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Assessment of threatening factors of medicinal plant species in Samre district, south-eastern Tigray, northern Ethiopia

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The study was carried out from January – April 2013 in Saharti samre district. Data were collected using questionnaires, interviews and informal discussion. Furthermore, field observation based on a checklist was used. A total of 138 respondents were selected using simple random sampling technique. Priority ranking was based on the level of destructive effects of each threatening factor 1 to 5 scores. A total of eleven different threaten factors were identified from the present finding. Around 17.39% of the respondents were responded that lack of awareness of the indigenous people about the type, use and management strategies of medicinal plant was the main threaten factor for the loss of medicinal plants. Next to this over-grazing, deforestation and Agriculture expansion were the other threatening factors responded by (15.21%, 13.76% and 12.31%) of the respondents respectively. But cutting for fence was the least threatening factors responded by (2.17%) of the respondents.

Keyword: Anthropogenic Factors, Medicinal Plant, Natural Factors, Saharti-Samre, Threatening Factors.

1. Introduction

About 65-80% of the world's population in developing countries depends on plants for their primary healthcare due to poverty and lack of access to modern medicine^[1]. Furthermore about 80% of the total population of Ethiopia is depending on traditional medicine to treat different types of human illness^[2].

The majority of medicinal plants, with few exceptions, is harvested from wild habitats and cultivated, which are currently under great threat^[3]. Nowadays both the plant materials and associated traditional knowledge are being lost due to lack of systematic conservation, research, proper utilization and documentation. In Ethiopia, it is very difficult to obtain their traditional medicinal information as they considered their indigenous knowledge as a professional secret, only to be

passed orally to their older son, at their oldest age^[4]. On the other hand, pressures from agricultural expansion, wide spread cutting for fuel wood combined with seasonal drought have been reported by^[5,6,7] as main factors for environmental degradation as well as the depletion of medicinal plants. In general, several studies in different parts of Ethiopia have shown that wild plant resources including medicinal plants are subjected to a number of anthropogenic and natural factors such as agricultural expansion, collection for fuel and construction, recurrent drought and overgrazing. Much of the knowledge on their use is held by traditional societies, and the knowledge is usually transmitted verbally^[8]. Therefore, more studies on the management, use and ecology of medicinal plants across the country are needed. The main objective of the

present study was to assess different anthropogenic and natural factors that treat medicinal plant species in the study area.

2. Materials and Methods

The study was carried out from January – April 2013 in Saharti samre district, south-eastern part of Tigray Regional State, northern Ethiopia. The study area is found around 60km far from the capital city of Tigray regional state Mekelle. The major activities of the local peoples are mainly depending on subsistence mixed agriculture. To collect the appropriate data regarding for this study primary source of data collection method was employed using both open and closed ended questionnaires, interviews and informal discussion were used. Field observation based on a checklist on the morphological features and habitats of each medicinal plant species in the field was observed. A total of 138 (79 male, 59 female) respondents were selected in the study area using simple random sampling technique. Semi structured questionnaire was prepared first in English and then translated to the local

language (Tigrigna). The relative importance of the threatening factors was ranked using priority ranking^[9]. Priority ranking was based on the level of destructive effects of each threatening factor (1 to 5 scores were assigned where one is for the least and five the most destructive threat). Finally, the data was analyzed using simple descriptive statistics.

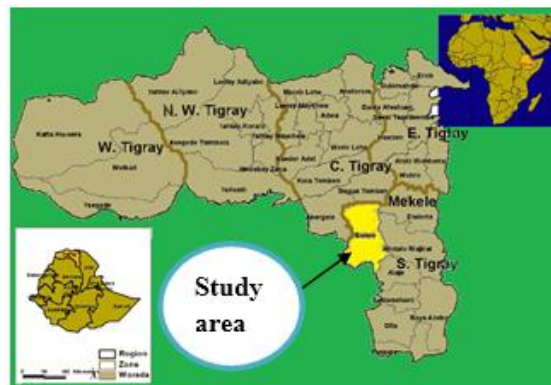


Fig 1: Study area (Saharti-samre district)

3. Result and Discussion

Table 1: List of different threaten factors that affect medicinal plant species in the study area

No	Threatening factors	Respondents		Rank	Examples of medicinal plants threatening by different factors
		No	%		
1	Agriculture	17	12.31	4 th	<i>Solanum incanum, Nigella sativa</i>
2	Firewood	15	10.86	5 th	<i>Olea europaea</i>
3	Drought	9	6.52	7 th	<i>Cucurbita maxima, Cucurbita pepo</i>
4	Construction	11	7.97	6 th	<i>Eucalyptus camaldulensis, Eucalyptus globulosus, Cordia africana</i>
5	Over-grazing	21	15.21	2 nd	<i>Lepidium sativum, Ruta chalepensis, Flueggea virosa</i>
6	Land fragmentation	6	4.34	9 th	<i>Plumbago zeylanica</i>
7	Urbanization	5	3.62	10 th	<i>Phytolacca dodecandra</i>
8	Lack of awareness	24	17.39	1 st	<i>Euphorbia tirucalli, Datura stramonium, Capparis tomentosa</i>

9	Erosion	8	5.79	8 th	<i>Aloe vera, Ricinus communis</i>
10	Deforestation	19	13.76	3 rd	<i>Carissa edulis, Buddleja polystachya</i>
11	Cutting for fence	3	2.17	11 th	<i>Euphorbia candelabrum, Schinus molle</i>
Total		138	100		

Source: (Own survey 2013)

As the above table indicated that a total of eleven different threaten factors that affect medicinal plants were identified from the present finding in the study area. The table showed that list of the threaten factors, response of the respondents in terms of number and percentage, rank of the threaten factors and some representative example of medicinal plants affected by the major threaten factors. Around 17.39% of the respondents were responded lack of awareness of the indigenous people about the type, use and management strategies of medicinal plant was the main threatening factors for the loss of medicinal plants. Previous finding by^[10] in the degraded dry lands of Tigray, Northern Ethiopia indicated that most of the respondents (90%) indicated that lack of awareness was the most threaten factor that affect medicinal plants because, they did not give much attention for the management of the traditional medicinal plants. This could be explained by the lack of knowledge as important medicinal plants are known by few local healers. So the present finding was agreed with the previous finding. Among the different medicinal plant species *Euphorbia tirucalli*, *Datura stramonium* and *Capparis tomentosa* were threatening by lack awareness or less attention of the community of the study area. Next to this over-grazing, deforestation, Agriculture expansion, use for firewood, for construction purposes and drought were the other threatening factors responded by (15.21%, 13.76%, 12.31%, 10.86%, 7.97% and 6.52%) of the respondents or ranked from 2nd - 7th respectively. This finding was disagreed with the result of^[11] in and Around Alamata, Southern Tigray, Northern Ethiopia which indicated that priority ranking of factors perceived as threat to medicinal plants based on

the level of destructive effects drought, grazing, soil erosion and urbanization and agricultural expansion were responded by (40%, 26.6%, 20% and 13.3% of the total respondents and ranked from 1st-4th respectively. Pressures from agricultural expansion, wide spread cutting for fuel wood combined with seasonal drought have been reported by previous findings of^[6] and^[7] as main factors for environmental degradation as well as the depletion of medicinal plants in different parts of Ethiopia. When compare the threatening impact of those different anthropogenic and natural factors on medicinal plant species; erosion, land fragmentation, urbanization and cutting for fence are categorized the least threatening factors responded by (5.79%, 4.34%, 3.62% and 2.17%) of the respondents and ranked from 8th – 11th respectively. Medicinal plant species like *Aloe vera*, *Ricinus communis*, *Plumbago zeylanica*, *Phytolacca dodecandra*, *Euphorbia candelabrum* and *Schinus molle* were threatened due to the above factors in the study area. The present study indicated that lack of awareness were the predominantly occurred problem that threaten the medicinal plants. However, this result is not similar with the works of^[12] on ethnobotanical study of medicinal plants in Asgede Tsimbila district, northwestern Tigray, which states that Agriculture, firewood, drought, construction and over-grazing are the most threatening factors based on their level of destructive effects on medicinal plant species. However the present finding was not in line with the previous study by^[12]. Availability of medicinal plants has been affected by a dramatic decrease in the area of native vegetation due to agricultural expansion, deforestation, fire, overgrazing, and drought, trading charcoal and

firewood and urban associated developments^[13,14]. This situation also similarly occurred in the present study Saharti-samre district of south-east Tigray regional state.

Table 2: The level of destructive effects of each threatening factor (1 to 5 scores were assigned where one is for the least and five the most destructive threat)

No	Threatening factors	Observation check list				
		1	2	3	4	5
1	Agriculture					√
2	Firewood				√	
3	Drought				√	
4	Construction			√		
5	Over-grazing					√
6	Land fragmentation			√		
7	Urbanization	√				
8	Lack of awareness					√
9	Erosion			√		
10	Deforestation					√
11	Cutting for fence			√		

Key: 1: Very low 2: Low 3: Medium 4: High 5: Very high

The above table indicated that the observation check list of both the anthropogenic and natural threatening factors fulfilled by the researchers during field observation in the study area. The check list showed that lack of awareness, over-grazing, deforestation and agricultural expansions were categorized under most destructive threat of medicinal plant species. This means those threatening factors are highly affected medicinal plant species when compare with others. In the study area the inhabitants also rely on medicinal plants for various purposes such as forage, medicine, firewood, spice, construction and food. This indicates that special focus should be given for conservation of these plants since they are being widely exploited for purposes other than their medicinal value. The present finding was agreed with previous finding of^[14] on indigenous medicinal utilization, management and threats in Fentale area, Eastern Shewa, Ethiopia.

4. Conclusions

The result of the present finding indicated that both anthropogenic and natural threatening factors were highly affected to lose and decreased different medicinal plant species. Existing mismanagement of medicinal plants like over harvesting for other purposes such as fire wood,

construction, agriculture, cutting for fence, lack of awareness, urbanization and over-grazing were some of the anthropogenic threatening factors identified in the study area. Moreover, pressure like recurrent drought, land fragmentation, erosion and deforestation were some of the natural threatening factors that aggravated the threats to the medicinal plant species. When compared with the level of destructive effects of each threatening factor lack of awareness were the most identified problem. Therefore, awareness creation campaigns are timely needed to improve local community's knowledge on the importance and management of medicinal plants in order to keep on the knowledge for the future generation. It is advisable to create awareness about the management strategies of medicinal plant species and replace these plants to ensure sustainability by establishing nurseries for the common medicinal plants so as to control deforestation as its associated consequences such as erosion and loss in soil fertility.

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