

# **THE ROLE OF INDIGENOUS HEALING PRACTICES IN ENVIRONMENTAL PROTECTION AMONG THE MACCAA OROMO OF ILU ABBAA BORA AND JIMMA ZONES, ETHIOPIA**

Milkessa Edae TUFA<sup>1</sup>, Fesseha Mulu GEBREMARIAM<sup>2</sup>

<sup>1</sup>Department of Oromo Folklore and Literature, Jimma University, Ethiopia

E-mail: [milkesaetae@gmail.com](mailto:milkesaetae@gmail.com)

<sup>2</sup>Department of Governance and Development Studies, Jimma University,

Ethiopia

E-mails: [fmulat647@gmail.com](mailto:fmulat647@gmail.com) or [fesseha2017@gmail.com](mailto:fesseha2017@gmail.com)

## **Abstract**

This article mainly attempted to explore the role of utilizing indigenous medicines in environmental protection among the Maccaa Oromo of Jimma and Iluu Abba bora zone, south-western Ethiopia. To this end, 4 separate interviews with 4 interviewees, 2 focus group discussions with 17 participants, and non-participant field observation were conducted to generate significant and reliable data. Besides, the researchers employed secondary data to make the study more significant and complete. The findings of the study show that since the source of medicines is the environment, the community protects their environment unless the society wouldn't accessed the natural medicines they need. The study also reveals that most of these folk medicines used by the Maccaa Oromos are from

plants. This further indicates the society protects the natural environment to get the plants they use for medication. Thus, folk healing practices are crucial on the one hand to treat illnesses, and to protect the ecosystem on the other hand. However, these societal knowledge is undermined as well as they are being replaced by western (scientific) knowledge, modern medicines. These days, our planet is suffering from global warming, wild fire, flooding, drought, and desertification. Averting these threats is impossible without protecting societal environmental indigenous knowledge.

**Keywords:** Ecosystem, Environmental conservation, Folk healing, Indigenous medicines, Maccaa Oromo.

**JEL Classification:** O47, O57

## **1. INTRODUCTION**

### **1.1. Indigenous Knowledge (IK): definition and characteristics**

As we trace at the history of mankind, through course of time, any society develop its own way of managing the relationship among its members and other societies, with nature and its inhabitants. To do this, societies equipped themselves with necessary accumulated and inherited, may be further developed knowledge, from their fore fathers. We can call this kind of knowledge “Indigenous Knowledge.” But, Indigenous Knowledge is beyond this, and various scholars have defined the same term differently from their own perspectives. For instance, some define Indigenous Knowledge as ‘local’, ‘traditional knowledge’, ‘non-scientific’ and ‘irrational,’ though this way of understanding and labelling IK is discriminatory and Eurocentric (Lanzano, 2013). Rather, IK is a form of knowledge that societies develop outside the mainstream scientific knowledge (Ibid). While Battiste (2002), define IK as a special kind of wisdom which has been tested and proved for centuries that has

the ability to solve problems which are beyond the capacity of the so called first Nations education and their knowledge system. He further noted that this knowledge has been there with the societies and be there forever despite the mainstream Eurocentric doubts the fact.

Other scholars such as Materer and et al (2002), perceived IK as a kind of knowledge inherited from previous generations, and are unlike scientific knowledge, holistic.i.e. the knowledge deals with the society's philosophy, flora, fauna, cultural treats, medicine and so on. However, it is wrong to define IK as ethnic or tribal knowledge, rather local (Ibid). Besides, Kloppenburg (1991 as cited by Materer and et al 2002), tried to define IK in reference to scientific knowledge. For him, unlike IK which is not mobile, dynamic and mutable, scientific knowledge is mobile, transferable, and not tied to a single local community. Furthermore, unlike scientific knowledge which is objective, systematic, open, some used to assume IK as non-objective, emotional, primitive and parochial (Briggs, 2005). Accordingly, IK is assumed to be the knowledge of the poor and traditional of the people living in the low and income middle countries (Ibid).

Moreover, Nakashima and Roue and Nakashima (2002), noted IK as the knowledge system referring to the knowledge before colonization /local knowledge in Africa and Asia where most of the inhabitants are native unlike to the residents in North America and Australia mostly migrants from Europe. Generally, based on the above the definitions and natures of IK, one can understand that IK as it is a unique body of knowledge developed through course of time and continue to develop outside formal educational system by a particular group of people or community or society through their generations living in close contact with nature and its inhabitants.

## **1.2. Understanding Environmental Ethics**

Various (sub) disciplines have their own way of conception of the natural environment. And, environmental ethics is one of sub-categories of applied ethics devoted in dealing issues related to environment, ecosystem, and the interaction between human beings and the natural environment. Besides, Environmental Ethics deals on how humans should treat natural habitats, how to use and exploit natural resources in a very sustainable manner, do humans have an obligation to protect the environment, and so on. Thus, Environmental ethics studies the relationship between human beings and nature (Nelson and Ryan, 2015).

Though some philosophers such as Kant argue that everything in the natural environment is for humans to satisfy their needs so that man can exploit nature without limit, the reality is if you intervene in to nature unwisely even your existence would be jeopardized-‘ecological debt’- Ecological debt is the concept referring to the earth/nature would give you or pays you based on what you did unto her (Fesseha, 2017a). This kind of thought is deeply rooted in Christian ethics as well (Ibid). The Holy Bible says “...God created mankind in his own image...and rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground.”

No one can deny that the world is suffering from Global warming, wild fire, desertification, flooding and so many environmental calamities as a result of unethical, unlimited, anthropocentric human intervention in to and exploitation of nature. This is called ‘ecological debt’(Fesseha. 2017b). There are various philosophical views in relation to environment. Among others: Anthropocentrism, Biocentrism, and Eco-centrism are the most dominant ones.

According to Anthropocentrism man is superior to all creatures in this nominal world next to God, the creator. Thus, man have superior value over other creatures, and man's interest is, therefore, what it matters a lot (Gunn, 2007). However, ethicists such as Peter Singer and Leopold strongly criticised this selfish humane centred thought (Ibid). Even to the extreme, Singer noted that the hierarchy of value among creatures should be determined based on the principle of "pleasure and pain." For him, all creatures that experience pleasure and pain are equal, no matter being man or animal. This kind of environmental philosophy is to be thought under biocentrism. Biocentrism noted that all living has moral values. Thus, moral value is not exclusive to humans.

But, eco-centrism is something broader nation thought that whatever in the natural world has its own value. Thus, man can't exploit nature without any limit (Rolston, 2007). And, this kind of perception to nature is widely accepted in these days where a number of environmental activists call for protection of the natural environment from where human beings and its inhabitants satisfy their needs. Governments, policy makers, and academicians have repeatedly mobilized the public to wisely utilize nature in a very sustainable manner. More recently, a number of countries have entered in to an agreement including China and the US to minimize the amount of CO<sub>2</sub> they release in to the atmosphere and to work on sustainable energy alternatives. Ethiopia as one of the signatory states, the government has ratified the agreement on the parliament, and make it part of the country's environmental policy (Fesseha, 2017b).

### **1.3. Environment the source for Folk Medicines**

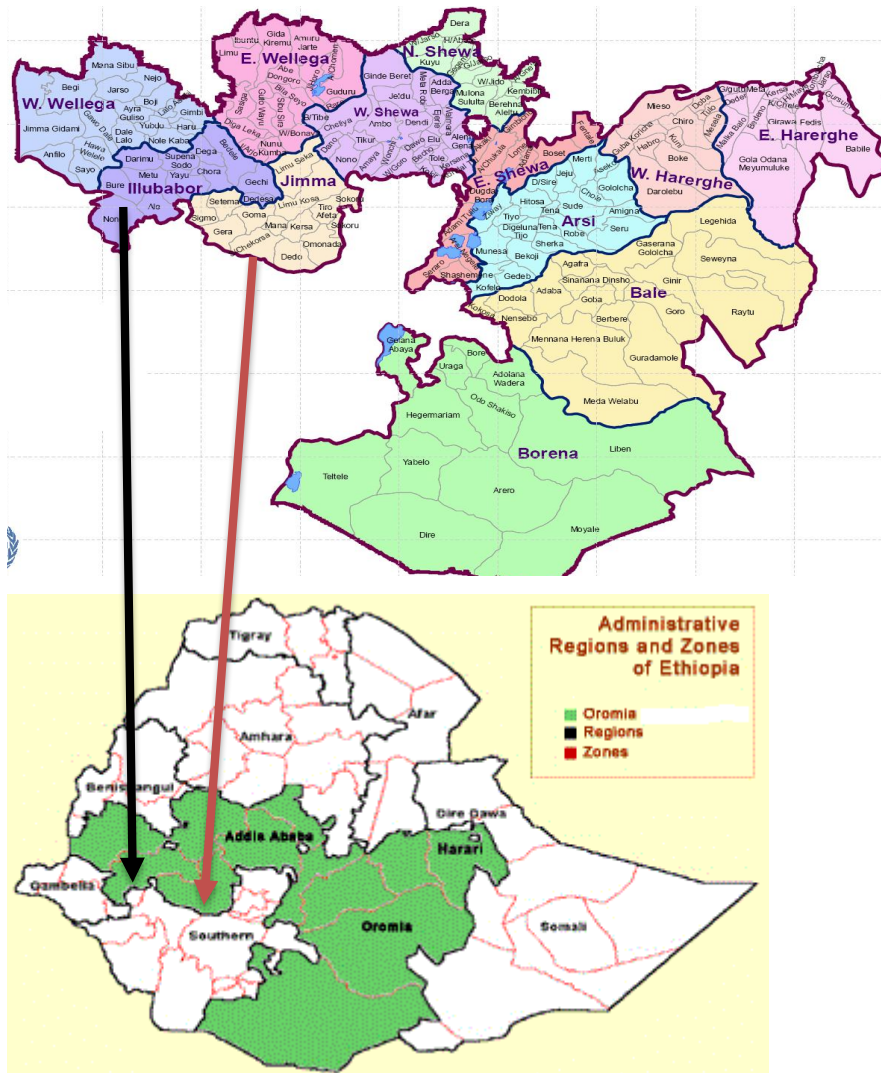
In various parts of the world, native societies classify natural resources (soils, climate, plant and animal species) and identify their diverse characteristics. Besides, indigenous people have codes for folk medicinal plants

and insects that have not yet been identified by the world's botanists and entomologists. Globally, some figures show that indigenous peoples use about 3000 variety of plant species for fertility (UNESCO, 2010). Even these days, scientists begin to believe that indigenous knowledge may help them to cure diseases where science failed to find curing drugs including AIDS and cancer (Ibid). Several the so called developed countries begun to realize the role of indigenous medicine in curing various diseases easily at local level. These medicines are locally available, culturally acceptable, and cheaper than scientific drugs. Local communities in developing countries use various medicinal plants, for example, to treat spiritual and physical diseases (Cheikhyoussef, Mapaure and Shapi, 2011). Thus, indigenous people are serving as the guardians of the various original precious indigenous wisdoms.

## **2. DESCRIPTION OF THE STUDY AREA: AN OVERVIEW ON THE MACCAA OROMO**

According to Hassen (1990), the Oromo are the biggest ethnic group in the Horn of Africa. They live in a land that extends from north eastern Ethiopia to east central Kenya and in eastern Sudan and in eastern Somalia (Lewis, 1984). The Oromo speak a common language called "*Affan Oromo*". This language is categorized as eastern Cushitic family (Lamberti, 1987). Lewis (1984), states that as there is no agreement among scholars about the population of the Oromo, but a consensus seems to reveal that within the present day Ethiopia alone the Oromo account either the majority or a good half of the total population.

Map 1. Geographical map of the study area



The Oromo, according to Gemechu (2002), referring Gemechis (1993), noted that the Oromos are divided into five yayyabaa (major groups). These are: the Tulamaa and the Macca, the Sabboo and the Goonaa, the Rayyaa and the Aseboo, the Siikkoo and the Mando and the Ituu and the Humbannaa. The Macca are a subgroup of the Oromo people in western Oromia. They live south of the Blue Nile (Laga Abbayyaa) in the north western part of the region of Oromia, and in parts of the former provinces of Wollega, Illubabor, Kaffa and

Shewa. A small group of them lives in the area north of the Blue Nile Wambara in the Benishangul-Gumuz Region. The area of Macca is a high plateau with undulating hills and some of the higher mountain ranges.

The Tulama and the Macca were lived under common *Gada* centre. The head quarter of their common government was located at Oda Nabe in Fatagar (Ibid). The Maccaa originally had a common Gadaa system with Tulama whose centre (*Chaffe*) was south of present-day Addis Ababa. But, according to Ta'a (1980), Gemechu (2002) and Hassen (1990), in the late 16th Century, Maccaa established their own *Gadaa* with *chaffee* in Odaa Bili around Tute Bisil upper Gibe Valley. A man named Makkoo Bili called there, the independent *Gadaa* of Macca. In their knowledge, and Macca Tulama make mutually responsible for this break. Macca Oromo in general and the Oromo of Iluu Abbaa Bora and Jimma in particular are known for protecting their environment and preserving a wide range of forest reserve in Ethiopia known internationally such as "Yayu Biosphere forest reserve" registered by UNESCO. This biosphere reserve is mainly known for its coffee forest.

Based on the report from CSA (2007), Jimma Zone with 15,568.58 km<sup>2</sup> has an estimated total population of 2,486,155. Jimma zone with the capital city of Jimma town consist of 16 *Weredas* (districts) namely: Limu Seka Wereda, Limu Kosa Wereda, Sekoru Wereda, Tiro Afeta Wereda, Kersa Wereda, Mana Wereda, Gomma Wereda, Gera Wereda, Seka Chekora Werea, Dedo Wereda, Omonada wereda, Sigamo wereda, Setema Wereda, Shebe Senbo Wereda, Chora Botor Wereda, and Guma Wereda (Knoema, 2013). This zone is well known for its Arabica Coffee that shares 23.2% of Oromia Regional State's total coffee production and 11.8% of Ethiopia's total coffee output (CSA, 2005). Though Jimma zone is geographical in Oromia regional state, the people in that are not merely Oromo. Together with the Oromo there various ethnic groups living in

the region such as Guraghes, Amhara, Tigrians, Kaffa, Yem, Dawro etc. In fact, 87.6% of the population of Jimma zone are Oromo followed by Amhara (4.05%) and Yem (3.12%), and the remaining 5.23% of the population is constituted by other minor ethnic groups come from various parts of the country such as the Tigrians (CSA, 2007). In terms of religious composition, there are a number of faiths there such as Christianity, Islam, *Waqaa* (traditional Oromo religion). *Affan Oromo* is the dominant language spoken by almost 90.43% of the population in the Zone as first language, and Amharic, Tigrigna, Guraghigna, Dawroigna, Kafficho, Yemigna are some of the other languages spoken in the zone (Ibid). Economically, residents of Jimma Zone are predominantly agrarians. Trade is next to agriculture where people based their livelihood.

Illu Abbaa Bora zone (formerly known as Illubabore Zone) is also one of the places where Macca Oromo resides for centuries. This zone has estimated total population of 1,271,609 (Ibid). Bedelle town is the capital of the zone, and It consists of 22 *Weredas*: Darimu Wereda, Aleje Sachi Wereda, Chora Wereda, Dega Wereda, Dabo Wereda, Gechi Wereda, Borecha Wereda, Dedesa Wereda, Yayu wereda, Metu Zuriya Wereda, Ale Wereda, Bure Wereda, Nono Sele Wereda, Bich Wereda, Bilo Nopha Wereda, Hurumu Wereda, Didu Wereda, Mako Wereda, Halu Wereda, Bedele Zuriya Wereda, Chewaka Wereda, and Dorenti Wereda (Ibid). According to the report from Oromia National Regional State Office of the President, the population of Illu Abba Bore zone depend their livelihood on agriculture (Accessed from: <http://www.romiapo.gov.et/index.php/en/2014-05-31-12-06-32/2015-05-07-11-26-26>, on April 24, 2017).

### **3. OBJECTIVES OF THE STUDY**

The paper aims to meet the following objectives:

- a. To explore indigenous Medicinal practices of Maccaa Oromo of Jimma and Illu Abbaa Bora Zones, south west Ethiopia;
- b. To describe the role of folk healing practices in protecting the natural environment; and,
- c. To identify challenges and opportunities of folk healing practices in reference to protecting the natural environment in the study area.

### **4. RESEARCH METHODOLOGY**

This descriptive study explores and explains the indigenous folk healing practices by the Maccaa Oromo of Jimma and Illu Abba bora Zones, Ethiopia. Besides, it discusses these medicinal practices in relation to the role they play to protect natural environment in the study area. To this end, secondary data from various sources such as articles, books, reports and other relevant literatures are utilized. Besides, primary data were collected with the help of Interview with 4 key informants and 2 FGDs with 17 participants of different social groups (please find a table consists of the list FGD participants attached on the last page of this paper) such as *Abbaa Gadaa* leaders, folk healers and Jarsa biyyaa local elders of the community, and the data have been analysed qualitatively. In addition, non-participant field observation was conducted by the researchers to observe the folk healing practices in reference to environmental protection in the study area.

The sampling technique employed to choose participants for FGD and Interview was judgmental or purposive. Because, folk healing knowledge and practices are well known by elders and very few people. The researchers choose the Oromo communities for the fact that these people are mostly known for

their practice of protecting forests and the area where these people live is the place where the only Biosphere forest reserve known as “Yayu Biosphere forest reserve.”

## **5. RESULT AND DISCUSSION**

The practice of indigenous knowledge has been used as an alternative way of protecting natural environment among the Maccaa Oromo. The scope of their indigenous knowledge comprises attitude towards the universe and natural resources around. They practice this knowledge system in the way of promoting and preserving ecosystem. Specially, their knowledge regarding to their folk healing practices to protect the health of their livestock and families. They have wisdom on identification and classification of medicine and its capitals, mode of preparation, mechanism of dose controls and spiritual and philosophical aspects of folk medicine (Interview with Hailu Legese, April, 2016, Mettu district, Ethiopia). Folk healers and local elders have knowledge on how to protecting folk medicinal plants and other sources of remedies from further wiping out and extinction. According to data generated from focus group discussion held at Mattu district shows that folk medicinal practice has the great role in keeping natural environment. This includes different conservation measures to cultivating and duplicating folk medicinal animals, plants and other mineral based medicines. The knowledge of community members in general and folk healers in particular is logical and fruitful on conservation of folk medicine in their natural environment. These days, folk medicine and folk medicinal plants have to be protected in natural habits based on their nature. In addition, there is indigenous mechanism to protect the capitals of folk medicine from further damage by planting and growing in their *Boro* garden in secret. In this sense, local community have original knowledge on protecting folk medicine in their

farm land, pilgrimage (ritual sites), scared grooves, around river and home garden (Interview with Haji Mohmed, April, 2016, Gomma District, Ethiopia).

Furthermore, indigenous Beliefs system on folk Medicine shared and exploited grounded on their world view. Culturally, cutting trees and killing animals intentionally will be seen as broken norms and values of the society. This act is just equal to undermining *seerauumaa* the law of God according to their knowledge. The Macca Oromo have very close relation with the natural environment and wild resources throughout. Even treat plants and animals as their *finna* (literally kids) and care for their sustainability (Interview with Abdella Kasim, March 7, 2016, Mettu district, Ethiopia).

Regarding to threats of indigenous knowledge on medicinal capitals (plants, animals and mineral) folk herbal practitioners are important custodians of indigenous knowledge on the utilization of medicine. Moreover, as a result of their life experience, folk healers are skilled, and have a great talent for locating the correct plant among the many plants species found around. However, many are less cooperative to show their knowledge and skill on traditional medicine to others. As Pankhurst (1990), asserted the knowledge and way how to utilize medicinal plants is inheritable among practitioners and the beneficiaries. Because of the impact of modern education, increase in health coverage and urbanization, indigenous knowledge and usage of medicinal plants are being lost globally at a fast rate (WHO, 2002).

*Figure 1: Protected forest areas in Jimma and Illu Ababa Bora Zones, South*

**Protected forest in  
Gibe River, Jimma**

*Ethiopia*



**Yayu Biosphere forest reserve in Illu Abba Bore Zone**



About 75-90 % of the rural population in the world (excluding western countries) relies on traditional medicines as their only healthcare system (Fassil,

2001). This underlines the significance of indigenous knowledge of folk medicine life and the special connection between folk medication and natural environments. Up to date traditional medicine has become an integral part of the culture of the Ethiopian people due to its long period of practice and existence (Mirgisa, 1998). According to folk healers, and local elders all-embracing indigenous knowledge on folk medicine is retained and transferred orally to a designated community members. For some people, practicing folk medicine is by itself have negative implication on natural environment (Interview with Obbo Abbaa Maccaa Abbaa Bulgu, 2016, Mettu district, Ethiopia). But, the reality is the opposite. Because, the local people and folk healers in particular have indigenous knowledge on environmental protection. If they need medicinal plant or animal to cure a series disease, they would never use in unethical way. In a FGD conducted in Illu Abbaa Bora, the discussants said the following to show the how and why they protect the natural environment and its inhabitants:-

*“Akkatasaillee yoo bineessa ilmoo qabdu ajeesan ilmoo ishee niguddisu. Bineesaa dulloomee fi sanyii bayyee qabu ofeggannoon fayyadamu. Sanyii biqiltuuyoota; esisaolguddatu lakkoofsan murasa ta’an hinmuran yookin hinkutan;lubbuu oolchuuf lubbuu hinballeessan.”*

*“Fortunately, if Macccaa community kill a mother of young wild animal(s), the killer or other members of the community are obliged to raise the young wild animal at their home. Besides, they used to kill the older animal among ta members of a large group of wild animal. And, they wisely use medicinal plants in a sustainable way-they don’t cut and use newly growing plants for medical purposes”* (translated version of the above Affan Oromo quote).

This quote show that the way in which Maccaa Oromo of Ethiopia protect and care for natural environment and wild life in it. However currently

most of the traditional healers reported that Modernization had effect on the transfer of the indigenous knowledge to the next generation.

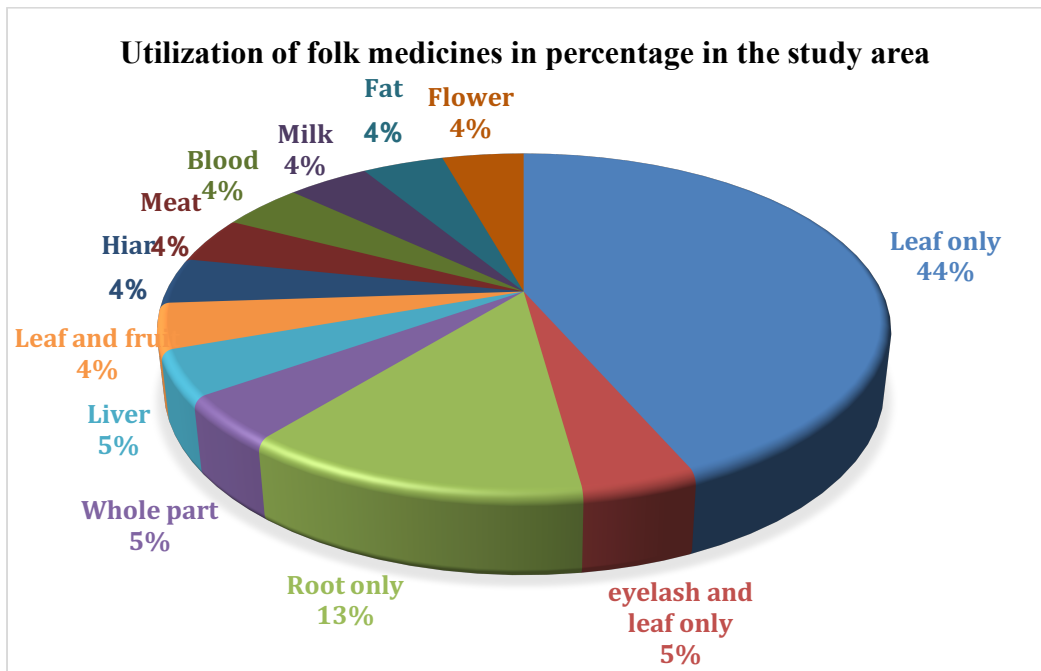
*Table 1: Table Illustrating indigenous Medicinal Plants and animals, scientific name, Mode of Preparation along with part used for treatments among the Maccaa Oromo*

Local name of Medicinal Plants & animals	Scientific Name	Parts used	Mode of Preparation	Diseases Treated	Type
Bakkanniisa	Englerina Woodfordioides	Leaf	Boiling	Malaria	Wild
Banjii	Stereospermumkunthian um	Root	Burning &fumigatin g	Mouth gum & toothache	Uninhabite d
Beeroo	Unknown	Leaf	Boiling and mixing	Ear ache	Wild
Ceekaa and Atara	Calpurnia aurea Crotalaria pallida	Root	Crushing and	Amoeba & combat human tapeworm	Wild & Domestic
Dhummuuga, a	Justicia	Leaf	Grinding & mixing	Dogs with rabies	Both wild and domestic
Eebicha	Vernoniaamygdalina	Leaf	Cooking & drinking	Malaria	Wild
Gurrahantuut aa	Unknown	Flowe r	Crushing & mixing	Uterine infection	Wild
Haqalaa	Calpurnia aurea	Root	Crushing &	Stomach	Wild plant

			mixing with milk	ache	
Harree	<i>Equusafricanusasinus</i>	Milk	Dousing	To ward off asma and breathing problem	Domestic animal
Illeettii	<i>Oryctolaguscuniculus</i>	Hair	Tying on wounded body	To cure series wound especially burn	Wild animal
Laaftoo/Garbi i	<i>Acacia abyssinica</i>	Leaf	Grinding and mixing	Wounded body	Wild
Maxxannee	Unknown	Fruit & leaf	Chewing	Stomach ache	Wild
Mukafoonii	Unknown	Leaf	Crushing	Stop vomiting	Wild
Reejjiadii	<i>Vernoniaauriculifera</i>	Leaf	Massage on palm	Tetanus	Wild
Roobii	<i>Hippopotamus amphibius</i>	Fat	Drenching and sometimes tie on	Prevention of skin infection	Wild animal
Sanaamakii	Unknown	Leaf	Ashing and spray	Snake bite	Wild
Saree	<i>Canis lupus familiaris</i>	Liver	Drenching	Treatment of rabies sickness	Domestic animal
Simbirahalkan ii	Chiroptera	Whole parts	Dousing	To prevent bat disease	Wild animal

Tamboodii	Unknown	Leaf	Squeezing and concoction	Internal problem (livestock)	Both
Walensu	Unknown	Leaf	Crushing	Skin irritation	Domestic
Waraabessa	Crocutacrocuta	Eyelash and coat	Drenching	To ward off evil spirits and witches	Wild animal
Weennii	Kikuyu Colobus	Hair	Drenching	Preparations to diseases of back animals	Wild animal

The above table shows that Macca Oromo used various natural resource for medicinal purposes to cure from illnesses. They use leaf, root, fruits and flowers of plants, liver, hair, milk, meat, fat and blood of animals and so on. This indicates as there is a close link between the life of the Maccaa Oromo and their natural environment. Besides, these people can get these medicines so long as they protect their environment. Protecting the environment means, getting the resources you want to have. Based on the above table, the following pie chart shows Utilization of folk medicines in percentage in the study area.



As you can see from the above pie chart, leaf and root of plants are mostly used for medicinal purposes in the study area. Besides, the figure 44% of the medicines are from leaf only shows that the Maccaa Oromo have a closer link to the natural environment in relation to forest in particular. Any leaf would not serve medicinal purposes. Medicinal leafs are peculiar, and grow in a protected area. The above chart also shows the life of the Macca Oromo is linked with animals as well.

## 6. CONCLUSION AND RECOMMENDATIONS

IK system though many people especially from the west thought as traditional, useless, out fashioned, and associated with poor low and middle income countries, in reality and undeniably have been used to cure various illnesses in the developing world. These can of practice is proved and inherited from generation to generations for centuries. IK developed as a result of human interaction with their natural environment. Indigenous medicines have the

ability to cure diseases which beyond science such as *Bird* (disease caused by cold weather), *Mich* (caused from an exposure to sunlight while eating fatty/oily foods), *Kifu menfaists* (psychological disease caused by Satan), *Ayne tila* (caused from fear to see crowd of people) etc. Since the source of these medicines is the natural environment, for the sake of getting an accesses to these medicines many native community protect wisely their environment, able to keep their forest area well preserved up to date. The same is true with Macccaa Oromo. On the one hand they protect their environment, on the other hand they protect their environment. This shows there is a closer link between utilizing traditional medicines and environmental protection. But, these practices are facing a clear threat on non-existence as a result of science, deforestation and the recent expansion of Christianity and Islam in these Zones of Jimma and Illu Abba Bora. Thus, based on research findings, the researchers recommend the following points:

✓ It is highly advisable that policy makers need to incorporate the good practices of Maccaa Oromo in their environmental policies and strategies as a role model to the whole world how they protect their environment sustainably for centuries.

✓ Developing agents, scholars, Medias, and related cultural experts should promote and work with local elders hand in hand to ensure the sustainability of IK among the young generation.

✓ Anthropologists, environmental activists, philosophers, Folklorist and cultural experts should also focus on identifying, recording medicinal plants and promoting their utilization and cultivation in collaboration with the local administrators and folk healers.

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## **Conflicts of interest**

The authors have not declared any conflict of interests.

## **REFERENCES**

Battiste M. (2002). Indigenous knowledge and pedagogy in first nations education: A literature review with recommendations Indian and Northern Affairs Canada, Ottawa.

Briggs, J. (2005). The use of indigenous knowledge in development: problems and challenges. *Progress in Development Studies* 5(2):99-114.

Cheikhyoussef, A, Mapaure, I and Shapi, M. (2011). The use of some Indigenous Plants for Medicinal and other Purposes by Local Communities in Namibia with Emphasis on Oshikoto Region: A Review. *Research Journal of Medicinal Plants*, 5: 406-419.

CSA (2007), population census Report, (also available on the following link:

[http://webcache.googleusercontent.com/search?q=cache:4s8UwBYAmlIJ:www.hopr.gov.et/c/document\\_library/get\\_file%3Fp\\_1\\_id%3D11631%26folderId%3D12186%26name%3DDDLFE-114.pdf+%&cd=5&hl=en&ct=clnk&gl=et](http://webcache.googleusercontent.com/search?q=cache:4s8UwBYAmlIJ:www.hopr.gov.et/c/document_library/get_file%3Fp_1_id%3D11631%26folderId%3D12186%26name%3DDDLFE-114.pdf+%&cd=5&hl=en&ct=clnk&gl=et),

Retrieved on 10/26/2016; 10:26 AM).

CSA (2005). Report on Agricultural Sector. (Also available on the following link: [http://www.csa.gov.et/text\\_files/2005\\_national\\_statistics.htm](http://www.csa.gov.et/text_files/2005_national_statistics.htm), retrieved at 24/4/2017).

Fassil, K. (2001). The status and availability of oral and written knowledge on traditional healthcare in Ethiopia. In: Medhin Zewdu and Abebe Demissie (eds.). Conservation and Sustainable Use of Medicinal plants in Ethiopia. Proceeding of the National workshop on Biodiversity Conservation and Sustainable use of medicinal plants in Ethiopia, 28 April-01 May 1998, IBCR, Addis Ababa. Pp. 107-119.

Fesseha, M. G. (2017a). Building on Sand! Can Environmentally Unfriendly (Economic) Development Sustain? Global Journal of Human-social Science-B: Geography, Geo-Sciences, Environmental Science & Disaster Management. Volume 17 Issue 1: 1-4.

Fesseha, M. G. (2017b). Neo-liberalists 'Straw man' diversion on Overconsumption-Does the real threat is Overpopulation or Overconsumption? International Research Journal of Social Sciences, Volume 6(3): 27-31.

Gemechu, D. (2002). Some Aspects of Conflict and Conflict Resolution among Waliso Oromo of Eastern Macha, With Particular Emphasis on the Guma. (Unpublished MA Thesis), Addis Ababa University, Ethiopia.

Gunn, A. S. (2007). Environmental ethics in a New Zealand context. NZ Journal of Forestry: 7-12.

Hassen, M. (1990). The Oromo of Ethiopia: A History 1570 - 1860. New York: 142 Cambridge University Press. URL: <http://hdl.handle.net/2027/heb.02601.0001.001>

Lanzano, C. (2013). What kind of knowledge is 'indigenous knowledge'? Critical insights from a case study in Burkina Faso. Transcience, Vol. 4, Issue 2.

Lamberti, M. (1987). Cushitic and its classification. *Anthropos* 86, 552-561.

Lewis, (1984). "Values and Procedures in Conflict Resolution among Shoa Oromo". In *Proceedings of the 8th International Conference of Ethiopian Studies*, Addis Ababa (1984). Pp 91-100 Addis Ababa: Addis Ababa University.

Nelson, M. P and Ryan, L.A. (2015). *Environmental Ethics*. (Available online at: <https://www.researchgate.net/publication/283349553> , accessed on 18/04/2017).

Materer and et al (2002). *Indigenous Knowledge System: Characteristics and importance to climate uncertainty*. Department of Agricultural Economics, University of Missouri, Working Paper No. AWEP 2001-03.

Mirgissa, K. (1998). Utilization of plant medicine for the treatment of health problems. The case of Oromo of Chora Wered Illubabor Zone, Western Ethiopia. *The Ethiopian Journal of Health Development*, 10(3): 161-166.

Pankhurst, R. (1990). *An introduction to medicinal history of Ethiopia*. The Red Sea Press, Inc. New Jersey. Pp. 250-261.

Rolston, H. (2007). "Living on Earth: Dialogue and Dialectic with My Critics." In *Nature, Value, Duty: Life on Earth with Holmes Rolston III* (eds.). Christopher J. Preston and Wayne Ouderkirk, 237–68. Dordrecht: Springer.

Roue, M. and Nakashima D. (2002). *Indigenous Knowledge, Peoples and Sustainable Practice. Social and economic dimensions of global environmental change*, Volume 5 (1), pp 314–324.

Ta'a, T. (1980). "The Oromo of Wollega: A Historical Survey to 1910". (Unpublished M.A Thesis), Addis Ababa University, Ethiopia.

WHO (2002): *World Health Organization. Traditional Medicines Strategy 2002-2005*. Geneva.

UNESCO (2010). Natural Remedies and Medicines. (Available online at: [http://www.unesco.org/education/tlsf/mods/theme\\_c/popups/mod11t03s02.html](http://www.unesco.org/education/tlsf/mods/theme_c/popups/mod11t03s02.html)), Retrieved on 23/04/2017).

Knoema (2013). Population and Households of Ethiopia, 2007. (Retrieved from: <https://knoema.com/EHPH2007/population-and-households-of-ethiopia-2007?region=1002830-bure-wereda-ilu-aba-bora-zone> on 24/04/2017).

## APPENDIX 1: MACCA ELDERS WHO PARTICIPATE IN FGDS

S. No.	Name	Sex	Age	Date	Place of FGDS
1	Mohammed weggarii	M	56	May,11/2016	Gabaa Guddaa
2	Sh/Nasir Muhammed	M	54	May,12/2016	Mattuu town
3	Kedir Beyena	M	76	May,10/2016	Gabaa Guddaa
4	Abdu Kedir	M	46	Augist, 9/2016	Gabaa Guddaa
5	Getaecho Gelata	M	51	Augist,8/2016	Gabaa Guddaa
6	Gishu Kamal	F	52	Augist,7/2016	Mattuu town
7	Hajii Ibrahim	M	67	Augist,7/2016	Mattuu town
8	Dadhii Sagni	M	53	Augist,7/2016	Mattuu town
9	Waqjira Amenu	M	54	Augist,7/2016	Gabaa Guddaa
10	Fatuma Jemal	F	53	Augist,9/2016	Gabaa Guddaa
11	Biru Jarra	M	74	Augist, 9/2016	Mattuu town
12	Wami Dinqa	M	61	Augist, 9/2016	Gabaa Guddaa
13	Abdela Kasim	M	47	Augist,7/2016	Mattuu town
14	Hirpha Gurmu	M	67	May,10/2016	Gabaa Guddaa
15	Ismael Kedir	M	45	Augist,7/2016	Mattuu town
16	Guta Jarra	M	43	Augist,7/2016	Gabaa Guddaa
17	Hawwaa Bulti	F	37	Augist,7/2016	Mattuu town