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Research Article

Ecotourism potentials and development in Kaffa Biosphere Reserve: A case study of Gimbo Woreda, Ethiopia

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Abstract: *Kaffa Biosphere Reserve is rich with varied types of tourist attractions, which give the area a great potential for cultural and educational tourism. The study attempted to examine the ecotourism potential and development in the Kaffa Biosphere Reserve Area, Ethiopia. For this purpose, a total of 218 sample respondents were selected for interviews in three local districts by using a simple random sampling method. The Weighted Sum Method tool was used among various tools of Multi-Criteria Decision Methods for assessing the tourism potentials of the study sites. In addition, questionnaire and key informant methods were used to assess the attitudes and perceptions of local communities towards ecotourism potentials in the area. Data was analyzed descriptively using frequencies and percentages, while inferential statistical analysis was done using the chi-square test. The study had confirmed that the Kaffa Biosphere Reserve is endowed with high potential of tourism attractions in areas of biodiversity, socio-cultural and physical resources. The findings showed that the mean score for attitudinal statements about local people's involvement in ecotourism development activities was 3.10. However, a slightly lower proportion disagreed with the same statement that local people were not involved in tourism development. The proportion of respondents also showed a significant difference (χ^2 =96.114, df =1, p=0.00<0.05) in their perception of whether the biosphere can serve to enjoy people or not. In addition, the level of awareness on tourism resources in the area was significant (χ^2 =60.457, df =1 p=0.00<0.05) among respondents.*

Keywords: Biosphere reserve, Destination development, Ecotourism potential, Multi- Criteria Decision
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1. Introduction

Tourism is one of the most promising drivers of growth for the national economy (WTO, 1995), and is considered an activity essential to the life of nations (Khan, 1997; Alisa and Ridho, 2020). In line with this, ecotourism represents one of the key pillars of tourism with the potential to generate social benefits for local communities. It can also empower and strengthen economic, social, and cultural aspects of the society (Scheyvens, 1999). Empowerment can be brought about by the capacity building and community development that supports sustainable ecotourism development (Stronza and Pêgas, 2008). In Ethiopia, ecotourism development has emerged as a sustainable form of tourism, and linking tourism development with poverty reduction is increasingly

considered as a strategic driver of per capita GDP growth (World Bank, 2006; Asfaw *et al.,* 2020).

Ethiopia possesses numerous tourist attractions, varied in type and appealing to a wide range of interests (Asefa, 2020; Aseres and Sira, 2021). The attractions include historical, cultural, archaeological, anthropological, scenic, climatic, therapeutic, as well as flora and fauna resources. Such a unique combination of attractions within a single country has no match on the African continent, or rarely anywhere else in the world (Martin and del Bosque, 2008). The most common tourist destination of the country could be nature-based and human-made sites such as Semien Mountains National Park, Bale Mountains National Park, Rock-hewn Churches of Lalibela, Fassil Ghebbi, Lower Valley of the Omo, Axum, Tiya, Lower Valley of the Awash and the fortified historical town of Harar Jugol (Berhanu, 2003; Solomon, 2023). Apart from these, the country is endowed with diverse ecotourism potentials, including the spectacular mountains that are almost untouched by climbers, numerous lakes of great appeal to tourists, rich birdlife, wildlife, vegetation, colourful ethnic groups, historical churches and monasteries, unique geological features, caves, as well as local arts and artifacts. These constitute some of the major ecotourism resources of the country (Henze, 2007; Aratuo and Etienne, 2019). However, ecotourism development was not fully recognized at the grass root level in the country (Woldu, 2018; Fakana *et al*., 2019; Gebreyesus, 2022). In addition, studies on the potential of ecotourism and the challenges are critical for the country in order to establish ecotourism destinations as a sustainable option in the tourism industry.

Few studies had been carried out in the Kaffa Biosphere Reserve, mainly on forest resources (Ali, 2020). However, there has been no empirical study done on issues pertaining to attitudes and perceptions of local communities towards activities and benefits of ecotourism in Kaffa Biosphere Reserve. In addition, ecotourism potentials identification and development were untouched in the area. Thus, based on these research gaps, the objective of this study was to identify the ecotourism potential and development of the Kaffa Biosphere Reserve area in Gimbo Woreda, Southern Nations, Nationalities and Peoples' Regional State.

2. Materials and Methods

2.1. Description of the study area

Geographically, the study area is located between 7^0 20' to 7^0 40' N latitude and 35^0 48' to 36^0 14' E longitude. Gimbo Woreda is bordered by Oromia Region in the north, Decha Woreda in the south, Chena and Gewata Woredas in the west and Adiyo Woreda in the east (Figure 1). It is 436 and 706 km from Addis Ababa and Hawassa, respectively. The area includes an array of rural settlements, traditional land-use patterns and sites of cultural and natural significance. Main economic activities in the area were dominated by agriculture and other sectors include services and tourism, manufacturing and trade.

The Kaffa Biosphere Reserve has an extremely diverse topography ranging from 1020 m.a.s.l to 3350 m.a.s.l, with its lowest point eastwards of Gojeb and its highest mountain range south of Kaka . The latitudinal variation results in extreme slope gradients, ranging from the flat lowlands (south of Konda in the Gojeb wetland) to extremely steep areas. As a result of these, the climate of the area varied considerably across the area. The study area receives rainfall almost all year round. From March to September, the mean monthly minimum rainfall received was 100 mm. The mean monthly rainfall in mm as observed in Bonga Station is shown in Figure 2.

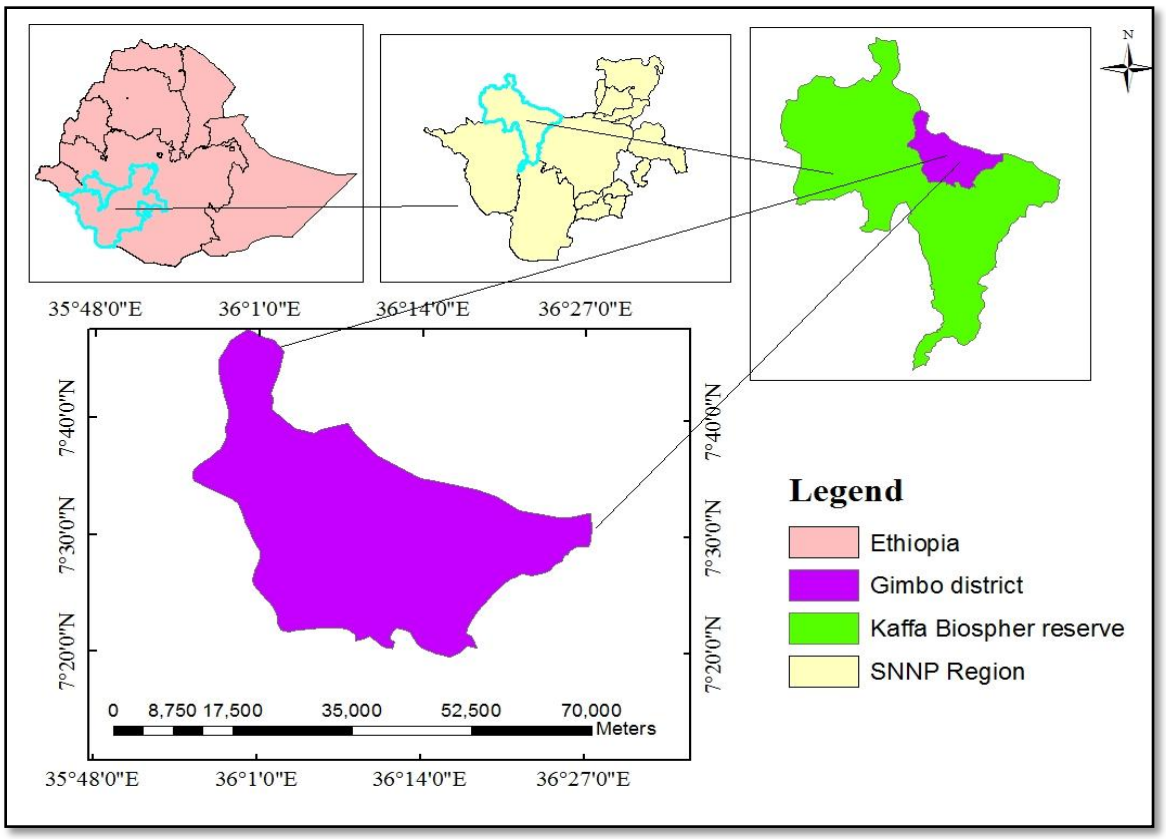

Figure 1: The map of the study area

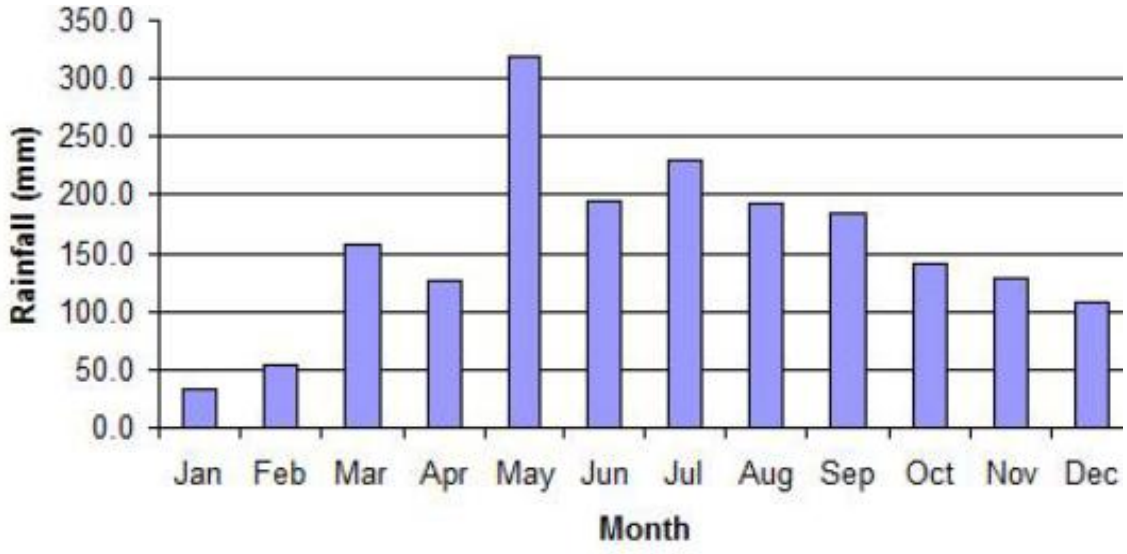

Figure 2: Mean monthly rainfall (mm) of Gumbo Woreda (2010-2018)

2.2. Temperature

The mean monthly temperature ranges between 18 and 21°C. From January to March, the difference between mean minimum and mean maximum temperature recorded increased, but gradually lower in April. The mean monthly Minimum, Average and Maximum Temperature, as observed in Wushwush Station, is presented in Figure 3.

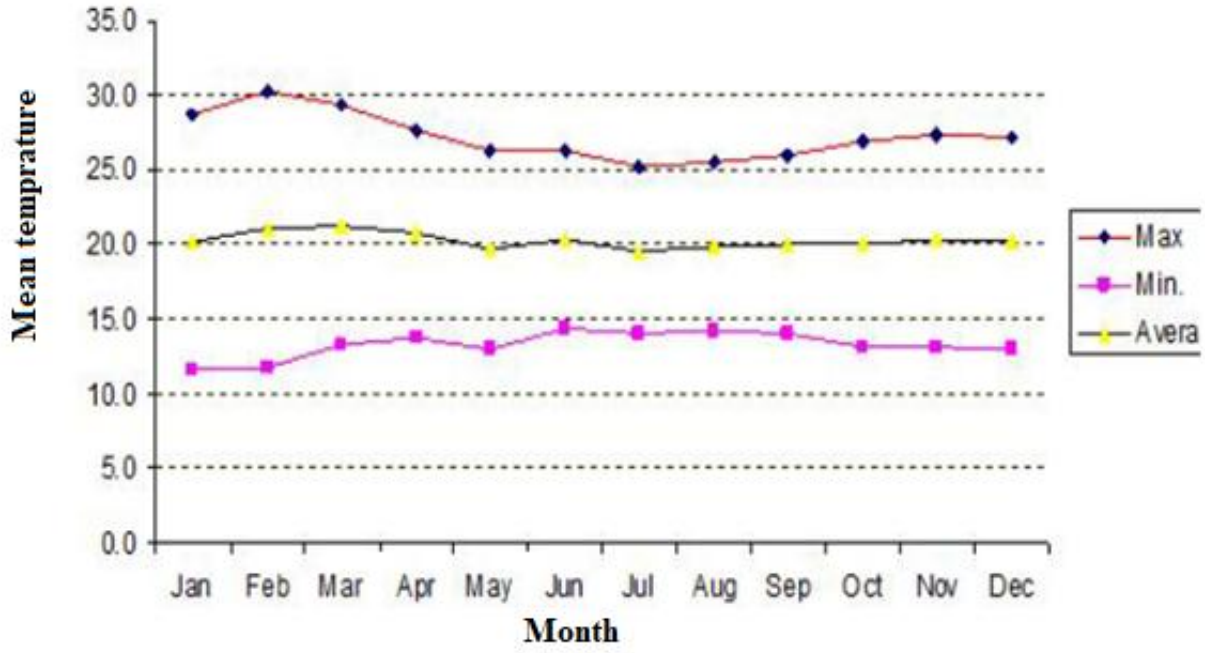

Figure 3: Mean monthly minimum and maximum temperatures (°C) of Kaffa Biosphere Reserve (2010-2018)

2.3. Floristic composition and wildlife

Of the total biosphere reserve, around 1.2% (8,360 ha) was very steep terrain covered by tropical mountain moist forest (Mengistu *et al*., 2022) and plantations (80%). But 12% of this Landscape was also covered by agriculture. All other steep areas were Savannah or covered by bush-land. The biosphere reserve consists of many indigenous plant species and small to large mammal species. The area is an important site for in-situ conservation of biological diversity. The main characteristics of forest species include *Albizzia gummifera, Syzygium guinnennense, Allophyllus abyssinicus, Schefflera abyssinica, Draceaena afromontana, Celtis africana, Chionanthus mildbraedii, Erythrococca trichogyne, Olea welwitschii, Vepris dainelli, Grewia ferruginea, Cyathea manniana,* and *Ficus* spp. It is also a home to wild coffee and other non-timber products that the local community uses for their livelihoods. It is home to an abundance of wild animal species, including the black and white colobus monkey, lions, leopards, wild cats, De Brazza's monkeys, bush pigs and antelopes such as the reed buck and duiker.

3. Sampling Design and Data Collection

The biosphere reserve includes different districts including Adiyo, Bita, Chena, Cheta, Decha, Gesha, Gewata, Gimbo districts and Bonga town where Gimbo district was selected purposively. From this woreda three sites, such as Uffa, Wushwush, and Shetta were selected purposively based on their ecotourism potentials. The ecotourism potentials were identified using field site observation and secondary information. Simple random sampling was used to select respondents for interviews and questionnaires.

3.1. Sample size for household questionnaire

The total number of household heads in this woreda is 18,224. From this figure, the researcher used 10% of HH heads to get a constant sample to determine the number of individual heads of household from each sample local district. The constant sample size for the HH interview was determined based on Cochrane's (1977) equation indicated below.

$$n = \frac{z^2 pq}{d^2}$$ ----------[1]

Where

n = the required sample size (when population is >10,000)

Z = 95% confidence limit (=1.96)

P = the proportion of the population to be included in the sample, which is 10% (0.1) of the population.

q = 1-P = 1-0.1 (= 0.9)

d = margin of error (= 5% = 0.05); accordingly:

$n = \frac{(1.96)^2 * 0.1 * 0.9}{(0.05)^2}$ = 3.842*0.1 * 0.9 / 0.0025

n = 0.346 / 0.0025

n = 0.35/0.0025 = 140

The total number of HHs in the three sampled district was 536 in Uffa, 622 in Wushwush and 689 in Shetta, respectively (Tezera, 2008). The sample size of each district was then determined using the proportional probability to size (PPS) method to make equal representation of HH in each district based on Israel (1992)

$ni = \frac{nNi}{\sum N}$.

Accordingly, the sample size of:

Uffa district = n_1= (536*140)/1847 = 41
Wushwush = n_2 = (622*140)/1847 = 47
Shetta = n_3 = (689*140)/1847=52
N_{total} =140

3.2. Methods of d**ata** c**ollection**

In order to determine the awareness, attitudes and perception of local communities towards ecotourism potentials and development in Kaffa Biosphere Reserve, we used both a questionnaire survey and focus group discussions. The questionnaire survey had both open and closed-ended questions. Open-ended questions apply to responses from the respondents on various issues related to awareness of ecotourism potentials in the area. Open-ended questions also enabled respondents to give their varied views based on their experiences and thoughts. On the other hand, close-ended questions were used to apply responses based on the Likert scale. The respondents were asked to respond to each of the statements given by choosing answers based on the five-point Likert scale. The responses about the perception and attitude of respondents were determined by the mean score method. Factors above 2.5 were strong factors and accepted, while those that score below 2.5 are regarded as weak factors. In addition, we used a focus group discussion and key informants in order to triangulate and enrich the questionnaire data, and for this purpose a pre-designed semi-open-ended questions were used for gathering information.

For assessing the tourism potential of the study sites Weighted Sum Method (WSM) tool was selected among various tools of Multi-Criteria Decision Methods (MCDM). Four steps, as explained below, were performed following the methodology of Mamun and Mitra (2012).

Step 1: Level-1 Attributes and Weight (Wi) Assignment

Three broad aspects, namely physical, socio-cultural and environmental aspects, have been considered as level-1 attributes for assessing tourism potential. The assignment of weights was worked through an expert opinion survey. So, three different weights were considered in the first stage (Wp for physical, Ws for socio-cultural and We for environmental).

Step 2: Level-2 Attributes and Weight (wj) Assignment

Each aspect of level-1 has a set of variables considered as level-2 attributes. These sets were explained hereunder.

1) Physical (Wp) aspects include landscape features, Transport infrastructure (road), Banking service, Telecom service, Electricity service, Accommodation service**,** Caves, and Natural hot springs were level-2 physical attributes.

2) Socio-cultural (Ws) Traditional handicrafts, Religious sites, Cultural songs of the ritual, Traditional New Year festivals, Indigenous ritual practice, Cultural dances, Cultural food making, Traditional building, cultural dressing, New Year festivals and Religious sites were level-2 socio-cultural attributes

3) Environmental (We) aspects are the probability of the Site's suitability, Air and water quality, Beautiful scenery, Openness of the landscape view, and Existence of flora and fauna.

Every respondent was asked to rank the attributes (1, 2, 3 …n)

Step 3: Intra-Attribute Scaling

The level of quality or service for each attribute may not be similar for all the sites. Depending upon variations in quality/quantity, each attribute is scaled on a 5-point scale. For scaling, 1 refers to the worst/weakest quality and 5 indicates the best/strongest quality. For computation, the lowest value was considered as 0.20, followed by 0.40, 0.60, 0.80 and the highest being 1.

Step 4: Computation of Aggregate Potential Value

Total Potential (V) = Potential Value for Physical Aspects (Vp) + Potential Value for Socio cultural Aspects (Vs) + Potential Value for Environmental Aspects (Ve).

Respondents from selected local districts suggested their ranking on physical, socio-cultural and environmental aspects as prescribed. As per opinion, weights (Wi) for physical, socio-cultural and environmental aspects were considered as 0.40, 0.40 and 0.20, respectively. The attributes under socio-cultural, physical and environmental aspects were selected from a list through opinion surveys.

3.3. Data analysis

Descriptive statistic was used to analyse responses to the questionnaires and interviews to come up with results and discussions. Data obtained from different sources were processed, presented and interpreted by using appropriate statistics such as Chi-square and data collected through questionnaires, such as age, sex and educational status of the respondent, were coded, analyzed, and relationships between variables were derived using cross-tabulation. Descriptive statistics were used to determine frequencies and percentages, while inferential statistical analysis using the chi-square test was used to determine whether awareness among the respondents was significantly related with variables such as variables such as age and educational level.

4. Results

4.1. Awareness of the local community about the ecotourism resources

Nearly 82.3% of the respondents replied that the natural tourism resources were the most abundant ones in the area (Table 1). But part of the respondents also replied that there were historical and cultural resources in the study area that could have a high power of attraction for both the local and international visitors.

The level of awareness about the presence of the natural tourism resources in the area varied significantly between respondents who replied ‘yes’ and those who replied ‘no’ (χ^2 =60.457, df =1, p=0.00<0.05). Moreover, the awareness of the respondents for the presence of cultural and historical tourism resources in the area also showed a statistically significant variation (χ^2 =83.314, df =1, p=0.00<0.05). Furthermore, the proportion of respondents showed a significant difference in their perception of whether the biosphere can serve as a place for enjoying people or not (χ^2 =96.114, df =1, p=0.00<0.05) (Table 1).

Table 1: Local community response towards ecotourism potentials

Awareness Questions	Response	Frequency	(%)	χ2, df,p
Are there natural tourism resources in the locality that can attract visitors?	Yes	116	82.3	χ^2=60.457
	no	24	17.7	df=1,p<0.05
Are there cultural and historical tourism resources?	yes	124	88.5	χ^2=83.314
	no	16	11.5	df=1,p<0.05
Are you interested in ecotourism activities or diversified livelihoods?	yes	125	89.2	χ^2=86.429
	no	15	10.8	df=1,p<0.05
Are there historical caves or heritages in this Biosphere reserve?	yes	124	88.5	χ^2=83.314
	no	16	11.5	df=1,p<0.05
Is there a guesthouse?	yes	134	96	χ^2=117.029
	no	6	4	df=1,p<0.05
Is there any place that makes people enjoy in this Biosphere reserve?	yes	128	91.4	χ^2=96.114
	no	12	8.6	df=1,p<0.05

4.2. Ecotourism resources and products in the Gimbo Woreda

The socio-cultural attribute in Wushwush showed that the traditional handicraft had a high scale of value, which was 0.8, while the defense site as an attribute has the lowest scale value (Table 2). It indicated that in this study site (Wushwush), traditional handicrafts had a great potential to attract tourists, and thus, socio-cultural attributes had a significant impact on tourism activities in the area. However, the defense site has the lowest potential to attract tourists which might be due to its nature of attractiveness for visitors. In line with this, among the physical attributes in Wushwush transport infrastructure, or road has a high scale of value, which was 1.0. In addition, this site had a significant scale of value of site suitability, which had a value (0.8) of tourist destination as a component of environmental attributes (Table 2).

Among physical attributes, natural forest had the highest scale of values, which was 0.6 when compared to other mentioned physical attributes of the Shetta local district (Table 3). The lowest potential attribute in this site was a natural hot spring, which had a scale of value 0.2. In socio-cultural attributes, indigenous ritual practices had the highest scale of value, which was 1.0, as compared to the defense site, which had a scale of value of 0.2. Among the environmental attributes of Shetta local district quality of air and water had the highest scale of value 0.6, while site suitability had the lowest scale of value 0.2 (Table 3).

Table 2: Attributes under socio-cultural, physical and environmental aspects in Wushwush

Site name	Attributes and ranks		Weights	Grade (quality)
Wushwush	**Socio-cultural attributes**			
	Rank1	Traditional handcrafts	0.4[4/10]	0.8
	Rank2	Religious sites	0.3[3/10]	0.6
	Rank3	Cultural songs of the ritual	0.2[2/10]	0.4
	Rank4	Defense sites	0.1[1/10]	0.2
	Cumulative value=1+2+3+4=10			
	Physical attributes			
	Rank 1	Transport infrastructure (road)	0.3[6/21]	1.0
	Rank2	Banking service	0.23[5/21]	0.9
	Rank3	Telecom service	0.2[4/21]	0.8
	Rank4	Electricity service	0.14[3/21]	0.6
	Rank5	Accommodation service	0.1[2/21]	0.4
	Rank6	Clean water service	0.04[1/21]	0.2
	Cumulative=1+2+3+4+5+6=21			
	Environmental attributes			
	Rank1	Site's suitability	0.33[5/15]	0.8
	Rank2	Air and water quality	0.3[4/15]	0.6
	Rank3	Rivers	0.2[3/15	0.4
	Rank4	Openness of the landscape view	0.13[2/15]	0.2
	Rank5	Existence of flora and fauna	0.5[1/15]	0.2
	Cumulative=1+2+3+4+5=15			

Table 3: The attributes under socio-cultural, physical, and environmental aspects, Shetta

Site name	Attributes and ranks		weights	Grade (quality)
Shetta	**Physical**			
	Rank1	Natural forest	0.4 [4/10]	0.6
	Rank2	Accommodations	0.5[3/10	0.8
	Rank3	Caves	0.2[2/10]	0.4
	Rank4	Natural hot spring	0.1 [1/10]	0.2
	Cumulative=1+2+3+4=10			
	Socio-cultural			
	Rank1	Indigenous ritual practice	0.22 [8/36]	1.4
	Rank2	Cultural dances	0.2 [7/36]	1.02
	Rank3	Cultural food making	0.2 [6/36]	1.01
	Rank4	Traditional building	0.13 [5/36]	1
	Rank5	cultural places	0.11 [4/36]	0.8
	Rank6	new year festivals	0.1[3/36]	0.6
	Rank7	Religious sites	0.05 [2/36]	0.4
	Rank8	Defense sites	0.02 [1/36]	0.2
	Cumulative=1+2+3+4+5+6+7+8=36			
	Environmental			
	Rank1	Quality of air and water	0.5 [3/6]	0.6
	Rank2	Variety of traditional arts and handcrafts	0.33 [2/6]	0.4
	Rank3	Site suitability	0.2 [1/6]	0.2
	Cumulative =1+2+3=6			

Table 4: The attributes under socio-cultural, physical and environmental aspects in Uffa

Site name	Attributes and ranks		Weights	Grade(quality)
Uffa	**Physical**			
	Rank1	Transport infrastructure(road)	0.25 [7/28]	1.2
	Rank2	Banking service	0.21 [6/28]	1
	Rank3	Telecom service	0.2 [5/28]	0.8
	Rank4	Electricity service	0.14[4/28]	0.6
	Rank5	Accommodation service	0.1 [3/28]	0.4
	Rank6	Clean water service	0.1 [2/28]	0.4
	Rank7	Electricity service	0.03 [1/28]	0.2
	Cumulative = 1+2+3+4+5+6+7=28			
	Social			
	Rank1	Religious sites	0.5 [3/6]	0.6
	Rank2	Cultural songs of the ritual	0.33 [2/6]	0.4
	Rank3	Traditional New Year festivals	0.2[1/6]	0.2
	Cumulative=1+2+3=6			
	Environmental			
	Rank1	Site's suitability	0.3 [6/21]	1.2
	Rank2	Rivers	0.23[5/21]	1
	Rank3	wetlands	0.2 [4/21]	0.8
	Rank4	Openness of the landscape view	0.14 [3/21]	0.6
	Rank5	Existence of flora and fauna	0.1 [2/21]	0.4
	Rank6	A variety of traditional arts and handicrafts	0.04 [1/21]	0.2
	Cumulative=1+2+3+4+5+6=21			

The potential values for the socio-cultural aspects of the three sites, such as Wushwush, Shetta, and Uffa, were quantified as 0.12, 0.20, and 0.09, as shown in Table 5. The potential value for the physical aspects of above mentioned sites was; 0.44, 0.29, and 0.33, respectively. The potential value of the environmental aspect is another attribute that was considered in this study and the potential value of the environmental attribute of the three sites is 0.24, 0.18, and 0.35.

Although the three sites hold high physical potential, the lack of socio-cultural attributes made it relatively low-grade tourism potentials, the absence of cultural resources keeps its potential behind. In line with this, the socio-cultural potential value quantified in Table (5 in Uffa showed the least value, which is 0.09. This is due to improper maintenance of the cultural heritage, cultural intermixing, and lack of awareness of the community that pushed the aspects of tourism behind. On the environmental aspects, the three sites have moderate potential value.

The environmental aspects in the three sites are good, and there are certain areas where there is a need for improvements. In contrast to low socio-cultural potential, Uffa has a high environmental potential value, scaled at 0.35, than other sites in Table (5. Similarly, Wushwush had the highest physical potential value, which was 0.44, compared to other sites. This is because the site is rich in infrastructural facilities (Table 5).

Sites	Potential attributes			
	Vp	Vs	Ve	Vt
Wushwush	0.44	0.12	0.24	0.8
Shetta	0.29	0.20	0.18	0.7
Uffa	0.33	0.09	0.35	0.8

Vt= Vp +Vs+Ve where; Vt = total potential value of specific site, Vp = Aggregated potential value of physical attributes, Vs = Aggregated potential value of social attributes Ve = Aggregated Potential value of environmental aspects.

4.3. Awareness of the local community about the ecotourism resources

The majority of the respondents agreed with the statement that local people were involved in tourism development activities within and around Gimbo Woreda (Table 6). The mean score for attitudinal statements about local people's involvement in ecotourism development activities was 3.10. However, a slightly lower proportion disagreed with the same statement that local people were involved in tourism development. Therefore, the mean score for attitudinal statement about "the area has high ecotourism potential" shown in Table 6 was 4.15.

Table 6: Perception and attitude of the respondents about ecotourism potentials and development

Attitudinal statements	SA	A	Nr	D	SD	Total	Mean score
The area has high ecotourism potential	42	58	18	12	10	140	4.15
Local people are involved in ecotourism development activities	48	52	16	14	10	140	3.10
Natural resource potentials have higher attraction core than other ecotourism potentials	70	31	16	4	19	140	4.33

SA = strongly agree; A = Agree; Nr = neutral; D = Disagree; SD = strongly disagree

5. Discussion

Identification and development of ecotourism potentials are fundamental steps in recognizing nature-based tourism as a viable option for self-sustaining livelihoods for local communities. Ecotourism destination development is an alternative off-farm strategy that enables to creation a diversified livelihood options for the local community in biosphere reserve areas.

In the present study area, sites like 'Wushwush' exhibited the highest scale values for the socio-cultural attribute, indicating the site's diverse traditional handicrafts and their considerable potential to attract tourists. This finding suggests that socio-cultural attributes had a significant impact on tourism activities in the area. However, the defence site had the lowest potential to attract tourists, and this might be due to its limited nature of attractiveness for visitors. Similarly, Neupane *et al.* (2013) and Amoiradis *et al*. (2021) stated that the socio-cultural value of destination sites is a substantial attribute to attract tourists, and the destination might be positively influenced by the travellers towards acknowledging the differences in the socio-cultural outlook of the local community.

However, the second site, "Shetta" local district, consists of many indigenous plant species and small to large animal species. The area was an important site for in-situ conservation of biological diversity as well as an important site for tourism development. Similarly, Chernet **(**2008) stated that the forest comprises a diverse plant and wild animal species that are important for a nature-based tourism activity in the area. The site is also a home for wild coffee.

These and other tourist attraction attributes favour tourists' influx in the area. Furthermore, SCBD (2004) had reported that biodiversity resources are one of the comprehensive components of tourism developed in local community areas that help achieve more sustainable development.

In terms of socio-cultural potential, the 'Shetta' local district demonstrated strong indigenous ritual practices, which contributed as a substantial potential for tourism activities in the area. In line with this, Wolde-Mariam (2017) had highlighted indigenous ritual practices such as '*Baaree Qoco',* a ceremony commemorating one's father's or grandfather's beliefs, conducted either under a big tree or within a house through covering the pillar of the house by '*Naaxxacho'* trees, *i.e.,* a young tree with succulent leaves. This ritual, associated with the practice of '*Afaallo* ', *i.e.,* the ceremony of purification, within the Biosphere reserve, played a great role in enhancing the site's attractiveness for tourism activities. Similarly, Wolde-Gebriel (1992) stated that the father's feast, *i.e.,* cultural songs and dances of the ritual, is considered spiritual and cultural practices that serve as a socio-economic significance for the local communities in the area.

In addition, the local ceremony of 'Qoollee Deejjoo' ritual was another ritual scarification ceremony held twice a year at the beginning of January and September. These periods were a major tourist attraction season for both the local and international visitors. In line with this, Wolde-Mariam (2017) stated that the ritual practices, accompanied by cultural songs, dances, lyrics and poems, were used as a means of conserving the sacred forest and need to be preserved by the Kafficho society. During these ritual periods, a huge gathering of local communities as well as tourists is observed in the area every year.

In the 'Shetta' local district, local handicrafts and products serve as a complement for tourism activities in the area. Similarly, WTO (2002) stated that the local products of tourist destination areas can serve as complementary elements to tourism apart from major components such as transport, excursions /tours and accommodations. In addition, Hana (2022) reported that traditional craft and artworks provide job creation opportunities for the artisans and serve as a means of income generation, thereby improving their living standards and playing a great role in tourism development in the area. Dutta (2015) had also reported that traditional craft can have a collective expression of a destination that has a significant contribution of the host community in tourism development and activities.

In the third site, Uffa local district, transportation had the highest scale of value among other physical attributes. This might be related to the proximity of the area to the zonal capital, where infrastructural development was easily expanded. In addition, this local district (Uffa) had high access to a high-standard road stretched from Addis Ababa to Gimbo town. However, electric services in the area had the least scale of value since electric service had already been provided in the study site. Furthermore, 'Uffa' local district had potential tourism supporting infrastructures like good banking service, telecom service, electricity service, accommodation service, clean water service and transportation. These infrastructures were well developed with the highest attribute scale of values. Similarly, Erduran *et al*. (2012) stated that ecotourism activities need to be accessible and able to meet the basic needs of visitors. In general, the area had rich biotic and abiotic resources. The different rivers with aquatic biodiversities like different species of fish, hippos and birds could be potential for ecotourism destination development in the area.

The three local district sites hold high tourism potential even though some constraints hinder the development of tourism in the area. Among them, 'Uffa' local district showed the lowest socio-cultural potential value (0.09). This was due to improper maintenance of the cultural heritage, cultural intermixing, and a lack of awareness of the community that limited the role of culture in tourism. On the environmental aspects, the three sites have moderate potential values, with generally favourable conditions but areas requiring improvement. In contrast to its low socio-cultural potential, 'Uffa' had a high environmental potential value (0.35), which was higher than that of the other sites shown in Table 5. Similarly, 'Wushwush' local district had the highest physical potential value, which was 0.44, as

compared to other sites. This was attributed to its well-developed infrastructural facilities.

The mean score value for attitudinal statement on local people involvement in ecotourism development was 3.1, indicating a positive orientation toward participation. The local people in the study area expressed their interest in being actively involved in the decision-making process and to have a voice when decisions are made as a way of ensuring their needs, priorities and interests are considered. This aligns with Tosun (2005) and Kariuki (2013), who emphasise that a meaningful and true involvement of local people requires direct participation in decision-making and management as well as tourism development. In addition, Boyd and Butler (1996) and Tosun (2006) had reported that sustainable natural resource management requires integrating the values and interests of a range of stakeholders. Since local people often have direct interest in local natural resources, their participation in the management and conservation is especially important.

6. Conclusion

Kaffa Biosphere Reserve is one of Ethiopia's richest areas in terms of biodiversity. It harbours diverse wildlife as well as cultural, physical and historical resources. However, despite these abundant resources, local communities have not been able to benefit significantly from them, mainly because there was no quantified assessment of ecotourism potentials". A comprehensive assessment of ecotourism potential has been conducted to support local economic development. The biodiversity reserve includes its exceptional biodiversity (flora and fauna), rich cultural practices and religious heritage, and favourable ecological conditions, all of which can attract both domestic and international visitors. The main strengths of the Kefa Biosphere Reserve include its exceptionally rich biodiversity, rich cultural practices and religious heritage, and favourable ecological conditions, all of which can attract both local and international visitors. Nevertheless, some sites of the biosphere reserve lack adequate tourism infrastructures and services, lack tourist information and are hindered by weak management. To maximise the tourism potential of the area and enhance the livelihood of its inhabitants, promotional activities such as tourism fairs, cultural dances, festivals and events should be carried out at regular intervals, while essential support services like trained scouts and tourist police should be strengthened.

Data availability statement

Data will be made available on request.

Conflict of interest

The authors declared that there is no conflict of interest.

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