



# ECOTOURISM DEVELOPMENT AS A TOOL FOR SUSTAINABLE ENVIRONMENTAL CONSERVATION AND ITS IMPLICATION TO COMMUNITY LIVELIHOOD: THE CASE OF THE SHEKA BIOSPHERE RESERVE, SOUTH WEST ETHIOPIA

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## Abstract

**Purpose of the study:** The majority of Ethiopian are engaged in agricultural activities that contributed to natural resource degradations. Ecotourism is an alternative option while achieving the conservation goals of protected areas. This study was conducted with the objective of identifying ecotourism development opportunities as a tool for future environmental conservation and its implication to community livelihoods in Sheka Biosphere Reserve.

**Methodology:** using survey questionnaires, document analysis, and field observation. To that end, information was collected and analyzed from 120 household heads living around the Biosphere reserve using a structured questionnaire. In addition, focus group discussions and key informant interviews were used. Field observations were held for recording ecotourism potentials using digital camera and GPS. The data collected by the above methods were analyzed using SPSS version 21.

**Main Findings:** The findings revealed that Sheka Biosphere reserve is endowed with attractive landscape scenery, fauna and flora and indigenous culture of the local community, which are the existing potentials for ecotourism development in the area, whereas, the current status of ecotourism development is at the lower stage as compared to its potentials. Soil fertility reduction, market problems, and the absence of ecotourism activities were the major socio-economic problems of the local community.

**Social Implications/Applications:** Ecotourism development as a tool for sustainable environmental conservation and its implication can be useful for community livelihood.

**Novelty/Originality of this study:** This study has shown that introducing ecotourism and development of infrastructures are central strategic directions for sustainable management of the Biosphere Reserve.

**Keywords:** *Ecotourism, Community Livelihood, Biosphere Reserve, Environmental Conservation.*

## INTRODUCTION

Tourism is one of the leading and the fastest-growing industry considered as one of the main economic sectors in the world ([Teresa, 2015](#)) and it plays a significant role to the economic development of many developing countries ([Torres & Momsen, 2004](#)) by serving as major sources of foreign exchange exceeding 80% of their total earnings ([Mequanint and Gebremedhin, 2015](#)).

Besides its economic role in the sectors has a negative environmental impact on the destination areas due to mass tourism ([Hastings, 2014](#)). Since, in the 1990s, the tourist's concern for environmental issues has increased and ecotourism emerged as an alternative form of tourism to reduce the environmental impacts and to maintain the socio-cultural welfare of the local community of the attraction areas ([Holden, 2009](#)) which obtained the attention of developing countries due to its contribution of conservation and economic development ([Pookhao, 2014](#)).

Wildlife tourism is also influential in the conservation use balance of nature and provides historical interaction by improving the economic wisdom of tourism ([Cetin and Sevik, 2016](#)). Protected areas are established to preserve the natural ecosystems and associated life features important for ecotourism attraction with the sense of nature and cultural visitation which has a big influence on wildlife tourism. Environmental education is vital in imparting an inherent aspect of nature amongst society, which enhances public environmental awareness ([UNESCO, 2014](#)). Management and planning of ecotourism are very important for the protection of ecotourism areas by supporting geographic information systems to determine suitable ecotourism areas ([Cetin, 2015](#); [Cetin, 2016](#); [Cetin and Sevik, 2016](#)).

Recently, most of Ethiopia's conservation areas experience threats and environmental degradations that alternative livelihood options like ecotourism are not practiced in an inadequate manner ([Bayou and Bedane, 2014](#)). However, ecotourism is still in its infancy since the country has not benefited the most output from its resources ([Eshetu, 2014](#)) and its contribution as socioeconomic and environmental aspects is low compared to the neighboring countries ([Dejene et al., 2014](#)).

The Sheka Forest Biosphere Reserve is part of Southwest Ethiopia lies within the Eastern Afromontane Biodiversity Hotspot and comprises one of the larger continuous stretches of forest left in the country which was recognized as man and biosphere reserve by UNESCO to conserve biocultural diversity and its sustainable use of natural resources (Matthias et al., 2016).

Even though Ethiopia has huge potential for tourism, the contribution of the tourism sector to the country's GDP is limited and its natural and cultural resources are exposed to degradations (Azage, 2013). Though the objective of Sheka biosphere reserve is to improve natural resources management of the reserve, its natural resources are being damaged due to increased conversion to monoculture plantations (Bedru, 2007).

Moreover, there were inadequate scientific studies carried out on identifying ecotourism potentials and challenges for generating empirical evidence contributing to developing nature-based tourism in the area. Therefore, the objective of this study was to identify ecotourism development as a tool for sustainable environmental conservation and its implication to community livelihood, the case of the Sheka biosphere. So, this study is focused on basic research questions: 1) what are the natural and cultural potential for ecotourism development, 2) what is the current status of tourism development in the study area, 3) what are the implications of socio-economic conditions of the society around the biosphere reserve, and 4) what are the major constraints for practicing ecotourism in the study area?

## MATERIALS AND METHODS

### Description of the Study Area

The study was conducted in the Sheka zone in the southwest of Ethiopia. The Sheka zone lies between  $7^{\circ}24' - 7^{\circ}52' N$  Latitude and  $35^{\circ}13' - 35^{\circ}35' E$  longitude, 676 km southwest of Addis Ababa. The altitude ranges between 900 and 2700 m above sea level and it receives a high amount of rainfall with an average of 1800–2200 mm annually. The Sheka Forest Biosphere Reserve covers a total area of 238,750 ha of forest, bamboo thickets, wetlands, agricultural land, rural settlements, and towns (MELCA, 2005). It covers a unique biogeographic unit extending from cold and very wet highlands rich in plant and animal species (Matthias et al., 2016) bordering with Illuababora zone of Oromya National Regional state and Kafa zone of Southern nation, nationalities, and peoples regional state to hot lowland areas bordering Gambela regional state and the Bench-Maji Zone of Southern nation, nationalities, and peoples regional state.

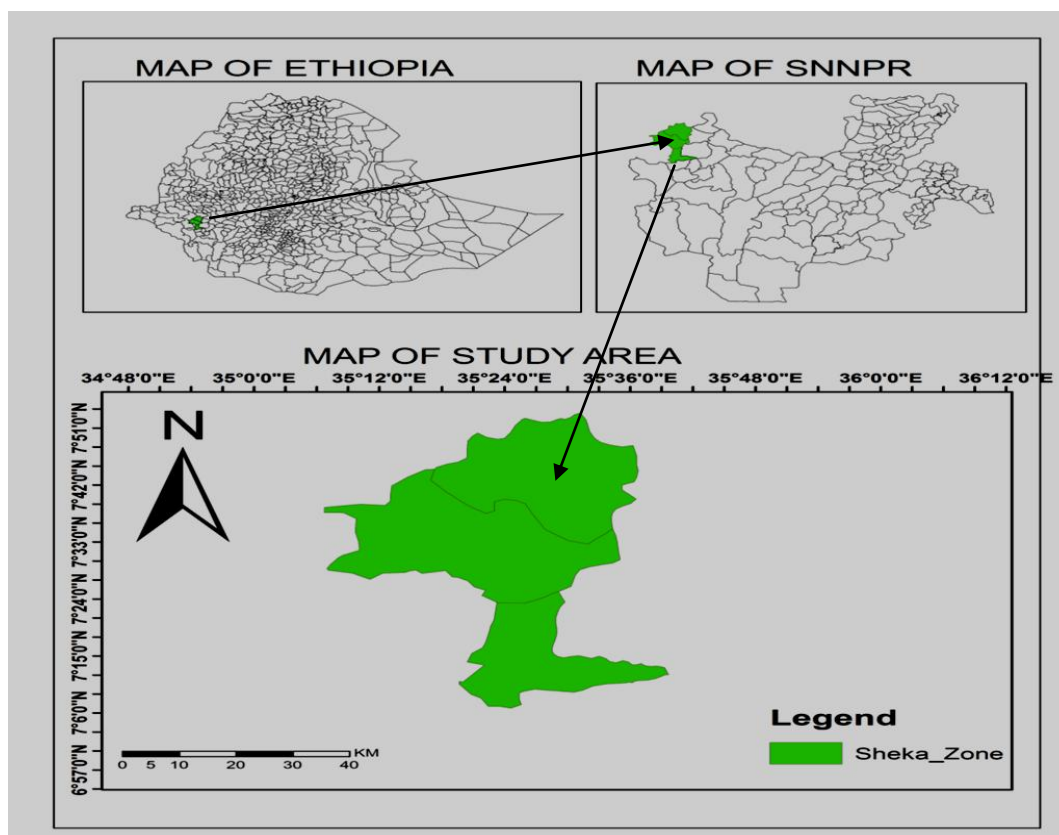


Figure 1: Location of the Sheka Forest Biosphere Reserve

Source: Authors

**Sample site selection, sampling design, and sampling methods**

Sheka Biosphere reserve was selected for this research because it is one of the remaining forest resources and recently established as a biosphere reserve in Ethiopia (Matthias et al., 2016). Out of 57 kebeles (villages) located within three woredas of Sheka Zone namely Masha, Andracha, and Yeki, six villages bordering the Biosphere reserve that have direct impacts on the reserve which were Depichinegawa, Yokichichi, Gebina, Tugiri, Yepo, and Karina were selected purposively. However, the households were identified by using a simple random sampling technique. The sample size was determined by a simplified formula as used by (Yamane, 1967; cited in Kasunic, 2005). This simplified formula assumes a 95% confidence level and the maximum variance (p = 0.5). The formula is:

$$n = \frac{N}{1 + N(e)^2} \dots\dots\dots (Kasunic, 2005).$$

Where: n -is the sample size, N -is the population size, e -specifies the desired level of precision, where e = 1-precision (0.05 limit of tolerable error) level of precision= 9% (0.09).

From 6 Kebele having 3353 household heads, finally, 120 household heads within the selected villages were included in the study. From community members of each village, 120 households were selected using systematic sampling methods.

**Methods of Data Collection and Data Analysis**

Different types of structured questionnaires (involving both closed and open-ended questions) for household surveys were used for data collection. To obtain more useful and detailed information, as well as for triangulation of information gathered through the household survey, Focus Group Discussions (FGDs) selected participants from all levels of job hierarchy were held and sixteen tourists were also included on voluntary bases.

In addition, six elders were selected purposively as key informants to provide supplementary information about ecotourism resources, and other potentials as well as existing challenges for the promotion of ecotourism in the area. Direct observation supplemented by digital photo camera, Global Positioning System (GPS), binocular, and bird guide books were also used for gathering primary data. Also, the camera trap was conducted for wild animals which were difficult for direct observations in the reserve.

Data collected using the above methods were analyzed with the help of Statistical Package for Social Science (SPSS version 21) cited by (Woyo and Slabbert, 2020). Accordingly, descriptive statistics such as percentages and frequencies were used for depicting socio-economic data of the respondents, and responses were compared using the chi-square test and t-test to indicate the responses were closely related or not including a tourist survey. The presentation and reporting of field observation data and the secondary data were supported by actual tables and photographs, in addition to text narrations.

**RESULTS AND DISCUSSIONS**

**Demographic and Socio-economic characteristics**

The type of demographic situation experienced in a certain area has an impact on its natural resources. The following table 1 shows the major demographic situations of the peoples near the Sheka Biosphere Reserve.

**Table 1:** Background Information of sampled Respondents (N=120)

		N	%
<b>Household head</b>	Male	101	84.2
	female	19	15.8
<b>Sex</b>	Male	102	85
	female	18	15
<b>marital status</b>	married	93	77.5
	single	8	6.7
	divorced	10	8.3
	widowed	9	7.5
<b>Literacy level</b>	illiterate	27	22.5
	able to read	49	40.8
	primary school	35	29.2
	secondary school	9	7.5

<b>language</b>	shekinonoo	59	49.2
	Amharic	14	11.7
	Shekinonoo and Amharic	31	25.8
	others	16	13.3
<b>Residency</b>	Less than one year	1	0.8
	less than 5 years	7	5.8
	six up to 10 years	15	12.5
	more than 10 years	97	80.8

Source: Authors

The primary economic activity of the respondents was mixed farming (64.2%), followed by crop production (40%), animal husbandry (35.8%), and bee farming (26.7%) (Figure 2).

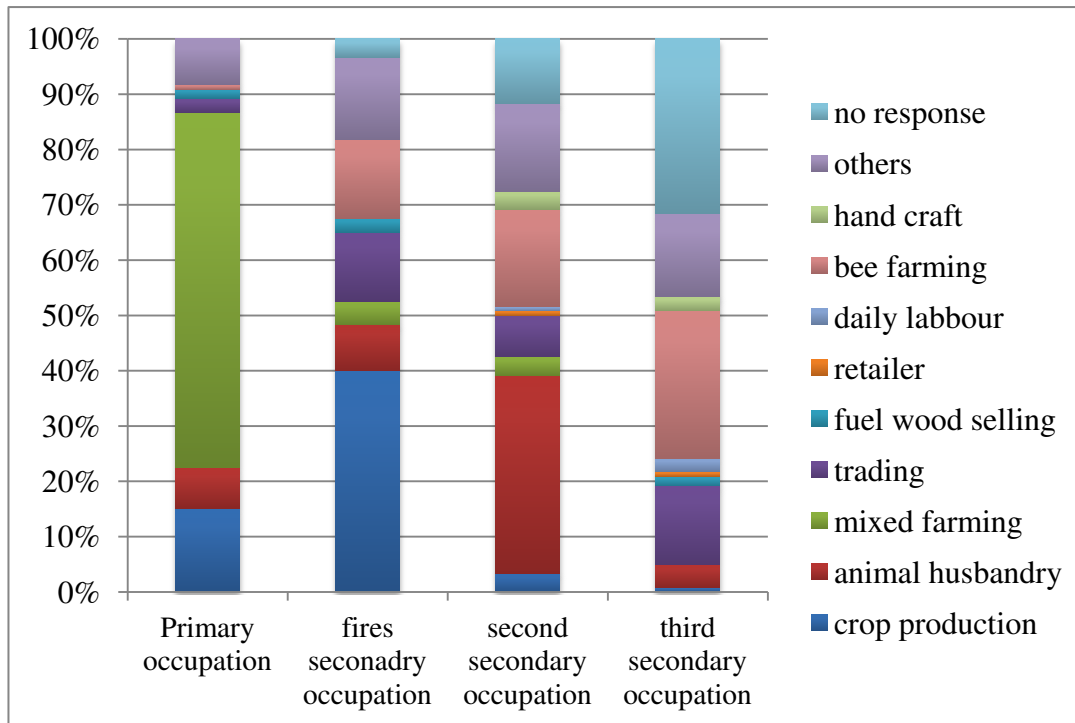


Figure 2: proportions of households in different economic activities (N=120)

Source: Authors

### Current status of Tourism

The study indicated that tourists visiting Sheka Biosphere reserves were from different countries including Belgium, Indian, Italy, France, Netherland, Norway, and the Philippines (Table 2). Most of their occupational backgrounds included academia, government service, and the tourism service industry. Additionally, the primary objectives or purposes of visits by the tourists were for giving volunteer services (37.5%) followed by a combination of leisure, research, and volunteer services, which accounts for 25%, and finally for leisure and research each with 18.8% (Table 2). The purpose of their visit to Sheka Biosphere reserve varied significantly ( $\chi^2 = 34.286$ ;  $p < 0.005(.001)$ ), with most tourists visiting the area for the first time. The ecotourism activities in and around Sheka Biosphere reserve was largely fauna and flora based. From sampled respondents of tourists (37.5%) identified fauna and flora as their primary attractions to the area, with combinations of all (flora, fauna, landscapes, waterfall and caves, and others) placed next potentials to visit followed by landscape viewing and waterfall and caves that shares 12.5% and 18.8% respectively. During the interview, all of them were interested to pay for recreational values of the destination areas with attractive attributes of species diversity, bird spotting or watching, landscape viewing, and other attractions such as sunset, lake, waterfalls, and caves.

**Table 2:** General information of sampled Foreign Tourists

Information required	Responses	Frequency (%)	Chi-square (X <sup>2</sup> )	Degree of freedom (df)	P-value	Sample size (N)
Nationality	Belgium	4(25%)	112.00	5	<0.000	16
	France	1(6.2%)				
	Indian	2(12.5%)				
	Italy	2(12.5%)				
	Netherland	1(6.2%)				
	Norway	1(6.2%)				
	Philippines	1(6.2%)				
Educational background	High school	2(12.5%)	30.048	21	>0.005(.091)	16
	Bachelors	3(18.8%)				
	Masters	7(43.7%)				
	PHD	4(25%)				
Occupation	Academics	13(81.2%)	13.077	14	.520	16
	Business	0				
	tourism service industry	1(6.2%)				
	Government	2(12.5%)				
Purposes of visitation	Leisure	3(18.8%)	34.286	9	<.001	16
	Research	3(18.8%)				
	Volunteer	6(37.5%)				
	Combination	4(25.0%)				
Duration of stay	2 days	5(31.2%)	27.200	21	.164	16
	3 days	4(25.0%)				
	4 days	2(12.5%)				
	More than 4 days	5(31.2) %				
Frequency of visitation	Once	10(62.5%)	26.800	14	.020	16
	Twice	3(18.8%)				
	More than 2 days	3(18.8%)				
Attributes of attractions that tourist were willing to visit	Fauna and flora	6(37.5%)	45.067a	21	<.002	16
	Landscape	2(12.5%)				
	waterfall and cave	3(18.8%)				
	Combination	5(31.2%)				

Source: Authors

### Major Natural Features as Ecotourism Potentials

Ecologically the forest vegetation of the Sheka biosphere reserve is an attractive forest with Afromontane rainforest and transitional rainforest types. The two forest types have many species in common. The characteristic species of the Afromontane rainforest are a mixture of broadleaved tree species including *Pouteria adolfi-friederici*, *Syzygium guineense*, *Polyscias fulva*, *Olea welwitschii*, *Diospyros abyssinica*, *Manilkara butugi*, *Cordia africana*, *Trilepisium madagascariense*, *Croton macrostachyus*, and *Schefflera abyssinica*.

The characteristic species unique to the transitional rainforest include *Aningeria altissima*, *Anthocleista schweinfurthii*, *Campylopermum bukobense*, *Celtis philippensis*, *Celtis zenkeri*, *Croton sylvaticus*, *Dracaena fragrans*, *Elaeodendron buchananii*, *Eugenia bukobensis*, *Ficus exasperata*, *Garcinia huillensis*, *Manilkara butugi*, *Morus mesozygia*, *Phoenix reclinata*, *Strychnos mitis*, *Trichilia dregeana*, *Trilepisium madagascariense*, and *Vepris dainellii*. These Afromontane and transitional rainforest is also home for different mammals, amphibians, and birds.

In this study, 39 natural caves, 70 waterfalls, and 1 Mountain Lake have been identified (Figure, 3). Using camera traps and direct observation, it was identified some mammals and birds of the area. These mammals were *Hystrix cristata* (porcupine), *Cercopithecus aethiops* (Chlorocebus), *Cercopithecus mitis* (blue monkey), *Cercopithecus neglectus* (De Brazza's monkey), *Papio Anubis daguera* (baboon), *Colobus guereza* (colobus monkey), *Tragelaphus scriptus* (Menel'bushbuck), *Redunca*

*redunca* (Bohorreed buck), *Leptailurus serval* (serval), *Sylvicapragrimmia* (Common duiker), *Civettictis civetta* (African civet), *Panthera pardus* (leopard), *Orycteropus afer* (aardvark), *Viverridae sanguineus* (shelmitmat) (Figure 4).

There were also common bird species having conservation importance that were identified in Sheka biosphere reserve during the study. These bird species include *Oriolus monacha* (Abyssinian black-headed oriole), *Bucorvus abyssinicus* (Abyssinian groundhornbill), *Turdus piaggiae* (Abyssinian ground thrush), *Dendropicos abyssinicus* (Abyssinian woodpecker), *Alcippe abyssinica* (African hill babbler), *Lybiud guifsobalito* (banded barbet), *Agapornis taranta* (black winged lovebird), *Francolinus leucoscepus* (chestnut naped francolin), *Nectarinia olivacea* (olive bellied sunbird), *Rougetius rougetii* (Rouget's rail), *Apusmyioptilus* (scarce swift), *Cinnyricinclus sharpie* (sharpe's starling), *Cossypha niveicapilla* (snowy headed robin chat), *Poeoptera stuhlmanni* (stuhmann's starling), *Tauraco ruspolii* (white checked turaco), *Poicephalus flavifrons* (yellow fronted parrot), *Bostrichina caruculata* (wattled ibis), *Cyanochen cyanopectera* (blue winged goose), *Parophasma galinieri* (Abyssinian cat bird), *Parus leuconotus* (white backed backlit), *Onchoganthus albirotris* (white billed starling), and *Carvus crassirostris* (thick billed raven).

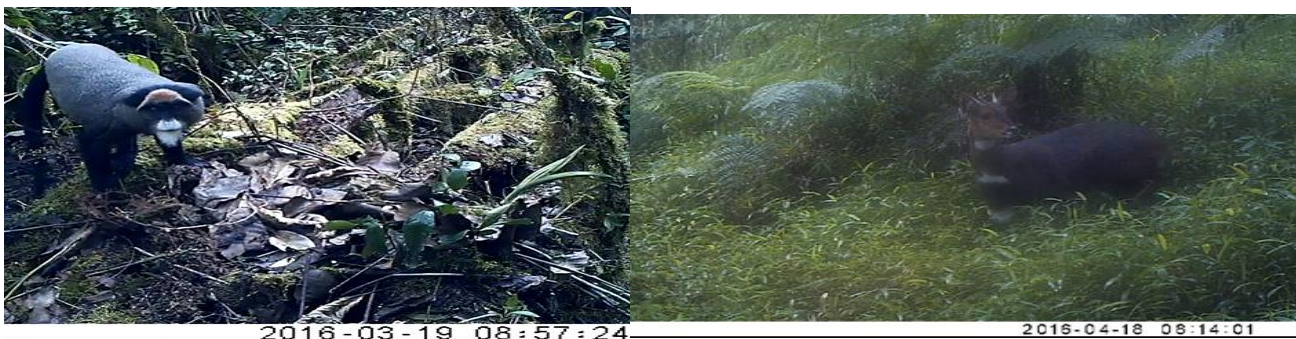


A. The view of the largest cave (Shekisheko waterfall and cave)



B. Gandochi Lake in Anderacha woreda

**Figure 3:** Some Fascinating Sceneries of the Sheka Biosphere Reserve (picture by Biniam, 2019)



A) *Cercopithecus neglectus* (De Brazza's monkey)

B) *Tragelaphus scriptus* (bushbuck)



C) *Panthera pardus* (leopard)



D) White checked Turaco



E) Rails

**Figure 4:** Some Mammals and Birds found in Sheka Biosphere Reserve (source: Sheka zone culture, tourism, and sports department)

#### Cultural Ecotourism Resources in Sheka Biosphere Reserve

Information from key informants and FGD participants indicated that in addition to the natural features, there are also huge potentials of local arts, handicrafts, tools, cultural dances, unique lifestyle of the indigenous community, distinctive cultural patterns, and cultural festivals that can contribute for promotion of ecotourism in the area (Figure 5).



A) An old man showing cultural song

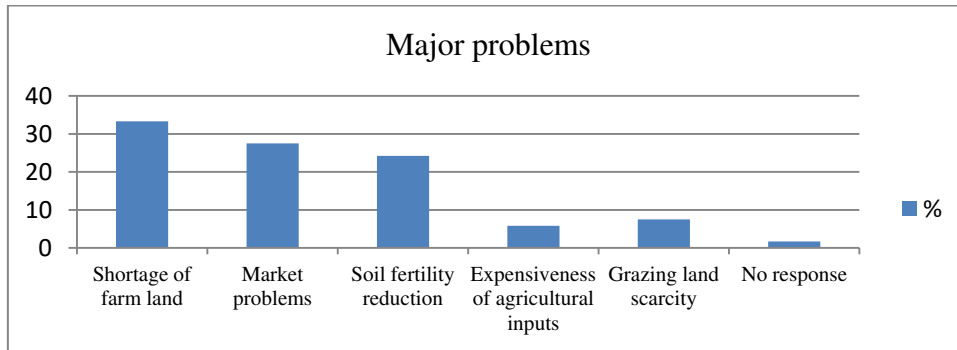
B) Cultural houses

C) Cultural beekeeping

**Figure 5:** Some of the Cultural Ecotourism Resources around Sheka Biosphere Reserve (source: Sheka zone culture, tourism, and sports department)

### Major Challenges of Ecotourism Development in Sheka Biosphere Reserve

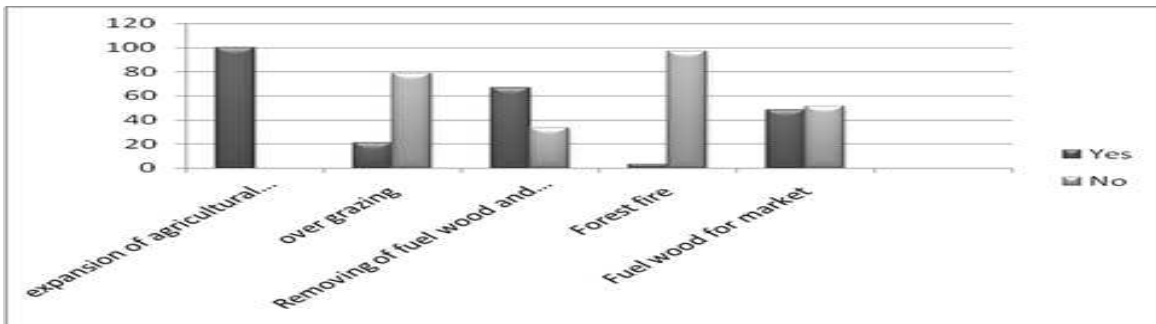
Out of the sampled households, a shortage of farmland (33.3%) and soil fertility reduction (27.5%) were identified as their primary and secondary problems followed by market problems for their products (24.2%) (Figure 6). These agriculture-related problems were identified as major challenges for ecotourism development in the area as they affect people's livelihood and result in encroachment to the biosphere reserve and pose some threats (such as deforestation, wildlife depletion through illegal hunting, etc.) to biodiversity conservation of the reserve.



**Figure 6:** Major Problems of the local community on agricultural activity (N=120)

Source: Authors

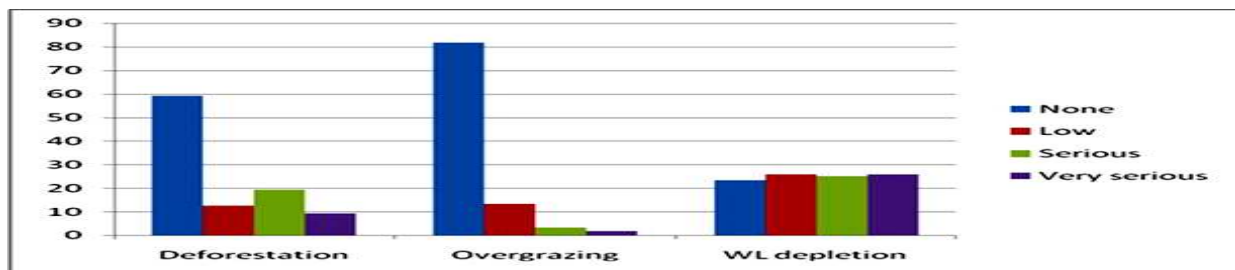
Out of the sampled households, 27.5% agreed that the size of the forest has been decreasing in the last five years. Different factors were identified as causes for the decline of the forest cover in the area. From there, expansion of agricultural activities toward the forest (100%) and collection of fuelwood and construction woods for domestic consumption from the forest (67%) have been reported as major causes followed by fuelwood collection for the market (48.5%), overgrazing (21%) and expansion of settlement in the forest (18%). The impacts of forest fires were not identified as critical problems (Figure7).



**Figure 7:** Responses on size and causes of destruction of Sheka forest in the last five years

Source: Authors

Regarding the challenge of natural resource degradation triggered by the aforementioned agriculture-related problems, the level of deforestation and wildlife depletion in and around the Sheka Biosphere Reserve was at serious and very serious levels respectively (Figure 8). There were significant difference among sites (kebeles) ( $t=11.564, p<0.05(0.00)$ ).



**Figure 8:** Views of Respondents on the level of Natural Resource Degradation in and around Sheka Biosphere Reserve (N=120)

Source: Authors



The survey result showed that diverse natural resource features are the main ecotourism attractions in the area. These resources include fauna and flora, as well as the beautiful scenery of the landscapes, Lakes, and waterfalls. In addition, the attractive local cultures, and indigenous knowledge of the community are also other important potentials for ecotourism development in the area. Therefore, it can be concluded that the study area has huge potentials for future ecotourism development. This has an implication that the existing ecotourism potentials in and around Sheka Biosphere Reserve can attract tourists and may contribute to the improvement of conservation of natural resources of the biosphere reserve. Determining tourism potential has significantly positive effects on landscape plants, forest areas, and protected areas ([Sevik et al., 2015](#)). [Bemanian and Ferial \(2013\)](#) also acknowledged that protected areas have been established to protect natural attractions and ecosystems in relation to economic, socio-cultural, and historical conditions as well as values of natural areas and landscapes.

The cultural sites identified by the community for different rituals, religious and traditional ceremonies that include gudo (religious ritual sites), checho (wetlands), dedo site (large trees under which prayer or religious ceremony is conducted); dero (lake) sites, and rivers are also other cultural eco-tourism amenities of the study area.

It was observed during the study that the landscape of Sheka biosphere reserve is characterized by undulating topography, and is highly dissected by several streams, which drain into the Baro, Akobo, and Gojeb Rivers. The topography of the area and amazing peaks like Getiba, Gay, and Gandhi nearby Yokichichi Kebele that are covered with dense forest are attractive sites for tourists. For example, Lake Gnocchi and the surrounding area covered by dense bamboo trees situated at 08203'05" N and 07670'98" E at an elevation of 2544 meter that is located in Andracha woreda and Shekiskeyo waterfall and cave, situated at 08640'41" N and 07689'45"E at an elevation of 2161 meter were high potential for attracting tourists.

In addition to this, the cultural activities and cultural products include wedding ceremony, local music and dances, locally produced artifacts, house construction styles, Geno system (traditional conflict resolution), community's traditional lifestyle and cultural foods and drinks, etc., which can be good tourist attraction resources. [Israel and Timar \(2017\)](#) recommended that promoting cultural products will help local communities to create alternative livelihood options and earn income.

The type of economic activity experienced in a certain area has an impact on its natural resources. The primary economic activity of the respondents is mixed farming including crop production, animal husbandry, and bee farming. The major socio-economic problems of the local communities can have an impact on the management of the resource of the Biosphere Reserve. Accordingly, the shortage of agricultural land, soil fertility reduction, and market problems were the critical socio-economic problems of the local communities in the study area, which have resulted in natural resources degradation. Deforestation, wildlife depletion, and overgrazing are the major challenges for ecotourism development in the area. Due to these problems and population pressures, further farmland expansion and encroachment to the biosphere reserve are threatening its biodiversity conservation that would have contributed to the socio-economic development of the people through ecotourism. ([Odede et al., 2015](#)) indicates the necessity of wise natural resources use through ecotourism development that stimulates economic development, social wellbeing of the people and at the same time preserves the natural environment and cultural heritage of the areas with limited agricultural. [Magio et al., \(2013\)](#) also recommended that to make use of the existing ecotourism opportunities, focusing on particular ecotourism questions of the areas is necessary as ecotourism development.

Almost one-third of the respondents agreed that the size of Sheka forest has decreased over the last five years with cumulative effects of agricultural expansion, removal of fuelwood, and construction woods as the major ones. Among the natural resource degradations, the levels of deforestation and wildlife depletion in and around the Sheka Biosphere Reserve were at serious and very serious levels respectively. There were significant difference among sites (kebeles) ( $t=11.564$ ,  $p<0.05(0.00)$ ). The rate of deforestation has been aggravated in recent years in the study area due to the increased rate of conversion to agriculture and monoculture plantations of coffee and tea ([Woldemariam and Fetene, 2007](#)). [Workaferahu \(2015\)](#) also showed that the problems of forest coverage in the study area were directly linked with the expansion of rural settlement and tea plantation.

Although the problem of natural resources degradation resulting from various socio-economic activities is the major challenge in the area, it can be addressed through developing ecotourism as alternative means of local people's livelihood as the area has got huge potential for ecotourism. [Aynalem \(2016\)](#) also acknowledged that if alternative livelihood opportunities are created to local peoples by ecotourism development, it has a significant role to address conservation problems which can result in promoting positive relationships among peoples and their environments.

In addition to the existing natural features and cultural attractions of Sheka biosphere reserve for ecotourism development, its international recognition as a world biosphere reserve is also another opportunity. The fact that it has got a global legal status and recognition by UNESCO as a world heritage can contribute a lot to the increasing flow of tourists to the area. [Temesgen \(2015\)](#) recommended that improving the livelihood of communities by integrating with concepts of ecotourism will make natural resources more valuable to local people.



## CONCLUSION AND RECOMMENDATIONS

Although there is a great potential for ecotourism development in the biosphere reserve, so far no adequate effort has been made for developing the required tourism infrastructures. [Ray et al., \(2015\)](#) underline that Physical infrastructure is one of the basic development catalysts in tourism industries of destination area by determining the accessibility and quality of a site. Therefore, the existence of the natural and cultural resources alone as potentials for ecotourism development for the area is not adequate unless tourism infrastructures, which are necessary for providing required services for tourists are given due emphasis by the concerned stakeholders. [\(Aynalem and Simane, 2016\)](#) acknowledged that governments, private enterprises, local communities, and NGOs should play their role in developing tourism infrastructure. On the other hand, enhancing agricultural production and productivity for smallholder farmers through appropriate interventions should be emphasized in order to discourage agriculture-related threats to the biodiversity of the biosphere reserve. Moreover, proper enforcement of environmental policies and laws for controlling illegal investment activities in the biosphere reserve is required.

## LIMITATION AND STUDY FORWARD

Financial, field material and time constraints were some limited the study only to in and around sheka Biosphere reserve though it shares boundary with Mejeg, Kefa and Illuababora zones. Stakeholders from above zones will not be included due to the aforementioned problems.

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## AUTHORS CONTRIBUTION

The main contributions of first authors (Biniam Assefa) was proposal development, data collection, data analysis and final result interpretation. The second author (Ferede Meseret) was also contributed his role as data collector and editor.

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