

# A Review on the Qualitative Method of the Study of People-Plants' Relationship in their Environment



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## Abstract

While peoples are living in their respective environments, their decisions and actions are mediated by culturally constructed values, beliefs and priorities. A common tool to quantify otherwise qualitative data in the biological and social sciences is the most important step towards for protection, conservation and benefiting of plant species diversity for different purposes for which qualitative and quantitative method of data collection mechanisms should be identified and used. These approaches could provide data amenable to hypothesis-testing, statistical validation and comparative analysis. Qualitative study of people-plants' relationship can show how different ethnic groups living within the same geographic landscape interact with the environmental resources. This qualitative ethnobotanical research can provide a wealth of information regarding both past and present relationships between plants and the traditional societies. To make realize the qualitative ethnobotanical approaches, there are various types of qualitative data collection means mainly: semi-structured interview, focus group discussion, pile sorting/ card mechanisms, Participatory Rapid Appraisal for which they have their own role in collecting qualitative data which is used to gain an understanding of underlying reasons, opinions, and motivations and it provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research. Hence, the conservation of ethnobotanical knowledge as part of living cultural knowledge and practices between communities and the environment is essential for biodiversity conservation and it is also hoped that, in the future, study of people-plants' may play an increasingly important role in sustainable development and ecological balance if the ethnobotanical approach is protected and valued.

**Keywords:** Ethnobotany; Qualitative method; People-plants' relationship; Environment

## Background

Throughout the world, wild, naturalized or non-cultivated plants provide a 'green social security' to hundreds of millions of people, for example in the form of low cost building materials, fuel, food supplements, herbal medicines, basketry containers for storage, processing or preparation of food crops, or as a source of income [1,2]. Edible wild foods often help prevent starvation during drought, while economically important species provide a buffer against unemployment during cyclical economic depressions [3]. This is important for people living in areas with drought-susceptible soils of marginal agricultural potential such as the vast areas of sub-equatorial Africa has also a long history of human use and many ecosystems and harvested species populations are resilient but their value is rarely taken into account and were pushed beyond recovery through habitat destruction or overexploitation this is because in many parts of the world, 'traditional' conservation practices have been weakened by cultural change, increased human needs and numbers, and by a shift to cash economies [4].

Ethnobotany, the study of human interactions with plants, is relevant to many global concerns including food security, climate change, conservation biology and human health [2,5]. In much of the developing world, humans rely heavily on local environmental resources, especially wild plants, for daily subsistence and health care [5]. Traditional knowledge of these resources, passed down from generation to generation, can serve as a reservoir of resilience and influence group survival during periods of hardship.

Ethnobotanical knowledge within a defined microsystem is represented mainly by experiential knowledge shared among community members identifying with a specific culture. Although this is influenced by introduction of outside ideas and practices, the core body of knowledge is typically linked to those resources that are most easily accessible to the local population [3]. It also shows how people of a particular culture and region make the use of indigenous plants for various purposes [6] for the humans to sustain ecologically, economically and socially.

The exploration and utilization of ethnobotanic resources, its identification, documentation and conservation is need of the time which is essential for restoration and preservation of traditional and tribal knowledge [1,7] and the acquired knowledge about the plants are very essential to be used in near future for ever increasing population [8].

The ethnobotanical study assists in collecting the local knowledge record from ethnic society. As an example, the study of medicinal plants can be used as the basis for the conservation and utilization of plants in a sustainable way and also the traditional knowledge for their local plants could be used for various indications, for instances, the research report from central Kapuas District indicated that the qualitative ethnobotanical approach like FGD used in-depth interviews and participation observation during field work visit used to obtain information of where the gold is located by using types of local vegetation [3]. Local wisdom which could be identified by qualitative approach can be an important component to carry out saving efforts of forest plant resources. With the local wisdom owned by the local people, it will be able to support the wisdom value in this environment especially for maintaining the sustainability of natural resources and genetic. In addition, local wisdom is a feature of national culture, which should be comprehensively studied and further developed.

To document scientifically the interaction between local peoples and plants use mechanisms, commonly two ethnobotanical approaches could be used namely qualitative and quantitative ethnobotanical approach. The qualitative approach of ethnobotanical is used to obtain information and describe local knowledge of certain tribes/communities about utilization of certain plants.

### Objectives

The overall aim of this paper is to review and compile information on the qualitative study of people-plant relationship on their respective environment.

### Main Body

World Bank reported that 25% of the world's poor directly or indirectly depend up on plant resources for their better livelihood. Ethnobotany is the study of human interactions with plants, is relevant to many global concerns including food security, climate change, conservation biology and human health. In much of the developing world, humans rely heavily on local environmental resources, especially wild plants, for daily subsistence and health care [6]. This knowledge of plants has always been transferred from generation to generation throughout the natural course of everyday life [9]. This important knowledge, collated through ethnobotanical studies, is valuable for conservation, and establishment of the local and indigenous plant usages has significant benefits [10].

### Ethnobotany

Ethnobotany, is a research field of science, that highlights the people-plants relationship (plant use by indigenous cultures for food, medicine, pesticides, clothing, shelter and other purposes), is widely used especially in Asian countries for the documentation of indigenous knowledge on the use of plants and for providing an inventory of phyto resources content of the local flora [11,12]. The different traditions, beliefs, needs and cultures of the various tribes and the diversity of flora richly contribute to the folklore. The traditional knowledge of any region represents a unique picture and is very much location specific to socio-cultural context which varies from place to place and community to community.

The traditional knowledge about the various uses of plant species i.e. food, medicine etc. is preserved from generation to generation and they depend mainly on the forest resources for their survival for which traditional societies are ideal example of traditional knowledge system which is derived from their ancestors [13,14] which uses commonly two types of mechanisms to confirm and upgrade the conservation as well as protection of plant species diversity for the sake of human welfare, these are qualitative and quantitative mechanisms of ethnobotany.

### Qualitative ethnobotany

Qualitative ethnobotanical data is primarily exploratory approach. It is used to gain an understanding of underlying reasons, opinions, and motivations. It provides insights into the problem or helps to develop ideas or hypotheses for potential quantitative research. Qualitative ethnobotany is also used to uncover trends in thought and opinions of local plant species diversity, and dive deeper into the problem, commonly in this method of ethnobotany the target/sample size of the participant is typically small [15,16].

Although quantitative survey data provides a solid base for ethnobotany, qualitative approach may yield more comprehensive and holistic views of traditional knowledge of communities on plants might be explored. The qualitative approach in ethnobotany allows studying the dynamic relationship between plants and peoples whereas quantitative ethnobotany consists of a systematic empirical study that provides data for statistical analysis. Quantitative and qualitative ethnobotany methods use different types of interviewing techniques [12,16]. There are different mechanisms of qualitative ethnobotanical approach that data or information regarding traditional knowledge of peoples to use plant resource for various purposes as well, some of which are mainly indicated in the following sections.

### Participatory Rapid Appraisal (PRA) approach

The Participatory Rapid Appraisal (PRA) is considered as an educational method for all individuals to discover, analyze and evaluate the challenges and opportunities and adopt attitudes towards projects and development programs [17,18]. It is a tool that enables the research team to collect information in a rapid

and organized way to be used in evaluating the needs of the inhabitants and analyze the general situation. In this method it's more important to get better understanding of the complexity and depth of a certain subject more than getting actual statistical information of a list of tens of variables [16]. It is similar to conducting surveys, which are the most common social research methods; it is also concerned with understanding the specific qualitative differences as well as the societal opinions and attitudes in order to comprehend the ambiguous changes in local communities. This is the most important part of PRA as it is based on learning from the inhabitants of the local community. PRA is carried out inside the local community by the participation of all its members [19], though difficult to quantify, provides a valuable insight into the multiple meanings, dimensions and experiences of local people. It captures information that standard plant use methods are likely to miss. Open-ended methods, such as unstructured interviews and discussion groups allow the emergence of issues and dimensions that are important to the community but not necessarily known to the data collector, thus allowing unanticipated themes to be explored by the interviewer in this PRA approach [20]. Therefore, PRA is easily adopted and allowed real participation at the community level. Members of the local community shall be asked to give the names of the most renowned traditional peoples who owned the indigenous knowledge about plant species for different purposes like for medicinal purpose as being healers in the area, wild edible plant species and etc. as indicated in the document, the traditional healers are professional practitioners who could medicate the local people using ethnomedicinal plants and their products, moreover, verbal informal consent shall be collected from interviewees about all traditional healers. To do this, the interviews and discussions should be carried out by using the local language if the collector/s is/are is/are not a native speaker of the respective community language during the PRA tasks [21].

### **Pile sorting mechanisms of data collection qualitative approach**

A lot of other methods can be used to collect data. One of them is pile-sorting (Boer H & Mashamba MT, 2007). Pile sorting or card methods is the one which is derived from cognitive anthropology, pile sorting is also one of the qualitative methodology designed to elicit how participants/communities evaluate their social experiences (Boer H & Mashamba MT, 2007). This mechanism of data collection, commonly used in the social sciences [20] and in various natural sciences is also too.

The pile sorting technique engages participants in sorting cards with words or pictures into piles that represent how they think about and categorize elements of interest. For pile-sorting, participants are asked to group items according to a certain criterion [17]. Typically, each name of an item, for example a plant, is written down on a card and participants are asked to group these items. In this kind of works, people can either choose the criterion or either a criterion for grouping the items

is given to them. By letting the local people choose their own criteria for grouping items. When the views, values, concepts and perceptions of local people are used in the categorization process without interference of facilitator [22] but the facilitator may provide participants labeled cards or may ask participants to label blank cards [17]. Pile sorting may be constrained in which participants organize cards according to categories determined by the facilitator, or, unconstrained when the participants organize cards according to categories that they determine, cards may be sorted a single time, or successive pile sorts may be performed in which participants apply new criteria to further divide previously defined categories [18]. Data generated include visual representations of relationship. Less commonly, participants are asked to verbalize their thought processes and rationales concurrent with or after sorting the cards, and narrative data are elicited (Boer H & Mashamba MT 2007) which implies that pile sorting mechanisms is used in qualitative ethnobotany for those communities who are indigenously professional for their local obtained plant species for various types of ecosystems services for the sake of human wellbeing.

### **Focus group discussions**

A focus group discussion involves gathering people from similar backgrounds or experiences together to discuss a specific topic of the interest. It is a form of qualitative research where questions are asked about their perception's attitudes, beliefs, opinion or ideas [22]. In focus group discussion participants are free to talk with other group members; unlike other research methods it encourages discussions with other participants. Focus group is also a technique where a researcher/data collector about ethnobotany assembles a group of individuals to discuss a specific topic, aiming to draw from the complex personal experiences, beliefs, perceptions and attitudes of the participants through a moderated interaction [22,23]. It generally involves group interviewing in which a small group of usually 8 to 12 people. It is led by a moderator (interviewer) in a loosely structured discussion of various topics of interest.

The group's composition and the group discussion should be carefully planned to create a non-discouraging environment, so that participants feel free to talk openly and give honest opinions. Since participants are actively encouraged to not only express their own opinions, but also respond to other members and questions posed by the leader, focus groups offer a depth, and variety to the discussion that would not be available through surveys.

Focus group is a type of in-depth interview to be accomplished in a group, whose meetings present characteristics defined with respect to the proposal, size, composition, and interview procedures. The focus or object of analysis is the interaction inside the group of population/participants. The participants influence each other through their answers to the ideas and

contributions during the discussion. The moderator stimulates discussion with comments. The fundamental data produced by this technique are the record of the group discussions and the moderator’s reflections and comments.

The general characteristics of the Focus Group are people’s involvement, a series of meetings, the homogeneity of participants with respect to data interests, the generation of qualitative data, and discussion focused on a topic, which is determined by the purpose of the duties.

This mechanisms of data collection is applicable in various fields like in ethnobotanical data, this approach could allow the communities to be participated freely like the types of questions that is prepared for such purposes of data collection should be open ended and semi structured questionnaire for the selected communities and then after they could act on it being in groups for instances, the general use of plants in the community (only plants that naturally grow there), more specific topics like one about plants used for food and beverages, medicinal plants... etc. for which different sessions for group discussions might be necessary and the aim of focus group discussion perhaps be to establish a list of all useful plants. According the principles just like the pile sorting mechanisms participants shall list out all

useful plant species they could think of, give their local names and clarify which parts of the plants they use and for which purpose, their growth location and whether they sell or trade the plant part or product and also the group shall put extra information about plants on prepared sheets which should consists of names of plants with different columns.

Focus group discussion consists of four major steps as shown in Figure 1 namely: research design, data collection, analysis and reporting of results which is adopted from Morgan et al. 1998. Focus group discussion requires a team consisting of a skilled facilitator and an assistant [17,24]. The facilitator is central to the discussion not only by managing existing relationships but also by creating a relaxed and comfortable environment for unfamiliar participants. Similarly, the assistant’s role includes observing non-verbal interactions and the impact of the group dynamics, and documenting the general content of the discussion, thereby supplementing the data (Boer, H & Mashamba MT, 2007) [18]. Non-verbal data rely on the behavior and actions of respondent’s pre-focus group discussion, during and post-focus group discussion. Non-verbal data provide “thicker” descriptions and interpretations compared to the sole use of (Figure 2).

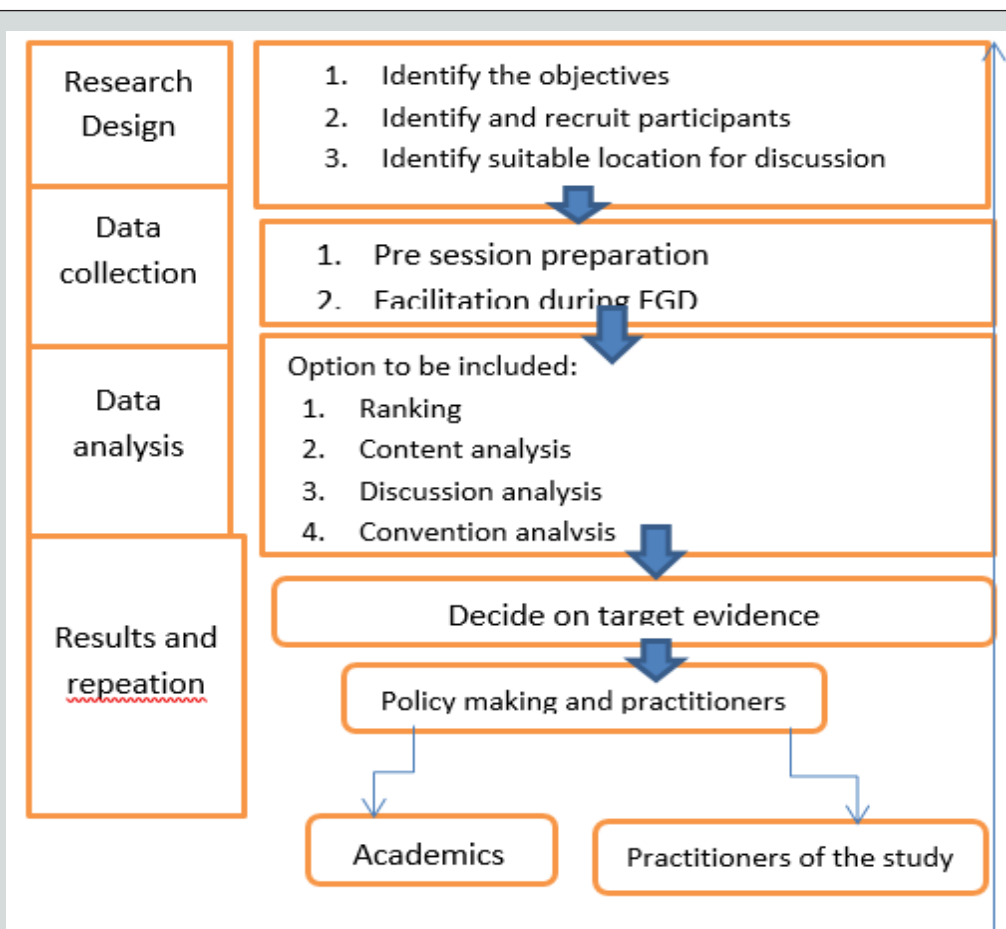


Figure 1: Flow chart of the steps of the focus group discussion techniques.





Figure 2: Focus Group Discussion seating style.

#### Advantage and disadvantage of focus group discussion

As any things shall have its own drawbacks, the focus group discussion has also its pros as well as cons:

From the advantage:

- a) The trends of free and open discussion among the respondents results in generation of new ideas that can be very useful for decision
- b) Focus group is not static rather the moderator can bring any changes in order to better facilitate the discussion during the group discussion which allows better results in terms of information derived by a focus group.
- c) Expressions other than those in verbal form such as gestures and stimulated activities can provide researcher with useful insights.

From the disadvantage:

- a) Though moderator can control the discussion, the extent to which he/she can control the discussion depends on his/her experience; inexperienced moderator may face problems in controlling some participants who try to dominate the group.
- b) Respondents may be reluctant to share some sensitive ideas and concerns publicly.
- c) Due to small sample size and heterogeneity of individuals, the findings may not be adequate to make projections or the composite picture of the situation.
- d) An FGD can be a very artificial set-up that influences the respondents to express and act unnaturally.

#### Semi structured questionnaire approach of qualitative ethnobotany

The semi-structured interview guide provides a clear set of instructions for interviewers and can provide reliable, comparable qualitative data [16]. Semi-structured interviews are often preceded by observation, informal and unstructured interviewing in order to allow the researchers to develop a keen understanding of the topic of interest necessary for developing relevant and meaningful semi-structured questions. The inclusion of open-ended questions and training of interviewers to follow relevant topics that may stray from the interview guide does, however, still provide the opportunity for identifying new ways of seeing and understanding the topic at hand.

Information will be collected from locals by free-listed observations and semi-structured interviews of people in public areas (generally in fields, tea houses, mosques, churches, village squares, etc.). Local people talked about the collected plants in the fields; the people of the respective area might be extremely generous in helping others whom they know this is because particularly Ethiopian peoples are honest in taking newcomers in positive ways. In this step, we should give attention to obtain information from the oldest local people as much as possible for which one thing should be in account is we could only work with local people who speak the local languages and who is familiar with the people in the area and then by using local guidance, we could interview with these local people without much difficulty. Moreover, during the semi structured review we have to have guidance from local with different backgrounds that could speak the same language as local people, like from religious centers (churches/, mosques, leaders of villages and the members of the security services of the villages.

The field of ethnobotany has developed greatly during the last two decades. Originally, ethnobotany was based on qualitative methods, such as open ended and semi-structured interviews. Ethnobotany produced the compilation of lists of plants used together with a description of how plants were used. Although it could reveal a good range and depth of information (Boer H & Mashamba) [16-18], qualitative ethnobotany is

unable to measure the importance of species, compare the relative usefulness of the plants, and rank the priorities of people [25,26]. Moreover, semi-structured interviews approach of the qualitative ethnobotany sit halfway between a structured survey and an unstructured conversation which is displayed as follows (Figure 3).

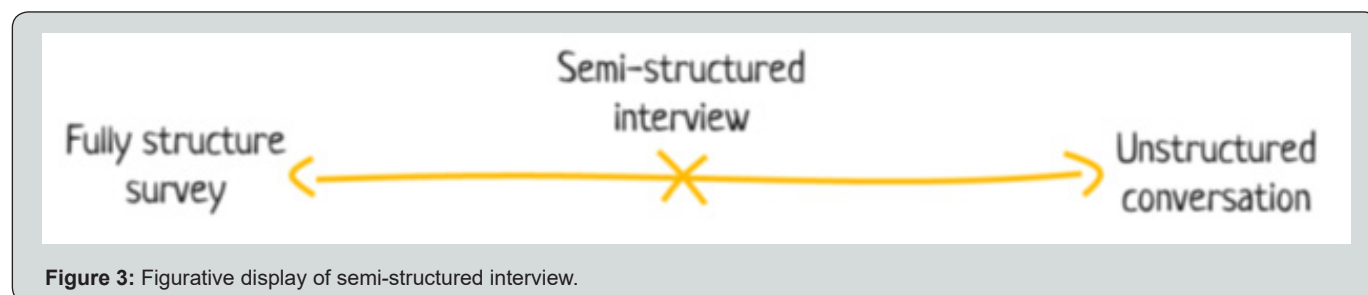


Figure 3: Figurative display of semi-structured interview.

Semi-structured interviews are also particularly useful for collecting information on people's ideas, opinions, or experiences. They are often used during needs assessment, program design or evaluation. Semi-structured interviews should not be used to collect numerical information, such the number of farmers using fertilizer in which quantitative survey is better.

### Uses of ethnobotany

Among the various use of plant species, the edible as well as medicinal and other purposes has also been investigated by different scholars from different parts of the world [27]. Food plants serves as alternatives to staple food during periods of food deficit and are the valuable supplements for a nutritional balanced diet one of the primary alternative source of income for many resource poor communities [28,29]. Plants also in addition to their traditional use of food, potentially these wild plants have many advantages [1] like they are used as medicine, fodder, and for rituals and other functions. Wild food plants are inexpensive, locally available and have a great socio-economic, cultural and spiritual significance because of their food and medicinal values [8,27].

#### Edible use of plants species

The eatable resources of plants could be categorized in different ways like vegetable, spices, fruits and underutilized plant species, apparently, Suresh et al. [29] listed 21 wild edible tree fruit species from Sikkim, India which have been generally consuming fresh and raw, are cheap and readily available with vibrant taste appeal along with nutritional, medicinal, therapeutic and industrial values [1]. Ethnobotanical study conducted at Xobe and Shorobe Villages in northwestern Botswana used 38 woody species which were used for fuel wood, furniture, medicine, food, fodder, farm implements and shade [30]. In Chelia district, Ethiopia Regassa et al. [31] documented 58 species of wild and semi-wild edible plants. This implies that

how much the ethnobotany plays an immense role in as being sources of food staples.

#### Medicinal uses of plants

Use of medicinal plants to treat various diseases has been part of human culture since ancient times. Botanically derived medicinal plants played a major role in human societies throughout history and prehistory. The ethnobotanical use of this unique group is of immense importance [32]. Medicinal properties of plants are mostly distinguished through trial and error but were also influenced by the belief systems of the people involved and often became entangled with religious and mythical practices [29,32].

Ethnobotanical studies have brought to light numerous plants having significant medicinal properties which were earlier unknown to scientific world [21]. Plants are important for pharmacological research and drug development, not only when plant constituents are used directly as therapeutic agents, but also as starting materials for the synthesis of drugs or as models for pharmacologically active compounds [1,30]. Traditional medicine forms a valuable resource for the development of new pharmaceuticals. Traditional medicine and ethnobotanical information play an important role in scientific research, particularly when the literature and field work data have been properly evaluated. Plant products are widely using among various indigenous communities particularly in the remote areas with few health facilities [33] including Ethiopian population which is till dominantly dependent on traditional medicine [34]. In home gardens of southwestern Shewa zone of Oromia Region in where the communities grow plant species of ethnomedicinal important [35] and recorded about a total of 163 medicinal plant species in Libo Kemkem district of Ethiopia [29] and similarly about 32 plant species were also recorded in southwestern parts of Ethiopia in Bench ethnic group of peoples has been using to treat against both human and livestock sickness [33].

## The protection and management of ethnobotanical knowledge

Indigenous knowledge can be adaptive and resilient [1,13]. Now days, the desire of medicine is increasing due the scaling up of disease attach of human being but on the contrary of this, the indigenous knowledge on the use of lesser-known medicinal plants is rapidly declining [27]. Information on the use of plant species for therapeutic purpose has been passed from one generation to the next through oral tradition, this knowledge of therapeutic plants has started to minimize and become outdated through the lack of recognition by younger generations as a result of a shift in attitude and ongoing socioeconomic changes [36] which exposes such plant species to be extinct easily.

The plant resources can be conserved by employing sustainable management practices involving all stakeholders, especially the local communities [37]. There is no vertical transfer of medicinal plant knowledge which is due to the lack of interest among the younger generation to learn and practice it, which might be attributed to the ever-increasing influence of modernization [27]. Transfer of knowledge can only take place along the family line, usually from parents to children [30].

There must be mechanisms of knowledge transmission and conservation of ethnobotany, like there is need to plant and domesticate the ethnobotanical plants species by using different local/national/international developmental projects which could promote the endogenous strategies for various purposes like for food staple , medicinal purposes, ecological purposes as well as for cultural heritage and sustaining small-scale food market circuits for conserving and replenishing this natural resource to uplift socioeconomic status and livelihood of indigenous communities [38]. Moreover, the principles of traditional, religious and practices where modern conservation programs could integrate traditional knowledge systems of indigenous communities into their activities in the conservation and management of natural resources should be also encouraged to preserve and conserve traditional knowledge of local communities.

## Challenges of qualitative ethnobotany

Due to land degradation and worsening of climate change from time to time makes the issue of continuity and sustainability of different plant species under question. For instances, to use traditional medicine, nowadays herbal practitioners have to walk greater distances for herb collections that once grew in the vicinity of their homes. This is because of availability of plants in general and medicinal plants in particular have been affected by a dramatic decrease in areas of native vegetation. The primary causes of this problem are loss of taxa of medicinal plants, loss of habitats of medicinal plants and loss of indigenous knowledge [31,34]. Moreover, Mirutse Giday [33] reported that the practice of using plant remedies by Zay people to treat different ailments has been declining from time to time mainly as a result of

continued deforestation in the area and it is also argued that medicinal plants are considered to be at conservation risk due to over use and destructive harvesting.

Generally, there are two sources of challenges to local different plant resources namely, human-made like rapid increase in population, fuel, urbanization, timber production, over harvesting, destructive harvesting, introduction of invasive species, commercialization, agricultural expansion and habitat destruction/fragmentation whereas recurrent drought, bush fire, disease and pest out breaks are some of the natural causes [31,34]. Not only, these aggravate the rate of loss of taxa with related indigenous knowledge and loss of widely useful plant species but the consequence shall be bad in such a way that, when the plants that have been serving as the raw material for the preparation of different remedies are being destroyed, the traditional practices associated with them would also diminish.

Thus, this circumstance implies that considering the role-played by plant-derived products in human and livestock health, the effective protection and conservation of plants species and associated with indigenous knowledge should be every one's homework [31,33, 39-42].

## Conclusion

Qualitative measurement and detailed observation of the concept attributes is an important step in the development of qualitative data-based literacy. This approach requires proper observation and measurement of concept attributes of the communities like measurement of attitudes, knowledge, the degree of adoption and etc. The clarity of the observed object can affect the accuracy of the qualitative data obtained in different ways.

This paper review is contained different types of qualitative ethnobotanical data collection mechanisms mainly: unstructured methods of data collection, PRA, semi-structured interview, focus group discussion and pile sorting/card mechanisms. The purpose of the unstructured phase is to address culturally appropriate questionnaires for testing hypotheses and to gather information on the context of the results of the questionnaires. The methods used during the unstructured phase is participant observation, free-listing, open-ended interviews, and collection of ethnobotanical specimens.

A focus group discussion is also another qualitative approach for data collection which involves gathering people from similar backgrounds or experiences together to discuss a specific topic of the interest. It is a form of qualitative research where questions are asked about their perception's attitudes, beliefs, opinion or ideas. Similarly, the pile sorting technique is the approach which engages participants in sorting cards with words or pictures into piles that represent how they think about and categorize elements of interest, in this, the participants are asked to group items according to a certain criterion.

Ethnobotany provides immense benefits to communities for instances plants in addition to their traditional use of food, potentially these wild plants have many advantages like they are used as medicine, fodder, and for rituals and other functions, moreover, the wild food plants are inexpensive, locally available and have a great socio-economic, cultural and spiritual significance because of their food and medicinal values, though it has positive contribution for developmental goals of the communities it has its own challenges which is the issue of sustainability.

Thus, the indigenous communities have rich traditional knowledge system about the ethnobotanical plants and also transferrable from generation to generation to learn and practice it.

The communities should be encouraged with improved cultivation techniques of commercially viable ethnobotanical species through capacity building, timely policy intervention along with strong market linkage. This shall ensure improvement of biodiversity conservation and livelihoods of the communities.

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