and the importance of environmental health to human health, are increasingly recognized and have drawn attention to the fact that biodiversity loss can have indirect effects on human well-being including health. This is due to the realization that by disrupting ecosystem function, biodiversity loss leads to ecosystems that are less resilient, more vulnerable to shocks and disturbances, and less able to supply humans with needed services. For example, the damage to coastal communities from floods and storms, for example, increases dramatically following conversion of wetland habitats, as the natural protection offered by these ecosystems including regulation of water run-off is compromised (St Leger, 2003). Bio-diversity loss diminishes the supplies of raw materials for drug discovery and biotechnology, causes a loss of medical models, affects the spread of human diseases, and threatens food production and water quality.

Methodology

The paper is based on the examination of secondary sources in various cases from the Eastern and Southern Africa regions to interrogate the link between traditional medicine, biodiversity including associated indigenous knowledge and public health care. As a method of data collection used in this paper the process of examination of secondary sources involved accessing information that is already gathered from past research papers, journal publications, books and archival materials relevant to the issues under discussion. The researchers used this method due to a number of factors: easy access of the sources online with limited costs compared to conducting primary research in two wide study regions; the available diverse secondary sources from the various countries of the two regions helped the researchers to clarify the research questions; the secondary sources also assisted to realize that most of the required information relevant to the discussions were already available.

Results and discussion

The Efficacy of Biodiversity, Traditional Medicine and Indigenous Knowledge in Public Health in Eastern and Southern Africa: The Case of Male Reproductive Health Care: This section interrogates one of the worldwide issues which tends to be neglected in reproductive health care policies within the context of biodiversity and traditional medicine. This is the

problem of erectile dysfunction (ED) sometimes referred to as impotence. It is defined as the repeated inability to get or keep an erection firm enough for sexual intercourse. It is one of the most distressing conditions a man can experience. The causes could be attributed to illness, drugs, depress or a cycle of stress and anxiety. Whatever the cause, ED can hurt self-confidence and relationships (Chinnoch, 1996). WHO (2015) states that the concept of reproductive health care in most African countries has been focusing mainly on women. The health policy priorities of men's reproductive health tend to be marginalized. The sexual and reproductive health rights in these countries focus on maternal and child mortality, family planning and the like exclusive of men's sexual needs and rights. Yet, it is estimated that over 300 million men worldwide are faced by this problem. Hirt et al., (2001) indicate that the gender specific conditions gender in reproductive health care are not given the due regard and as a result the suffering persons tend to shy away. Sexual impotence and ED in men is considered a secret affair and the suffering person keeps quiet or seeks medical help in privacy. The psychologically affected men might try other women to test the viability of their manhood. Women with spouses with such erectile problems may be tempted to go outside their marriage vows to satisfy their sexual needs. This can also lead to infection of HIV/AIDS and other sexual transmitted diseases and result in broken homes and marriages. The consequential outcomes of promiscuity, low self-esteem, polygamy, diseases are more detrimental to the individuals and society. The study by Kamatenesi-Mugisha et al., (2005) provides various descriptions of impotent men in western Uganda among the Banyankore ethnic grouping. They are considered as persons having no legs (Kifabigyere, Runyankore) in the local language. This implies that the penis is dead (cannot bear children). There are other various terms used to describe such men with sexual impotence and ED like the one trampled by a goat) in Kinyankore language. In other places they called, such men who were unable reproduce as "Ekifera" in Kinyankore meaning worthless). In such as traditional society the men who were unable to have children were not supposed to be given the positions of responsibility or leadership because they were regarded as abnormal. Socially these men were excluded from society, even on drinking joints for the local brew or beer, they were not expected to talk. Even women and children always taunted the suffering individuals. Socioeconomically, sexual impotence and ED was demeaning and tortured the sufferers by reducing their self-esteem and worthiness in the society. Traditionally, among the Banyankore, the impotent men married wives and entrust their wives to very close friends and or relatives to bear them children. In central

Uganda, the men with erectile problems were equalled to car engines that cannot start on their own or cars whose batteries have no or low charge. The common treatments for ED have been in conventional medicine. However, shows that most of the conventional drugs and treatments have limited efficacy, unpleasant side effects and contra-indications in certain disease conditions. Although Viagra® has been a successful drug that modifies the haemodynamic in the penis, studies show that it has side effects such as headache, flushing, dyspepsia and nasal congestion. Furthermore, it is not compatible in some men; it works in less than 70% of men with various etiologies. Modern medications available for ED treatment in men are too expensive for most rural inhabitants of developing countries (Kamatenesi-Mugisha et al., 2005).

The paper argues that the contribution of traditional medicine in the treatment of ED in Africa tends to be neglected. The paper uses research cases from Limpopo Province in South Africa and Western Uganda (Uganda) to demonstrate the use and efficacy of traditional medicines in mitigating this important public health care challenge. In African traditional medicine, several plant species have been used to treat ED (Kamatenesi-Mugisha and Oryem-Origa, 2005). These have been found to be effective, safe and with minimum side effects (Sofowora, 2002). The paper uses research cases from Limpopo Province in South Africa and Western Uganda to demonstrate the use of traditional medicines to mitigate this public health challenge. Mathibela (2013) shows an inventory of medicinal plants commonly used by the Bapedi people in South Africa to treat erectile dysfunction. A total of 21 medicinal plant species belonging to 15 families, mostly from the *Apocynaceae*, *Asteraceae*, *Celastraceae*, *Fabaceae*, *Hyacinthaceae* and *Hypoxidaceae* were used. The most frequently used species were *Zanthoxylum humile*, *Catha edulis* *Ozoroa sphaerocarpa*, and *Hypoxis hemerocallidea*. Roots, bulbs and tubers were mostly preferred for medicine.

Dlamini et al., (2002) state that the widespread use of subterranean parts (roots, bulbs and tubers) to prepare medicine was based on the perception that more healing power is contained in them as opposed to others parts. This is in line with scientific evidence that subterranean parts generally contain high concentrations of bioactive compounds than aerial parts. However, because their extensive harvesting is threatening the existence of the affected plant and ultimately the species healers should be encouraged to supplement this harvesting practice with parts such as leaves. The parts were prepared by boiling and pounding. They were mostly taken

orally for a period of one week or until symptoms of erectile dysfunction disappears (Fennell et al., 2004).

The validation of these plant species were done through their extensive use by various cultures in South Africa and other parts of Africa. For example, the Vha-Tsonga people of the Limpopo Province use both *D. elata* and *H. obtusa* as an aphrodisiac (Moeng and Potgieter, 2011). The utilization of *Callilepis laureola* by Zulu healers of KwaZulu-Natal Province of South Africa to treat ED was noted earlier by Seedat and Hitchcock (1971). *Elephantorrhiza elephantina* is used by the Shona people of Zimbabwe to treat ED (Gelfand et al., 1985). Mutheea et al., (2011) reported *Osyris lanceolata* as one of the most important species used by Maasai healers in Kenya to treat ED. The observed similarities between Bapedi traditional healers and healers of these other ethnic groups in terms of species used are significant. This is because identical plant use by different people from different areas may be a reliable indication of curative properties. However, the study revealed that species such as, *Ammocharis coranica*, *Artemisia annua*, *Ceropegia purpurascens subsp. purpurascens*, *Gomphocarpus fruticosus subsp. fruticosus*, *Jatropha curcas*, *Ozoroa sphaerocarpa* and *Zanthoxylum humile* were noted for the first time in the treatment of ED in area. Semenya et al., (2013) indicate that most of the species used by the Bapedi traditional practitioners were harvested from the communal land, and other were collected from the wild or cultivated in home gardens. The practice of the Bapedi traditional healers harvesting medicinal plants from communal land relates to the easy access to natural resources. However, the, natural resources in communal lands were exploited with little or no control as are a result most of the species become rare or extinct in these lands. The Bapedi traditional healers diagnose ED based on symptomatic presentation. This is because they do not have access to laboratory results to guide diagnosis and treatment, or they shy away from written information due to their illiteracy skills. Importantly, communication prior to diagnosis between Bapedi healers and their patients is very deep. Before commencement of the treatment, Bapedi healers closely observe the condition of their patient and request information about prevailing symptoms. Low sex drive was the most commonly cited diagnostic criteria, followed by a weak erection. It is interesting to note that both low sex drive and weak erection could possibly be linked ED. Bapedi traditional healers depended on the patients' testimony to determine treatment success. Some Bapedi healers claimed that their ancestors confirmed the effectiveness of their herbal prescriptions. This claim was expected as most of African healers believe that the

ancestors have a positive influence on herbal prescriptions. The disappearance or the improvement of symptoms and signs of ED from patients were perceived by Bapedi healers as indicators of a successful treatment.

Similar studies have been done in western Uganda on traditional herbal remedies used in the management of sexual impotence and erectile dysfunction. Kamatenesi-Mugisha (2004) reveals that about 70 - 80% of the Ugandan population still rely on traditional healers for day-to-day health care. The utilization of indigenous knowledge in traditional medicine has been proved to be vital in male sexual reproductive health care delivery in western Uganda. For instance, in his discussion of the social and psychological impact of gender specific reproductive health care generally in Uganda, Chinnoch (1996) states that gender specific malfunctions or complications or diseases and conditions in reproductive health care are not given the due regard and the suffering persons tend to shy away. Sexual impotence and ED in men is considered a secret affair and the suffering persons keep quiet or seek medical help in privacy. The psychologically affected men will try other women to test the viability of their manhood. Women with spouses with such erectile problems may be tempted to go outside their marriage vows to satisfy their sexual needs. This can also lead to infection of HIV/AIDS and other sexual transmitted diseases and result in broken homes and marriages. The consequential outcomes of promiscuity, low self-esteem, polygamy, diseases are more detrimental to the individuals and society. The study by Kamatenesi-Mugisha et al., (2005) provides various descriptions of impotent men in western Uganda among the Banyankore ethnic grouping. They are considered as persons having no legs (Kifabigyere, Runyankore) in the local language. This implies that the penis is dead (cannot bear children). There are other various terms used to describe such men with sexual impotence and ED like the one trampled by a goat) in Kinyankore language. In other places they called, such men who were unable reproduce as “Ekifera” in Kinyankore meaning worthless). In such as traditional society the men who were unable to have children were not supposed to be given the positions of responsibility or leadership because they were regarded as abnormal. Socially these men were excluded from society, even on drinking joints for the local brew or beer, they were not expected to talk. Even women and children always taunted the suffering individuals. Socioeconomically, sexual impotence and ED was demeaning and tortured the sufferers by reducing their self-esteem and worthiness in the society. Traditionally, among the Banyankore, the impotent men married wives and entrust their wives to very close friends and or relatives to

bear them children. In central Uganda, men with erectile problems were equalled to car engines that cannot start on their own or cars whose batteries have no or low charge. Erectile dysfunction and sexual impotence are old problem and traditionally the indigenous knowledge had ways of treating or managing these conditions associated with male reproductive system. These medicinal plants have been in use for centuries in treating or managing conditions in male reproductive organs. The frequently used medicinal plants were *Citropsis articulata*, *Cannabis sativa*, *Cleome gynandra* and *Cola acuminata*. The herbal medicines used in the management of sexual impotence and erectile dysfunction were mainly prepared by pounding, chewing and boiling and were mainly orally administered. The traditional healers in the study are treated sexual impotence and ED by prescribing some of these herbs in tea or using local beers, fermented milk and porridge. Some herbs were roasted or smoked such as coffee before administration. The dispensing of herbal medicines used in sexual impotence and ED using local beers, fermented milk and porridge possibly the alcoholic content improves on the kind of active chemicals extracted than water alone (Kamatenesi-Mugisha et al., 2005).

The Threats to Biodiversity and Traditional Medicine in Eastern and Southern Africa: Implications for Policy Development: This section discusses the threats to biodiversity and traditional medicines in the two African study regions, i.e. Eastern and Southern Africa. Wang (2006) shows that among the Maasai of Kenya and Tanzania in East Africa diverse plant species were invaluable for all facets of life, including animal fodder, medicine, housing and rituals. This also shows that the Maasai have indigenous knowledge of resilient, drought-resistant grasses and other plant species for climate change adaptation. Most of this knowledge is not documented to contribute to the global pool of knowledge on climate change and public healthcare. The significance of this documentation is compounded by the rapid increase in human population, the expansion of human settlements and the creation of national parks for exclusive wildlife habitation, which is contrary to the traditional Maasai pastoral system (Abdullahi, 2011).

A study conducted in Tanzania by Kayombo et al (2013) on Prospects and Challenges of Medicinal Plants Conservation and Traditional Medicine in Tanzania showed that traditional medicine and its practitioners play an important role in healthcare, especially in the rural areas where most of the people live ; and where health facilities, medical personnel, drugs and other medical supplies were inadequate . On the issue of bio-diversity and traditional medicine for

health care study in Tanzania conducted in the Pare Mountains (Kilimanjaro Regions) revealed there were a number of threats to traditional medicine and medicinal plants in the country. Most of the, medicinal plants and animals used locally and those exported were collected from the wild. As result of the increasing demand for herbal medicine worldwide, it has led to indiscriminate harvesting from spontaneous flora including in sacred forests. The growing demand is attributed to high cost in conventional medicine and which is often inaccessible. Many plant species are becoming extinct and others were being endangered in the study areas. Examples of medicinal plants that were being threatened or endangered included. Kizulu in the local Kipare language (*Osyris lanceolata*) and *Kigelia (Steganotaenia araliacea)*. It was also reported that the introduction of exotic plant species in many parts of the country threatened indigenous plants growing in the same area. Two exotic plant species cited were *Azadirachta indica* and *Eucalyptus ssp.* The study observed that little effort was made in planting indigenous medicinal plants in home gardens and farms in the affected areas. Another threat to medicinal plants mentioned in the study was climatic change due to global warming. This effected the distribution of medicinal plants and contributed to loss of genetic resources in areas where they were traditionally found. There was also absence of inventory of medicinal plants and specific policy frameworks to regulate access and harvesting of medicinal plants and other natural resources from the wild (Mahunnah et al., 2012). It was also revealed that besides the threat posed by western on African indigenous medicine, there was an increase in alternative medicine practitioners in the country especially Chinese Traditional Medicine, Homeopath and Radionic medicine. This competition impoverished African Traditional Health Practitioners who depended on traditional medicine and healing practices for livelihood. African researchers complained about multinational gene hunters involved in traditional medicine research and bio prospecting. These gene hunters created an unfair competition on issues of formal collaboration. They linked directly with THPs, instead of mandated linking through Tanzania research institutions (Rukangira, 2001).

The studies in Tanzania also showed that the transmission of indigenous medical knowledge and practice of traditional medicine across generations was in danger. This was due to the situation that some of the potential youths to practice traditional medicine were moving to urban areas, boarding schools, higher learning institutions. Others were not interested in the practice of traditional medicine. They considered it to be primitive and unscientific due to

influence of western education and civilization. Furthermore, the development of traditional medicine in Tanzania was constrained by the situation that in spite of the recognition of traditional health practitioners were recognized by the Traditional and Alternative Medicine Act 2002, the attitude of some western doctors and researchers towards traditional medicine and its practitioners with regard to building partnerships was negative. This made the integration and complementarity of the two knowledge systems in health care difficult. Furthermore, despite the important role played by Traditional Birth Attendants (TBAs) in public health care such as child delivery in rural areas, where health facilities were limited. They, traditional birth attendants were still considered to be major causes of maternal and infant mortality due to their ignorance in managing maternal health problems (Kayombo et al., 2013).

Moreover, although traditional medicine had a crucial role in the public health of the people, limited effort had been done to ensure that it is mainstreamed into the formal health care system in the country. The THPs pointed out the problems of accessing traditional herbal materials from government reserved forests. They had either to have a dialogue with the security officers of the forest or went at odd hours when they could not be seen by security officers. There was lack of transparency from researchers on herbal remedies collected for scientific investigation. The THPs wanted feedback information to healers from whom researchers collected from on medicinal plants. A study by Siangulube (2007) on Vegetation Use and Traditional Conservation Practices in Rural Communities in Mongu and Senanga districts in Western province of Zambia Zambia, demonstrates that more than 80% of the people in the study communities use traditional medicine for health care. The conservation of the bio-diversity of the ecosystem is, therefore, very central as the source of medicinal plant species. The plant parts commonly harvested for medicinal uses were leaves, the bark and roots. Various traditional conservation methods of extraction of medicinal plants sustained abundance and composition of vegetation the local communities. Among the common methods cited fell in the myths and taboos categories. Local people believe that “when one cuts the whole plant for medicinal use, all the diseases that it can cure will be transferred to the family members”.

The indigenous knowledge including belief systems were meant to allow plant regeneration. The local people believed that “our ancestral spirits do not allow us to de-bark a tree on the side where the sun rises or sets when harvesting tree barks”. This concept allowed the

harvested plant to survive and, subsequently, reduces the rate of forest destruction. This indigenous medicinal knowledge was passed on orally from one generation to another through elderly members of the family. The extended family system is still intact among the Lozi family structures who are the inhabitants of the study districts. These elderly people were responsible for educating the younger generations on conservation of the medicinal plant species using myths and taboos. However, due to acculturation, elderly people lamented that younger people generally are discarding traditional beliefs relating to dos and don'ts of medicinal plants. Shapi et al., (2004) look at biodiversity and traditional medicines in Namibia. He indicates that the Namibian plant diversity falls mainly within three *phytochoria* namely the Zambebian, Kalahari Highveld and Karoo-Namib centers of endemism. The main vegetation types are: desert, savanna and woodland. There is a decreasing species diversity with decreasing rainfall. A total of 3159 plant species have been reported to occur in Namibia. This is complemented by Cheikhoussef et al., (2011) who examined the Use of Some Indigenous Plants for Medicinal and other Purposes by Social Communities in Namibia with special reference to Oshikoto Region. He indicates that the indigenous knowledge of Namibian THPs plays an important role in plant genetic resources conservation, the variety of life styles and land-use practices from San hunter-gatherers, pastoralists to subsistence and commercial farmers. He laments the situation that the diversity of indigenous knowledge is rapidly being lost as life styles of people change and many plant species are becoming more difficult to obtain. The endangered medicinal plant species include *Albizia brevifolia*, *Commiphoramollis*, *Commiphora glaucescens*, *Commiphora pyracanthoides*, *Elephantorrhiza elephantina*, *Fockea angustifolia*, *Gardenia spatulifolia*, *Momordica balsamina* and *Protea gagedi*. There are also reported cases of local extinction of plant species such as *Protea gagedi* populations in North-East of Namibia which occurred naturally along the Okavango River in Namibia. This is attributed to local trade in its roots for traditional medicine as an aphrodisiac and due to frequent field fires

Besides the existence of biodiversity of the plant species, there is also the diversity of medicinal use by different cultural communities in Namibia. The Topnaar communities who live in the Kuiseb valley use 42 plant species and 53 in Sesfontein in the south west of Namibia. They are known to make their own traditional medicines by using mixtures of animal and plant products (Botelle et al., 1999). The San communities of Namibia are well known to have a wide knowledge of indigenous plant species and associated knowledge systems for health care: For

example the For example, the! Kung San know about 7 plant species. They are the main ethnic community of the San people who belong to three different tribes, the Jul'hoansi, Punguvlei and Vasekele. The! Kung hunter-gatherers have a particularly rich knowledge of tubers and roots with edible or medicinal value. The genera *Boophane*, *Urginea*, *Ornithogalum* and *Asclepidaceae* contain certain glycosides or alkaloids. Although, highly toxic, they are sometimes used for medicinal purposes. A study on the biodiversity of plant species was conducted among the San people in Nyae Nyae Conservancy in the eastern Tsumkwe Constituency. It is the home to one of the oldest cultures in Africa. They include the Jul'hoansi, Makuri, Xamsa, N#anemh! Aotta, N!on!xom, Denlui, !Aotcha, Djxohoe and Baraka people. The objective was to document the wisdom and experience of these indigenous people and preserve it as part of their heritage. More than 238 plant species were observed to be found in the area and highlighted their traditional uses. Although a wide range of different plants and plant parts were used, plant roots played a significantly important role. In some cases, potentially toxic plants were used as medicines, hence the issue of dosage was very important. Several plant species were also used as insect repellents while others were worn as belts, pendants, or as protective charms against diseases. Inhalation of smoke or vapour from a wide range of plant species was also practiced.

The Lozi people of the Caprivi region Namibia, especially in the capital city of this region; Katima Mulilo have very strong beliefs in the use and efficacy of traditional medicines. Indigenous medicinal plants are used to manage HIV/AIDS opportunistic infections. A total of 71 plants belonging to 28 families were identified in the region. The most used plant families were *Combretaceae*, *Anacardiaceae*, *Mimosaceae* and *Ebanaceae*. The common plant parts used were leaves, bark and roots. The traditional healers used these plants to treat various conditions such as diarrhoea, malaria, herpes simplex, tuberculosis, meningitis, skin infections, herpes zoster, candidiasis and others ailments. For example, *Aloe zebrina* leaves were used to treat herpes zoster which can be also treated with several plants, including: *Rhus natalensis*, *Annona senegalensis*, *Capparis tomentosa*, *Garcinia buchananii* and *Syzygium guineense* (Chinsembu and Hedimbi, 2010). However, the availability of these diverse medicinal plant species was threatened by unsustainable harvesting techniques; overgrazing by goats and cattle, increase in population and high demand for medicinal plants by traders, drought and climate change as some of the medicinal plants are only found during the rainy season (Cordell, 2009; Sher et al., 2010).

Conclusion

The paper used cases from several countries in Eastern and Southern Africa to demonstrate the important link between biodiversity, traditional medicine and public health care. This included an interrogation of role of traditional medicines. The findings demonstrated that traditional medicines were culturally acceptable and would continue to be used in future because of limited resource for conventional health practices including inability of poor people in rural and other marginalized communities to access expensive modern medicines. Traditional medicines were also shown to be common and effective in treating male reproductive health challenges such as impotence.

The study recommends the need for governments to promote the importance of traditional medicines and associated indigenous knowledge systems in public health care. The majority of African people depend on traditional medicines for health care. People, especially traditional healers should be sensitized on the importance of sustainable harvesting of medicinal plant species to avoid their extinction. This should include encouraging and training traditional medicine practitioners and other stakeholders in medicinal plants conservation through establishing medicinal plants farms or botanical gardens as *ex-situ* conservation. Local communities should be sensitized in replacement of trees through planting and establishment of by-laws to protect plants of medicinal value.

The government needs to support research on traditional medicines and production of drugs/remedies from medicinal plants especially for diseases that had no cure. Genuine collaboration based on trust, respect, and transparency between researchers, conventional and traditional health practitioners should be encouraged and supported by all stakeholders (public and private) for improved public health care, especially in the rural and marginalized areas where people depend on traditional medicine for primary health care. This is based on the belief that genuine collaboration would lead to disclosure of the secrets of the practice of Traditional Health Practitioners (THPs). Traditional medicine and its practices should not be associated with witchcraft. The THPs should be capacitated through training on elementary knowledge of human body, hygiene, processing of herbal remedies, and storage, establishment of dosage and better ways of record keeping.

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