

## The Role of Forest Biodiversity Conservation Practices for Tourism Development in a Case of Tara Gedam Monastery, South Gonder Zone, Ethiopia

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### Abstract

Monastery has long history of planting and conserving trees in yards of its churches. The objective of this study was to assess the role of forest biodiversity conservation practice for tourism development in case of Tara Gedam monastery. The study was conducted (2014) in Tara Gedam (Monastery) in Libo Kemkem Wereda, South Gondar Zone, Ethiopia. The main attraction of the site includes the forest landscape; indigenous tree, birds, ancient monastery cave, speculator erected mountain and wildlife in the surrounding. The vegetation data samples were collected from plots of 20 m × 20 m which were laid systematically along parallel transects lines in the forests. Both primary and secondary sources of data were used. Primary data were collected from a survey of 132 visitors at recreation site. For the socioeconomic survey, questionnaires were collected from 120 household/living residents. Focus group discussion and key informant interviews were also employed in which religious scholars; number of tourist and local community were considered. Data were analysed using SPSS and Microsoft excel. The result of survey revealed that 82% of respondents have direct link between biodiversity and tourism. Biodiversity is one of tourism's greatest assets and fundamental to its long-term sustained growth. Sustainable tourism establishes a suitable balance between environmental, economic and socio-cultural aspects and is key to maximizing tourism's positive contribution to biodiversity. Conservation of forest in the name of religion in the study area was widely recognized by the followers as conservation approach. Result show that biodiversity contributes to sustainable tourism development on the grounds that it has less impact on the environment than other industries, based on an enjoyment of the natural and cultural environment. Summary of the studies indicate that the recreational economic benefits of the local community was increase time to time. So that tourism significantly contributes to the local and national economy. Tourism generates high income; employment opportunities to local communities, its conserve the environments and biodiversity conservations.

**Keywords:** Tourism; Monastery; Biodiversity

### Introduction

Biodiversity conservation is now currently the top agenda for world community [1]. That is why it gets infancies in terms of research for significance consideration of decision-making. Biodiversity loss has high impact on human's life on both current and future generations. For this reason, the need for conserving biodiversity is fundamental [2]. Even though biodiversity conservation has long history it has drawn world attention particularly after the 1992 Rio Earth Summit [2].

Biodiversity provide the direct and indirect benefits to humans including food or material goods, environmental regulate, reduced carbon emissions and reduces climate change [3]. The main objective of biodiversity conservation is to use the resource sustainably. Tourism is one of economic development option to use biological resources sustainably.

Tourism has long been considered a clean industry, without any negative effects on the environment worthy of mention and contributes to a growing value of nature [4]. According to Yeung and Law [5], ecotourism is the tourism industry's fastest growing sub-sector, with an estimated world-wide annual growth of 10-30% which is based on biodiversity and natural landscapes.

Tourism is a key source of foreign exchange and essential contributor to the balance of payments, especially in developing countries [6]. It is a primary or secondary source of export earnings in 20 out of the world's 49 least developing countries (LDCs) and the principal source of export earnings in 10 of these countries [7]. International tourist arrivals have shown a continuous growth, rising from 675 million

in 2000 to 940 million in 2010 [7]. According to WTTC (2013) the total contribution of tourism comprised 9% of global GDP (US \$6.6 trillion) and generated over 260 million jobs. Development of tourism can also be a way to make nature reserves economically viable and to provide employment and source of income for most individuals in a community [8].

It also contributes to sustainable socio-economic development, cultural and environmental conservation. Tourism and biodiversity are closely linked both in terms of impacts and dependency. Many types of tourism rely directly on ecosystem services and biodiversity ecotourism, agri-tourism, wellness tourism, adventure tourism, etc. [9].

Nowadays, tourism is a strong tool to give local communities economic and social benefits and encourage local people to support conservation. That is why local people started to support protected area management systems and it plays an important role in biodiversity conservation in worldwide [10]. Tara Gedam forest is one of the peach forests in the country which is inhibited by a number of indigenes plant

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Received April 24, 2017; Accepted May 26, 2017; Published June 03, 2017

**Citation:** Worku M (2017) The Role of Forest Biodiversity Conservation Practices for Tourism Development in a Case of Tara Gedam Monastery, South Gonder Zone, Ethiopia. J Ecosyst Ecography 7: 231. doi:10.4172/2157-7625.1000231

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diversity, very spectacular erected mountain and ancient cave. The objective of the study role of Forest biodiversity conservation practices for tourism development in a case of Tara Gedam.

## Materials and Methods

### Description of study area

The study was carried out in Tara Gedam forest located very close to Addis Zemen town, northeast of Lake Tana, northwestern Ethiopia (Figures 1 and 2). It located in South Gondar Zone within the Amhara National Regional State. Addis Zemen town is located at 12°06'59" N–12°07'25" N and 37°46'14" E–37°47'02" E, on the Addis Ababa Gondar main road, about 82 km north of Bahir Dar and 93 km south of Gondar town.

The altitude ranges from 2062 to 2457 m.a.s.l. The forest covers 625 hectares. Two agro-climatic zones: moist 'Weina Dega' (95.1%) and Dega (4.9%) uni-modal rainfall of approximately 1300 mm per year, the majority of which falls between June and August. The mean annual maximum and minimum temperature are 32.8°C and 8°C, respectively [11].

### Methodology

Primary and secondary data were used [12]. Interview, questioners, focus group discussion and key informant interviews were applied

to get primary data from 132 tourists, randomly selected tourists. From 120 local residents 15 experts and 105 households from three targets selected villages around Tara Gedam by using simple random sampling methods. Interview: purpose questions were prepared and key informant interview was conducted with selected individuals from church scholars, community elders, Agricultural, Tourism development experts were participated. Questionnaires: this survey method which allows capturing households and visitors as to generate the required data. FGD: composed of elders, church community, leader, youth and landless household heads. Secondary data were taken from institutional reports. Moreover, regular observation from September-December 2014 was applied to get qualitative data regarding to tourism that can strength primary and secondary data. To get plant diversity of the area, reconnaissance survey was carried out in September 2014, before the actual data collection, in order to have an impression of the sampling sites and to determine the sampling methods to be used for vegetation data collection.

The vegetation sampling was done systematically sampling method. Samples take were laid along line transects based on altitudinal variation of the study area which described by Bullock [13]. Ten Parallel transects line were laid across the forests and 40 plots measuring 20 m × 20 m, were established along the line transects at 100 m intervals. To collect information of woody plant species composition, all live trees with a diameter ≥ 5 cm were recorded.

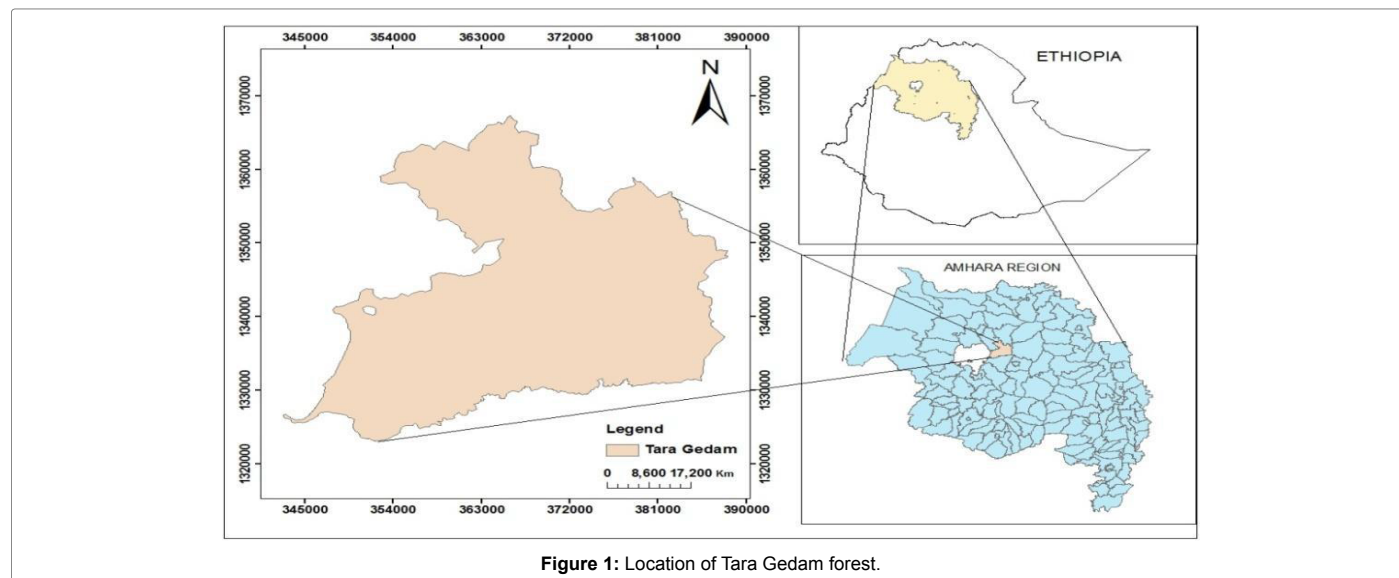


Figure 1: Location of Tara Gedam forest.

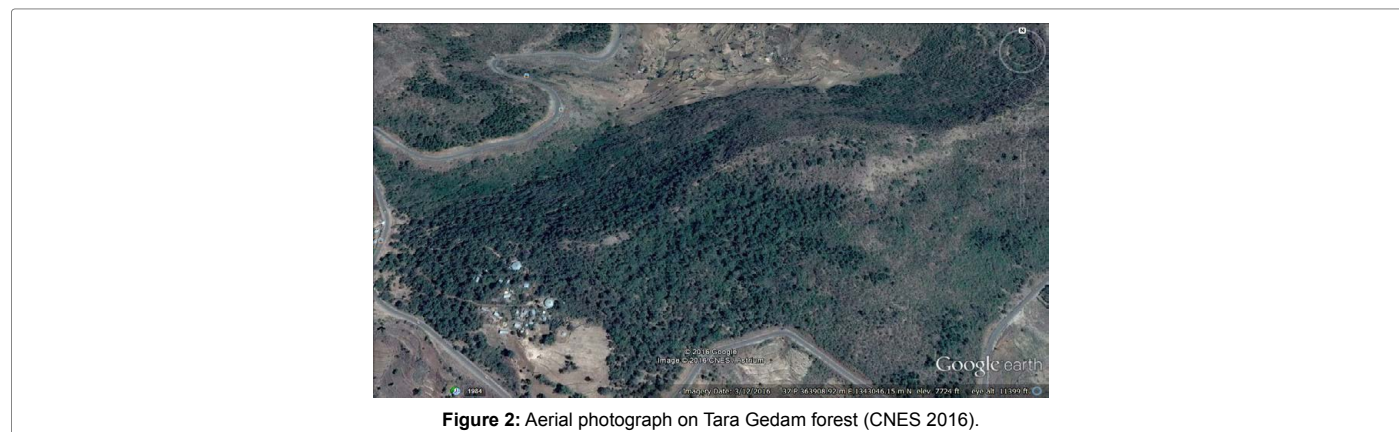


Figure 2: Aerial photograph on Tara Gedam forest (CNES 2016).

### Data analysis

All data gathered through visitor and local household questionnaire survey were coded, entered and analyzed in Statistical Package for Social Science (SPSS) version 20. Frequency distribution, central tendencies and dispersion were computed in order to show respondent characteristics and their opinion to different questions. Data obtained through interview with different key informants was analyzed through explanatory and category methods. Some of the results were then presented in forms of tables, graphs, charts and pictorial devices.

## Results and Discussion

### Demographic and socioeconomic characteristics

In order to gather data from tourists and local residents/household, 132 samples taken from tourists while 120 samples were taken from local residents living around monastery and experts (Figure 3). From total visitor 70.4% of them were male and 29.4 % were female; and 63% of local resident were male and 37% were female.

In terms of origin, 57% of the respondent were international tourist and rest were local resident. This indicates that there are more things to be done in order to attract international visitors and local tourist. As shown in Figures 4 and 5, education qualifications of respondent from the local residents in Tara Gedam, majority of the respondent were found to be primary educated.

### Forest biodiversity composition in Tara Gedam

The result revealed that a total of 6343 individual of woody plant recorded and thirty-seven species was recorded from 40 plots. Among those *Olea europaea* was the dominant plant in the forest which has recorded value of 477 individuals, *Allophylus abyssinicus* is second dominant species which has recorded value of (423) and

*Albizia schimperiana* (387) ranked the third. Majority of them were representing a growth habit of trees 56.12% and 21.54% were associated tree/shrubs, 18.46% were shrubs, 4.61% climbers/herbs (Table 1).

Similar to the above finding the study of Demel [14] suggested that the highlands of Ethiopia were once covered by diverse forest dominated by *Olea europaea* tree, its grace, strength and durability presumed. Apart from ecological and climatic reasons the social values of these indigenes species can contribute to their dominance once.

As shown in Figure 6, in Tara Gadem forest, most of the tree species with DBH class of 11-20 cm and 21-30 cm were recorded. This indicated that the tree was old age and high DBH class.

### Status of biodiversity conserving the area

According to the result show that, 92% implies that the trees in Tara Gadem forest were will very dense forest and it conserved plant biodiversity. In line with the finding of this study Alemayehu [15] also stated that, local communities do have higher respect and thrust in it than other local institutions, which has made the church the central institution and platform for socio-economic issues of the people. The monastery located in the forest the main reason for its sustainability of the forest. The study of Alemayehu [15] on church forest of South Gonder stated that if a traveller can see a patch of indigenous old aged trees in the northern highlands of Ethiopia, most probably it is sure that there is an Orthodox Church in the middle.

Tara Gedam was the role model in biodiversity conservation prior to better keep indigenous knowledge in forest conservation and get technical support/advices from government organization mass mobilization of local resident to conserved natural resources in the areas. According to household respondent, relatively outstanding examples where one can observe the remaining natural patch forest. Similar observation was stated by Alemayehu [15] on forest around

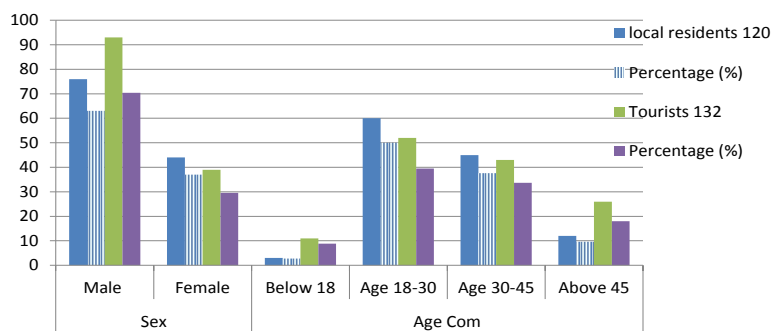


Figure 3: Respondent characteristics sex and age composition (field survey, 2014).

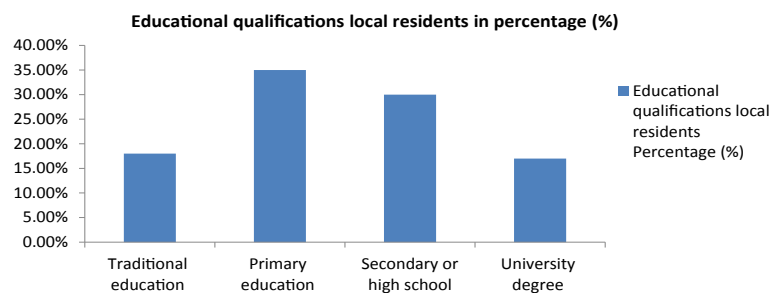
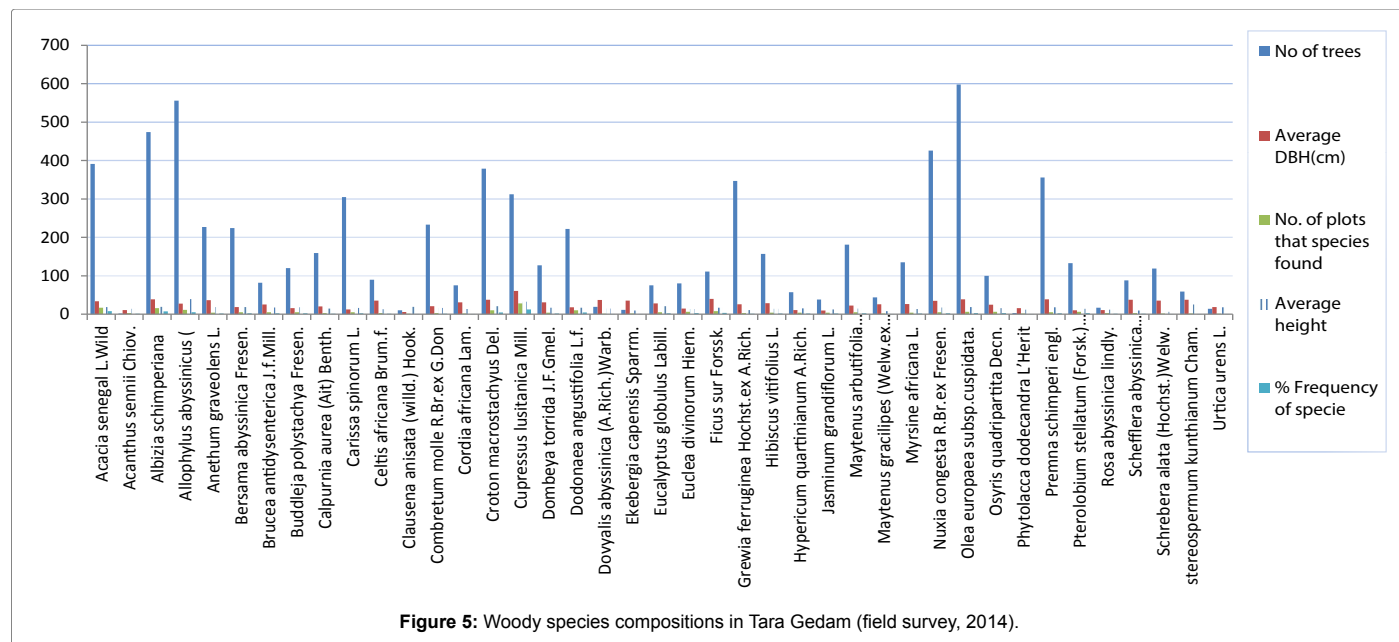


Figure 4: Respondent education qualification local residents in Tara Gedam (field survey, 2014).



No.	Species Name	Density	Rank	Percent	Cumulative Percent
1	<i>Acacia abyssinica</i>	86	7 <sup>th</sup>	2.4	2.4
2	<i>Acacia melanoxylon</i>	33	16 <sup>th</sup>	0.9	3.4
3	<i>Bersama abyssinica</i>	33	16 <sup>th</sup>	0.9	4.3
4	<i>Carissa spinarum</i>	97	6 <sup>th</sup>	2.7	7.0
5	<i>Croton macrostachyus</i>	32	17 <sup>th</sup>	0.9	8.0
6	<i>Discopodium penninervum</i>	6	23 <sup>rd</sup>	0.2	8.1
7	<i>Dombeya torrid</i>	63	10 <sup>th</sup>	1.8	9.9
8	<i>Dovyalis abyssinica</i>	69	9 <sup>th</sup>	2.0	11.9
9	<i>Ekebergia capensis</i>	27	19 <sup>th</sup>	0.8	12.6
10	<i>Erica arborea</i>	12	21 <sup>st</sup>	0.3	13.0
11	<i>Eucalyptus globules</i>	1042	1 <sup>st</sup>	29.5	42.4
12	<i>Ficus sur</i>	4	24 <sup>th</sup>	0.1	42.6
13	<i>Hagenia abyssinica</i>	15	20 <sup>th</sup>	0.4	43.0
14	<i>Hypericum revolutum</i>	7	22 <sup>nd</sup>	0.2	43.2
15	<i>Juniperus procera</i>	643	2 <sup>nd</sup>	18.2	61.4
16	<i>Maesa lanceolata</i>	93	6 <sup>th</sup>	2.6	64.0
17	<i>Maytenus addat</i>	86	7 <sup>th</sup>	2.4	66.4
18	<i>Maytenus arbutifolia</i>	237	4 <sup>th</sup>	6.7	73.1
19	<i>Myrsine africana</i>	31	18 <sup>th</sup>	0.9	74.0
20	<i>Myrsine melanophloeas</i>	56	12 <sup>th</sup>	1.6	75.6
21	<i>Nuxia congesta</i>	78	8 <sup>th</sup>	2.2	77.8
22	<i>Olea europaea</i>	28	19 <sup>th</sup>	0.8	78.6
23	<i>Olinia rochetiana</i>	239	3 <sup>rd</sup>	6.8	85.4
24	<i>Osyris quadripartite</i>	69	11 <sup>th</sup>	2.0	87.3
25	<i>Pavetta abyssinica</i>	12	21 <sup>st</sup>	0.3	87.7
26	<i>Pittosporum viridiflorum</i>	43	14 <sup>th</sup>	1.2	88.9
27	<i>Prunus africana</i>	51	13 <sup>th</sup>	1.4	90.3
28	<i>Rhamnus staddo</i>	12	21 <sup>st</sup>	0.3	90.7
29	<i>Ricinus communis</i>	31	18 <sup>th</sup>	0.9	91.5
30	<i>Rosa abyssinica</i>	190	5 <sup>th</sup>	5.4	96.9
31	<i>Rubus abyssinica</i>	31	18 <sup>th</sup>	0.9	97.8
32	<i>Scolopia theifolia</i>	35	15 <sup>th</sup>	1.0	98.8
33	<i>Vernonia amygdalina</i>	43	14 <sup>th</sup>	1.2	100.0
	<b>Total</b>	<b>3534</b>		<b>100.0</b>	

**Table 1:** Species list collected from Tara Gedam monastery forest with their relative density, rank, percent, cumulative percent trees and the species that occurs repeatedly in the plots.



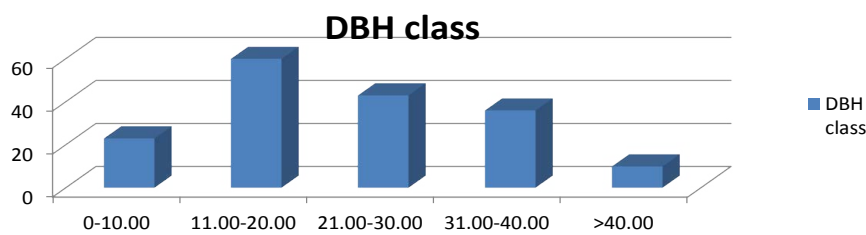


Figure 6: DBH distribution of plants in Tara Gedam forest (field survey, 2014).

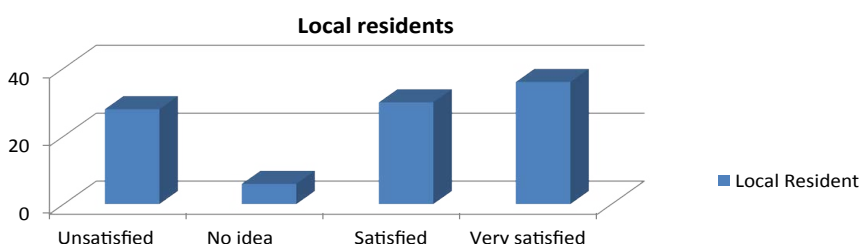


Figure 7: Attitudes on conserve biodiversity and tourism developments Tara Gedam forest (Survey, 2014).

the church which states that local communities do have higher respect than other local institutions. The same observation was also stated by Hall et al., (2009) every creature being animal, plant or human has a soul and should be treated with respect.

### Perception of local communities on biodiversity conservation and tourism

The graph shows that 30.3% of respondents were satisfied and 36.2% were very satisfied in terms to conserve biodiversity and tourism development in the area (Figure 7). Local communities/household were satisfied because they are directly or indirectly benefited from biodiversity conservation and tourism.

The community directly benefit from the forest were used to collect wild fruits and non-timber forest products such as wild berries, medicinal herbs, and firewood. This also creates employment opportunity to local tour guides, small shops and handicraft selling for tourist.

Biodiversity is one of the tourism's greatest assets and fundamental to its long-term sustained growth. Sustainable tourism establishes a suitable balance between environmental, economic and socio-cultural aspects and is key to maximizing tourism's positive contribution to biodiversity. It is argued that, without local community support, conserving biodiversity in areas will not be easily achieved [16].

As far as knowledge of biodiversity, it is directly link to tourism development. Concerned 82% of respondents believed that Tara Gedam had dense natural forest which is rich in biodiversity, it impact going to direct link between biodiversity and tourism. As high biodiversity are currently under increasing pressure from tourism [17] and are frequently exposed to increasing negative ecological footprints [18].

Although biodiversity conservation may benefit not only the local communities but also the whole humanity, the costs are usually imposed to the local communities who depend on the natural resources for different goods and services [2]. According to Johnson (1992) conservation biodiversity is directly relevant to local residents primary source of livelihood, medicine, economically, aesthetically, culturally, scientifically and spiritual values.

The rest of the respondent was 28.3% unsatisfied. The evident show that negative perception/attitudes toward biodiversity conservations and tourism development. It also low levels of awareness and concern and hold negative perceptions of biodiversity conservation and tourism.

### Tourism for sustainable development

Respondents from resident toward tourism were captured based on three scale of (Strongly agree, Agree, Disagree) major selected questions. 92% strongly agree tourism development in the areas. It implies that tourism directly or indirectly benefits from local community. Tourism as a desirable supplement for local economy was indicated by most interviewees that perceived positive impacts of the current tourist activities were generally expressed. Tourism was expected to benefit the locals by bringing in economic opportunities, improving living standards, promoting agricultural products, and facilitating cultural preservation.

This conservation trapped tourists who travelled from Bahir Dar to Gondar and other tourist destinations like Semain Mountain Nation Park and push them to spend their time to observe the area as it is has varies aesthetic values which can fell the demands of various tourist even they are being in mass.

International NGO, known as World Vision, PFM and GTZ serves local community to protecting the natural resource, healthcare, clean water, education, distributed alternative energy sources, support poor people, capacity building and to established tourism association on Tara Gedam. This brings up new opportunities for these villages to attract tourists because of the natural beauty of their surroundings. Those NGO contributions very important job opportunity local community. Tourism provides a financial incentive for public sector bodies to protect the natural environment and raise tourists' awareness of environmental issues. Tourism activities involve a special relationship between visitors, the industry, the environment and local communities [19].

## Conclusion

The study indicates that the holistic approach has favored the respect and good care of biodiversity conservation in monastery which built good opportunity for tourism development. These could in addition tourism potential with the landscape of the area, spectacular erected mountain and caves which located within a hundreds of meter radius Biodiversity assessment result shows that the area is rich in plant diversity. Total of 6343 individual thirty-seven different species was recorded. Among those plant species *Olea europaea* (477) individual was the dominant one then follows *Allophylus abyssinicus* (433) and *Albizia schimperiana* (387). The area is not any home of plant. And also contain variety of species including birds and mammals. In field observation there are a number bird species are frequently seen. The result indicated local community has a positive attitude toward biodiversity conservation and tourism development. The community directly/indirectly benefit from the tourism creates employment opportunity to local tour guides, small shops and handicraft selling for tourist.

## Recommendation

As the result shows most of the tourist have not information about the area but they like it. This indicates that there is lack of promotion about the tourism potential of the area. So, responsible body shall promote the area to increase tourism number and there stay. This promotion campaign could be by using offices calendars, large billboards, social Medias with full stands. If there could be tourist facility like guest houses and restaurants or cafeteria or lodges and other related services tourist may stay for days rather than hours. These can create good job opportunity for the local community and can help for sustainable biodiversity conservation in the area. Tourism can actually be the very reason for protecting environmental and natural resources and can be beneficial to the natural environment by providing a motivation for conservation [20].

## Acknowledgment

I would like to express my special thanks to OMICS INTERNATIONAL Journal, Deber Tabor University, Mr Hailu Menale, Mr Berhanu Debela and Department of Forestry, starting from the beginning of this research up to accomplishment.

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