

Ecosystem Services and Tourism Potential in Lake Tana Peninsula: Ethiopia Review

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Abstract

Lakes Tana is one of Ethiopia Lake, It located in Amhara Regions', this Lake one of ecosystem services are very essential to the functioning of the earth's life-support system and priceless for humankind as they contribute to human wellbeing and welfare at the current time. Lake Tana in valuable ecosystem services like comfort aquatic biodiversity, marine birds, tourism activity (religion), source of hydropower, recreation, irrigation for farmer around the Lake Tana, transporting, medicine values, rich flora and fauna can play multiple crucial roles in ecosystem services. These roles support the regulation, habitat, production functions of ecosystems. The review suggest that illegal settlements expansion especially agriculture practices around the Lake Tana to overexploitation of water resources and threatening of biodiversity in the Lake Tana. The responsible body aware and train because this Lake its functions and associated services.

Keywords: Lake Tana; Ethiopia

Introduction

In June 2015, the United Nations Educational, Scientific and Cultural Organization (UNESCO) has registered Lake Tana as Biosphere Reserve. The lake is registered as UNESCO's Biosphere Reserve site for its being rich in biodiversity. Lake Tana is one of Importance Lake in Amhara Rigion situated in Bahar Dar town. These provide an important means of livelihood to the local people. They comprise of food (crops, wild fruits, small quantities of fish), agriculture, livestock, water resource, forest and wildlife, tourism, and fishery development besides too high biological diversity. There are animals, plants, fish, wetland and forest resources (thatching grass, charcoal wood, fuel wood and animal fodder) and medicinal resources (medicinal plants). Water of the Lake are believed by the local people to be important to cure generate hydroelectric power. Since then, it has been serving in parallel not less than 15,000 local people as source of water for drinking, cleaning, animal watering, recreation, irrigation, fishing, etc. Basin wide development, uncoordinated uses and management practices, transparent and efficient regulatory institutions, through adequate policy and legal frameworks, uncontrolled human interactions with the ecosystem etc. have all led to the rise of a huge social and environmental problem, i.e. pollution of Lake Tana. This has consequently been adversely affecting the local people, whose livelihoods are entirely dependent up on the existence and continuity of the lake, and its ecosystem that something urgent needs to be done in order to curb the trend and create a convivial future.

These ecosystems directly and indirectly support the livelihoods of the population and much of the country's economy. Although is characterized by rich, diverse and distinct terrestrial and marine ecosystems, modification of habitat due to demographic and socio-economic processes is the ecosystems in the country provide ample biodiversity. Four critically stressed ecosystem services in that need immediate attention are: maintenance of biodiversity; food and fiber provision; water supply, purification and regulation; and fuel provision.

At the current time the main direct drivers of environmental change in the Lake are: land-use change, sedimentation, worn-out of fish product, and water pollution linked to liquid waste from fabric, hotel, loge, consumption of water for urban greening and drinking, agricultural run-off and soil erosion; and over harvesting of natural resources for small- and large-scale markets and industry expand

the main hindering factor to deteriorate ecosystem in the area. These stressors will be driven by indirect drivers of change including widespread poverty, and human population and consumption growth, which will increase the demand for food, water, and land within the next decades. Future changes in rainfall and temperature are likely to contribute to changes in plant and animal species composition and diversity.

Lake Tana is the primary reason that Bahir Dar exists. It is a huge lake-one of the largest in Africa and it feeds the Blue Nile River. There are several small islands on the lake. Lake Tana which is the largest lake in Ethiopia situated in the study Area. It covers 3,050 km². Lake Tana has a shallow depth with a maximum of 14 m deep and an average of about 9 m. Lake Tana is among 250 important lake regions of the world. In the lake there are greater than 60 islands covering 4304.43 ha of terrestrial land in side Tana Lake of which 45 have an area greater 1000 2 including the biggest Deke, and Dagastifanos. Among 45 islands 19 have churches and/or monasteries that are home for monks and other service providers to the churches and monasteries. Although biodiversity conservation may benefit not only the local communities but also the whole humanity, the costs are usually imposed to the local communities who depend on the natural resources or different goods and services [1].

The Ecosystem-based Adaptation (EbA) approach relates to the management of ecosystems within interlinked social-ecological systems to enhance ecosystem processes and services that help people and ecosystems adapt to the adverse impacts of global change, such as changing climatic conditions. This approach depends highly on healthy and resilient ecosystems, which are able to deliver a bundle of ecosystem

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services to support adaptation in the face of various pressures. At the core of this approach lays the recognition of existing.

Classification of Ecosystem Functions and Services

Regulation functions

Natural ecosystems are crucial in the maintenance and regulation of life support systems and ecological processes. "The maintenance of earth's biosphere as mankind's only life support system in an otherwise hostile cosmic environment depends on a very delicate equilibrium between many ecological processes" [2]. Regulation functions are essential to human existence on earth, however, they are often only recognized after having already been severely disturbed or lost. In order for humankind to continue to benefit from these functions, we need to safeguard the continued integrity and existence of natural ecosystems and processes [3]. The regulation functions as a main category can be split into different sub-functions:

Water regulation and supply

Water regulation is related to the regulation of hydrological flows at the earth's surface. Water regulation provides us with, for example, provision of a medium for transportation, buffering of extremes in discharge of rivers, maintenance of natural drainage and irrigation, and regulation of channel flow. Water supply refers to the retention, filtering and storage of water in lakes, streams and aquifers. Retention and storage depend on soil characteristics and topography of an ecosystem and filtering mostly depends on vegetation cover. Services we obtain from water supply relate to the use of water by agriculture, industry and households.

Genetic resources living Habitat

The earth's ecological unit makes available living space for all flora and fauna. Since it is this diversity of species, and their role in the ecosystems that provide most of the world's ecosystem functions [4], the maintenance of healthy habitats is necessary for the provision of all ecosystem services and goods. Habitat functions can be separated into two purpose; nursery and immigrant functions. Many ecosystems universal make available garden center and propagation surroundings to species that are important for humanity's continuation and are of lucrative value. Natural ecological unit are also crucial to the continuation of the earth's hereditary and natural variety through the stipulation of living breathing space. These ecosystems can be well thought-out as a genetic documentation and to maintain its viability, the safeguarding of natural ecosystems is essential (Figures 1 and 2) [2].

Production functions

Earth provides us with many resources, such as water, food, oxygen, medicinal and genetic resources, energy, and raw materials. Humankind has learned how to manipulate the productivity of ecosystems so they provide greater than natural quantities of resources [2]. These production functions can also be categorized into a number of different sub-functions: Food and raw materials although today most foods are derived from crops and livestock, a considerable amount still comes from wild flora and fauna. Natural ecosystems provide an almost endless source of consumable plants and animals, ranging from fruits, vegetables, fungi, to game, fish and fowl. They also provide us with renewable resources such as wood, biochemical, fibres, and organic matter. These materials are used for building, fuel, handicrafts, clothing etc. [3,4].



Figure 1: Lack Tana the Habitat of water float Bird species (Mango Recreations site).



Figure 2: Lack Tana the Habitat of Bird species (Around the peninsula).

Medicinal resources

Mother nature provides chemicals that can be used as pharmaceuticals and medicines. An example is epibatidine, a chemical from the skin of the Phantasmal poison frog (*Epipedobates tricolor*). A derivative from this chemical has the ability to kill pain 200 times more effective than morphine, without the negative side effects [1]. Also, animals serve as medicinal tools, student specimens or are used to test new drugs [2].

Information functions

Natural ecosystems provide numerous opportunities for recreation, education, spirituality and mental development. Nature is a vital source of inspiration for art, science and culture, and provides many opportunities for research and education [3]. As Forster [5] already started 40 years ago "natural environments provide a highly inspirational and educative form of recreative experience, with opportunities for spiritual enrichment, cognitive development and reflection through exposure of life processes and natural systems". Information functions can be divided into different sub functions.

Aesthetic information

The majority community take pleasure in and be grateful for natural landscape and area. Aesthetic in sequence also has significant trade and industry importance; through, for example, its pressure on real worlds. Most of the people come to Bahr Dar to refresh Mango recreational sites (Figure 3).

People get pleasure from environment through amusement, shot in the arm, rest and entertainment. The accepted surroundings make available numerous activities, such as mountain climbing, fishing, campsite, biking, and swim given that of an approximately immeasurable variety of countryside and artistic character. The



Figure 3: Mango recreational sites and the potential of tourism.



Figure 4: Transports activity to ward Lack Tana monastery.

authority for usual areas for implement will most likely maintain to amplify in the view due to the rising number of citizens and wealth. Present are 37 islands in lake and most of them have monasteries with chronological, educational, religious and touristic principles.

Irrigation and transported

since of the significance of Lake Tana in at the bottom of concentrated irrigation foundation cultivation at the in number present and in the opportunity, as a starting place of hydroelectric superiority (the foundation of hose down for Tana Beles and GERD Hydroelectric Power vegetation supposed to produce 460 and 6000 MW in that order), fishery and traveler manufacturing, bird background and biodiversity belongings, it is consequential safeguarding its environment. However, the lakes are in receipt of ever increasing wastes from the position and broadcast sources. The riparian group of people for the most part depends on the raw water for drinking, cattle watering, irrigation and pastime (Figures 4 and 5).

Cultural, artistic, spiritual, historic, and educational information

The world's recognized natural stability and its fundamentals make available us with an understanding of our location in the humanity and a cleverness of toughness and religious values, such as reverence of certain elements.

Also provides the natural humankind us with almost unlimited opportunities for environmental education, excursion, and surroundings study. Expected areas also hand round as the world's most important reference for monitor ecological modify. Nature is also significant in culture and folklore and is used as a foundation of encouragement for movies, book, approach etc.

Cultural, historical and heritage attractions of Bahir Dar

A epigrammatic examination of the majority traveler magnetism of educational and chronological heritage goes with the association of

churches and monasteries in the island and peninsulas of Lake Tana. Hence birthrights in Bahir Dar describe reconciliation with the times gone by of these institutions.

Kibran Gabriel monastery: This monastery is bring into being in the southern measurement of Lake Tana 7 km north western of Bahir Dar town. Abune Ze Yohannis, come to naught of the monastery of Kibran Gabriel, move toward on or succeeding to imposing acquaintances. He was one of the seven stars born in Merha Bete, Northern Shewa (Figures 6).

Debre Maryiam island: This Island is to be found in the southern region of lake Tana about 5 km far from Bahir Dar town. Here the monastery of Debre Mariam is establishment for the duration of the reign of Amade Tsion (1314-1344) by Abune Tadewos.

It was rebuilt by King Tewodros II (1855-1868). In 1688, King Iyasu chose the church as a site of commission gathering which the called to try to end the quarrel of the monks, the religious dignitaries, and the ark bishop Abba Sinoda. The religious incongruity troubled the problems of the natural world of Christ. The church is in possession of one of the oldest manuscripts, the Tetra Gospel which dates from 1360-1380. This document is delightfully illustrated as another of the indistinguishable type which is behind the times from 1640-1660 which is also found here. The latter is an exceptional text of Ethiopian in good health art. In the beginning the church was hut complete of sludge and stone but before 20 years the chanting room and the holy of the church was from top to bottom re-establish with strengthen but the consecrated of consecrated of the house of worship kept its innovative style. The position or the quarter in the region of the church is also called Gumare Bahir (Hippopotamus' Lake), for the reason that of the



Figure 5: Parking of bots in The Lake Tana (Mango Recreations site).



Figure 6: Kibran Gabriel Monastery/ island.

continuation of many hippopotamus in the region of the area. It is also called Abay Ras (Head of the Nile), to represent that it is entrance of the lake out of which the Blue Nile comes out. This island is one of the unsurpassed attraction sites which can be access either by ship or on bottom from Bahir Dar.

Entos Eyesus monastery: This Island is situated in the southern part of Lake Tana and to the Northwest of Bahir Dar. It is easily reach only by cruiser. At this point, there is Entos Eyesus monastery built by Abune Ze Yohannis for the duration of the time in authority of Amade Tsion in the 14th. It is positioned near to Kibran Gebriel and sheltered with impenetrable forest. In this monastery, there is antediluvian construction that is hypothetical to be second-hand for prison, flora and fauna (bird), cross total from silver and wood, ancient books and clothing made from hide. It is best put for surveillance memento during manufacture.

Daga Estifanos monastery: It is transport into being in the Daga Islands, inside constituent of Lake Tana. It is positioned on the 1909 m above preserved that is the highest leave of the lake and easily seen from any bearing of Lake Tana. The coral reef wrapped in cotton wool with Jungle forest. The monastery is establish by Abune Hirut Amlak, for the duration of the period of weight of Emperor Yikun Amlak, in the 13th monastery be different from the other is that in its museum it surround the carcass of Atse Dawit I, Atse Zeriyakobe, Atse Sesinios and Atse Fasildes.

Kristos Semera church: The church is established in the Kristos Semera peninsula positioned at the eastern shore of Lake Tana. The genuine church of Kirstos Semera was theoretically institute in the late 14th century during the reign of Emperor Dawit (1380-1412) (Figures 7 and 8).

Traditional church schools after introduction Christianity in to Ethiopia in the 4th century AD, Traditional church schools have been

opened in many area of the county. Thus, the Ethiopia Orthodox church earliest to beginning education in Ethiopia. The system of education and living style of the students in the small huts are amazing. This situation at the current time famous Traditional church schools to learn Geez languages. These languages currently extinct only known around church of orthodox, but ancient time the national languages Ethiopia during former of Emperors (Figure 9).

Rema Medhanealem monastery: The monastery was established by Abune Nob throughout the time in power of Emperor Yishaq (1414-1429). It was also reconstruct by Susenyos in the 17 century.

The Tiss Isat falls: It was located 35 km away Bahir Dar. On future the waterway, car must be parked further than the Fasilde Bridge construct in the 17th century. Beyond the bridge a path leads precipitously ascending to a accepted veranda overlook the fall. This is the out of this world sight, in particular in the rainy period. The name Iss Isate comes from “isoha” the be on fire of fire- and it is uncomplicated to see why the fall were so name. The divided river bed plunges down wards in two stages for almost 45 meters causing deafening, “smoking” water fall (Figures 10-12).

Zegie peninsula monasteries and culture: These monsteries are located to the south west edge of Lake Tana, 11 km via lake and 20 km via

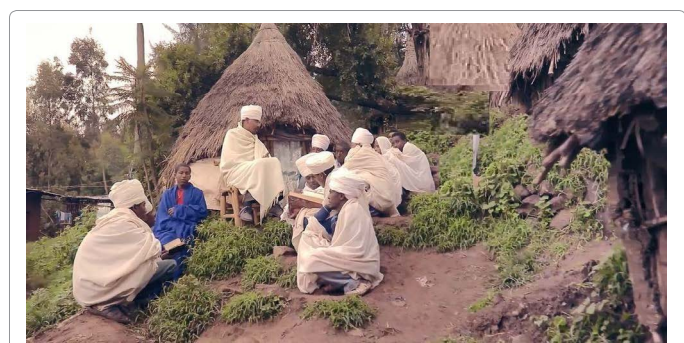


Figure 7: Traditional Church School at Kristos Semera Peninsula.

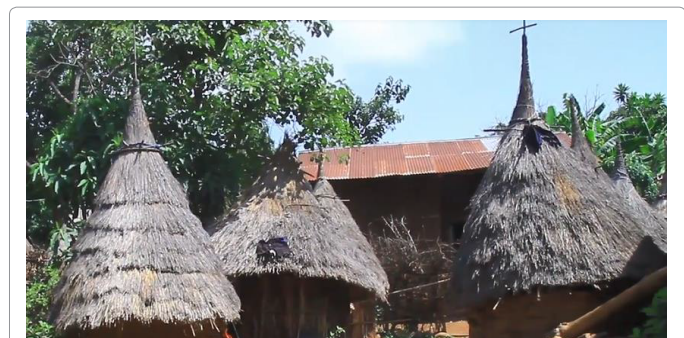


Figure 8: Azwa Mariyam traditional church schools.



Figure 9: Church holyday festivity at Kristos Semera Tana st Charkos Peninsula.



Figuer 10: The Tiss Isat Falls.



Figure 11: Over all view of Tiss Isat Falls.



Figure 12: Tiss Isat Fall and Nile watershed basin.

from Bahar Dar. It covered dense forest. The chronological experience of Zegie goes with the originator of monasteries in the peninsula. Aba Betre Mariyam, from Muggar in the territory of Showa. His name and his desirable quality go mutually, “Betre” revenue attaches. He was called Beter Mariyam for the reason that he had attach that win the heretics and overpowered the mischievous sprite. Betre Mariyam not tied up his people from the repression of the evil spirit. Betre Mariyam did many wonder as the stick of Zecharias did. In the end he rested at Zegie. After the gratitude Zegie given by Amade Tsion for the established monasteries conventional natural capital, chronological and educational inheritance have been approved from age bracket to production and now Zegie is a place the inhabitants reputable their source of revenue submissive with the monastery existence in which no plow background and clearing of natural undergrowth and the people had been loyal to interdiction given by the crash of the monasteries Aba Betre Mariyam [3] (Figure 13).

Ura Kidanemehre monastery/church: Ura is positioned south of eastern part of the peninsula of Zegie near Lake Tana which is immense monastery. The term Ura itself is believed to have be full from the man who had land owner in the area collaborate with Betre Mariyam in allow him to establish the monastery. The name had given in remembrance of this man name “Wura” that the term Ura adopted. It is bring together at the reign of Amde Tsion. Kidanemehiret means and covenant of charitable trust & in which many churches are dedicated. The monastery of Ura-kidane Mehret, part of the main land, its orientation is different from that Kebran Gebriel. In this monastery many impermanent heritages are found; some of them are king Tekele Hymanot’s of the 19th c. Atse Tewodros of the 19th c, also Yohannes’s



Figure 13: Zegie pensile promotions.

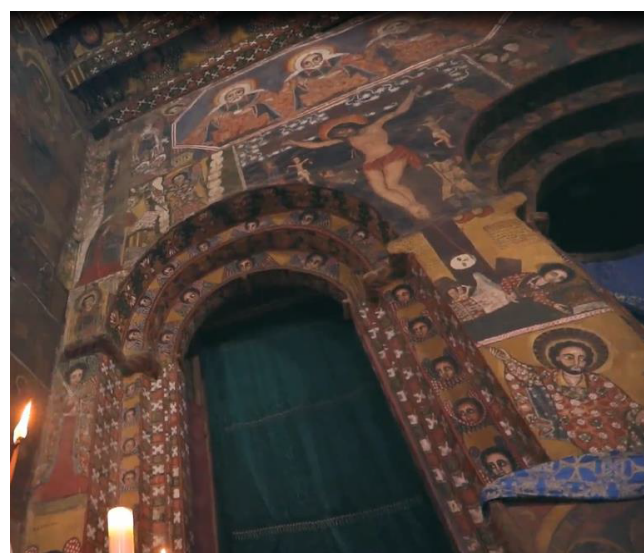


Figure 14: Paints of Ura Kidan Miheret.

of the 17 c silver crown and also the crown of queen Mitwab made from gold, crown of Atse Fasil in the 17th c, and Atse Lebene Dingel in the 16th century, Bekafa of the 18th c, and Atse T/Giorgise in the 18th c exist in this monastery. In calculation, document, circler of kings, cross and other chronological inheritance, are the main heritages frequently visited and impress tourist (Figure 14) [3].

Azwa Mariyam: It was founded in 1307 E.C. which is brightly ornamented by wall paints. The works of art were complete by Aleqa Sirak of the Zegie and Aleqa Berhan of the Gonderian the 16th century. The church is completed of sludge and sandstone and inexpressive pillars. The church was known in the past as the “Seil Bet” which earnings house of paints and pictures for the reason that watercolorist used to copy paints from Azwa to decorate other churches. It is covered with a thatched roof keeping its resourcefulness. It is rich in poles apart types of religious birthright. A number of these are the crown of Adyam Seged Iyasu, Yohannis I, Bakafa, a sword of Bakafa, in surplus of all coat of Itege Mentwab, representation of St. Marry made in the hands of St. Luke, different document, cross, play the drums, and cyst rums etc. put in museum. It is one of the most frequently visit sites in the peninsula. The green campus natural loveliness and more proximity to the port with connected forest under growing coffee and citrus fruits and primates, birds, squirrels remarkably draw the appointment diagram of tourists.

Mahal Zegie Giorgis churches: Mahal Zegie Giorgis the original church built and situated to the eastern outskirts of the peninsula. The originator was Abune Betremaraim who transports the Ark during the reign of Amde Tsion (1314-1344). The exact period of foundation is not clear.

Conclusion

The review points toward that the holistic advance has preferential the admiration and good quality care of aquatic biodiversity preservation in Lake Tana monastery which put up good chance for visiting the attractions expansion. The cultural, chronological and tradition attractions have greater potentials for tourism industry if they are promoted properly. These could in addition tourism potential with the landscape of the area, around the lake and large different caves which located within a Monastery. The area is not any home of aquatic plant, animal contain variety of species including birds and mammals and also the source of traditional church school. The community directly/

indirectly benefit from the tourism creates employment opportunity to local tour guides, small shops and handicraft selling for tourist.

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