

Full Length Research

Investigating Indigenous Knowledge of Ethnic Groups in Biodiversity Conservation and its Implementation in the State of Benishangul Gumuz Region

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Traditional environmental knowledge and practices often make indigenous people and local communities highly skilled in environmental protection. Local and indigenous languages are repositories and means of transmission of this knowledge and the related social behaviors, practices, and innovations. Accordingly, this study was targeted on assessing indigenous knowledge of Ethnic groups in biodiversity conservation in the State of Benishangul Gumuz region, Ethiopia. In this study, mixed research method was employed with quantitative and qualitative data were collected and analyzed. The required information were collected in seven woredas from the targeted population-elders and residents of the woredas, who have different background and experience through semi-structured interviews that was interpreted and analyzed qualitatively and questionnaires which was presented quantitatively. The result of the research reveals that, even though communities have the adequate traditional knowledge of conserving biodiversity, the government employees of agriculture, environmental protection and culture and tourism offices erroneously perceived that the indigenous people have no knowledge about biodiversity conservation. Native forest types and crops unable to be regenerated and artificial forests are dominating the area where as some are on the way to extinct. The other repercussion that followed the disregard of indigenous knowledge in biodiversity conservation was development of destructive outlook of the community towards saving nature. As a result, the current status of biodiversity conservation is at its infant stage. In conclusion, the people of the region had their own indigenous way of maintaining their environment which could contribute much in perpetuation of nature. However, the deficient of understanding of this indigenous way of maintaining environment by educated employees of local government sector has resulted in low level of applying knowledge of indigenous people in biodiversity conservation at ground. Thus, this implies intensive and extensive awareness creation for woreda environmental protection, and agriculture bureaus employees has to be given about the potential role and indispensability of indigenous knowledge in biodiversity conservation. Besides policy makers need to mainstream indigenous knowledge of people in to environmental policy and proclamations both at regional and national level.

Key words: Biodiversity, indigenous knowledge, conservation, and implementation

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BACKGROUND OF THE STUDY

Literally, multilingualism is the natural potential available to every normal human being that sourced from existence of multi ethnic groups. It refers the use of two or more languages spoken either by an individual speaker or by communities. Hence, it is becoming a social phenomenon governed by the needs of globalization and cultural openness (Cooper, 1992). But the aim of this study was most significantly deals and focuses on speaker of different languages comprised in a particular community

Meanwhile, biodiversity refers to all the varied forms of plants, animals and micro-organisms in the natural environment (Cooper, 1992). In other expression, it represents variety and abundance of life forms, processes, functions, and structures of plants, animals, and other living organisms (Queensland Conservatorium Griffith University, 2008).

Then, biodiversity is essential to sustaining the living networks and systems that provide us all with health, food, wealth, fuel, and the critical services our lives depend on. These organisms, ecosystems and an ecological processes supply us with oxygen and clean water. They help keep our lives in balance and regulate the climate. Yet this rich biodiversity is being lost at a greatly accelerated rate because of human activities (Tove and et al., 2004).

Language, users of the language and knowledge of environment naturally are related throughout human life. This relationship is still obvious particularly in indigenous and local societies that maintain close material and spiritual ties with their environments (Tove and *etal* 2004). Over centuries, such people have built up a wealth of wisdom about their environment and its functions, management, and sustainable use (*ibid*).

The customary environmental knowledge and practices often make indigenous people and local communities highly experienced in environmental protection. Local and indigenous languages are repositories/storage/ and means of transmission of this knowledge and the related social behaviors, practices, and innovations (*Ibd.etail*). People who lose their linguistic and cultural identity may lose an essential element that commonly teaches respect for nature and understanding of the natural environment. Losing cultural and linguistic entities on indigenous and other traditional people weaken the health of the world's ecosystems and the goals of nature conservation (*Ibd.etail*).

The state of Benishangul Gumuz regional is a place where we can find a variety of flora and fauna. Much of the land in the region is abundant which makes it attractive to different settlers in addition to early inhabitants (Abebe Ano, 2010). As a result, almost all the major language family speakers that are spoken in Ethiopia are commonly found in the region. Thus, this

clearly shows the existence of many ethnic groups with different cultural backgrounds and with many different language speakers which have potential for biodiversity conservation.

Now days, biodiversity of the world is at dangerous (The European Investment Bank, 2013). It stated that the planet's biodiversity and natural resources are under threat from global warming, pollution and accelerated development. This is not also exception for State of Benshangul-Gumuz Region, because it is part of the world. The intrusion of large number of agricultural investors, who need vast land area, tremendous population increment both naturally and in-migration from neighboring regional states may create pressure on local ecology in challenging the biodiversity and also the development of industrial sectors can be some of the endangers that can affect the natural environment. From simple observation of current situation one can notice globalization and modernisms are this century events that eroding indigenous knowledge of biodiversity conservation; because the indigenous/cultural/ and organic crops and domestic animals are being replaced by hybridized species for assuring food security. This has potential to jeopardize nature of biodiversity in the environment. For that reason, one can infer there is high press upon the biodiversity of the region. The reduction of wild life species, reduction of natural productivity and replacement of natural forest by manmade could be a practical and it has come show for this in the region.

Consequently, the current intention of people could focus on coping up with challenges in satisfying daily basic requirement than thinking fate of future generation though they might have accumulated traditional knowledge to conserve their environment that could sustain the biodiversity. This could be the effect of lack of natural resource. When natural resources become scarcer due to environmental changes, the competition for localities where they can be found are intensified (Euromodel – environment and development, 2005). This could result as a challenge to conserve biodiversity. Therefore, various alternatives need to be searched for the potentials and challenges against environment. Among the alternatives, exploiting indigenous knowledge that rooted in different ethnic groups could be a solution to minimize the magnitude of the harm.

Accordingly, Benshangul Gumuz region is characterized by multi ethnic group .The existence of multi ethnic group in the region resulted in dominance of multilingualism. The Berta, Gumuz ,Shinasha, Mao and Komo are the indigenous ethnic group while Amhara, Oromo, Agew and other ethnic groups that intermingled by language, religion and other social practices with the indigenous people.

Despite the fact that the state of Benishangul Gumuz Region comprises different ethnic groups with different backgrounds, less attention has been given in conserving

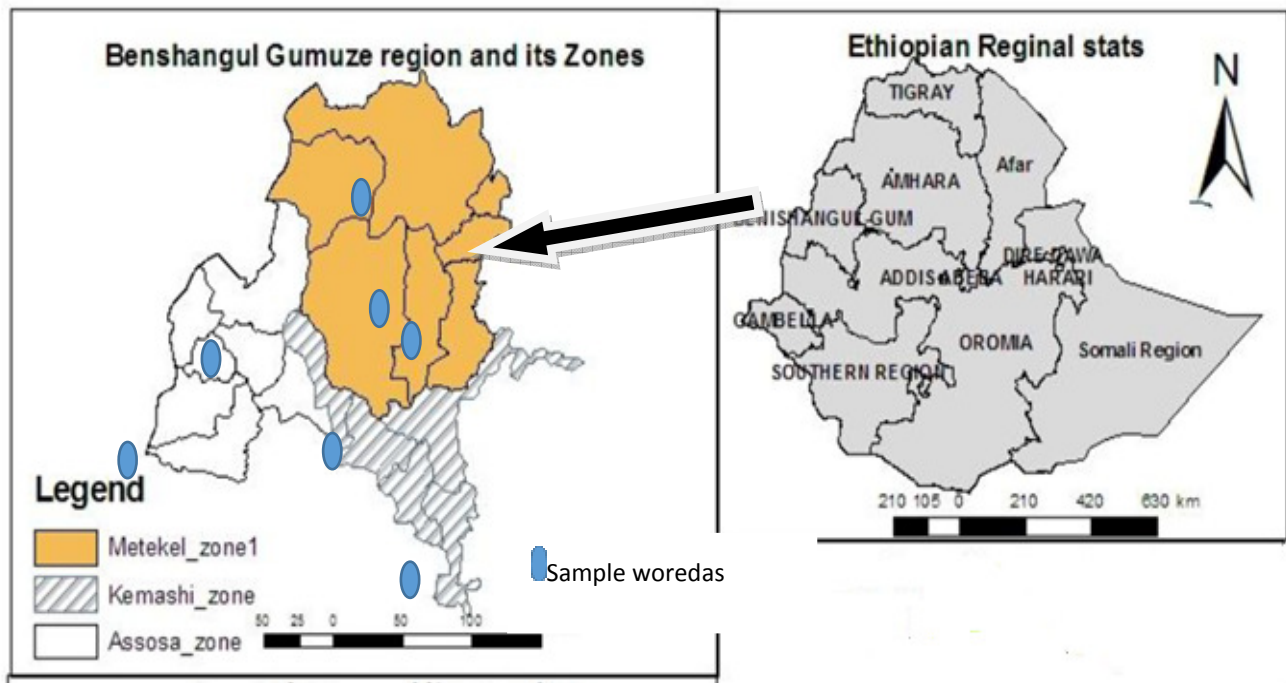
biodiversity so far. Consequently, the traditional knowledge of conserving biodiversity has not been revealed in scientific studies in the region at its wide context. Thus, this study intends to explore indigenous knowledge of ethnic groups that has potential in contributing biodiversity conservation and to what extent this indigenous knowledge of biodiversity conservation has been implemented in the region.

METHODOLOGY

In order to achieve the objective of the study, mixed research design was employed. Quantitative and qualitative data were collected and analyzed. Then, this was strengthened by integration and interpretations of ideas in the lights of some related scholar writings. The fundamental principle of mixed methods in conducting research is that multiple kinds of data should be collected with different strategies and ways that reflecting complementary strengths and non-overlapping weaknesses, allowing a mixed methods study to provide insights not possible when only qualitative or quantitative data are collected (Johnson & Turner, 2003). Data were collected in seven districts/woredas/ from the targeted population- elders and residents of the weredas who have different background and experience through semi-structured interviews that was interpreted and analyzed qualitatively and questionnaires which was presented quantitatively. This was supported by focus group discussions. Therefore, this research is quantitative and qualitative.

For reasons of cost and time, usually researchers only obtain information for part of it, referred to as a sample of the population Paul J. Lavrakas (2008). Considering this the study was purposive sampling to generalize for the whole. In addition to time and cost constraints, since the research dealt with multilingualism, areas of multilingual community were purposely selected. In Benshangul Gumuze Region there are three zones and one special woreda.

Following this, in Metekel Zone; Dangure, Debatie and Bulen woredas(districts) were purposely selected for the reason that they have more multilingualism (Shinashegana, Gumuzegna, Amharic, Oromegna, Agewgna speakers are prevailed). In Kemashi Zone Kemashi and yaso woreda were sample area (Gumuzegna, Oromegna and Amharic commonly spoken). In Assosa zone Homosha and Bambasi woredas were selected (Bertegna, Amharic and Oromegna commonly spoken). (Figure 1)



Map 1. Map of the study area
Source: Atnafu Morka (2009)

Figure 1

The selected sample woredas were not considered only on the basis of multilingualism factors but also are vulnerable to immigration. Then, from each woreda sample kebeles were determined based on the information that was obtained by snowball method for interviewing and focus group discussions that fits for the purpose.

The following table shows the sampling areas, the number of people that were interviewed from different ethnical groups in the selected woredas and focus group discussion was held.

In Addition to this, from the woredas' environmental officers, agriculture, the regions agriculture and environment protection offices, imaginative knowledgeable residents- 105 respondents (15 from each woreda) was purposely selected for self-administered questionnaires regarding the existing condition of biodiversity in each woredas and the traditional culture of conserving environment(because of purposive, 105 is believed to provide sufficient information. The selection criteria consider, people assumed to have scientific and traditional knowledge of the biodiversity and culture of the local areas.

Data Collection Instruments

Questionnaire

In spite of some disadvantages, questionnaire as a data collecting tool has many advantages. Firstly, it enables the researchers to collect back ground and baseline information quiet easily, can help to gather reasonable amount of data with in short time, provide information which can be followed up and is suitable for collecting initial information on attitudes and perception (Koshy,2005). Meanwhile, the questionnaire was prepared in the forms of questions –open and closes ended nature that easily identified the existence of many ethnical groups and roles of multilingualism in the conservation of biodiversity in Benishangual Gumuz Regional State. And the questionnaire was administrated or distributed to officials in some woredas of each zones (Kemashi woreda in Kemshi zones, Bullen, Debate and Manbuk in Metekel Zone)who were expected to respond with relate to the role of multilingualism in conservation of biodiversity to gather or collect primary data. Hence, the questionnaire was in two forms of questions. The first section consisted close ended questions that was analyzed quantitatively in simple mathematical expressions (percentage) whereas the second section was designed to consist of open ended questions that addressed feelings or attitudes of the respondents in their own words without limiting their power of expressing in line with nature of the questions.Hence,this questionnaire was used to gather both qualitative and quantitative data-

open-end questions were used to gather quantitative data that could be analyzed thematically whereas close-ended questions were used to obtain quantitative data which could be described in simple mathematical expressions. Therefore, 105 questionnaires were prepared and distributed and filled in each zones based on the number of wordas proposed. However, three (3) questionnaires were not returned back.

Interview

Interview, the second tool that was used in collecting primary data which is proposed as triangulation technique for the data obtained through questionnaire. According to Selinger and Shohamy(1989) interview is used to collect data for the study that permits a level of in-depth information, free response and flexibility that cannot be obtained by other procedures. And hence, semi-structured interview will be used. Because, semi structured interview is the one most favored by educational researchers as it allows respondents to express their feelings in the way they like at some length, but offers enough shape to avoid aimless ramblings (Koshy, 2005).

Focus Group Discussion (FGD)

Focus group discussion (FGD) was the third tool designed to collect the desired data from people of indigenous group who were expected to have similar back ground knowledge and experience about the roles of multilingualism in the conservation of biodiversity in the three respective zones, in the selected woredas of the region. So that, 7 focus group discussions (10 people in each group) in the mentioned zones and woredas were invited to have discussion , which enabled the researchers to listen and collect their feeling, opinions, attitudes about the selected topics of the issue. Therefore, the information obtained in this manner was highly helped the researchers to strengthen and triangulated with the data gained through questionnaire and interview made. Focus group discussion (FGD) is a good way to gather people from similar back ground or experiences to discuss a specific topic of interest. So that, facts obtained through this tool was used to check and validate the data obtained through questionnaire and interview

Observation

Traditionally conserved areas- community forest, indigenous crops, wild fruits and the like were observed. This was afield visit ways of checking the information obtained through other tools where the expert moves along with the researchers to offer expertise ideas while needed.

Data Collection Procedure

Fourteen data collectors- one from each woredas was given an orientation on the purpose of the research, what they were to do in the data collection, and the challenges they might face in data collection process. Trained data collectors moved in the selected woredas to collect the data. The three principal researchers moved to each woredas along with the trained data collectors to supervise and assist the situation. In addition, they were also collected data by observation and focus group discussion in line with their professional background.

RESULTS AND DISCUSSIONS

Indigenous knowledge on Biodiversity Conservation

As table 4.1 depicts, the level of traditional knowledge in managing forest is responded as very low by 29% and low by 52.9%. It is only 15.7% and 2% that responded as high and very high respectively. Similarly, responses for level of knowledge in managing the life hood of animals (Domestic animals and wild animals) and managing domestic crops (Crops which were commonly used but on the way to extinct) were also low due to lack of awareness about sustainable environment protection and conservation of natural resource.

Table 2. Existence of Indigenous knowledge in conservation of biodiversity

item	Very Low		Low		High		Very High		Total	
	No	%	No	%	No	%	No	%	No	%
Managing the forest of the area	30	29.4	54	52.9	16	15.7	2	2.0	102	100.0
Managing the life hood of animals (Domestic animals and wild animals)	32	31.4	60	58.8	7	6.9	3	2.9	102	100.0
Managing domestic crops (Crops which were commonly used but on the way to extinct).	36	35.3	46	45.1	17	16.7	3	2.9	102	100.0

The facts depicted on the above table were validated based on data obtained through interview and focus group discussions (FGD). Following this, despite the fact the prevalence of lack of indigenous knowledge in conserving and keeping wild animals, is observed in the study areas except Tongo special woreda/district/. As interviewees informed, oral tradition tell that the people of Mao-komo uniquely from others, has the culture of conserving wild life. For elders of Mao-Komo, March and April months were seasons to hunt wild animals and they never hunt pregnant and kids- today we call selective hunting. This times/seasons/ were preferable to clearly observe the nature of animals to be hunted as this time forest is relatively sparse than any other time because it is winter season.

In the tradition of Gumz people particularly in metekl zone, there had been the culture of land use planning. The farm land in the Gumuze people is determined to be minimum of one hour distance by foot. Within the range of one hour distance from residence, land is reserved for forest coverage and grazing land.

The community express their knowledge by poem and proverb about biodiversity conservation importance “ከሰፍና ፉቁ” “ካሚ ሞጃ ጠፈናና ሙቁ”. This is the shinasha people proverb which is to mean in the community where culture is maintained, you find every cultural items (material and intangible) and in the protected forest, they call “nemigema” you find everything to sustaining life (fruit, flower for honey production, trees for construction) and animals for food etc.) According to the community elders’ experience, Nemigemo was the source of medication for different disease like tooth pain, headache and many other. They also perceive *Nemigemo* is source of rain so it has to be conserved and protected. If *Nemigemo*- cultural forest is cleared or destroyed by someone she/he had to be punished by isolating (socially out casting) from the community.

According to the local community response, the Mao-komo people had the tradition of conserving biodiversity in the past. In their culture no one was allowed to cut /clear any forest unless planted by him/herself. Even when land is needed for agricultural purpose, the highly forested area was reserved for coffee production, and relatively bare/non-forest area/ was cultivated. Forest was also conserved in their culture for the reason that it contains many medical plants, wild fruits and vegetables.

According to informants, in former time both individually and in group forest was conserved. Individual farmers with their farm land maintain some important tree at least for shadow purpose. There was norm of respecting protected forest areas unlike present generation for whom conserving for forest is none of his business

Here, let us raise the model person with whom we made an interview. The name of this person, was Ato Degsira Shibabaw Agewgna speaker and 45 years old, living in south west of M nabuk town. Without any initiation from anybody, he encouraged by himself and able to conserve about 18 types of indigenous trees in Manbuk town.

Table 3. Model Indigenous trees conserved

No	Type of indigenous trees		
1	<i>Wanza</i>	10	<i>Dabda</i>
2	<i>Gambelo</i>	11	<i>Shola</i>
3	<i>Agam</i>	12	<i>Banba</i>
4	<i>Enquaye</i>	13	<i>Anter</i>
5	<i>Girawa</i>	14	<i>Bankakshi</i>
6	<i>Girar/ Acacia /</i>	15	<i>kerekera</i>
7	<i>Alingo</i>	16	<i>Doqema</i>
8	<i>Sarkuni</i>	17	<i>Qerkeha</i>
9	<i>Durba</i>	18	<i>Antir</i>

Magnitude of Application of Indigenous Knowledge in Biodiversity Conservation

Table 4 shows that 24.5%, 55.9%, 14.7% and 4.9% respectively replied that the experience of conserving forests in the area was very low, low, very high and high respectively. The table also shows that the experience in conservation of the life hood of animals (domestic animals and wild animals) was low and very low as 34.3% and 49.0 % replied respectively. One could also see that 60.8 % of respondent responded for the experience in conservation of domestic crops (crops which were commonly used but on the way to extinct) was low. Interviewed individuals were also admitted that the community was not applying traditional knowledge due to socio-economic and globalization challenges. It means that the low social and economic status of people of the area were forced them to use the natural resources found within their environment. That is the low experience of conserving forests in the area, the low experience in conservation of the life hood of animals (Domestic animals and wild animals) and the low experience in conservation of domestic crops -Crops which were commonly used but on the way to extinct.

Table 4. Experience of Community in Practicing Conservation of Biodiversity as Indigenous to this Area

item	Very Low		Low		High		Very High		Total	
	No	%	No	%	No	%	No	%	No	%
The experience of conserving forests in the area.	25	24.5	57	55.9	15	14.7	5	4.9	102	100.0
The experience in conservation of the life hood of animals (Domestic animals and wild animals)	35	34.3	50	49.0	14	13.7	3	2.9	102	100.0
The experience in conservation of domestic crops (Crops which were commonly used but on the way to extinct)	20	19.6	62	60.8	16	15.7	4	3.9	102	100.0

The Current Status of Biodiversity Conservation Culture

It was crucial to deal with the present situation of conserving biodiversity in the study areas because knowing the present status of conservation is foundation for remedial actions. Accordingly, the following result (from table 5) was obtained from self-administered questionnaires. Relative to conserving animals and domestic crops, the extent that the community have been conserving forests nearby was better because the 32.4% and 45.1% of respondents answered it is high and low respectively. Whereas majority response for conserving animals and domestic crops was low and very low. However, the table infers that the existence of biodiversity conservation endeavors to some extent. On the other side, interview and focus group discussions indicate discrepancy of conserving culture of biodiversity among sample woredas. For example, in Kemashi zone (Kemashi and Yaso woreda), Bulen and Tongo woredas there were great attempts to protect biodiversity, especially forest and wild life whereas in Bambasi and Dangure woredas integrated work of community and local government was less reflected.

According to Kemashi Zone Yasso Woreda Environmental Protection Office, in kemashi zone there were lots of conserved areas which were conserved both by the major involvement of government and to some extent the contribution of personals especially in yasso woreda. Besides, the data obtained through interview and focus group discussion(FGD) revealed that in kemashi woreda the following conserved areas are well known "jermma Tefases", Basha Abamoti, Bashan ya ya where this name was given from both the Oroma naming called Bashan which mean water and Ya Ya is a name taken from Gumuz language and it mean Mother. In turn this naming hugely implies the presence and enrolment of multilingualism in the conservation of the natural environment. Whereas the following table display the conserved areas and their particular names given to the area and also the land coverage of the conserved area in hectares.

In kemashi Zone, kemashi woreda there were some conserved area where the community was devotedly working in replacing the missed animals and trees, which in turn case change on the air condition of the environment. As a result, Daguba, which covers 45 hector, Jirmma Tefasis, Jallo were the conserved areas in kemashi woreda. This conserved areas was governed by the government. The missed animals, and trees was reappearing currently in the area.

Table 5: The Present practice of conservation of Biodiversity

Item	Very Low		Low		High		Very High		Total	
	No	%	No	%	No	%	No	%	No	%
To what extent have your community been conserving forests nearby your community	13	12.7	46	45.1	33	32.4	10	9.8	102	100.0
To what extent have your community been conserving domestic and wild animals nearby your community?	37	36.3	47	46.1	10	9.8	7	6.9	101	99.0
To what extent have your community been conserving domestic crops nearby your community	32	31.4	35	34.3	17	16.7	16	15.7	100	98.0



Figure 1. Sample Forest Conserved Areas in Kemashi

In the case of Yasso woreda lots of wild animals and trees or biodiversity were found in the conserved areas. To attain conserved areas in yasso woreda, rules were set by officials in the area to manage the maladministration of these illegalize. Ten years of prisoning and ten thousand birr was the punishment that the man would respond for cutting a single tree and animals in whether conserved or frees areas of the woreda -Yasso Woreda kemashi Zone. There was also similar legal basis in protecting and conserving nature in Bulen woreda.

Table 6: the Coserved Areas in Yaso Woreda

No	The keble it is found	Name of forest	Area in hectare	Year established	Remark
1	Yaso	Yaso mountain forest	1887.85	2005 E.C	Map prepared
2	Ayani and Yaso	Gadlo forest	422	2006 E.C	
3	Qersa dalati	Jeldesa mountain	2068	2005 E.C	Map prepared
4	Bomja tebela	Bomja	52	2005 E.C	Map prepared
5	Chigsha	Bonkosh	3637.66	2005 E.C	Map prepared
6	HalloMukreba	Cherak	57	2007 E.C	Map prepared
Total			8119.51		

Table 7. Conserved Areas in Bulen Woreda

No	The keble it is found	Name of forest	Area in hectare	Year established	Remark
1	Appar	Appar forest	5000	2001 E.c	
2	Metinagisa	Bushes forest	770	-	
3	Matana bapuri	Manzin forest	40		
4	Gongo	Gongo lunba forest	120	2001E.c	
5	Mojib	Mojib forest	3500		
6	Baruda	Kezguri forest	600		
7	Baruda	Gulaye forest	1600		
8	Bedorie	Saga gishmishinda	1500	2001 E.c	
9	Bakuji	Dorajila forest	2500	2001 E.c	
10	Doshnamoch	Zembaha forest	4800	2001 E.c	
11	Kushagonji	Kushagonji forest	2600	2001 E.c	
12	Dobina akonti	Zeni mountain forest	4500	1992 E.c	
13	Chilankogichduki	Lunbyn forest	500	1996 E.c	
14	Mora	Gunden	200	1995 E.c	
Total			28230		

In Tongo woreda there were some areas that has been protected and conserved in collaboration with government and community. These are Wedesa mountain in Mimiya kob kebele, Tsulumumu in Gurie kebele, Shemolo mountain park, Millennium Park, and Meles Zenawi park in Shoshor kebele.

Besides to the above discussions, the result of interviews, open ended questionnaires and focus group discussions conducted with the local elders shows contrary result with quantitative data in that the community had their own ways of conserving biodiversity/ indigenous knowledge / . Therefore table 4.1 result infers that the government employees of agriculture, environmental protection and culture and tourism offices are erroneously perceive that the indigenous people have no knowledge about biodiversity conservation. Here Kemal Raj 2006 argument sound hot-often poor understanding by national government of interrelation between biodiversity and cultural diversity causes rapid loss of traditional biodiversity knowledge.

As the research result reveals the study areas communities have indigenous knowledge of conserving

biodiversity (forest , domestic crops and animals) because selective hunting which is modern concept was practiced traditionally by Mao-komo people; Land use planning in which sections of land left for forest coverage by Gumuz people; culture of protecting forest areas locally called *Nemigema* and socially out casting of any one who damage the nemigema by Shinasha people; existence of evidences of individual practices to maintain organic environment by Agew People witness the community had have indigenous knowledge of biodiversity conservation. Previous researchers like Roy Haines –Yound 2009, has noted that land use plan has direct effect up on biodiversity conservations. Similarly, others also inferred that land use planning can affect the health of our environment (Jeffrey P. Cohn, writer, Takoma Park, Maryland 2003).

From table 2 we can see that the perception of the educated peoples working in culture and tourism, environmental protection, and agricultural offices were low though the evidences at grass root elder members of the communities show and justify that they had their own tradition of conserving biodiversity. Now it is important to

discuss to what extent this indigenous knowledge is being applied at ground. In this regard i.e. the magnitude of implementation of indigenous knowledge in biodiversity conservation community was not applying traditional knowledge due to socio-economic and modernization challenges. Scarce natural resources due to environmental changes, intensify the competition for localities and this could result as a challenge to conserve biodiversity (Euromodel – environment and development, 2005).

The indigenous knowledge that embedded in the community for centuries remained oral due to increasing of population by in migration from neighboring regions and natural increase creating competition for resource. Consequently, indigenous knowledge of biodiversity conservation was given no attention. Besides to this, technological advancement in agricultural inputs has contributed much for reluctant action of people toward traditional knowledge .The use of modern agricultural inputs like chemical fertilizers and pesticides has its own repercussion on biodiversity in two aspects-one direct losing of life due to chemical and secondly, since the inputs show high product within short period of time, people are diverted to its use and become careless for traditional knowledge. The extensive and intensive use of modern agriculture causes biodiversity loss (Bruno Lanz,Simon Dietz & Swanson, 2017) Moreover , the indigenous seeds were being replaced by hybrid and high yielding varieties of seeds.

Finally the research result reveals that the current status of environmental conservation in Benshangul Gumuz Region is at its establishing stage. The discrepancy of environmental /biodiversity/ conservation practice among the sample districts/Woredas/ was existed. In some Districts/Woredas/ environmental protection has begun strictly by delineating protected forest cover, whereas others like Dangur districts such practice existed shallow(see table 6 and 7) Though indigenous knowledge of biodiversity conservation was not observed, protected areas in many of sample districts shows commencing of commitment to sustain environment . Protected areas are indicators of environmental sustainability that help to maintain biodiversity (Euromodel-Environment and Development, 2005).

CONCLUSIONS AND RECOMMENDATIONS

From the finding of this research it is possible to conclude that the existence of multi ethnic groups in Benshangul Gumuz Region has potential role in conservation of biodiversity. The people of the region had have their own indigenous way of maintaining their environment which could contribute much in perpetuation of nature. However, the deficient of understanding of this

indigenous way of maintaining environment by educated employees of local government sector has been largely reflected. This in return had potential adverse effect on deeds of maintaining nature.

As a result of different factors, the magnitude of applying knowledge of indigenous people at ground perceived to be low in biodiversity conservation. These factors includes grabbing of wide forest areas by non-productive agricultural investors- whose primary intention is charcoal production in some areas and means of gaining loan from banks, pressure of refugees especially in Tongo special Worfeda, population increment and wildfire .

The study also shows that there has been appreciable attempts in protecting and conserving forest and wild animals in some sample woredas like Tango, Kemashi, yaso and Bulen in collaboration with the community and concerned woreda offices. One the other side, woredas like Bambasi and Dangure have been given less attention in biodiversity conservation.

There were many indigenous trees and domestic crops which had been stable serving economic value beyond maintaining ecosystem for many century in the area but now being vanished like *Dija, Tela and many others*. Some of indigenous forest types and crops unable to be regenerated and artificial forests are dominating the area where as some are on the way to extinct. The other repercussion that followed the disregard of indigenous knowledge in biodiversity conservation was development of destructive outlook of the community towards saving nature in favour of day to day earning. Finally, it is recommended that:

- The existence of many ethnic group/multilingual/ is good opportunity for the region regarding conserving biodiversity because every ethnic group have their own way of conserving nature which passed from generation to generation. Therefore, intensive and extensive awareness creation for woreda environmental protection, and agriculture bureaus employees has to be given about the potential role and indispensability of indigenous knowledge in biodiversity conservation by Assosa University in collaboration with concerned regional government. This is because the result of the research reveals that these bodies do not perceive the exploitable traditional knowledge that embedded in the community.
- The national and regional government has to take caution when permitting land for investors and refugees and should follow strictly the application of rules in line with biodiversity conservation
- The regional government has to assure that protection and conservation of biodiversity is

- ➔ being practiced uniformly among woredas.
- ➔ Concerned agricultural experts need to make intensive and extensive research on indigenous trees and crops to regenerate.

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