

Oromo indigenous forest knowledge and Environmental sustainability among East Wollega Zone Oromo society; western Ethiopia

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ABSTRACT: Indigenous knowledge plays a significant role in conserving the environment and natural resources. The aim of this study to explore the role of Oromo indigenous knowledge for forest and environmental sustainability that is inscribed in the traditional Oromo worldviews, values, norms, Safuu/moral, and its challenges with particular reference to East Wollega zone of Oromia regional state. Many researchers have argued that sustainable natural resource management includes forest resources that cannot be realized without considering the indigenous knowledge, perceptions, and culture of local people living in or near the forest. This study, therefore, endeavors to contribute to the significance of Oromo indigenous knowledge for forest conservation and environmental sustainability and its challenges. Descriptive research design and Qualitative research approach were employed. The sample size for this study was 42 purposively selected respondents from Abba Gadaa, local knowledgeable elders, culture and tourism experts, environment and natural resources protection agency, and from secondary data sources. The result of this study revealed that Oromo people have developed detailed interactive knowledge of ecology and human-environmental relationship, properties, and peculiarities. Then, the role of Oromo indigenous knowledge, belief system, values, norms, customs, and worldview play a great role in environmental sustainability, management, and forest conservation in their course of life. Appreciating these immense values and threats from changing the environment, the natives indicated approval for the integration of indigenous knowledge with modern forest management practices. The study, therefore, contends that for the continued sustainability of forest biodiversity, conservation strategies need to recognize local knowledge in both content and practice. The study concludes that governments, policymakers, and environmentalists need to give important remedies to employed indigenous knowledge and local people's strategies for environmental sustainability.

KEY WORDS: Indigenous knowledge, Natural resources, conservation, Forest

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I. INTRODUCTION

Indigenous knowledge (IK) is a cumulative, dynamic, long-term, holistic, local, embedded, moral and spiritual (Menziess and Butler, 2006). Indigenous knowledge (IK) is used at the local level by communities as the basis for decisions pertaining to food security, human and animal health, education, natural resources management, and other vital activities. It refers to “a cumulative body of knowledge, practice and belief evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment” (Berkes, 2012, p7). The term “traditional”, often used to qualify indigenous knowledge, should not be understood as meaning “static”, “ancient” or “outdated”. It rather implies that each generation modifies the accumulated body of knowledge, practices and beliefs according to its own experiences, in a dynamic and adaptive fashion. Indigenous forest knowledge is cumulative as it is the sum of empirical observations acquired through trial-and-error by passing generations. This is somewhat similar to scientific knowledge, also based on empirical evidence. Indigenous forest knowledge is thus constantly being updated by modifying, adding, or deleting information to take into account the evolving context and the apparition of innovations. Indigenous forest knowledge is holistic, meaning that it considers all elements of the environment (including humans) to be interconnected and influencing each other.

People value forest biodiversity in different ways: spiritually, economically, aesthetically, culturally, and scientifically. Its values also differ on international, national, and local levels. The conservation of forest and biodiversity is important and directly relevant to local residents, for whom biological resources often represent their primary sources of livelihood, medicines and spiritual values. The devolution of natural forest

management to local communities has become more widespread due to a growing recognition that local communities are likely to manage forest resources better than the state.

Natural ecosystems including forest resources cannot be understood, conserved, and managed without recognizing the human cultures that shape them since biological and cultural diversities are mutually reinforcing and interdependent. Where indigenous knowledge systems are maintained through customary ways of life, the natural environment is more protected confirming its sustainability for posterity (Byres et al., 2001, Lemessa, 2011; 2012). In many countries, indigenous identities, cultures and practices are tightly linked to traditional lands. This intimate connection between cultures and ecosystems is reflected in the vast body of indigenous forest knowledge.

Despite the cogent power of globalist knowledge systems, recent developmental efforts prove that indigenous knowledge systems are more widely perceived and recognized as genuine and environmentally friendly. Nevertheless, it is often argued that the twentieth century's global discourse of development was dismissive of local knowledge, including knowledge of the environment. Dove and Carpenter, (2008) argue that just as the development of the concept of indignity was a reaction to modernity's delocalizing impacts, so was the rise in interest in indigenous knowledge in part a response to modernity's [ominous] vision of and consequences for local communities.

Africans had conservationist values, practices, and ways of life. African views and thoughts on ontology, cosmology, medicine and healing, and religious practices supported their moral attitudes toward the conservation and preservation of nature. Traditional African thought sees nature as holistic and as an interconnected continuum of humans and all-natural objects which exist in harmony. People's actions and ways of life reflected the efforts to exist in harmony with nature. These efforts led to the preservation of nature. Many of these traditional African values, ways of life, and the moral attitudes of conservation were destroyed by the exploitative ethos of European colonialism and modernity (Burnett, 1994: 149).

Forest resources are home to many animal and plant species. A large percentage of the population of the world has a direct relationship with the forest and green environment. Specifically, in developing countries, there are communities that live within or adjacent to forest areas and make their livelihood out of this resource (Ayele, 2000). The major problems facing many developing countries in the world today are environmental degradation and their consequential results. However, according to FAO (2012), Africa continues on its fast track of deforestation with no signs of a slowing down. Ethiopia is one of the Sub-Saharan African countries known for its fast population growth, accelerated environmental degradation and structural food insecurity (Tesfaye, 2003).

In Ethiopia, the diverse forest resources available provide goods and services of significant values to the society, environment and economy. Ethiopian economy is largely based on subsistence agriculture, which is almost entirely rain-fed. Among the rural population, 87% of the household receive their income from agriculture (World Bank, 2006). The agricultural sector accounts for 40% of national GDP, 90% exports, 85% of employment and 90% of the poor (World Bank, 2007). From Ethiopia population Oromo people is more than 40% and the big ethnic group in east Africa. They develop gada system which governs all the socio-economic, political, cultural religious, human-natural environmental relationships and etc. In traditional ways of conserving and protecting forest resources, for thousands of years Oromo society has used accumulated indigenous knowledge of their natural resources and environments to sustain for them and to maintain their cultural identity. Also, the Oromo people ascribe important Value to the natural environment (Knutson, 1967. Kassam and Gemechu, (1994) argue that the Oromo have some of the finest principles and codes of behavior towards nature. They stress that the Oromo maintains a perfect balance between nature and culture.

For the Oromo and other people in developing countries, forests have been a major source of food, honey, material, medicine, ritual & cultural objects, aesthetic, and dyes. Oromo peoples recognize their cultural relations to nature and are conscious of the power that regulates them to nature. According to Debelo, (2012) their wisdom of interaction between human and non-human nature is guided by their indigenous knowledge.

Ethiopia's forest resources have been disappearing at an alarming rate. A century ago (nineteenth century) forests covered about 40 percent of the total land area. This forest resources coverage has been reduced to 16 percent in the early 1950s and to less than 3 percent today (MNRDEP, 1992). Ethiopia loses about 141,000 hectares of natural forest each year due to firewood collection, conversion to farmland, overgrazing and uses of forest wood for building material (FAO, 1998). Oromia regional state shares this forest degradation proportionally. The Oromo peoples settlement area where known by its environmental greenness and forest coverage in their history. They see tree/s as their soon/children and big tree/s as their respected elder/s of their community. For Oromo people, forest resources have been a major source of socio-cultural and ecological values, medicine, ritual objects, aesthetics, furniture, and dyes. However, in recent time the indigenous knowledge as a general and Oromo indigenous forest knowledge was under dangerous threats and undermined by new generations with excluded from the current development arena.

Despite Oromo people are develop holistic indigenous knowledge which embedded in their different customary institutions and the owner of Gada system which rule and govern all economic, political and social issues including the relationship between the environment, natural resources /forest/, forest resources are disappearing as a general and in the study area in particular. The local community was losing its indigenous knowledge and best practices that hold all the protection issues of the environment and its sustainability as general and forest resources in particular. Therefore, today we are faced with harsh impacts of climate change with seasons shifting, temperatures rising and sea levels rising at alarming rates.

Local peoples have been losing their accumulated indigenous knowledge that contributes to minimize environmental degradation and save their green environment for the future generation. As we move towards a new development agenda, the general Indigenous knowledge and forest knowledge must not be left behind. Some studies were done on Oromo indigenous knowledge, forest and environment like (Workneh, 2005; Lammessa, 2012; Kitessa, 2007) have studied the role of Oromo indigenous knowledge in environmental conservation. In line with, Lammessa (2012), stated the role of belief system in guarding the natural forest. However, none of these studies were focused on Oromo indigenous forest knowledge, environmental sustainability among east Wollega zone Oromo society and its current challenges. In addition, the works of (Kassam, and Gemechu 1994; Kitessa, 2007; Bartels, 1990; De salvia, 1901 and Aneesa, 2002) touched about Oromo forest knowledge and environmental Philosophy directly or indirectly. So the study focuses on Oromo indigenous forest knowledge, their interaction and cultural values on the protection and the sustainability issues in Oromo indigenous knowledge.

Being rooted in traditions and still mostly transmitted orally, indigenous forest knowledge provides a long-term perspective, which can prove particularly useful in areas where written archives or instrumental data are recent, discontinuous, or unavailable. There is growing concern over the loss of indigenous knowledge and cultural erosion that proceeds at an accelerating pace. When the coming generation undermines their indigenous knowledge, they lost their indigenous environmental and forest knowledge of protection and management which is an integral part of local community livelihoods and their productivities.

II. METHODOLOGY

This study employed a qualitative research approach and descriptive research design. The target population of this study was local communities that have direct relation and interaction with the green environment and its natural resources. Therefore, primary data were collected from 42 purposively selected knowledgeable elders, *Abba Gada*, forest and wildlife experts, environment and natural resources protection experts, environmental protection experts and development agents (DA's). Secondary data collected from different written documents. In this study, Oromo indigenous knowledge, customary institutions, locals' thoughts, perceptions, values, religious and philosophical attitudes towards the forest and natural resources management, conservation and protection were obtained by a combination of focus group discussions, in-depth interviews, observations and revision of written materials. All collected data were analyzed and interpreted by using triangulation cross-checking of information obtained through the interview, documentary analysis and observation was used in the study to assess the convergence of the information.

III. RESULTS

The results of this study were discussed based on data obtained from 42 purposively selected respondents, field observation and document review for the study. Accordingly, the following results were analyzed and recommendation was forwarded.

3.1 Oromo concepts of environment and environmental sustainability

For thousands of years, the Oromo have survived due to their understanding of forest importance for ecology, animal and human economic facility and systems of the management of natural resources, all of which are the products of complex processes of their tradition and worldviews Oromo peoples envision a kinship relationship between themselves and the natural world. They have developed an organic conception of nature that promotes an ecological interdependency among human, plant, and animal life. *Safuu* governs the use of natural resources. They developed judicious use and conservation of the natural resources including trees and forest of their area. Their concepts of conserving, managing natural resources, green environmental and its sustainability were fetched from their concept of *Namummaa*. The concept of *Namummaa* of Oromo people is the relational philosophy that is complex, dynamic and has values that are connected to the behavior and character of a person. It is Oromo philosophy of humanness that claims what makes a person human being, not just human, is her or his potential to grow into good and mature vertical and horizontal relationships: relationship with the community in which a person lives and with the human community as the whole, and relationship with *Waaqa/Waaqayoo Uumaa*-God the Creator and with all that is created respectively. One knowledgeable elder interviewed elaborated that:

...The traditional culture and way of life of our peoples are intertwined with the forest ecosystem and demands that they utilize the forest in a sustainable manner as a sacred obligation to bequeath a healthy forest fully capable of providing life to its human inhabitants to future generations. This has resulted in the protection of watersheds, prevention of soil erosions and provision of livelihoods for communities, thus contributing to sustainable development. This all activities and natural resources conservation and protection remedies are guided by our local indigenous knowledge which we hold for a generation. Really...really we the Oromo peoples are very sensitive and give high consideration and respect to our environment and issue of the green environment sustainability in our courses of life (Local elder with 52 years, from Nunu Kumba district, June 2020).

To support Assefa asserts that the Oromo society, like any other society, has been conscious of its cultural identity, its relation to nature, and the existence of a powerful force that regulates the connection between nature and society. The Oromo concepts of natural resources protection and resources management were manifested through the Oromo indigenous knowledge and institutions which guide by the norms, values, moral/Safuu Uumamaa/ that developed through their course of life. Therefore, for ecology conservation to succeed and its use to be sustainable, Oromo traditional management practices play an important role.

According to Gemechu, (1998), the Oromo's view of the world, the world consists of three elements: *Uumaa*, *Ayyaana* and *Safuu*. *Uumaa* has two meanings referring to *Waaqa* (the creator) and the entire physical world (the creation). *Ayyaana* refers to by which and through which *Waaqa* (God) creates everything. According to Gemechu *Ayyaana* also becomes that which it has caused to come into being. *Safuu* is a moral code of ethics by which human actions are judged as right or wrong. Hence, it is these three concepts, which constitute the basis of the Oromo's view of the world (Gemechu, 1998: 42). Workineh (2005: 6) indicates that the Oromo believe that *Waaqa* created human beings to live amicably together on the earth.

The Oromo believe *Waaqa* and *lafa* (the earth) are not separable. They say *Waaqa* is our father and *lafa* is our mother. In my view, in this saying the Oromo expresses their philosophy in that the mother earth gets everything she has from her master God to provide what her children, the „Oromo“ need from her. The Oromo also expresses the association between *Waaqa* and *lafa* when they condemn somebody to stop his/her wrongdoing by saying: *adaraa Waaqaa fi lafaa waan akkasii gochuu dhaabi!* "Please stop doing this by the name of God and the earth!"

The beliefs and the associated *Safuu* of the Oromo seem to play a significant role in the conservation of natural resources. The Oromo, for instance, perform prayer ceremonies along permanently flowing rivers, by the side of big mountains, hills and trees. This is because the Oromo believe that *Waaqa* likes the natural features that are green and distinguished by their size or other impressive qualities that have aesthetic appeal (Workineh, 2005: 8).

3.2 Moral (Safuu) and ethics of the use of tree/s and forest among the Oromo in the study area

Each community has its particular orientation or adaptation to the wider environment institutionalized in the culture of the group, particularly in its technology, which includes established knowledge of plants and animals, weather and minerals, as well as tools and techniques of extracting food, clothing, and shelter. This idea strengthens and supports the importance of the philosophical worldview of the community in the practices of natural resources management. As the community level interaction is the best social space from which to witness environmental problems, the study of how they view and define the cosmic order is an option-less option to revive and set the actual management strategy, and for the assessment of the cause of environmental problems.

The results of my data revealed that Oromo peoples are knowledgeable about plants, animals and natural phenomena of the ecosystems and their surroundings. This rich knowledge, coupled with their close relationship with their lands, has enabled them to live in harmony with nature. Indigenous institutions guide human behavior and interactions with each other as well as their environment including forest resources. For instance, in environmental pro-culture where environmental resources are highly valued, the individual members of the society do not engage in the indiscriminate destruction of the resources as the existing societal values, rules and regulations do not allow them to do so. Because the existing social institutions and values of the local community in the study area dictate that the indiscriminate destruction of natural resources including forest resources

3.3 Oromo indigenous knowledge contribution to natural resource protection

Through generations of experimentation and as custodians, peoples have developed an expansive body of knowledge for sustainable use and management of the resources around them. The role and continuity of the Oromo forest knowledge and sustainable use and management practices of natural resources are enforced through rules, beliefs and morals/Safuu, which form a part of their customary laws embedded in their customary institutions and spirituality. According to Oromo, it is only *Waaqa* who gives life and creates human beings. As

they believe the responsibility, ethics, respects, moral and Safuu of conserving and protecting the environment and natural resources in general and forest, in particular, is embedded in their indigenous knowledge, indigenous institutions and attached with their traditional religion. Oromo Indigenous forest knowledge is holistic, meaning that it considers all elements of the environment (including humans) to be interconnected and influencing each other. So the belief that if peoples respect their natural environment like the forest, mountain, river, seas, etc and when they pray their lord around tips of the mountain or on the river and around the seas their God hear their prayers and quickly give them the answer of their pray. Oromo Indigenous forest knowledge is context-dependent, not only environmentally, but also culturally. Knowledge is indeed embedded within their culture's idiosyncrasies that shape how Oromo people acquire and use their indigenous knowledge. So as local elders have been said that respecting the natural environment and natural resources show the positive relationship between Oromo peoples and their creator/Waaqa/. When interviewed the elder of the local community with 78 years old, elaborated that;

...During the use of trees for a different purpose, culturally cutting down a straightly growing young tree in the forest and along the river bank is culturally not allowed. "We consider young growing trees as our boys and daughters. If locals and children needed to cut down straightly growing young trees, local elders advise and teach how they should have to use trees and what kinds of trees they have to cut down to meet their interests. If straight growing trees are cut down, on local community meetings they had decided to curse the person who had cut the tree. Before they arrived at this final decision local elders advice again, if that person did not stop his distractive activities they decided to go to the person to punish as their local rule and regulation (Local elder with 78 years, May 2020).

Commonly, Oromo peoples take rest under the shades of trees when they are on a journey or on work during dry season and shelter under big trees to protect themselves from heavy rain during rainy seasons and winds. Oromo has the ethos of selective management of trees as, for instance, in the agricultural highlands where many trees characterize the agricultural fields of the Oromo. (Bassi (2003: 11), during my observation in Gidda Ayyana districts, what I observed could be witnessed for this idea. Oromo societies have had the tradition of conserving trees in agricultural farmlands. They believed that forests divert or weaken strong winds (cyclone) from demolishing houses or damaging crops. One Abba Gada members during my interviews elaborate that:

"...The use of Odaa (sycamore tree) as a meeting hall in Gada assembly is one of the unique examples of the use of trees or forests as shades for our people" Abba Gada members, March 2020).

In general cutting young straight growing trees and cutting big trees separately in agricultural fields for different purposes is not allowed and not the moral or Safuu of Oromo society. Concerning this, *local elder* with 62 years of age explained that:

...Our local communities have developed good moral views on the conservation of trees and forests. When we want trees for different purposes cutting down big and straight growing young trees was not allowed. Also, big trees in the farmlands were respected and seen as similar to Oromo local elders in the community. When one member of the local community cut down big and young trees local elders advise him on local meetings and if he continued cutting such like trees local elders were punished him in front of the local community. From the punishment process, the remaining member of the community can learn. Local elders, March 2020)

They use dead trees for firewood and branches for construction and other purposes rather than big and young growing trees. Abba Gada with 67 years stated that:

...When it becomes necessary to cut big or young growing trees, we will show our condolence by putting green grass on the remaining parts of the trees wishing them quick recuperation and we give care for the apex or growing parts of plants and for flowering and seed-bearing trees (Abba Gada with 67, March 2020).

Another noticeable feature in the Oromo society which this study digs out was the high presence of luxuriant big trees. Most of these trees are believed to be residents of the ancestral spirits. Observations during the study revealed that the bases of big trees with canopy for shade are used for social events and as groves for shrines. Also Data obtained from culture and tourism expert revealed that:

...Oromo society had traditional plant-based medicine. In the extraction of nature-based medicines and healing process, they are usually concerned with environmental sustainability. When they used plants for medicinal purpose, plant-root-based medicine, only parts of the roots should be cut from the plants. For some plants, only leaves should be used for medicine" this all activities are contributed in the conservation and protection of forest resources for long period of time (Culture and tourism expert, March, 2020).

This activity of the Oromo people in the study area shows that, they used plants/trees by considering the sustainability of both the tree/s and the sustainability of the green environment.

3.4 Socio-economic issue, forest and environmental sustainability

Forest is the main source of economy and livelihood for peoples in the study area. Historically Oromo believes that forest has multiple importances in their lives, without which life would not possible. The result of my data revealed that forest resources are a source of shelters, a source of food for humans and animals, a source of traditional medicine, and a source of firewood. For the Oromo, forest resources have socio-cultural and ecological values. The socio-cultural importance of forest resources is manifested in their daily shores and facilitates their socio-cultural and spiritual life, including cultural material objects and related significance. Oromo society has accumulated Indigenous knowledge that is vital in the conservation of forest resources.

Agriculture (shifting cultivation) and other associated activities like construction, implements, utensils, hunting, and food-gathering have a direct link with their forests. Their diet includes various types of vegetables, fruits, and nuts, hunted animals, and materials from the forests. The social customs, beliefs, faiths tradition, etc of the Oromo people reflect the deep imprint of the nearby forests. So as data gathered from local elders revealed that: Probably, their ancestors realize that they worship the forests as a feeder to human beings.

Resources obtainable from the forest range from plants and animals to fresh air and water. In the local community, the importance of these resources is even depicted on the artifact designs. As forest resources are vital sources of building materials, food, medicine, and cultural items, the local people make an effort to know and understand their purposes; hence the classification of these resources becomes a useful method of appreciating their purposes and uses. Moreover, the aesthetic quality of forest resources also makes conservation vital because this makes people appreciate and enjoy the forest. Application of forest knowledge is vibrant in the local community because of their daily encounters with the forest whereas it is declining due to lack of practice. Conservation of forest resources and the reasons for their conservation therefore becomes an issue of concern and should be encouraged. To support this, As Fien (2002) notes, the intimate environmental knowledge of the indigenous people had enabled them to co-exist with their environment over many generations. This co-existence was exhibited by the sustainable practices of the people in ensuring that forest resources were wisely used.

This study also revealed that local people have knowingly practiced sustainable practices for many generations. Some of these practices were intentional while others were not. Intentional sustainable practices stemmed from the conscious environmental practices of the people while unintentional practices evolved from indigenous belief systems. Sustainable practices are essential for biodiversity conservation as they encourage wise use of resources.

Although the informants identified that in a society where “modern” health service is not so much available and accessible, the role played by traditional medicine is very determinant. Since the availability of health institutions in the research area is minimal and limited to the level of health clinics and even those are far from the community at large, the reliance on traditional health system is undeniable fact. These traditional medicines are obtained from nearby forest plants. Parts of medicinal plants which are identified by both key informants and group discussants include leaf, root, stem, and fruit. They identified some of these medicinal plants together with the diseases they cure. In addition as data gained from culture and tourism expert indicated that, Oromo peoples well know all about ecological, medicinal, cultural and religious purpose of forest and they give high priorities than the socio economic advantage they gained from trees/forest resource.

..Forest is useful for humans to protect themselves from blazing sun, heavy rain and strong wind for thousands of years. Oromo have survived due to their understanding of forest importance for ecology, animal and human economic facility, medicine and systems of the management of natural resources, all of which are the products of their complex processes of tradition and worldview. They know and teach their generation how, when and which types or parts of trees/forest they cut down to use (Sibu Sire District Culture and Tourism expert, March, 2020).

Therefore, for ecology conservation to succeed and its use to be sustainable, the Oromo people’s traditional management practices have to be considered at all levels of conservation efforts. This shows how Oromo people had been allowed to use wisely forest resources. As interviewed local elder of Gidda Ayyana districts with 62 years old elaborated that:

...In addition to socio-economic and eco-system advantage of the forest and trees for Oromo, traditionally trees are used for cultural religious, and political and aesthetic functions. Then the sacred forests are for ritual worships, used primarily as places of worshipping by ancestors during times of sickness, drought and famine. Also forests used as clan reserves for building poles, hunting and gathering of wild foods and as hiding sites during war. Forests used for traditional ceremonies, initiation of youth and sites to hide secret objects for ritual practices, Forests where clan meetings are held and are protected in accordance to customary laws, not based on government legislation also it used us the place where the conflict and disputes can solve and local knowledgeable elders give decision on every aspects of the society (Interviewed Local elder of Gidda Ayyana with 62 years, March, 2020).

Also according to my own observations and experiences in Western Oromia including the study site indicate that our people leave with trees even in its compound and agricultural fields under which cattle shelter during dry season. Each group or family has its own tree/s which their cattle, sheep, goats and donkeys take a rest which called in local dialect as “*muka ciibsaa or Gaadisa loonii*”. Such tree/s reflected in the traditional songs of the Macca Oromo of Western Oromia (in the study area). The song goes as follows:

*“Yaa mukeen gaaddisa loonii murtaniiree
Yaa gurbeen yaaddessa diinaa dhuftaniiree?”*

This is roughly to mean, “Have you cut trees which are shades for cattle? You youngsters who threaten our enemy, have you come?” This traditional song shows the need to conserve or not to cut down trees, which serve as shades for cattle. Similarly, it also indicates that trees are shades/ shelters for cattle in the same way that youngsters are defenders of their people from enemy. The association of forests with rearing of cattle by the Oromo groups of different areas is, indeed, a clear witness that the Oromo deeply rely on forests resources in their course of life.

3.5 Challenges that face Oromo indigenous knowledge for forest and natural resources protection

Oromo indigenous forest knowledge is cumulative as it is the sum of empirical observations acquired through trial-and-error by passing generations through their course of life. They modify the accumulated body of knowledge, practices and beliefs according to their own experiences, in a dynamic and adaptive fashion from generation to generation. Also Oromo indigenous forest knowledge is thus constantly being updated by modifying, adding or deleting information to take into account the evolving context and the apparition of innovations in their history. However, there is growing concern over the loss of Oromo indigenous forest knowledge and cultural erosion that proceeds at an accelerating pace in recent time.

The result of this study shows that because of different challenges from different sides both forests resources and the indigenous knowledge of local community for their environmental sustainability and especially for tree/s and forest are under dangerous threats. A hundred years ago, about 40% of the landmass of Ethiopia was covered by forest. But currently, less than 3% of the land is covered by forest. The FAO estimated a decline of forest cover from 15.11 million ha in 1990 to 12.5 million ha in 2015. Proportionally Oromia National regional state share the lion share in Ethiopia forest resources coverage. Historically Oromo people occupy a green territory in their settlement during their expansions. Western parts of Oromia including the study area were known by its greenness and forest resource with its full season rain coverage. However, in recent time due to different challenges from different perspectives both Oromo indigenous knowledge and forest resources were highly eroding simultaneously. Among the major challenges that face Oromo indigenous forest and environmental knowledge were discussed below.

3.5.1 Population density and poverty

Population and environment are closely connected in a complex and dynamic manner. This relationship depends on a number of socio-economic, cultural, political and developmental aspects this obvious. Growth in population affects the environment, principally through changes in land-use and industrial activity.

The majority of rural people depend heavily on the forests for their survival and most of their economy is forest and land dependent. This means that total population of an area divided by total land area. Population density may affect natural resource management by affecting household decisions about land use, labor or capital intensity, product choice, technology adoption, off-farm employment, migration, or fertility Panayotou, 1994. It may affect natural resource management by affecting community and societal decisions relating to collective management of common property resources (Baland and Platteau, 1996).

In another way traditional institutions enforce codes to protect the forests and clearly prohibit activities which affect the natural resources such as felling trees from natural forests, commercial logging, charcoal making, timber extraction, unwise use of fire in the forest, debarking girdling, and indiscriminate under slashing. Regarding to this the interviewed local elder stated that

...We the (local community) not think about our Safuu/moral and environmental ethics when the life of our (local people) is under poverty and socio-economic hardship especially in recent time. Our local communities jump over all that our accumulated indigenous knowledge and moral/code of environment and natural uses we have for generation and we try and focus to satisfy our basic needs. It is obvious that to satisfy our basic needs and to survive from socio-economic problem, the first things or choice come to in our mind is go to the forest resources for both short and long term interests. Therefore, socio-economic challenge is one main reason to lose our indigenous knowledge in recent time (Local elder with 49 year from Jimma A. district, May, 2020).

During the study, FGD discussants explained in the study area population density was highly affecting the forest and destroy natural resources due to local community's competition on natural resources and unwise use of forest resources The result of the study revealed that population density on small scale area was one

factor for the decline of the local community attitudes and indigenous knowledge and moral/*Safuu*/ to respect the tree/s and forests and wisely use of forest resources without considering the sustainability of the resources for the next generation.

3.5.2 Widespread of Christianity and Islam

In the research area some trees direct connected with the Oromo indigenous religion /*Waaqeffanna*/. In Oromo traditional religion some scared tree/trees considered as *Abdaarii* and *Dakkii*, which are sacred and respected. Therefore, cutting of these tree/trees is strictly prohibited. These tree/trees under which different religious prayers and cultural practices are conducted during thanks giving, prays during drought, famine, disease out breaks, unexpected disasters. In ecology conservation the roles of such sacred trees are noticeable. Thus by protecting tree in particular and forest in general the Oromo protects their environment from degradation and they contribute for the sustainability of green environment. Also they manage or control different ethnic based or individual's conflicts. They bless their generation and curse the wrong doer under respected trees in the communities.

However, by the wide spread of both Islam and Christianity in the study area in last for more than 15 decades, Oromo people accept those religions both by forcefully and peacefully. Forcefully they obtained Orthodox Christianity by the pressure of northern colonial parties. Northern ruling class was attached their religion or state church/Orthodox Church, culture and language to damage the Oromo original religion which connected to the wide range of the Oromo long lasting ways of life. This system and process takes more than one century to change the dynamic Oromo ways of life and paralyzed the Oromo indigenous knowledge and its customary institutions. Usually, Oromo people use different ethical code in conservation and bring in their own varying conservation codes and principles. But, in changing global thinking the experts are overlooking the fact that local communities' knowledge are playing the primary role in protection of forests and that they have the practical knowledge and skills of resource management.

3.5.3 Low education of indigenous knowledge

Education of indigenous knowledge involves oral history with no form of written instruction about what knowledge is essential for survival. Nonetheless, the local people are knowledgeable about what is vital and have to be disseminated to the younger generation. The findings in this study indicated that such forms of knowledge include indigenous family knowledge, knowledge about plants and animals, and other physical components of the environment and general knowledge was necessary for the Oromo people's survival. Nearly all forms of this Oromo indigenous knowledge are disseminated through oral history by means of storytelling, folktales, arts, social work, artifacts, and modeling and rituals. Also, one thing pointed out during the study is indigenous knowledge in Ethiopia not incorporated into the educational curriculum. The major characteristic of indigenous knowledge systems is often, although erroneous, looked down upon relative to the written tradition. Therefore, there is no action taken to incorporate Oromo indigenous knowledge and its customary institutions in this country until recent times. This is one main challenge of the acceptance and transition of the general Oromo indigenous knowledge.

Also, the collected data for this study revealed that the impact of modern education increase in all coverage without any consideration or room to the role and values of local community indigenous knowledge for the conservation of the environment and natural resources was identified as one threat to indigenous Knowledge. Knowledge of the conservation of forest has variation across various age groups. Focus group discussion and interview held in the study area provided additional information i.e older age populations think more and very sensitive about the forest, other resources, and environmental sustainability than the young age group. Age is considered as a demographic factor that affects the attitude and practice of individuals towards environmental management (Torgler *et al.*, 2005). In addition to this, according to the Ethiopian Forestry Action Program, rural people are against their environment not because they have no knowledge of the environment but it is their poverty that leaves them to over-utilize the resource (MNRDEP, 1994).

3.5.4 The weakening of Gada system: The Oromo indigenous institution

The Oromo people used its customary institutions to govern its social, economic, political, spiritual, judicial affairs and environmental relationship by the principles and rules of their indigenous institutions. They also put restriction on human interactions with environment by regulating who should be involved in natural resource extraction, how, when, which type and what amount of the natural resources have to be used to meet the various human needs. Hence, human being has developed institutions that contribute to the conservation and sustainable use of natural resources including forests. Indigenous institutions and knowledge are part and parcel of the institutions. According to Negi, such social institutions exist in invariably in all cultures throughout the world and define the human behavior towards the exploitation of the natural resources. However, the role of these informal institutions in conservation of biodiversity has not been given its due emphasis (Negi, 2010).

The indigenous Gadaa system organized and ordered society around political, economic, social, cultural, and religious institutions (Baissa, 1971, 1993; Legesse, 1973). This institution has a determining role in every arena of the Oromo lives. The institution vests responsibilities on men for public services, like, wells excavation; natural resources management; herding livestock, territory defense, and political affairs. Every Oromo man at an age of 40 (Gadaa stage) can take the position of Abba Gadaa (a traditionally elected leader) with its power and authority that given by the institution. An elected leader (Abba Gadaa) and its administrative officials stay on a power only for one term-eight years and have the responsibilities of governing all socio-economic, political, judicial and ecological affairs of the societies based on the laws and principles of the customary institution. Gada system has principles by which they react to social, economic and ecological factors that satisfy their demands. However, in recent time Gada system is weak and paralyzed with all its principles of natural resources protection and management in many parts of the Oromia national regional state including the study area. One my informant elaborated that:

...The former legal forms has cultural roots that based on an indigenous knowledge, practices, principles and norms guided by the Gadaa institution and social organization of the people while the later has been dictated by the external actor, Ethiopian ruling parties. The introduced property rights laws and development policies of the Ethiopian regimes have redesigned the traditional resource management system, ownership entitlements and disputes resolution principles, norms and rules of Oromo peoples (Abba Gada member from Sibru district, May, 2020).

Another interviewed respondent explain that:

...The decline of Oromo indigenous institutions like Gadaa as consequences of the negative actions taken on it by successive Ethiopian rulers and the promotion of resettlement (specially the Amhara peoples from the north), agriculture (crop production), mining and forestry without addressing the needs and the indigenous knowledge of the society are unlikely reversible within a short period of time. Indigenous knowledge, on the other hand, has remained in the minds of the elders. If these elders pass away, there is no possibility of getting it back. Generally, the Oromo indigenous institutions were paralyzed in recent time (Local knowledgeable elder with 58 year from Nunu Kumba District, April, 2020).

Therefore, the result of the study revealed the socio-cultural and political pressure and dominance of the Abyssinian rulers for more than 15 decades were affect the Oromo customary institutions and their principles in the conservation and protections of forest and environmental sustainability. The result of this study pointed out as Oromo peoples believe as Violations of these institutions are considered as violation of the law of creator. They have much contribution to the conservation of habitats, and of biodiversity, both temporally and spatial

3.5.5. Settlement in/around the forest resources

Natural resources in general and forests in particular have immense contribution for the socioeconomic development of any society. Because human being depends on natural resources especially on forests for a number of their competing needs. The pattern of settlement of people influences the conservation of forest resources. The data gathered indicate that local communities surrounding the forest expand their land farm to prosper land in and around the forest resources. Also new settlers from different area and from different ethnic group are illegally settled in and around the forest which hold the prosperous land and other natural resources. The illegal settlement of local community for the competition of expansion of farm land and unwise use of natural resource of local community around the forest is highly distracted the forest and other natural resources.

New settlers especially from Amhara peoples were affect the forest resources. They were not respect and give priority to the conservation of trees and forest resources rather they give first priority to their needs. These negatively affect the Oromo worldviews and their indigenous forest knowledge and Safuu/moral which guide the relationship between the Oromo people and the natural resources around their settlement. Because they live together closely then they exchange and adapt one each other ways of life. So the application of indigenous knowledge of the local community to the conservation of tree/s and forest was highly decline due to such activities and illegal settlement.

IV. CONCLUSION

Oromo people have pearls of wisdom long held in their indigenous knowledge about the human, and their relation to the physical environment they occupy as general and forest resources in particular. Through generations of experimentation and as custodian, Oromo peoples have developed an expansive body of knowledge for sustainable use and management of the resources around them. The role and continuity of the Oromo forest knowledge and sustainable use and management practices of natural resources are enforced through rules, beliefs, and morals/Safuu, which form a part of their customary laws embedded in their customary institutions and spirituality. They meet their day to day needs and requirements largely depend on the forest resources. Their traditional ways of hunting, fishing, food gathering and extraction of materials for

construction of the house are sustainable and conservative. The in-built mechanism in their social and cultural tradition has made them thrifty on overexploitation and contributed towards the protection of the forests.

To do this, they were using accumulated indigenous knowledge embedded in Oromo Safuu/moral, environmental ethics, indigenous institutions, oral folk, and literature, etc. Their oral kinds of literature also embody repositories of thoughts about the non-human part of nature. They develop their wisdom and mechanism how, when, and which they use forest/trees for their daily life to fill their interest and for the sustainability of green environment in their course of life. This wisdom also reveals the societies' values and beliefs about the place of humans, and their responsibility towards the environment and natural resources including forest resources. The Oromo worldview is environmentally friendly and encourages a positive relationship with the environment. For the Oromo trees/forest resources is not only a resource for man's utilitarian. It needs care, because it has been given to them by their ancestors, and has its value given to it by Waaqaa/God/. Accordingly, the present generation is obliged to preserve it and hand it over to future generations. The Oromo, thus, believe that the natural environment and human beings are correlated. The rationale behind Oromo traditional religion has an important message for modern environmental ethicists.

The trees/ forests are believed to have been endowed with cosmic agents who are guardians of humans and nature. Thus, the one who attacks against culturally protected sacred forest is believed to provoke retaliation from the agent of the sacred places and this is said manifested in the forms of change in climate, a chain of droughts, a series of crop failures, airborne diseases, inter and intra-family and community conflict, and other natural and social affliction. Also, the results of the study revealed that due to social, economic and cultural, technological changes and cultural erosion due to widespread of western ideology, widespread of Christian and Islam religion, colonization and Northern political pressure, the decline of Oromo indigenous institutions, etc was highly affecting the role of Oromo indigenous knowledge and indigenous institutions for forest protection and environmental sustainability in recent time. The researcher believes that the knowledge obtained in this study may help in the forest conservation activities by using accumulated Oromo indigenous knowledge which embedded in Oromo

V. RECOMMENDATIONS

Based on these conclusions, this study makes the following recommendations.

I). The government through joint ministries of water mineral and energy, environment and natural resources protection agency, agricultural ministry, forests, and climatic change agency, relevant NGOs, donor community and private sector should take adequate steps to focus on mainstreaming traditional (indigenous knowledge and best practices of Oromo people with proven value/utility into contemporary environmental management systems and enhance the capacity of the community members for its adoption and application in conserving the various elements of the environment as a general and forest resources in particular.

II). The Oromo peoples environmental ethics, principles Safuu/moral code for conservation and management of natural resources in general and forest resources, in particular, were established by customary laws, hold by customary institutions and are transmitted from generation to generation through oral traditions, or through daily practice in the family and between the elders and the young people in the community. Such practices should be identified and documented in a way that they can easily be accessed by others. Because of Oromo indigenous knowledge is mainly oral and not written and partly it is people or Oromo knowledgeable elders and Abba Gada centered. Therefore, it needs research, documentation, and support and promotes its transition.

III). Effective decision-support tools are needed to foster the integration of local indigenous knowledge at all steps of the sustainable forest management process, from inventory to monitoring, through planning and management.

IV). The decline of Oromo indigenous institutions like Gadaa as consequences of the negative actions taken on it by successive Ethiopian rulers and the promotion of resettlement, agriculture (crop production), mining and forestry without addressing the needs and the indigenous knowledge of the society are unlikely reversible within a short period of time. Indigenous knowledge, on the other hand, has remained in the minds of the elders. If these elders pass away, there is no possibility of getting it back. Therefore, the researcher recommends that more detailed studies should have to conducted by a group of researchers, higher education, curriculum developers, NGOs, and other organizations in a more coordinated and organized by involving the local communities of Oromo people (mainly from elders, knowledgeable local leaders, and Abba Gadaa and educated people from among the Oromo people), working in the community so as to identify valuable indigenous knowledge of the society not only on forest conservation but also on all aspects of the role of the indigenous knowledge of the Oromo people and take in an account by policymakers.

V). In the end, I recommend that the experiences and indigenous knowledge of Oromo passed from generation to generation in dealing with environmental and forest resource care should be taught, appreciated and refined to meet the challenges of the day; cultural knowledge of plants, soils, and food should be made part

of the environmental views and I would appeal for genuine partnership regarding scientific and indigenous knowledge towards environmental sustainability. Safuu/moral ethics of environmental and indigenous institutions in Oromia and Ethiopia as well should be integrated and protected for future generation. Because Oromo Indigenous forest knowledge can provide extensive biological and ecological information at every levels that would be purposeful for the continuity of forest resources, plant species and environmental sustainability. Hence, as nearly all Oromo's speak closely related dialects of the same language, *Afaan Oromoo*, share a common cultural heritage (Asmarom 1973: 7); and constitute the largest population in Ethiopia and eastern Africa whatever happens in Oromia concerning the conservation of natural resources in general and forests, in particular, could have a great impact on the entire region of the Horn.

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