

Full Length Research Paper

Medicinal plants use and conservation practices in Jimma Zone, South West Ethiopia

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Traditional medicine has continued to be the most affordable and easily accessible source of treatment in the primary healthcare system of Ethiopia. However, the medicinal plants used for such treatments are becoming increasingly rare and vulnerable to extinction because of improper utilization and conservation practices. Hence, this research was initiated with the aim to assess the use, management and conservation practices of medicinal plants in some selected districts of Jimma Zone, south west Ethiopia. Ethnobotanical methods such as focus group discussions, key informant interview, semistructured interview and field walks were used to collect ethnobotanical data on use and management practices of medicinal plants in the study area. Data collected were classified into the use of the plants and management practice. Data of the semistructured interview was analyzed using SPSS version 16 software. The result revealed that a total of 67 plant species were identified in the study area, of which 30 are nutraceuticals, 30 are collected at wild habitat and 37 are cultivated. Source of medicinal plants include: cultivation in home gardens, live fences, crop fields and wild collection from the nearby environment. The cultivation practice include home gardens, mixed in field crops, live fences and agro-forestry. About 87% of respondents explained that they get medicinal plants easily in the study area and 10% explained that it is difficult. About 76% of respondents explained that medicinal plants are not sold in the market and 23% responded marketability of medicinal plants. About 33% of informants explained that medicinal plants are under threat and 67% explained that they are not threatened. Focus group discussion and key informant interview revealed that people conserve medicinal plant in live fences, home gardens, and they cultivate some species because of their nutraceutical value. They interpreted that there is no specific conservation activities targeted to medicinal plants by extension program. This indicates the necessary strategy and conservation of medicinal plants in the study area. Postharvest handling is not commonly known for many medicinal plants because they are collected and used immediately. Therefore, local people use their knowledge nowadays in this region. The resources require an urgent attention in research and policy which should include training on knowledge of medicinal plants use and management in cultivating, production, postharvest handling, promoting their use and sustainable utilization.

Key words: Conservation, medicinal plants, Jimma, Kersa.

INTRODUCTION

Traditional medicine has continued to be the most affordable and easily accessible source of treatment in the primary

healthcare system of developing countries. The need is more pressing for resource poor communities and the local

therapy is the only means of medical treatment for such communities (Haile and Delenasaw, 2007). These medical systems are heavily dependent on various plant species and plant based products (Jansen, 1981). It is estimated that 70–80% of people worldwide rely chiefly on traditional, largely herbal; medicines need to meet their primary healthcare (Farnsworth and Soejarto, 1991; Pei, 2001).

The list of medicinal plants in Ethiopia, which is documented for National Biodiversity Strategy and Action Plan by Tesema et al. (2002) shows that about 887 plant species were reported to be utilized in traditional medicine. Among these, 26 species are endemic and they are becoming increasingly rare and are at the verge of extinction. It is believed that the greater concentrations of these plants are found in the southern and southwestern parts of the country following the concentration of biological and cultural diversity (Yineger, 2005; UNEP, 1995).

In Ethiopia, most of the medicinal plants used by herbalists are collected in the natural vegetation (Asfaw, 1999, 2001). Medicinal plants obtained at wild habitats are found in different natural ecosystems of the forests, grasslands, woodlands, wetlands, in field margins and garden fences, as weeds and in many other microhabitats where they are harvested when the need arises. These are free access resources. Many medicinal plants are also harvested for non-medicinal purposes such as for timber, implements, firewood and other purposes, and hence they are subjected to multiple depletion. Hence, sustainable utilization measures and conservation of plants should target the habitats of such vulnerable species.

Except in a few medicinal plant species where a few food crops are cultivated with medicinal value, there is no organized cultivation of plants for medicinal purposes in Ethiopia. The reason for this is that the quantities of medicinal plants traded are very small, and there is no organized large scale value addition and processing. However, there is a potential in the future for increased demand for some species, and therefore it is important to identify them and start the necessary research on the conservation and sustainable utilization techniques (Bekele, 2007).

Abera (2003) assessed the locally available medicinal plants in Jimma zone and found that 39 medicinal plants were used for treatment of various diseases. Haile and Delenasaw (2007) carried out also an assessment on traditional medicinal plant knowledge and their use by local healers in Jimma Zone on 27 medicinal plants. They found that the majority of the reported species grow in wild and they are rare. In addition, ethnobotanical study

of medicinal plants was carried out by Awas and Demissew in southwestern Ethiopia (2009). However, there is no comprehensive systematic study on the use and conservation practices of medicinal plants in the current study districts. These demanded an urgent attention to conserve such vital resources. Therefore, this study was proposed to assess the use, management and conservation practices of medicinal plants in some selected districts of Jimma Zone, South West Ethiopia.

MATERIALS AND METHODS

Study site

The study was conducted in Jimma Zone (Manna, SeqaChekorsa and Kersa) districts in Oromia National Regional State, Southwestern Ethiopia where 3 peasant associations were selected from each district.

Geographical location of the study area

Manna, SeqaChekorsa and Kersa districts are located in Jimma in southwestern Ethiopia. It is one of the zone of the Oromia National Regional State. It has a latitude and longitude of 7°40'N 36°50'E respectively.

Population

Total population of the districts is: Kersa 165,331(83,579 male and 82,812 female); Mana, 146, 67 (74,512 male and 71,878 female); Seka Chekorsa, 208,096 (104,758 male and 103,338 female).

Vegetation

The study area lies in moist evergreen montane forest of Jimma zone in south western Ethiopia and this specific study was conducted in Agro forestry, cultivated lands. Emphasis was given more on utilization and conservation practices of medicinal plants than on ecosystem and forest type description or characterization.

Ethnic group

In Seka Chekorsa, Mana and Kersa districts the five major ethnic groups are Oromo the Yem, Amhara, Kafficho and Dawuro. The majority of the inhabitants are Muslim, Ethiopian Orthodox Christianity, Protestant Christians and Waqefata .

The study area (Jimma Zone) has an agro-ecological setting of highlands (15%), midlands (67%) and lowlands (18%). The zone is one of the major coffee growing areas of Oromia National Regional State well endowed with natural resources contributing significantly to the national economy of the country (Lemessa, 2000).

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Table 1. Source of medicinal plants in the study area.

Medicinal plant cultivation	Frequency	Percentage
Cultivated	112	48.91
Collect at wild habitat	85	37.12
Buy in market	17	7.42
From neighbors	14	6.11
others	1	0.44
Total	229	

Table 2. Cultivation status of medicinal plants in the study area.

Cultivation area	Frequency	Percentage
Home garden	114	59.69
Mixed with other crops	11	5.76
Live fences	42	21.99
Agro-forestry	24	12.57
others	0	0.00
Total	191	100

country. Major crops grown include are: coffee, maize, teff, Of medicinal plants was carried out by Awas and sorghum, barley, pulses (beans and peas), root crops (enset,-false banana and potato) and fruits (Lemessa, 2000).

Climatically, Jimma Zone reliably receives good rains, ranging from 1,200–2,800 mm per annum.

Study design

The districts were purposively selected based on their accessibility and because they are believed to be better biodiversity. Twenty informants were selected and interviewed in each district after having discussion with the inhabitants and authorities. Moreover, some discussions were held with concerned offices including agricultural development offices and development agents in each study site. Key informants are selected to get guidance in the field walk exercise.

Data collection

Both qualitative and quantitative approaches were used for this study. Ethnobotanical methods following Martin (1995) and Cotton (1996) were used for collecting data on the use and management practices and applied semistructured questionnaire, key informants' interview and focal group discussion. Data were collected from December 2012 to April 2014. Ethical clearance was sought from concerned departments of Jimma University and the district agricultural development offices, as well as from the informants who were involved in providing information in the study areas. The help of local administrators, local people and field assistants were taken care of before embarking on data collection.

Indigenous knowledge on local names of plants and their conservation practices was recorded. Plant species were also identified by field walk together with key informants. Related to the possible threats on plant species and traditional conservation,

observation was made in the field on the general habitats of the medicinal plants. The medicinal plants were identified in the field spontaneously *in situ* by the help of taxonomic keys using Flora of Ethiopia and Eritrea such as Hedberg and Edwards (1995) and other volumes and for those which were not identified *in situ* voucher specimen were collected for further consultation of experts. There was no difficulty faced in identification as most of the plants mentioned have medicinal uses and there are sufficient information in the Flora books.

Data analysis

Questionnaires was coded, entered into excel sheet and analyzed using SPSS software version 16. The qualitative data was narrated and summarized into tables, figures and graphs for explanation following Martin (1995) and Cotton (1996).

RESULTS

Medicinal plants in the study area

The present study identified 67 plant species, of which 36 are used for medicinal purpose and 31 both for food and medicine, that is, nutraceuticals.

Source of medicinal plants in the study area

In the study area, 48.91, 37.12 and 7.42% of the respondents explained that medicinal plants are obtained in cultivation, wild and purchased from market respectively (Table 1).

Cultivation of medicinal plants

As a result, 48.91% of the respondents explained that people cultivate medicinal plants whereas, 37% collect at wild habitat and less than 20% in market and from their neighbours by social relations (Table 1). This indicated that medicinal plants need more attention in production, and accessibility to the community by minimizing unstructured production approach.

The analysis showed that 48.9% of the respondents cultivate medicinal plants for their day to day use. Among the commonly used method of cultivations, the followings can be mentioned: home gardens (59.69%), mixing with other crops (5.76%), maintaining in live fences (21.99%) and in agro-forestry (12.57%) (Table 2). These medicinal plants are not maintained or cultivated for medicinal use only; rather they have food value and other multiple uses for families. This is an issue for more research which need to promote nutraceutical plants for conservation and family use, marketing and extraction of crude drugs to contribute to health care system and conservation of biodiversity.

About 37 of the medicinal plants are cultivated and 30 species are collected at wild habitats. This indicates the existence of diversity of medicinal plants both in farm and natural habitats in Jimma Zone.

Table 3. Availability of wild medicinal plants in the study area.

Availability of wild medicinal plants	Frequency	Percent
Easy to get	128	87.07
Difficult to get	15	10.20
Very difficult to get	1	0.68
No information	3	2.04
Total	147	

Table 4. Threats to medicinal plants in the study area.

Threat to medicinal plants	Frequency	Percentage
Yes	52	33.33
No	104	66.67
Total	156	100

Wild medicinal plants' availability

The result of the current study revealed that medicinal plants are easily available in forests, grasslands and woodlands. It was witnessed by 87% of the respondents. Whereas, < 20% of the respondents explained that it is difficult to get medicinal plants even in wild state (Table 3). These responses focus on a debate in the light of the increasing agricultural land, selective harvesting of medicinal plants for medicine and other multiple uses.

Marketability of medicinal plants

Among respondents, 76% explained that medicinal plants are used locally for traditional treatments and not sold in the market. However, 23% explained that some medicinal plants are sold in the local markets seasonally depending on their availability in local harvest (Table 4). Concerning marketability of medicinal plants, 23.77% of the respondents explained that medicinal plants are marketed while 76.22% of them explained their not marketed state.

Threat to medicinal plants

Respondents were asked whether there are threats to medicinal plants in the study area or not. Hence, 66.67% of them explained that there is no threat to medicinal plants and 33% of them mentioned a critical threat due to deforestation, urbanization, agricultural land expansion and lack of awareness among the community and inadequate extension which support targeted to sustainable harvesting of plants (Table 4).

Conservation efforts of medicinal plants

The result of this study showed that 55% of the respondents explained no effort for conservation of medicinal plants. Whereas, 44% of them highlighted general conservation effort on natural resources which also include medicinal plants as a part of the conservations system. However, all respondents agreed that there is no particular attention given to medicinal plants conservation. The authors also observed the inadequate efforts made by the governmental and nongovernmental organization in conserving medicinal plants. The area has rich diversity of medicinal plant species; however, it is increasingly becoming degraded and lost at their natural habitat so that attentions must be given before time passes.

Postharvest management and conservation methods

The community has a living experience and knowledge on managing of medicinal plants for long term and short term benefits (Table 5). The applied conservation methods vary from species to species (Table 5). Some of postharvest managements include storing dried seeds for short and long times, dried leaves are stored for short time, crushed and pounded leaves kept in canned containers and sucks, and dried fruits in sucks and other containers for long time (Table 5). Even though the community has sufficient indigenous knowledge on conservation, postharvest storage and use, this unwritten knowledge should be supported with scientific studies and researches for the future as per the personal observations of the authors. In spite of variety of seasonal and temporary postharvest management of the medicinal plant parts, most users prefer the fresh material collected requiring more research in finding solutions for better postharvest management or identifying the alternative indigenous postharvest practices which will help the sustainable utilization of medicinal plants in the study area and elsewhere.

The commonly used conservation methods of medicinal plants include the following: seasonally cultivation, planting in home garden and live fence, planting as live fence and farm borders, seasonal cropping as field crop and home garden, planted in home and field top, as well as semi wild and grown as perennial field drop (Table 5). The key informants explained that these methods have helped to get medicinal plants year round.

DISCUSSION

Source of medicinal plants in the study area

The result revealed that people of the study are get medicinal plants from their agricultural land followed by wild collection. Similar studies have been reported from

Table 5. List of medicinal plants used in the area along their conservation and postharvest management practices.

S/N	Local name	Scientific name	Family	Postharvest management	Conservation method	Habit	Production type
1	Korarimaa	<i>Aframomum korarima</i> Perea	Zingiberaceae	Dried fruits stored in sacks and other containers for long	Seasonal planting	H	Cult
2	Qulubi adi	<i>Allium sativum</i> L.	Liliaceae	Crushed, pounded and kept in covered container, mostly used in fresh form	Planted as field and home garden crop	H	Cult
3	Ariti	<i>Artemisia afra</i> Jacq. ex Willd.	Compositae	Dried leaves stored	Grown in home garden	H	Cult
4	Neemii	<i>Azadirachta indica</i> A. Juss	Meliaceae	Fresh leaves and sticks used	Planted as live fence	T	Cult
5	Xosinyi	<i>Calamintha paradoxa</i> (Vatke) Ryding	Labiatae	Dried leaves stored in sacks and also fresh leaves used as collected	Farm boarders in some homes, mostly collected at wild habitat	H	Cult
6	Ceeke	<i>Calpurnia aurea</i> (Ait.) Benth.	Fabaceae	Fresh leaves used	Collected at wild habitat	S	wild
7	Gora	<i>Capparis cartilaginea</i> Decne.		Fresh collected	Collected at wild habitat	S	wild
8	Arangama	<i>Capparis tomentosa</i> Lam.	Capparaceae	Not stored	Planted as live fence	S	wild
9	Miximixaa	<i>Capsicum minimum</i> L.	Solanaceae	Dried fruits stored for long	Grown as field crop and home garden	H	Cult
10	Papayaa	<i>Carica papaya</i> L.	Caricaceae	Fresh fruits used	Planted in home garden and field top	T	Cult
11	Hagmasa	<i>Carisa spinarum</i> L.	Apocynaceae	Fresh fruits used	Collected at wild habitat	S	wild
12	Azmudi adi	<i>Carum capticum</i> L.	Umbelliferae	Dried fruits stored for long	Grown as field crop and home garden	H	Cult
13	Shumburaa	<i>Cicer arietina</i> L.	Leguminosae	Dried seeds stored	Seasonal planting/cropping as field crop	H	Cult
14	Burtukana	<i>Citrus sinensis</i> (L.) Osbeck	Rutaceae	Fresh fruits used	Grown as field crop and in some cases in home garden	S	Cult
15	Buna	<i>Coffea arabica</i> L.	Rubiaceae	Dried beans collected and stored for long	Grown as perennial field drop	S	Cult
16	Wadesa	<i>Cordia abyssinica</i> R.Br	Boraginaceae	Fresh leaves and fruits are used	Collected at wild habitat	T	wild
17	Dimbilala	<i>Coriandrum sativum</i> L.	Apiaceae	Seed stored	Seasonally cultivated	H	Cult
18	Makanisa	<i>Croton marostachyus</i> Hochst. ex Ferret et Galinier	Euphorbiaceae	Fresh from forest or farm borders	Collected at wild habitat	T	wild
19	Dabaqula	<i>Cucurbita pepo</i> L.	Cucurbitaceae	Fresh fruit used and seasonally stored	Grown as home garden plant	C	Cult
20	Irdii	<i>Curcuma</i> (L.) <i>domestica</i> Valetton	Zingiberaceae	Bulb kept for long	Grown as field crop and few as home garden	H	Cult
21	Astanagiri	<i>Datura stramonium</i> L.	Solanaceae	Fresh leaves and dried seeds used	Collected at farm borders	H	wild
22	Karootii	<i>Daucus carota</i> subsp. <i>sativus</i> (Hoffm.) Schübl. & G. Martens	Apiaceae	Tap root collected and used in fresh form/state	Grown as field crop and home garden	H	Cult
23	Akuku	<i>Dovyalis abyssinica</i> (A. Rich.) Warb.	Flacourtiaceae	Fresh part collected from the wild	Collected at wild habitat	T	wild
24	Barzafi adi	<i>Ecucalyptus gamadulensis</i> Labill	Myrtaceae	No data	Live fences	T	Cult
25	Ulaga	<i>Ehretia cymosa</i> Thon	Boraginaceae	Fresh leaves used	Collected at wild habitat	T	wild
26	Coqorsa	<i>Eleusine jaegeri</i> Pilg.	Poaceae	Fresh leaves	Collected at wild habitat	H	wild
27	Moqmoqo	<i>Embelia schimperi</i> Vatake	Myrsinaceae	Fresh buds collected and used	Grown as live fence	S	wild

Table 5. Contd

28	Hadamii	<i>Euphorbia abyssinica</i> J.F.Gmel.	Euphorbiaceae	Fresh exudates collected and used	Live fence	S	wild
29	Ano	<i>Euphorbia tirucalli</i> L.	Euphorbiaceae	Fresh exudates	Live fences	S	wild
30	Insilal	<i>Foeniculum vulgare</i> Mill	Umbelliferae	Dried seeds stored	Seasonal cropping	H	Cult
31	Koso	<i>Hagenia abyssinica</i> J. F. Gmel.	Rosaceae	Dried flower is stored and fresh and dry flowers used	Collected at wild habitat	T	wild
32	Gatira	<i>Juniperus procera</i> Hochst. Ex Endl	Cupressaceae	Fresh leaves collected and used immediately	Planted as live fences	T	Cult
33	Dhumuga	<i>Justia schimperi</i> Jaub. & Spach	Acanthaceae	Fresh leaves used	Planted as live fence	S	wild
34	Dhumuga	<i>Justia Schimperi</i> Jaub. & Spach.	Acanthaceae	No data	Live fences	S	Cult
35	Kusaye	<i>Lantana trifolia</i> L.	Verbenaceae	Dried leaves stored in sucks	Live fence and farm borders	S	Cult
36	Ras kimir (Amh)	<i>Leonotis</i> spp.	Labiatae			H	wild
37	Shimfi (Fexo)	<i>Lepidium sativum</i> L.	Cuicifarae/Brassicaceae	Seed stored for long	Planting in home garden and live fence	H	Cult
38	Talba	<i>Linum usitatissimum</i> L.	Linaceae	Dried seeds stored for long	Grown as field crop	H	Cult
39	Abbayi	<i>Maesa lanceolata</i> Forssk.	Myrsinaceae	Fresh seeds used	Collected at wild habitat	S	wild
40	Kombolcha (atat)	<i>Maytenus ovata</i> (Wall. ex Wight & Arn)	Celastraceae	Fresh parts collected from wild when needed	Collected from wild habitat	T	wild
41	Qoda	<i>Myrtus communis</i> (L) Myrtle	Myrtaceae	Fresh collected	Collected at wild habitat	T	Cult
42	Qoda	<i>Myrtus communis</i> L.	Myrtaceae	Fresh leaves used	Collect at wild habitat	T	Cult
43	Timbo	<i>Nicotiana tabacum</i> L.	Solanaceae	Dried leaves stored in sucks or used in fresh form	Seasonal cropping as field crop and home garden	H	Cult
44	Abasuda guracha	<i>Nigella sativa</i> L.	Ranunculaceae	Dried seeds and leaves stored	Seasonal cropping as field crop	H	Cult
45	Damakasse	<i>Ocimum lamifolium</i> Wild	Lamiaceae	Fresh leaves collected and used	Planted in home garden	S	Cult
46	Basobila	<i>Ocimum sanctum</i> L.	Lamiaceae	Fresh leaves collected and used	Rarely in home garden and mostly collected at wild habitat	S	Cult
47	Ancabi	<i>Ocimum suave</i> Willd.	Lamiaceae	From wild forest, borders and grasslands	Collected at wild habitat	H	wild
48	Nole	<i>Olinia usambarensis</i> Gilg ex Engl.	Penaeaceae	Fresh fruits and leaves collected	Collected at wild habitat	T	wild
49	Hincini	<i>Pavonia patenis</i> (L.f.) Redouté	Malvaceae		Collected at wild habitat	S	wild
50	Avocadoo	<i>Persea americana</i> Mill	Lauraceae	Fresh fruits used	Planted in home garden and field top	T	Cult
51	Handodee	<i>Phytolacca dodocandara</i> L. Hert	Phytolaccaceae	Dried seeds stored in sucks	Planted as live fence and mostly collected at wild habitat	S	wild
52	Surumaa	<i>Pilea</i> spp.	Urticaceae	Dried leaves stored and mostly fresh leaves used	Grown in home garden	H	wild

Table 5. Contd

53	Zayituna	<i>Psidium guajava</i> L.	Myrtaceae	Fresh fruits used	Planted in home garden and field crop in a semi wild habitat	S	Cult
54	Geesho	<i>Rhamnus prinoides</i> L.	Rhamnaceae	Leaves dried & stored fir shirt time	Planting in home garden and live fence	S	Cult
55	Qobo	<i>Ricinus communis</i> L.	Euphorbiaceae	Dried seeds stored	Grown as a field crop	S	Cult
56	Tult(Amh)	<i>Rumex repalensis</i> Spreng	Polygonaceae	Fresh roots and leaves used	Collected at wild habitat	H	wild
57	Cilatama	<i>Ruta graveolens</i> L.	Rutaceae	Fresh leaves collected and used immediately	Planting in home garden	H	Cult
58	Alaltu	<i>Salix subserrata</i> Willd.	Salicaceae	Fresh young stems and leaves	Collected at wild habitat	T	wild
59	Chifrigi	<i>Sida ovate</i> Forssk.	Malvaceae	Fresh stem and root used	Collected at wild habitat	S	wild
60	Hiddi	<i>Solanum incanum</i> L.	Solanaceae	Fresh leaves used	Collected at wild habitat	S	wild
61	Hiddi holota	<i>Solanum</i> spp.	Solanaceae	Fresh leaves and fruits are used	Collected at wild habitat	S	wild
62	Dinicha	<i>Solanum tuberosum</i> L.	Solanaceae	Freshly and used	Grown as field crop	S	Cult
63	Baddessa	<i>Syzygium guineense</i> (Willd.) DC.	Myrtaceae	Fresh fruits used	Collected at wild habitat	T	wild
64	Abishi	<i>Trigonella foenumgraecum</i> L.	Fabaceae	Seed stored for long	Seasonal crop in home garden and mixed with crops	H	Cult
65	Dheebicha	<i>Vernonia amygdalina</i> Delile	Compositae	Fresh leaves collected and used	Planted as live fences and in some cases in home garden	S	Cult
66	Reeji	<i>Vernonia auriculifera</i> Hiern	Asteraceae	No data	Collected wild habitat	S	wild
67	Jinjibila	<i>Zingiber officinale</i> L.	Rosaceae	Collected and used	Perennial crop in home gardens and as field species	H	Cult

Cult= Cultivated, wild = collected at wild habitat, nutraceutical = medicinal and food value, medicinal = reported for medicinal use, T = tree, S = shrub, H = herb, most local names are in Afaan Oromo (Oromo language), Amh = Amharic language.

different parts of the country. Yirga (2010) reported 16 medicinal plant species utilized in Mekele town, Tigray National Regional State by the local people. The same author explained that most of plants are collected from wild habitat. The author also indicated that people have knowledge of indentifying the plant species which is believed to have medicinal value. Luizza et al. (2013) reported in their finding, women's local ecological knowledge is noted by many scholars to be unique and important for local conservation and development planning. This includes conservation in homegardens contributing to agrobiodiversity,

thereby to food security of the family. Farnsworth and Soejarto (1991) stated that the conservation of biodiversity has uses. Kokwaro (1993) attested the sustainable utilization of Africa's medicinal plants which are wealth of people.

Luizza et al. (2013) stated that "with rapid population growth in the highlands and rural people's dependence on natural resources across Ethiopia, cataloguing and preserving local ethnobotanical knowledge is critical for future community based conservation efforts". This indicated that the diversity of nutraceutical plants need to be sustainably utilized and conserved for

continuity of biodiversity in the study area at Jimma and elsewhere.

Wild medicinal plants availability

The farm ecosystem and natural vegetation are major sources of the medicinal plants in the present study districts of Jimma Zone. The same author stated that "contrary to previous thinking, it is becoming clear that women know more about these plants, because throughout history, women's daily work has required more of this

knowledge". Seventy one plant species were reported for use in the treatment of various diseases in the study area. These plant species belongs to 41 families in the Ngai and Otwal Sub Counties in Oyam district, Northern Uganda (Howard, 2003; Kamatenesi-Mugisha et al., 2011). The use of medicinal plants in primary healthcare is still a common practice in Ngai and Otwal Sub Counties. This is a practice similar to that the present study area, Jimma, Ethiopia. Kamatenesi-Mugisha and Oryem-Origa (2005) described, as a way to recognize the values and roles of traditional medical knowledge in health care provision, further research into the efficacy and safety of herbal remedies were emphasized in Uganda and beyond. As the research reports indicated availability of medicinal plants across contents and the present study area, it is essential to make efforts for the year round availability of these valuable resources. Hamilton and Alan (2004) stated that "billions of people in the world rely on herbal medicine, while millions gain income in their wild harvest or cultivation, or are involved in their trading or processing. Medicinal plants are symbolically significant in many cultures, often being seen as sources of power." Thus, indicate that local people are motivated by the use of nutraceutical species and conserve them in home gardens, live fences and nearby forests in Jimma Zone.

In the present study area, medicinal plants are collected from the wild. Kamatenesi-Mugisha et al. (2011) has concluded that "it should be noted that a high percentage of these plant species are harvested from the wild, but with no consideration for domestication hence threatening their existence. The plant species are being overexploited, and the rapid environmental degradation coupled with insurgency has put mounting pressure on the environment. This may lead to the disappearance of many species of medicinal plants of economic value."

Marketability of medicinal plants

From direct observation by researchers, there is no formal market scheme for medicinal plants in the present study area. It is an area which needs further investigation. According to Shahidullah and Emdad Haque (2010), the value chain for medicinal plants is produced by village-based marginal farmers and homestead growers whose livelihoods are significantly supported by the commercial scale production of several plant species. They suggested an improved value chain system through economic coordination that links production with the enhancement of the producers' livelihoods in Natore district of northwest Bangladesh.

In the study area, Jimma Zone, there is no clear and closer relationship between producers and processors through necessary integration in the value chain which can result in a diversified benefits to the producers and processors of medicinal plants in terms of price, quality

and overall control of the supply chain. The authors believed that un-marketability and low return value of medicinal plants could be the reason for low production and area coverage of medicinal plants, so that marketing of medicinal plants should be promoted so as to encourage farmers who cultivate medicinal plants in the study area.

Conservation aspects

People in the study area are conserving medicinal plants in Agroforestry, farm fields and live fences not to lose the valuable resources for its livelihood. The result indicated that 44.77% (30) medicinal plants in the study are collected from the wild. Wild collection has detrimental consequences unless the wild gene pool is sustainably handled. Mujawar (2012) reported that out of 235 species in 184 genera and 65 families, the herbaceous floristic composition is dominant and it shows that 120 species are recorded from this area. He also explained that floristic vegetation is affected by local activities and their natural regeneration prevented due to heavy cuttings, grazing, stone and soil mining activities. There is urgent need for whole area under conservation and protection as well to alert the peoples about the plant biodiversity. The recommendation of this author can be adapted to the present study area as there is increasing population pressure on natural vegetation, accompanied agricultural expansion and other development activities.

Conclusions

As sum, the study area involves diversified medicinal plants which have a potential role to contribute to healthcare system of the country. Currently, these medicinal and nutraceutical plants are serving for the majority of people as a source of medicine and food which narrow the gap in the shortage of medication and nutrition. The results show also the use, management and conservation of medicinal plants in agricultural fields, home gardens and live fences. These data have a positive contribution to the availability of medicinal plant in the study area and contributed generally to the conservation of biodiversity, and to the agricultural biodiversity, too. It also contributes to continued existence of the ingenious knowledge as a part and parcel of the use and management of medicinal plants.

There is no focused research in the region, conservation activity and postharvest management technology which can complement the indigenous postharvest management method which local people are using currently. People have their own value system in the production and utilization of medicinal plants.

However, there is no system which makes all stakeholders closely linked and benefit from the system.

From the present study, it is possible to state that medicinal plants are part and parcel of the livelihood of people in the study area. The fact that local people are owners of the knowledge of medicinal plants use and management needs integrating the traditional knowledge to conventional approach of medicinal plants production.

Local people's resources utilization needs attention in research and policy. This needs to include training, on knowledge of medicinal plant use and management including cultivating, production, postharvest handling, promoting their use and sustainable utilization. Appropriate market value chain need to be assessed and prompted for equitable utilization of the benefit arising from plants and also encourage the indigenous knowledge in this regard.

Conflict of interests

Authors did not declare any conflict of interest.

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