



WOLKITE UNIVERSITY

COLLEGE OF AGRICULTURE AND NATURAL RESOURCE

DEPARTEMENT OF WILDLIFE AND ECOTOURISM MANAGEMENT

**THREATS AND ECOTOURISM POTENTIALS OF AREKIT LAKE-IN
GUMMER WOREDA, GURAGE ZONE, ETHIOPIA**

SENIOR RESEARCH PROJECT SUBMITTED TO DEPARTMENT OF
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DECLARATION

The researcher conforms that the study in entitled with “**threats and ecotourism potentials of lake Arekit**” is my original work and is being submitted to Department of Wildlife and Ecotourism management, college of Agriculture and natural resource, Wolkite university in partial fulfillment for the award of BA degree in wild life and Ecotourism management. This research has not been submitted earlier to this and other institution.

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LIST OF ACRONYMS

GDP ----- Gross Domestic Product

NGO ----- Non-Governmental Organization

UNESCO ----- United Nation Educational Sciences and Culture Organization

WNWTO ----- United Nation World Tourism Organization

WWF ----- World Wide Fund

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Abstract

The Study Was conducted to examine or identify Threats and Ecotourism Potentials of Arekit Lake-in Gummer Woreda, Gurage Zone, Ethiopia. Lake is a body of water surrounded on all side by land and Lake Water is standing, meaning, it does not flow. Lakes are among the most fragile environments due to anthropogenic effects alongside natural phenomena that can trigger rapid environmental changes to their ecosystems. The main Objective of the Study Was to Identify: the Ecotourism potentials, to examine major threats, and to identify the constraints of ecotourism development practices in Lake Arekit. The Data were collected by means of both primary and secondary data used questionnaire, interview, and direct field observation. The secondary source of data was used, written and unwritten materials, internet sources, newspaper, and research. The major threats in the study area, Agricultural expansion, Pollution, Irrigation, Dropping of plastics, Invasive plant species like eucalyptus tree and Car washing. Major constraints of ecotourism development practices in the study areas: lack of promotion, lack of infrastructure, low level of community awareness, lack of effective implementation of policy and shortage of budget. The mitigation methods of the problems Creating awareness and giving proper training to all stockholders, to stop car washing, to reduce or minimize agricultural practice and irrigation, to cutting down invasive plant species near the lakes, to formulate rules and regulation, to recognize, promote and conservation practice develop, to increase and facilitate work of ecotourism development activity and also Creates qualified person and management strategy.

Key words: threats, ecotourism, potentials, lake

1. INTRODUCTION

1.1 Background of the study

Lake is a body of water surrounded on all side by land. Lake water is still or standing, meaning, it does not flow. Lakes are among the most fragile environments due to anthropogenic effects alongside natural phenomena that can trigger rapid environmental changes to their ecosystems. For instance, declining lake levels were indicative of climate-driven changes, (Williamson, Saros and ,Schindler., 2009) Soil erosion and sediment deposition as well as pollution from municipal, industrial and agricultural waste are among the major menaces to which lakes are exposed (Lawniczak, Choinki,and Kurzyca., 2011) Severe erosion and sedimentation may result in diminishing lake size and, in some cases, can cause the disappearance of a lake body and induce changes in its fauna and flora population. Because lakes and reservoirs are low points in the landscape, they receive water and sediment inputs from the surrounding terrestrial catchment and the upwind air sheds (Williamson,*et al.*,2009) these inputs can influence the environs positively or negatively and bring about environmental change resulting.

Ethiopia has a number of lakes, most of which are found with in the rift valley, that are central for socio-economic development. Those lakes are classified in to two rift valley and none rift valley lakes. The number of rift valley lakes is around nine to twelve. It found in the central rift valley system. Lake Arekit, which is located about 60 k/m south of Wolkite town. Increasing, they report that salinity is increasing along with chemical and organic pollution from urbanization .The Lake is extremely rich in uni fauna diversity and population than any other water bodies in the country. (Aayneh,Taddese.and.SChandravansh., 2003) Due to lack of intensive research in the rift valley lakes, Ecotourism encompasses two independent issues: the environmental input and the environmental output (Zinabu and Gebremariam., 2002).The environmental input is the primary attractions which are potentials, not the level of service or facilities provided as part of a product package, but the geographical factor that leads the tourist to a particular destination. The environmental output is the overall net global cost or benefit of the tour operation to the natural environment. This is an accounting question, which requires the identification, quantification and summation of all costs and benefits through all potential mechanisms, of which there are many (Buckley R., 2003). Ecotourism is no panacea. It is

important not to exaggerate the opportunities and benefits it can bring. Careful planning and improved knowledge is needed. Ecotourism and responsible tourism should be part of wider sustainable development strategies, whether at a community or an international level (WWF International., 2001). It is important to avoid spending time pursuing ecotourism and raising expectations in circumstances which are highly likely to lead to failure. An initial feasibility assessment should be made before instigating a community based strategy (AsfawA., 2014). Ecotourism, often misconstrued as simply taking a holiday in a nature, watching wildlife, or engaging in an outdoor or adventure sport, is distinguished from conventional tourism in that it employs measures to assure that the negative impacts on the natural and cultural environment are minimized and mitigated (Solomon., 2015). Ecotourism is a conservation tool in and around protected areas that were building environmental awareness and cultural respect (Bushell and Eagles., 2006). Today's protected areas focused on conserving biodiversity and large-scale natural ecosystems. However, these protected areas are facing tremendous challenges (Wearing and Neil., 2009)

1.2. Statement Problem

Lakes globally as well as on the study area have been greatly degrading due to natural and human factors. Physical and biological water quality indicators were affected by various ways. The main causes for the water quality deteriorations are anthropogenic and natural agents (RoessingJ.M., 2004)

Some of the natural and human induced factors which affect the quality of water for various purposes are geology ,hydrology ,natural ,hazards ,sedimentation erosion ,agricultural activity ,industrial ,mining ,fishing ,swage ,discharge dispose, deforestation other commercial activities. Lake Arekit is degrading progressively as a result there is a tremendous influence on the quality and quantity of the lake, biodiversity and environment as a whole. The major problems in the study area are pollution, urbanization, domestic city waste, agriculture expansion and invasive plant species affects the sustainability of Lake Arekit (Elias Dadebo., 2000). There is no further study which related to treats and ecotourism potentials in Arekit Lake. Beside in this area no study has been done issue related to threats and ecotourism potentials in the study area. According to the above problem the researcher motivated to conduct this study.

1.3. Significance of the Study

The research work was beneficial environmental managers as well as policy makers at all levels of the government in showing the challenges and threats of Lake Arekit. This research was help for researcher as source and base line information and also it was create awareness for local communities. The researches was conducting and reducing the problems of Ethiopian lakes to find their solution and also the local communities are equal benefited from the lake resources and this researches also used for well-known for the study areas of Ethiopian ecotourism sites.

1.4. Objectives the Study

1.4.1. General objective

The General Objective of this study was to assess the major threats and Ecotourism Potentials of Lake Arekit, South, Ethiopia

1.4.2. Specific Objectives

- To examine major threats of Lake Arekit
- To identify the constraints of ecotourism development practices around Lake Arekit
- To identify the Ecotourism potentials of Lake Arekit

1.5. Research questions

1. What are the major threats of Lake Arekit?
2. What are the ecotourism potentials in Lake Arekit?
3. What are the constraints of ecotourism development activities around Lake Arekit?

1.6. Scope of the study

The research was conducted in a limited scope regarding with geographical, budget, time and conceptual delimitation. The study was covering a specific area with in Arekit town. Moreover, the study was to assess the major threats and Ecotourism Potentials of Lake Arekit.

1.7. Limitations of the Study

In this study the researcher was faced different challenges. It includes lack of enough sources of information; budget constraint and full materials, some respondents was not concentrate attention for the answer was the main limitation during the study. Besides, Due to time the study were limited to Arekit Town which is considered as representative. Finally, the study is limited on assessment of major threats and ecotourism potentials of Lake Arekit .

2. LITRATURE REVIEW

2.1 Definitions of lakes

A lake is an area filled with water, localized in a basin that is surrounded by land, apart from any river or other outlet that serves to feed or drain the lake. Lakes lie on land and are not part of ocean, and therefore are distinct from lagoons, though there is no official or scientific definition. A lake can be contrasted with river or streams, which are usually flowing. Most lakes are fed and drained by rivers and streams. Natural lakes are generally found in mountainous areas, rift zones, and areas with ongoing glaciation. Other lakes are found in endorhic basins or along the courses of rivers.

A lake is a relative stagnant stretch of water which fills a ground depression. The inflows are: rivers and runoff from the catchment area, atmospheric precipitation and supplied by ground water. The main source of outflow from a lake is: streams, evaporation from the lake surface and ground water. They are a heterogeneous water body with a very wide range of surface areas. Lakes are extremely heterogeneous with their physical and biological features. The largest lakes in the world are: Caspian and Superior. The deepest lake in Africa is: Baikal and Tanganyika. The deepest lake in Ethiopia is Lake Shalla and biggest lake is Tana.

2.2 Major Threats of Ethiopian Rift Valley Lakes

2.2.1. Draining for agriculture

Long term draining interferes with the ecological recovery of the wetland system and will hasten its drying up. In Afar regional state, many areas of wetland have been lost during 1960's due to the increase of irrigation practice in the area (Brylińska, M., 2003). As a result the state has lost many of wetlands from the area.

2.2.2 Over grazing

Over grazing of wetlands is often a last destination for pastoralists during the dry season. Over grazing is a threat when year round grazing excludes ecological recovery period of the wetland which implies loss of biodiversity (Riberio *et al.*, 2008). Compaction of the wetland also has impact on the infiltration capacity of the soil hence affecting the hydrological system and balance of the land itself.

2.2.3 over exploitation of wetland resources

Over exploitation of wetland resources Over-exploitation of wetland resources is now a major threat in several wetland areas of Ethiopia. A good example of over-exploitation is the fishery resource from Lake Ziway in the Oromia Regional State (Genovesi and Shine., 2003). Excessive exploitation of resources can also lead in some cases to a direct collapse of the wetland itself. A good example for this scenario is the collapse of Lake Alemaya. An excessive water withdrawal was believed to be a major cause for the collapse of the lake even though siltation also has played its part's.

2.2.4 Deforestation, siltation and soil erosion

The accumulation of siltation complete change in the ecosystem biodiversity alteration decreases in the water holding capacity and in the worst case the collapse of the wetland itself. Introduction of nonnative plants to the wetland (Kostrzewa and Grabowski., 2003), removal of buffering vegetation and upland forest degradation are the main causes for the loss of vegetation.

2.2.5 Urbanization and industrialization

Due to the abundance of natural resources many urban centers are located near wetlands. Although wetlands are capable of absorbing pollutants from the surface water, there is a limit to their capacity so the primary pollutants; sediment, fertilizer, human sewage, animal waste, pesticides, heavy metals (Stokstad., 2006).

2.2.6 Overfishing Over fishing may result in the loss of some fish species. On Lake Chamo, the 'gancho' net has caused the rapid depletion of Nile perch stocks. Some 70% of the fish landed from the Rift Valley Lakes comes from Lake Ziway alone, suggesting excessive fishing pressure (Kownacki., 2004).

2.2.7 Introduction of floriculture industries

The rift valley in Ethiopia is a hot spot for flower production. Water availability and transport links provide suitable conditions for this industry. One large company Ethiopia now occupies about 300 hectares in Ziway.

2.3 Ecotourism development in lakes

The concept of ecotourism is a new phenomenon to and it is difficult to explain its significance achievement since the approach of ecotourism is not widely disseminated in Ethiopia. The government of Ethiopia also has recognized development and promotion of ecotourism and

provided consultancy services for a number of potential developers of ecotourism sites. Although, developers and policy makers do not properly take the idea of ecotourism, some investors started to involve in development of ecotourism in different regions of Ethiopia. Bishangari Eco-Lodge located at Eastern of Langano Lake in Oromia Region and Village Ethiopia located at Afar Region (Bilen) is examples of these private ecotourism developments in Ethiopia (Theodros, A., 2004) The aims of ecotourism development is to create alternative income generating means ecotourism is to reduce the pressure on the natural resources of land through conducting a pre-feasibility study of proposed areas on the potentials of ecotourism (Tadele, Z., 2002)

2.4 Significance of Ecotourism Development in Ethiopian lakes

Ecotourism, a recent but widely hailed tourism alternative, has high potential to be an instrument for rural economic development and environmental conservation. Role tourism plays in poverty reduction and natural resource management (UNWTO., 2012)

Economic and Social Benefits of lakes: the economic benefits of ecotourism as identified by different scholar (Torres, and Momsen., 2004) include; Employment opportunities: -it brought employment opportunities to often previously disadvantaged people and a significant amount of the industry remains in the form of small scale projects that can be funded by locals. Since the sector is labor intensive, its expansion generates more employment opportunities at semi-skilled, technical and managerial level than an equivalent expansion in other sectors of the economy.

Social Benefits Ecotourism development, in addition to economic and environmental benefits, might contribute socially by enhancing local community esteem and provides the opportunity for greater understanding and communication among people of diverse background. Ecotourism helps for political empowerment of local communities and fosters respect for different cultures (helps to develop tolerance). It is an important vehicle for promoting cultural exchanges (Ademe., 2008) and (Abera., 2016).

Creating new jobs:-tourist expenditures on lodging, transportation, food, guides and souvenirs is an important source of income for local communities by providing supplemental income to rural farmers, women and young people.

Diversifying regional economies: -it is relatively decentralized industry that is highly capable of diversifying regional economies of less developed countries which are dependent of primary activities.

Catalyst for development: -tourism activities act as catalyst for the development of other sectors of the economy, that is, it provides strong forward and backward linkages so that induced macro/micro economic incentives as well as motivations for development in the region. Ecotourism stimulates profitable domestic industries like hotels and other lodging facilities, restaurants and other food services, transportation systems, handicrafts, guide serves etc.

GDP: -ecotourism contribute a great deal of gross domestic product. Foreign Exchange earnings: while tourism is sensitive to the level of economic activity in the tourist generating countries, it provides higher and stable earning for developing countries than those from primary products.

Development of infrastructure: -the benefits accruing from investment in infrastructure and super structure as air ports, hotels and restaurants, road networks, communications, power and water supply as well as other related public utilities are widely shared with other sectors of the economy, resulting in to greater economic efficiency. **Transfer of income:** -tourism is an excellent vehicle for transferring income from wealthy nations and persons to the poorer sections of society. Ecotourism is especially effective in this transfer since travelers often venture in to remote, economically disadvantaged regions

3. Method of data collection

3.1 Description of the study area

Lake Arekit lies at the western side of, the capital of southern nation nationalities and people's regional state (SNNPRS) and one of the water bodies of lakes, Lake Arekit is far from 65km south of Wolkite town and 227km from Addis Ababa in the central part of the Ethiopian rift valley. the coordinates of lake Arekit $75^{\circ} 56'16''\text{N}$ $-38^{\circ} 4'19''\text{E}$. lake Arekit is bordered on the southeast by the silt'e zone , on the southwest by Geta , on the northwest by Cheha , and on the north by ezha and found in Gumer woreda. Towns in Gumer include Arekit and k'ebul. Geta and alicho werero woredas were separated from Gumer. Bodies of water in this woreda include Lake Arek'it, after which the town was named.

3.2. Source of Data

Both primary and secondary data used for this study. The primary data was collect by using questionnaire and interview from, tourism office and the local community and direct field observation. The secondary source of data was includes any related documents, written and unwritten materials, internet sources, newspaper, research.

3.3 Data Collection Methods and Procedure

Document analysis, interview, questionnaire, and observation are going to be employed so as to collect data for the study area.

3.3.1 Questionnaire: First questionnaire was prepared for interviewing the respondent. This research data collection method will be used for the data collection from local community, tour guide, and tourism office. Local community is the major part of research and they know about the challenge of the lake.

3.3.2. Interview: For the interview method key informant, local community, fishery man and tourism employee is to interview. Research was gathered in depth information from individuals through face to face.

3.3.3. Field Observation: This method of data collection was used in order to identify the challenges and ecotourism potentials of Lake Arekit. Furthermore, it is very important to get

deep understanding about the conditions of the resources in the lakes and used to identify the challenges that encountering the study area as well as to collect real accurate data from the field through directly. By this method the researcher was able to distinguish the essential mitigations of the threats of Lake Arekit.

3.4. Sampling Technique and sampling size

This study was employed to purposive sampling techniques so as to address the stakeholders' issues in the study area. The rationale behind the choice of this design and technique is because the issue needs great detail identification of the problem raised at the selected site. A purposive sampling technique was used to 90 households from those 40 respondents who were perceived to be aware of detailed points raised during the survey and to select surroundings near the lakes of arekit. For the sake of clarity it is important to explain some terms. The total sample from the total population of the study area is based on the formula adapted from (Israel, 1992): $n=N/1+N(e)^2$

Where, n= the sample size required

N= the total population size

e = the level of precision which is = ($\pm 10\%$)

3.5. Data Analysis

After the data collected through the questionnaire and interview the researcher analysis will be made. The researcher used both qualitative and quantitative data analysis methods. The data obtained through the questionnaire was analyzed using descriptive statistics, especially was subjected to table in the form of numbering and percentages. However, the information gained through the interview was analyzed qualitatively using word-based method by categorizing similar themes together.

4. RESULT

4.1. Demographic characteristics

According to the following table 1, 62.5% (25) of the respondents male and 37.5 % (15) of the respondents that female. Further indicate the respondents replied that found in the age between (18-25), are 25%(10) of the respondents in the age between (26-35), 50%(20) of the respondents in the age between (36-45), 15%(6) greater than 45, 10%(4).- Regarding to educational level 25%(10) of the respondents that replied that illiterate, 37.5% (15) of the respondent are literate , 1-4 level of the respondents are no, 5-9 22.5% (9), >10 educational level are 15% (6).-In marital status indicators 40 %(16) of respondents are single, 60 %(24) of respondents were married.

Table: 1 Demographic characteristics of sampled population (n=40)

Demographic character	Section	No of respondents	Percent (%)
Sex	Male	25	62.5
	Female	15	37.5
Age	18-25	10	25
	26-35	20	50
	36-45	6	15
	>45	4	10
	Total	40	100
Education status	Illiterate	10	25
	Literate	15	37.5
	1-4	---	-----
	5-9	9	22.5
	>10	6	15
Marital status	Single	16	40
	Married	24	60

Source: personal survey, 2019

4.2. Major threats of Lake Arekit

According to the respondent during data collection the major threats of in the study area, was reported by from tourism office Agricultural expansion 10(25%), of the respondents that was Pollution 9(22.5 %), Irrigation 8(20%), Dropping of plastics 6(15%), Invasive plant species like eucalyptus tree 5(12.5%), Car washing 2(5%) based on threats or problem levels are listed the above tables.

Table: 2. Major threats of Lake Arekit

Threats	No of respondents	Percent (%)
Agricultural expansion included over grazing	10	25
Dropping of plastics	6	15
Pollution	9	22.5
Irrigation	8	20
Car washing	2	5
Invasive plant species like eucalyptus tree	5	12.5

4.2.1. Agricultural expansion, irrigation and Invasive plant species

According to field observation and interview surveys, agricultural expansion is increased near and around the lakes; the local community is used for fertilizers and pesticides. After they used the fertilizer and pesticides inter in to the lakes then after the pesticides directly affect the aquatic species like zooplankton and phytoplankton finally the aquatic species will be disappeared or extinct from that environment.

According to field observation and interview surveys, Irrigation and drainage have often been associated with a loss of water quality caused by salt, pesticides and fertilizer runoff and leaching, Irrigation water is applied to supplement natural precipitation or to protect crops against freezing or wilting. Inefficient irrigation can cause water quality problems. In arid areas, for example, where rain water does not carry minerals deep into the soil, evaporation of irrigation water can concentrate salts. Excessive irrigation can affect water quality by causing erosion, transporting nutrients, pesticides, and heavy metals, or decreasing the amount of water that flows naturally in streams and lakes. It can also cause a buildup, a toxic metal that can harm

water fowl reproduction. According to the information's during data collection from culture and tourism office above five farmers are worked for irrigation.

Invasive plants are plant foreign to an ecosystem. Invasive plant species have significantly changed the lakes ecosystem. These changes greatly affected the Economy, health and wellbeing of the people that rely on the system for food, Water and recreation. According to the respondent most of the lake is affected by eucalyptus tree meaning the roots of the plant have high capacity to absorb water, besides the leaf of the plant is directly enter to the lake then it results for the drying of the lake.



Figure1; over grazing in the study area (photo by Antehunegn, 2019)



Figure 2, Invasive Plants of Eucalyptus Tree in the Study Area (Photo by Antehunegn, 2019)

4.2.2. Pollution

Pollution is the introduction of contaminants in to the natural environment that causes adverse changes of wildlife, wildlife habitats and related with human health are affected. Major forms of pollutions are listed below along with the particular contaminants. Such as air pollution, soil contamination, light pollution, plastics pollution and water pollution. But the lake is mainly affected by dropping of plastics from the environment.

A. Dropping of plastics pollution

Dropping of Plastics involves accumulation of plastic products in the environment that adversely affect the wildlife, wildlife habitat and aquatic species like zooplankton and phytoplankton especially aquatic bird species and also human beings.



Figure 3 Dropping of Plastics in the Study Area (Photo by Antehunegn, 2019)

B. Waste Pollution

Means the discharging of waste water from the domestic sewage and chemical contaminants into surface water including agricultural runoff like fertilizer, pesticides and including human feces from open defecation and dead organism sewages.



Figure 4, pollution by dead organisms (photo by Antehunegn, 2019)

C. Car washing

Car washing is also one of the major threats of lake Arekit. When a car is washed on a water surface, like in a driveway or in a parking lot, the soap, detergent, automotive fluids, oil, and roadway dirt that gets rinsed from the vehicle goes straight into nearby storm drains. These storm drains lead directly to lakes, streams, and bodies of water in the Puget Sound area. This contaminated runoff, even runoff containing biodegradable soap, can cause significant harm to aquatic plant life, fish, and other animals. In short, something as seemingly harmless as a car wash can cause serious damage to local water quality.

4.3. Major constraints of ecotourism development practices in the study area

There are some constraints related to ecotourism developments practice in Lake Arekit.

Table 3 Constraint of ecotourism development in Lake Arekit

According to the following table 3 majority of 30% of respondents the major **constraints** of ecotourism development practice in the study area are lack of promotion and the least **constraints** are Lack of effective implementation of policy and management 10% **covered**.

Constraint of ecotourism development in lake Arekit	No of respondents	Percent (%)
Lack of infrastructure to reach the destination	8	20
Shortage of budget in Gummer Woreda culture and tourism Communication Office	6	15
Lack of effective implementation of policy and management	4	10
Low level of Community Awareness	10	25
Lack of promotion	12	30

4.3.1. Lack of infrastructure to reach the destination

To develop tourism activities in one area firstly infrastructure must be full fill, like:-road, hotels, telecommunication, lodge, electricity and different accessibility due to those reason the tourism destination of the study area cannot fully visited by tourists.. As a result the expansion of different form road structure like asphalt, coble, and trailers the major factor to reach the destination. However, in the study site there is no completed accessibility appropriate road and other above mentioned infrastructure for tourism.

4.3.2. Shortage of budget in Gummer Woreda culture and tourism Communication Office

To commercialize and promote the attraction site enough budgets should be needed for make advertisement for promotion of resources. Evens lack of infrastructure is more or less lack of budget.

4.3.3. Lack of effective implementation of policy and management

Eco tourism is a new and recent industry in our country as well as for Woreda. Because of this the office has no professional or trained man power at Woreda level. The staff now in the office do not take care of nature based recreational activity and opportunity due to lack of profession.

4.3.4. Low level of Community Awareness

During The time of data collected from interviews showed that the level of community awareness for conservation is very low. Some of the informants said that “the mindset of the rural community of gummer Woreda communities is not ready for welcoming and accepting both the tourism activity and tourists”. This is due to low level of community’s awareness and illiterate.

4.3.5. Lack of promotion

According to the observation and interviewed response of respondents the local communities. There is lack of promotion especially in natural potentials of ecotourism in the study area. As discussed in the potential of nature based ecotourism part, there are a lot of fauna species especially for birds (avian species) are not promoted, and benefited the community as expected. So promoting of the study area is necessary if ecotourism development is needed.

4.4. Mitigation Measures of Lake Arekit Threats

According to the respondents acquired information from open ended question some mention are the following to solve the above problems: Creating awareness about the importance of Potential tourism resources found in the lakes for community and giving a proper training to all stockholders, to stop car washing near the lakes, to reduce or minimize agricultural practice and irrigation, to cutting down invasive plant species near the lakes, to formulate rules and regulation for performed local communities, to recognize, promote and conservation practice development works are performed in the lakes, to increase and facilitate work of ecotourism development activity and also Creates qualified person and management strategy.

4.5. Benefits of Arekit Lake for local community and Ecotourism Attraction

According to the respondent during the data collection Arekit Lakes Are Used for money purpose for Local Communities in terms of percent are listed. Some of the importance is used for local communities (30%) of local peoples used For Animal Drinking, (27.5%) used for bird housing, (15%) of local community Used For Washing Cloths, (12.5%) of local and foreign peoples Used For As Recreational Value, (10%) of local community Used For Wedding Ceremonies, (5%) of local communities Used For Reducing Fire Problems In The Adjacent City. And also local communities are used for lakes for the purpose of irrigation

Table: 4. Benefits of Arekit Lake for local community

Benefits of lake Arekit for local community	Frequency(no of respondents)	Percent (%)
Used For Animal Drinking	12	30
used for bird housing	11	27.5
Used For Washing Cloths	6	15
Used For As Recreational Value	5	12.5
Used For Wedding Ceremonies	4	10
Used For Reducing Fire Problems In The Adjacent City	2	5

Source: personal survey, 2019

As shown table 4 below some of the Ecotourism potentials of bird species endemic to Ethiopia and found in Lake Arekit are Egyptian goose (*Alopchen aegyptiaca*), thick billed raven (*Corvus crassirostris*), wattld ibis (*Bostrychia carunculata*), white collard pigeon (*Columvb albitorques*)

Table: 5. potential endemic birds of the study areas

common name	scinetific name
Egyptian goose	<i>Alopchen aegyptiaca</i>
thick billed raven	<i>Corvus crassirostris</i>
wattld ibis	<i>Bostrychia carunculata</i>
white collard pigeon	<i>Columvb albitorques</i>



Figure.5, potentials Bird in the study area (photo by Antehunegn, 2019)

5. DISCUSSION

The result of present study was the major factors affecting of Lake Arekit were compared with lake hawassa The result of present study show that the major factors affecting of lake Hawassa were urbanization because the lake is near in to the town as this might be then urbanization is more affected than lake arekit. Because Lake Arekit less urbanization than Lake Hawassa.They had reported that urbanization and agricultural activities were responsible for the largest extent of lake losses in the worldwide. This may be due to that when urbanization increases more land is needed for settlement and building infrastructures such as roads, factories. In addition to these, due to food security problem people need land for cultivation. It is well known that Hawassa is one of the fast expanding cities of Ethiopia and therefore, there is shortage of land for settlement and for agriculture and there is huge amount of wastes damped from city as well as from industries. Therefore, Lake of Hawassa has been reducing dramatically causing negative impacts on Lake Hawassa. Lack of awareness about lake and its importance was another factor that effects of Lake Hawassa. Water diversion for irrigation especially during dry season and lake water extraction for watering urban plantation were another factors affecting of Lake Hawassa. Similar result is reported by Yosef Haile Giorgis, who had reported that lack of awareness of among community and less attention by government highly affected of lakes Abijata and Shalla (Yosef, *et al.*, 2010).

The result of present study showed that there are some lake conservation practices for Lake Hawassa but they mentioned that although some conservation activities exist, it is very weak. There is no strong conservation for Lake arekit similar with lake hawassa. Because there is lack of awareness among community as well as government officials, less attention given for management by concerned bodies of the government might be another cause for weak management of Lake Hawassa. But The Hawassa regions environmental protection agency gave great attention for other investments than for Lake Arekit conserving activities. Compare with agricultural activities of the factors in Lake Arekit is more affected than Lake Hawassa. Because

most of the peoples are found in rural areas. the cause of these threats are lack of create awareness for the purpose of lakes in local community, lack of promotion, lack of integration for local community and tourism office profession, there is no conservation management practice in the study areas because there is lack of awareness among community as well as government officials and Water diversion for irrigation especially during dry season and lake water extraction for watering urban plantation were another factors affecting lake Arekit.

Additionally, similar result is reported by (Tenagne, Addisu and Wondie., 2009) who stated that degradation of wetland of Lake hawassa the same with Arekit also causes reduction of wetland birds and wetland plants including medicinal plants. The result is in agreement with the work of (Yosef Haile Giorgis, *et al.*, 2010). Who stated that the degradation of wetlands of Lake Hawassa, Abijata and Shalla lakes caused reduction of aquatic bird's biodiversity and fish biodiversity This may be due to the reason that when wetland degraded, many species of plants and birds that have special adaptation on wetland ecosystem may disappear.

Similar results is reported by (Girma, Tilahun and Ahlgren., 2009) who stated The result of present study was there is lake conservation and mitigation measures are practiced like Creating awareness about the importance of Potential tourism resources found in the lakes for local community and giving a proper training to all stockholders, to stop car washing near the lakes, to reduce or minimize agricultural practice and irrigation, to cutting down invasive plant species near the lakes, to formulate rules and regulation for performed local communities, to recognize, promote and conservation practice development works are performed in the lakes, to increase and facilitate work of ecotourism development activity and also Creates qualified person and management strategy.

6. Conclusion and Recommendation

6.1. Conclusion

There are many factors that affect Lake Arekit. The most important factors that include: Agricultural expansion, Pollution, Irrigation, Dropping of plastics, Invasive plant species like eucalyptus tree, Car washing, urbanization, road construction, lack of research worked in the study area before, Lack of awareness among the community and government official and less attention given by concerned bodies of the government are also another factors affecting Lake Arekit. Lake Arekit has been reducing from time to time at an alarming rate due to the above mentioned factors. There are some constraints related to ecotourism developments practice in Lake Arekit. like lack of infrastructure to reach the destination, shortage of budget in gummer woredas culture and tourism communication office, lack of effective implementations of policy and management, low level of community awareness and lack of promotion. The mitigation measures to solve the above problems is Creating awareness about the importance of Potential tourism resources found in the lakes for community and giving a proper training to all stockholders, to stop car washing near the lakes, to reduce or minimize agricultural practice and irrigation, to cutting down invasive plant species near the lakes, to formulate rules and regulation for performed local communities, to recognize, promote and conservation practice development works are performed in the lakes, to increase and facilitate work of ecotourism development activity and also Creates qualified person and management strategy. the importance of lake Arekit is used for local communities For the purpose of Animal Drinking, local community Used For Washing Cloths, local and foreign peoples Used For As Recreational Value, local community Used For Wedding Ceremonies, local communities Used For Reducing Fire Problems In The Adjacent City, local communities are used for lakes for the purpose of irrigation and used for bird housing. Some of the Ecotourism potentials of bird species endemic to Ethiopia and found in lake Arekit. such as black winged love bird, Egyptian goose, , Thick billed raven, wattle ibis and White collard pigeon. Conservation practices for Lake Arekit, the practice is very weak. The effects of degradation on Lake Arekit include: lake water volume reduction, reduction of wetland birds production, reduction of biodiversity and increase lake water pollution.

6.2. Recommendation

Based on the obtained result of the present study the following points are recommended to mitigate the threats of Lake Arekit and the constraints of ecotourism development practices in the study area:

- The concerned governmental and non-governmental organizations should work cooperatively to reduce the degradation of Lake.
- Universities, NGOS and other organizations should work together to create awareness for the community as well as other concerned bodies through trainings.
- The government should give attention for natural resources at large and Lake in particular besides the attention given for the threats of lakes.
- Although there are some laws and policies on Lake Management in Ethiopia, the implementation is very loose. Therefore, government should work strongly for implementation of these laws and policies.
- The government bodies and professional manpower's to give information and create awareness in the local community for the importance of lakes.
- The decision maker should take account participation of local community during planning, implementing, and monitoring process of ecotourism for protection and conservation of natural resources and community wellbeing.
- Promote the resources of the woreda by using many systems like websites, gazette, brochures, and other social media.
- Create enough and clear awareness for local community for better conservation.
- Protect and conserve natural resources, of the woreda through different measurement action.
- Increased skilled man powers in the woreda office for better understand.
- Show and indicate direction and distance of tourism destination by using sign, symbols, like tapela to reduce confusion of tourist.
- Government and NGOS should be developed for Good management strategy
- The concerned body should have given response, to give solution for the above problems.

References

- Abayneh. A, Taddese. W and B.S Chandravanshi., (2003). Trace metals in selected fish species from Lake Awassa and Ziway. *SINET:Ethiopia Journal of Science, Vol 26;No- 2* .
- Abera, F., (2016). *Factors Affecting Development of Tourism in Oromia Rift Valley Lakes Area* .
- Ademe., (2008). *Assesment of Ecotourism Potentials for Sustainable Natural Resources Management in and Around Abijata-Shala Lakes National Park in the Central Ethiopian Rift Valley t in and* .
- Asfaw. A., (2014). Development of community based ecotourism in Borena-sayint National park north central challenges and opportunities. *journal of hospitality and management tourism.*, 81-83.
- Brylińska. M., (2003). *Rybysłodkowodne Polski and failed invaders. Ecological Applications 14: 587-596.26. Brylińska M (2000) Rybysłodkowodne Polski. The freshwater fishes of Poland. PWN, Warszawa, Poland* .
- Buckley. R., (2003). Environmental Inputs and Outputs in Ecotourism:Geotourism with aPositive Triple Bottom Line. *Journal of Ecotourism, 2:76-82*.
- Bushell. R, Eagles. J., (2006). Tourism and Protected Areas: Benefits Beyond Boundaries. *The 5th World Parks Congress.UK. The 5th World Parks Congress. UK*.
- Elias Dadebo., (2000). Reproductive biology and feeding habits of the cat fish *Clarias garipinus* (burchell) in Lake Awassa, Ethiopia. *SINET; Ethiopia journal of science. 23* .
- Genovesi. P, Shine. C., (2003). European strategy and invasive alien species. czeck book, Final vers. *Strasbourg, France*.
- Girma, Tilahun and Ahlgren G., (2009). Seasonal variations in phytoplankton biomass and primary production in the Ethiopian Rift Valley Lakes Ziway, Awassa and Chamo-The basis for fish production. *Elsevier Sc. Limnologica.*, 330-342.
- Kostrzewa. J, Grabowski. M., (2003). Oportunistic feeding strategy as factor promoting the expansion of racer go by (*Neogobiusgymnotrachelus*Kessler, 1857) in the Vistula basin. *Lauterbornia*, 48: 91-100.
- Kownacki. A., (2004). *Branchinecta palludosa* Müller of 1788. In: Głowaciński. Z, Nowacki J (Eds.), Polish Red Data Book of Animals Invertebrates. *IOP PAN - Kraków, AR- Poznań:* , 35-36.

- Lawniczak. A, Choinki. A and Kurzyca., (2011). Dynamics of lake Morphometry and Bathymetry invarious Hydrological Conditions.
- Riberio. F, Elvira. B, Collares-Pereira. MJ, Moyle PB., (2008). Life History trans of non-native fishes in Iberian watersheds (czech republic book)across several invasion stages: a first approach. *Biol Invasions* , 10: 89-102.
- Roessing . J., (2004). Effects of global climate change on marine and estuarine fishes and fisheries. 48-49.
- Solomon., (2015). mental Science and Water ResoThreats of biodiversity conservation and Ecotourism activities in Nech sar National park,Ethiopia. *International Journal of Biodiversity and Conservation*, pp:131-140.
- Stokstad, E., (2006). Global loss of biodiversity harming ocean bounty. *Science* , 314(5800):745.
- Tadele, Z. , (2002). *Ecotourism, Community Perception and its Implication to Natural Resources Conservation: A case study at Langano Catchments, South Central Ethiopia. Msc. . ThesiThesis*, Dresden University of Technology, Faculty of Forest, Geo and Hydro sciences p.35.
- Tenagne , Addisu and Wondie., (2009). *The impact of urban storm water runoff and Domestic waste effluent on water quality of Lake Tana and Local ground water near the city of Bahirdar, Ethiopia.*
- Theodros, A., (2004). *Sustainable Tourism Development and Ecotourism, Walia.* 24(3):34-41 .
- Torres. R., and Momsen. J., (2004). .Challenges and potentials for liking tourism and agriculture to achieve propoor tourism objectives. *Progress in Development Studies* . 4, 4:294-318.
- UNITED NATIONS WORLD TOURISM ORGANISATION(UNWTO)., (2012). *World Tourism Barometer.* Vol,10. <http://mkt.unwto.org/en/barometer> (Date: 14.02.2012).
- Wearing .S, Neil. J., (2009). *Ecotourism:Impacts,Potentials,and Possibilities. Pote Reed Educational and Professional Publishing Ltd1999.Great Britain...*, 106-109.
- Williamson.E, Saros. J, Schindler.W., (2009). Lakes and reservoirs as sentinels,integratets,and ragulators of climate change. 64-66.
- Williamson, Saros, Vincent,and Smol . J., (2009). Lakes and reservoirsas sentinels,integrates,and ragulators of climate change in ethiopian water bodies. 73-75.
- WWF International., (2001). Guide lines for community based eco-tourism development in Switzerland.

Yosef HaileGiorgis, Bekele Lemma, Behailu Birhanu, Kefyalew Sahu and Wondewosen Sintayehu. 2010. (2010). Environmental impact assessment and policy on Lake Hawassa, SNNPRs. SOS-Sahel, Ethiopia. published.

Zinabu and Gebremariam., (2002). The Ethiopian Rift Valley Lakes: Human interactions and water quality changes as a possible threat to the biodiversity, Awassa, Ethiopia. .

Zinabu and Gebremariam., (2002). the ethiopia rift valley lakes and Human intraction.

APPENDIX
WOLKITE UNIVERSITY

COLLEGE OF AGRICULTURE AND NATURAL RESOURCE

DEPARTMENT OF WILDLIFE AND ECOTOURISM MANAGEMENT

Part I: Personal Information

I am Antehunegn Gashew graduate student at Wolkite University. Currently I am conducting a research study on Threats and Ecotourism Potentials of Arekit Lake in Gurage Zone, Ethiopia.

This case is in partial fulfillment of the requirements for the Degree of Bachelor of Science of Wildlife and Ecotourism management. I require your help to spend some minutes of your time with us for interview. The purpose of this Interview is to gather information about then to identify the threats and ecotourism potentials in the study area.

1. General information

Household code number _____ Name of interviewer _____ sin

_____ Date of interview day _____ month _____ year _____

1. Name of household head _____

2. Sex 1) Male 2) Female

4. Keble's _____ village _____

5 .Level of education

A) Illiterate B) literate C) 1-4 grade D) 5-9 grade E) grade 10 and above

6. Are there challenges in Lake Arekit? A. Yes B. No

.

7. If yes justify the reason for the threats? _____

- A. Yes
- B. No

8. If no justify the reason for the threats?

9. Which one of the threats is found in Lake arekit?

A. Agricultural expansion

B. Invasive plant species

C. Dropping of plastics

D. Car washing

F. Others

10. What are the other challenges in the study area?

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11. What are the benefits for local community in the lake?

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12. Is there any conservation activities on Lake Arekit? A, yes B, no

13. If your answer for the question number#13 is yes how to conserve?

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.....

14. Which methods use to conserve Lake Arekit?

A, to reduce illegal agriculture expansion

B, to create awareness about benefits of Lake

15. What are the other methods used to conserve Lake Arekit?

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.....

16. What are the constraints of ecotourism development activities in the study area?