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Review on Diversity, Use, Threats and Conservation Status of Wild Edible Plants in Ethiopia

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Abstract: Wild edible plants have been used as source of food since ancient times and are an essential source of supplementary foods in many parts of Ethiopia. Different studies conducted in different parts of the country indicated that there is difference in records of wild edible plant from place to place and this was suggested that the variation was due to cultural difference among communities in different parts of the country and variation in vegetation cover and agro- ecology of the country. Still the country hosts unmapped areas of the country with the highest number of edible plants in diverse habitats which needs extra studies. The habits of recorded wild edible plants were herb, shrub, tree and climbers. Majority of the reported wild edible plants from some parts were herbs followed by shrubs and also in some parts of the country the majority of the edible plants were trees followed by shrubs. But the percentage of habits or life forms of the reported wild edible food plants show slight variation across the country. This may be the choice of edible plants may vary from place to place and between cultures. Regarding parts to be used as food were fruits, leaves, tubers, young shoots, seed and nectars. However, fruits were the dominant part of wild edible plants that was reported to be highly edible in most parts of the country and majority of them were consumed as raw without any processing and fruits are dominant. Agricultural expansion, over-exploitation, cutting for fuel wood, charcoal and construction material, overgrazing and settlement were majorly reported anthropogenic factors threatening their future sustainability throughout the country. Except some traditional conservation practices implmented by traditional experience and knowledege of local peoples the conservation status of wild edible plant in particular and their ecosystem is very poor. So, it needs careful attention towards conservation of these useful biodiversity resources from concerned body.

Key words: Wild Edible Plants · Biodiversity · Growth Form · Country

INTRODUCTION

The term wild edible plant refers to non-cultivated edible plants collected from wild habitats [1]. These plant resources are collected outside of agricultural areas mainly from forests for human consumption [2]. Wild edible foods may be consumed as raw or prepared into vegetables and they are the crucial source of wild foods for the rural communities in different parts of the globe [2]. It is estimated that one billion people worldwide use wild edible plants to complement their nutrients in their diet to improve the deliciousness of staple foods [3]. Utilization of wild edible plants as a food source is an essential part of the culture of indigenous people that live in the rain forests of Africa and South America [4] who gather and consume wild edible plants as snacks and at times of food scarcity [5].

The value of wild edible plants to sustain people in different parts of the world has been well acknowledged [6, 7]. African populations, especially poor households in rural areas, have depended on wild edible plants to reduce spending of limited cash resources on energy, shelter, food and medication [7]. Ethiopia as part of Africa its people, especially the rural people, has good knowledge on the use of wild edible plants because of the presence of a common consumption practice in the country [8]. Ethiopia is a country with diverse landscape and a wide range of habitats presenting a large number of endemic

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plants and animals. It is estimated about 6000 higher plant species of which about 10% are endemic [9] and the country also harbors two of the 34 global biodiversity hotspots [10] and is recognized as a Vavilovcenter of origin and variation for many food plants and their wild relatives [11]. Forests, grasslands, riverine environments and wetlands are home to numerous wild edible plants in Ethiopia [12].

However, many more wild edible plant species are believed to be undocumented to date, 413 species of wild and semi-wild species used as food by the people in Ethiopia have been documented [13]. Wild edible plants have been used as source of food since ancient times [14] and are an essential source of supplementary foods in many parts of Ethiopia. These delicious resources have a great role, particularly, as a supplementary role in household food security [15-18], as a staple food to supplement staple foods [19]. These all shows the greatest potential of these resources for food security and nutritional diversity. Still the country hosts unmapped areas of the country with the highest number of edible plants in diverse habitats which needs extra studies. Despite with these vital roles, the wild edible plants of Ethiopia have been lost because of agricultural land expansion [13, 15, 17, 19-21]. Thus, this review is initiated to identify the types of wild edible plants in different parts of the country with diverse uses and the major threats that hinder their potential and sustainability and existing conservation status. As a general this review is expected to have its own contribution on the country data base regarding these resources and as a base line for motivated researchers in this field for the future.

The Objectives of the review is to identify the potential of wild edible plant species used in different parts of the country, to know their use diversity, growth form and to identify the major threats associated with their potential and sustainability and current conservation status.

Diversity of Wild Edible Plant Species, Growth Form and Edible Parts

Diversity of Wild Edible Plants: Earlier studies conducted in different parts of the country reported that edible plants of Ethiopia are estimated to about 8% of the higher plant species in the country [22]. It is further analyzed that about 25% of these are cultivated as food crops and the remaining (75%) could be categorized as wild, semi-wild, or naturalized. Generally, 203 species of wild edible plants belonging 135 genera and 60 families are mostly picked or harvested from natural stands and consumed by the community in different parts of Ethiopia under a variety of conditions [22]. These account for about 3% of the higher plant species and about 50% of the wild edible plants of Ethiopia. There are also wild plants in Ethiopia whose edibility has been reported from other parts of the world but edibility in Ethiopia awaits clarification. Specifically study conducted by [23] in Adiarkay, Debark and Dejen districts of the Amhara region reported that 44 wild species producing edible fruit belonging to 30 genera and 24 families are available for use in the areas. This number is nearly similar with study reported from 41 plant species, distributed among 23 families and 31 genera identified as sources of food. [24] in Borena pastoralist areas in Oromia region. Another study report from majang zone of Gambela region recorded a total of 77 wild edible plants species belonging to 62 genera and 37 families were collected and identified [25]. [26], also reported that 40 plant species are reported in semiarid zone of East Shewa as wild edible plants. Forty six wild edible plants species of representing 35 family and 41 genera used as edible plants were recorded Adola district in Guji zone, Southern Oromia [27]. According to [28] a total of 46 wild edible plant species belonging to 37 genera and 29 families were documented in Burji district of segen zone southern Ethiopia used by local communities as food. Also 38 wild plant species were reported as sources of food by Kara and Kwego informants from Debub omo zone of Southern Ethiopia which distributed among 23 families and 33 genera [29]. The study conducted in Derashe and Kucha district in Southern Ethiopia, documented 66 wild edible plant species classified among 54 genera and 34 families [30]. [15], documented 32 wild edible plants that were recorded in the Yilmana Densa and Quarit Districts of Amhara region. These species were grouped in 30 genera and 24 families. High numbers of wild edible plant species were reported from Konso special district in Southern nations, nationalities and people's regional state which is 137. Of these one hundred twenty-two were identified to the species level, 5 were identified to generic level and the remaining 10 were recorded only by their local names [2]. [31] reported 41 species as wild edible plants out of 71 species identified in Aris zone oromiya region belonging 58 genera and 34 families. A total of 88 wild edible plant species were identified by surveyed respondents as being utilized by local communities in the studied dry land areas of

Ethiopia. Of these, 52 species belonging to 40 genera and 27 families were identified as WETs [32]. Anbessa [33] reported a total of 29 wild edible plant species belongs to 27 genera and 22 families in Bule Hora districts of Guji zone oromia region which is smallest number compared to other areas.

The comparison of the results further showed that there is significant variation in the record of wild edible plant species in different parts of the country. Such variations in the diversity of wild edible plants between different parts of Ethiopia might be because of cultural variation among the community of the country in the consumption of wild foods [15]. This means that plants that were edible in some parts of the country might be non-edible in other areas. Thus, it might result in variation in the number of wild edible plants in that area. For example, many species of wild edible plants that were recorded as wild edible plants in the Konso community by [2] were non-edible in the Densa and Quarit Districts of West Gojjam Zone of Amhara Region [15]. This was a cultural difference in selecting wild food plants as a source of food. This means that some communities in Ethiopia might have a consumption habit of some wild edible foods but some others might ignore some others. The other reason for species number variation among different parts of the country might be due to variation in vegetation cover and differences in agro-climatic zone, which in turn depends on the soil, temperature and rainfall, that are determining factors for the survival and growth of species in the country [15, 28].

Growth Form and Edible Parts: Study conducted in West Gojam zone of Amhara region shows that the species recorded were herbs, shrubs and trees. Herbs were reported to be the primary source of wild food with a percentage distribution of 37-40.6% followed by shrubs and trees [15], [34]. Similar result was reported from study conducted at Delanta Northern Ethiopia stated that the growth form analysis of the WEPs indicated that herbs represented the dominant group (30 species, 61.2%), followed by shrubs (14 species, 28.6%) and trees (5 species, 10.2%). Also Alemayehu *et al.* [35] reported the life form of wild edible plants recorded in Northern shewa zone of Amhara region, were shrubs were the highest life forms with 27 (51%), followed by trees with 14 (26%) whereas herbs 12 (23%) were the lowest life forms. The result of the study revealed that the two major plant habits (i.e., shrubs and trees) accounted for the highest proportion of life forms. This shows for some differences in growth forms of commonly reported species. Contrarily other studies conducted in different parts of the country revealed that the growth habits of wild edible plants were dominated by Trees (30.4%) and shrubs (26.1%) followed by herbaceous forms (21.7%) tree or shrub growth forms (19.6%) and climbers (2.2%) [27, 29, 31, 36] reported growth form of wild edible plants tree followed by shrubs. Generally it shows more of similarity on growth form of wild edible plants across the country exceptionally with little differences reported in some areas. But the percentage of habits or life forms of the reported wild edible food plants show slight variation across the country. This may be the choice of edible plants may vary from place to place and between cultures.

Parts Used: Regarding the parts used, fruits of the wild edible plants are the most frequently used part whereas root, bark and stem are used less frequently around Derara town Aris Ethiopia [31]. High numbers of edible parts were reported as a source of food by [15]. Fruits composed the highest edible parts (17 species, 53.1%) followed by leaves (6 species, 18.8%). The other 7 edible parts contributed to 28.2% of wild food sources.. Alemayehu *et al.* [35] noted that 67% of the edible plant parts were fruit, 9% gum, 8% were leaves and flower nectar each, 6% roots and 2%. About (49 species, 92%) of these fruits were reported to be eaten raw, whereas (4 species, 8%) were consumed cooked or processed. Fruit is found to be the most edible plant part and mostly taken as raw. According to Anbessa [33], fruits were the most widely used edible plant parts (79.31), while tubers and fruits (3.45%), young shoots (6.90%), young shoots and fruits (3.45%), roots (3.45%) and gums (3.45%) were the remaining edible parts. Another study states that among different parts of medicinal and wild edible plants, fruits are the plant parts that are most widely used for medicinal purposes as well as for edible food [37]. The figures indicated that different parts of wild edible plants are used for consumption. Leaves, fruits, roots and seeds are parts of wild edible plants commonly used. According to Sina and Degu [38] part of the wild edible plants, about 62% of fruits, 18% of shoot, another 18% of flower/nectar and 12% tubers roots and barks are edible. The increased use of wild fruits compared to other part of the plant indicates that the plants are used more during season of food shortage since eating fruit do not take much time to prepare [39].

Table 1: Species diversity of WEPs and location reported in different parts of the country

No.	No.of species reported	No. of family	No. of genera	Area where study conducted	Author
1	46	35	41	Adola district Southern Oromia	Demise S., 2020
2	40	-	-	East Shewa in Fantalle and Boosat districts	Hunde *et al.,* 2012
3	41	23	30	Dheeraa' town Aris Ethiopia	Wondimu *et al.,* 2006
4	55	26	39	Buffer area of Awash National Park Ethiopia	Bahru *et al.,* 2013
5	46	29	37	Burji district Segen zone of SNNPRS	Ashagre *et al.,* 2016
6	33	22	-	Chilga district Amhara Region	Tebkew *et al.,* 2014
7	38	23	33	Kara & kwego Debub Omo zone SNNPRS	Teklehaymanot T. & Giday M., 2010
8	66	34	54	Derashe and Kucha districts, SNNPRS	Balemie K. and Kebebew F., 2006
9	32	24	30	Yilmana Densa Quarit district Amhara region	Alemneh D., 2020
10	137	-	-	Konso district SNNPRS	Addis *et al.,* 2013a
11	88	27	40	Low land Areas of Ethiopian Regions	Dejene *et al.,* 2020
12	36	22	-	Quara district Amhara Region	Tebkew *et al.,* 2018
13	130	52	-	Alamata, Cheha, Goma and Yilmana Denssa districts, of Ethiopia (In four region)	Addis *et al.,* 2005
14	93	-	-	Hamer & Konso districts of SNNPRS	Addis *et al.,* 2013b
15	41	23	31	Borena in Oromia Region	Gemedo *et al.,* 2005
16	77	37	62	Majang Zone Gambella Region	Teklu Y., 2019
17	50	31	46	Sidama Zone SNNPRS	Sina B. and Demissie H., 2015
18	29	22	27	Bule Hora district Borena Zone Oromia Region	Anbessa B., 2016
19	16	13	-	Yalo district Afar Region	Teklehaymanot T., 2017
20	53	30	38	Berehete District of Amhara Region	Alemayehu *et al.,* 2015

Table 2: Comparison of habit or growth form of WEP species in different parts of the country

	Percentage of growth form/%						
No. of species recorded	Tree	Shrub	Herb	Climber	Other	Area where study conducted	Author
46	NI	NI	NI	NI	NI	Adola district Oromia Reg.	Demise S., 2020
40	NI	NI	NI	NI	NI	East Shewa in Fantalle and Boosat districts	Hunde *et al.,* 2012
41	68.29	24.39	4.89	2.43		Dheeraa' town Aris Ethiopia	Wondimu *et al.,* 2006
55	37.7	49.3	7.3	5.8	-	Buffer area of Awash National Park Ethiopia	Bahru *et al.,* 2013
46	28.3	37	30.4	4.3	-	Burji district SNNPRS	Ashagre *et al.,* 2016
33	45	27.3	15.1	9.1	12.12	Chilga district Amhara Region	Tebkew *et al.,* 2014
38	50	28.9	18.4	5.26	-	Kara Kwego Debub Omo zone SNNPRS	Teklehaymanot T. & Giday M., 2010
66	NI	NI	NI	NI	NI	Derashe and Kucha districts, SNNPRS	Balemie K. and Kebebew F., 2006
32	28.2	31.3	40.6	-	-	Yilmana Densa & Quarit district Amhara region	Alemneh D., 2020
137		62	28	-	10	Konso district SNNPRS	Addis *et al.,* 2013a
88	56	-	-	-	-	Low land Areas of Ethiopian Regions	Dejene *et al.,* 2020
36	44	15.6	31	15.6	-	Quara district Amhara Region	Tebkew *et al.,* 2018
130	NI	NI	NI	NI	NI	Alamata, Cheha, Goma and Yilmana Denssa districts, of Ethiopia (in four region)	Addis *et al.,* 2005
93	-	-	-	-	-	Hamer & Konso districts of SNNPRS	Addis *et al.,* 2013b
41	66	-	20	15	66	Borena in Oromia Region	Gemedo *et al.,* 2005
77	32.5	18.2	36.4	12.9	-	Majang Zone Gambella Region	Teklu Y., 2019
50	36	24	32	8	-	Sidama Zone SNNPRS	Sina B. and Demissie H., 2015
29	27.6	37.93	13.7	6.9	13.79	Bule Hora district Borena Zone Oromia Region	Anbessa B., 2016

Note: NI not identified

The majority of the species (72%) has their fruits and or seeds as the edible parts and in only one-third of the species is the vegetative parts of the plants, leaves, stems and tuberous roots reported to be eaten. Few species (about 6%) offer both their vegetative and reproductive parts for consumption. Generally Fruit was the dominant part of wild edible plants that was reported to be highly edible in most studies undertaken in different parts of Ethiopia [29, 34, 40]. Recent report conducted in low lands of Ethiopian region by [32] reported that the edible plant parts that were commonly used were the fruit, leaf, bark, root and seed. Although the fruit of all 30 of the most commonly reported species was utilized by peoples in study regions. From this review it is possible to say all the parts listed in different use category were used across the country among different cultural community. However, fruits were the dominant part of wild edible plants that was reported to be highly edible in most parts of the country.

Use Diversity of Wild Edible Plants: According to [40], wild edible plants in the buffer area of Awash National Park Ethiopia were found to have multi-purpose values in various ways such as forage/fodder, medicine, fuel wood

(charcoal and firewood), material culture and miscellaneous uses. Out of the total recorded wild edible plants, about 40% of the species were found to have four distinct uses, 20% with five uses and 24% with six uses to the local people. Likewise, 2% of the species were found to have one and two distinct uses each and 15% with three uses. Food plants have multiple values to human beings, of which the value of food plants in the health care is quite prominent.

WEPS are also the main sources of energy (fuel wood and charcoal), construction, fencing, fodder, medicine [41]. WEPs also serve as a shade for local community when they fetch water and conduct meeting. In addition, they protect the soil from erosion through their roots and protection. The rural community in Quara District North western Ethiopia does not have any plantation for use in construction, protection and implements making and other alternative source of energy. Wild edible plants in Adola district, addition to food it provide various uses such as fuel wood, fencing, construction, soil and water conservation, shading and shelter, rope making, medicinal, fodder, timber, Charcoal preparation, honey production and washing clothes as detergents [36]. In addition to these wild edible plants used as economic benefit for local people by many directions. The products or by-products of food plants serve human beings in so many ways, one of which is medicine. Similarly in addition to food value, wild edible plants were marketable and provide the opportunity to supplement household income. For example, many of the wild edible plants play a significant source of income by selling them for medicines, timbers, furniture, dyes, shelter, fibers and religious and cultural ceremonies [38]. Food plants that also offer medicine are known as nutraceutical plants [31]. Also study conducted in Burji district of Southern Ethiopia shows all 46 wild edible plants identified in the study area were reported to have additional uses other than their use as food [28]. The additional use categories included; fodder with 35 species, fuel with 28 species, construction with 11 species, medicine with nine species, utensils with six species and live fence with two species according to their importance. Likewise underutilized wild edible plants offer various uses in Chilga district North Gonder zone such as fuel wood, fencing, construction, medicinal, fodder, timber, honey production and detergent [19]. Also more than three-fourths of UWEPs in the areas are used for fuel wood and fencing purposes. In addition to these UWEPs could generate income for households through either sales to domestic market or exporting to neighboring countries, mainly the Sudan [19]. According to Teklehaymanot and Giday [29], thirty-seven percent of the recorded wild edible plants in Kara and Kwego semi-pastoralist people in Lower Omo River Valley, Debub Omo Zone, Southern, Ethiopia were also used as medicine. Some of the plant parts used as a food source was also ingested as a medicine. Most of the medicinal plants were trees and shrubs and roots were predominantly used as a remedy. Likewise Sina and Degu [38] reported that in Sidama Zone of Hula district, among the recorded wild edible plants, 31 species (62%) have been cited as medicinal plants. Most of the medicinal plants were trees (11 species) and herbs (9 species) followed by shrubs (8 species) and the least were climbers (3 species).Generally wild edible plants species were used for multipurpose functions in rural communities in different parts of the country. Little is reported for species having only single use.

Mode of Consumption as Food: According to Anbessa [33], about 89.66% of wild edible plants consumed raw outside. However, about 3.45% can be consumed raw or fermented, about 3.45% can be consumed raw or boiled and the rest 3.45% of wild edible plants are found to be eaten cooked. Study conducted by [27] shows that the fresh ripe fruits (72%) eaten were the highest followed by Root/tuber cooked (11%), leaf cooked (7%), Seeds eaten fresh (7%), part cooked (2%) and flowering nectar used (2%). Likewise Balemie and Kebebew [30] reported that that nearly 85% of the recorded edible species or their parts are consumed fresh without further processing and most of them are fruits and seeds. Most of the plant parts, 87 % were eaten uncooked (raw) while some of them 6.5 % needed processing and cooking to make them suitable for consumption and few of them 6.5 % could be eaten either cooked or uncooked. [28] noted that WEPs were consumed in fresh, dried and cooked or prepared in different forms. Majority of plants were consumed fresh, while some of them were consumed after dried. Another study conducted in four selected districts of Ethiopia (Cheha, Alamata, Goma and Yilmana Densa) assured that the edible plant parts consumed directly without any processing were 71.4%, raw, processed 5.8% and processed (cooking and spicing) 24.7% [39]. Some of the wild plant species had more than one edible part and are listed accordingly. Also, [25] stated that most of the recorded wild edible plant species or their parts were consumed as raw/fresh without further processing. Only 13.75% species were reported to be cooked before consumption. The majority of mode of consumption of wild edible plants were raw (68%), flowers (6%), herbal tea

(4%), liqueurs (6%) and cooked vegetables (14%) [38]. The highest number of raw mode
of consumption can be explained by the fact that wild fruits are more favored by children. In general, majority of wild edible plants reported from different parts of the country were consumed as raw without any processing of which fruits are dominant.

Threats and Conservation Status of Wild Edible Plants

Major Threats: Wild edible plants are threatened with various human and natural factors like land use change (expansion of agricultural lands), developmental activities (road construction and urbanization), habitat destruction (timber harvest, fuel wood collection and wildfire), drought, overharvesting and overgrazing [42]. These are among the main factors that reduce the diversity and density of wild edible plants in different parts of the country. Threats such as over grazing by domestic animals, deforestation for agricultural practices and settlement and cutting for construction and preparation of home furniture were reported from Bule Hora Guji zone [33]. Likewise the study conducted by Molla *et al.* [13], Teklehaymanot and Giday [29], Balemie and Kebebew [30] revealed that agricultural expansions, Overgrazing, deforestation, Fuel wood collection and urbanization as the major threats of wild edible plants through out the country. This might cause the depletion of the resources through out the country.

The finding of [43] indicated that agricultural activities and drought are the major threatening factors followed by construction, overgrazing, fuel wood collection and urbanization. Similarly, [36] reported that deforestation and human encroachment ranked as the 1st and 2nd major factors, respectively, followed by drought and firewood collection in the 3rd and 4 th places, respectively. Despite their accessibility and availability, the utilization of wild edible plants is challenged by numerous factors. Other study conducted in Majang Zone of Gambella Region by [25], reported that there was loss of plants because of agricultural expansion, firewood collection, charcoal making, timber and construction material was contributing factors for the loss of plant species in general and Wild Edible Plants in particular. Also, investment was the main threat to wild edible plant availability. Similar results were obtained in a different investigation in Ethiopia, [37] showed that need for agricultural land and population pressure severely threatened plant species in general and wild edible plants in particular. According to [27], wild edible plants were highly threatened in connection to population growth by agricultural expansion followed by firewood collection process of anthropogenic activities and very poor conservation efforts for threaten wild edible plants. Likewise, a number of natural and anthropogenic factors contribute towards the loss of wild edible plants [40]. Among these, agricultural expansion and human settlement, overgrazing, forest fire, deforestation for construction and energy supply, environmental degradation and global climatic change have direct impacts reported [26, 31].

According to Ethiopia's Fifth National Report to the Convention on Biological Diversity many threats affecting WETs are similar to those that affect other biodiversity resources in Ethiopia. Study by [32], indicated that wild edible tree plants are exploited more for their nonfood uses than for their food values. Overharvesting of these WETs to obtain fuel wood, medicine and for fencing, construction and forage purposes is aggravating the degradation status of these species in Amhara, Gambella, Benshangul Gumuz, Oromia, Tigray and SNNP regions of Ethiopia. Moreover, the species were also affected by pests and diseases, which might have a direct influence on their degradation status. Diseases and pests start to occur when local communities change from a pastoral to an agro pastoral way of life [18]. These factors can also limit the benefits that can be derived from the management and conservation of wild edible food plants in the dry land part of the country. Generally there are number of factors either of natural or anthropogenic which threatening their potential and future sustainability which needs wise strategy for conservation. But anthropogenic factors took greater role towards affecting wild edible plant species across the country.

Conservation Status: According to Balemie and Kebebew [30] as to the conservation status, most of the wild species have no protection. Especially the low land vegetation, which is the potential source of wild edibles, is now shrinking. Likewise there was a lack of training to local community to improve management, conservation and utilization of UWEPs [19]. This indicated that the local community utilizes, manages and conserves these plant resources only through experience and traditional knowledge. The conservation practices implemented by farmers included deliberately leaving of trees on their farm land and sometimes planting of important wild edible trees in their garden and are differed significantly among species [32]. [40], noted that local communities

have various indigenous management strategies of conservation. Due to their diverse uses, wild edible plants

Table 3: List of reported threats those affecting plant biodiversity in particular WEPs in Ethiopia

No. of WEPs Reported	Threats identified	Study Area	Author
46	• Agricultural expansion • Fire wood collection	Adola district Guji zone, Oromia Region	Demise S., 2020
55	• Over grazing • Removal of woody plants for different purposes • Human Settlement • Agricultural expansion • Burning of Forests	Awash National Park	Bahru *et al.,* 2013
46	• Agricultural expansion • Over grazing • Fuel wood collection	Burji district SNNPRS	Ashagre *et al.,* 2016
33	• Charcoal production • Fuel wood collection • Construction • Agricultural expansion • Overgrazing • Fire	Chilga district Amhara Region	Tebkew *et al.,* 2014
38	• Making bee hives and canoes	Debub Omo SNNPRS	Teklehaymanot T., & Gidey M., 2010
66	• Agricultural expansion • Fire • Fuel wood collection • Overgrazing/Overstocking • Selective harvesting	Derashe & Kucha District SNNPRS	Balemie K. & Kebebew F., 2006
32	• Agricultural expansion • Fire wood	Densa & Quarit district Amhara Region	Alemneh, 2020
127	• Overexploitation • Agricultural expansion	Konso district SNNPRS	Addis *et al.,* 2013a
88	• Over harvesting for differentv purposes • Pest and Disease	6 regions of Ethiopia (Amhara, Gambella, Benshangul Gumuz, Oromia, SNNPRS and Tigray)	Dejene *et al.,* 2020
36	• Fire • Agricultural expansion • Deforestation • Free grazing • Fuel wood and construction.	Quara district Amhara Region	Tebkew *et al*., 2018
93	• Agricultural expansion • Deforestation	Konso & Hamer district SNNPRS	Addis *et al.,* 2013b
29	• Over grazing • Agricultural encroachment • Cutting for construction and home furniture	Bule Hora district Oromia Region	Anbessa B., 2016
77	• Investment • Fire wood • Charcoal production • Coffee plantation • Construction and tools	Majang Zone Gambella Region	Teklu Y., 2019
53	• Construction & tools • Grazing • Charcoal • Agricultural expansion • Fire wood	Berehet District Amhara Region	Alemayehu *et al.,* 2015

are left to widely grow in farmlands, farm boundaries and watershed areas. Others frequently appear around

homesteads as live fence, shade and along roadsides and degraded areas. Similarly, local peoples protect different plant species in the communal land and in spiritual areas such as in the compounds of churches and mosques [28]. There are certain restrictions on the use of some plant species which is controlled by the elders of this ethnic group traditionally. Local people practice some traditional management, which includes planting around the home garden, pruning, pollarding, fencing and preventing cutting of some plants by local culture. Management and conservation of WEPS in Hamer and Konso area have focused on human settlement areas, live fences, home gardens, farmlands, farm margins, wastelands and forest habitats. Individuals, community leaders and the community at large are vanguards of the endeavor. The established agroforestry system developed through many years of experience, live fences and tolerated and cultivated plants around the mora, the sacred forests owned by the community and the traditional leaders all made Konso a reservoir of botanical diversity and useful plants [44].

CONCLUSION

Ethiopia hosts many biodiversity resources which is distributed in different agro-ecological zones and cultural groups of the country. In different parts of the country tribal and rural peoples have longlived experience and knowledge towards utlization of wild edible plants for different purposes. There are significant difference in records of the number of wild edible plants in different parts of the country. This difference was suggested as the difference in culture across the different parts of the country and agro-ecology of the country. In generall wild edible plants were served as supplementary food sources at normal times, source of important nutrition and drought survival means during hard times or shortage of main agricultural foods. In addition to this wild edible foods are used for different purposes rather than food like, income generation, fuel wood and charcoal, fodder, medicine, construction material and making different utensils. However, these important food sources are threatening by various anthropogenic and natural factors. Agricultural expansion, over-expoitation, fire, cutting for fuel wood, charcoal and construction and overgrazing are major anthropogenic factors that hinder their sustainablity. Except traditional conservation practices implmented by traditional experience and knowledege of local peoples the conservation status of wild edible plant in particular and their ecosystem is very poor.

Recommendation: As it was noted that Ethiopia harbors diverse biodiversity resources used for many purposes. From the review it was indicated that the number and types of wild edible plants used as food was significantly varied in different parts of the country due to many reasons. Generally most literatures indicated that still there are unexplored areas of the country in relation to wild edible plant resources and the number of plants recorded used as food is still in progress. This shows little was known and recorded about these resources. Hence it is recommended that: (1) Further investigation and research will be needed to know the exact potential of these resources throughout the country (2) Government and concerned body should give attention towards conservation of these essential biodiversity resources (3) Moreover, government should prepare wise conservation plan and strategy for domesticated wild edible plant resources and in particular wild edible plants in their natural environment.

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