Waterfront Development Planning and Design for Tourism Development in the Case of Lake Hawassa

Lensa Endale Mulugeta

A Thesis Submitted to

The department of Architecture.

School of Civil Engineering and Architecture.

Presented in Partial Fulfillment of the Requirement for Master of Science degree in Urban Planning and Design

Office of Graduate Studies

Adama Science and Technology University

June 17, 2023

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APPROVAL OF BOARD OF EXAMINER

I, the advisors of the thesis entitled "**Waterfront Development Planning and Design for Tourism Development in the Case of Lake Hawassa"** and developed by **Lensa Endale,** hereby certify that the recommendation and suggestions made by the board of examiners are appropriately incorporated into the final version of the thesis.

Yared Girma(Ph.D.)		
Major Advisor	Signature	Date

We, the undersigned, members of the Board of Examiners of the thesis by **Lensa Endale,** have read and evaluated the thesis entitled "**Waterfront Development Planning and Design for Tourism Development in the Case of Lake Hawassa"** and examined the candidate during the open defense. This is, therefore, to certify that the thesis is accepted for partial fulfillment of the requirement of the degree of Master of Science in **Urban Planning and Design**.

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DECLARATION

I hereby declare that this Master Thesis entitled **"Waterfront Development Planning and Design for Tourism Development in the Case of Lake Hawassa"** is my original work. That is, it has not been submitted for the award of any academic degree, diploma, or certificate in any other university. All sources of materials that are used for this thesis have been accordingly acknowledged through citation.

LENSA ENDALE	_____	_____
Name of student	Signature	Date

RECOMMENDATION OF ADVISORS/ SUPERVISORS

I, the Advisor of this thesis, hereby certify that I have read the revised version of the thesis entitled "**Waterfront Development Planning and Design for Tourism Development in the Case of Lake Hawassa".** prepared under my guidance by **Lensa Endale Mulugeta** and submitted in partial fulfillment of the requirements for the degree of Masters of Science in **Urban Planning and Design**. Therefore, I recommend the submission of the revised version of the thesis to the department following the applicable procedures.

Yared Girma (Ph.D.)	_____	_____
Major Advisor	Signature	Date

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LIST OF ACRONYMS AND ABBREVIATIONS

AUTOCAD……...Computer Aided design

CSA…… Central Statistics Agency

GIS……... Geographic information systems

LS……. Local Street

LULC…… Land Use Land Cover

OLI……... Operational Land Imager

RII……. Relative Importance Index

SAS……Sub Arterial Street

SPSS……..... Statistical Package for Social Science

TM…… Thematic Mapper

UTM……..... Universal Transverse Mercator

USGS…… United States Geological Survey

Abstract

Waterfront development plays a crucial role in promoting economic growth and social transformation in various regions worldwide. In Ethiopia, Lake Hawassa's waterfront development has the potential to create jobs, stimulate tourism, and enhance the quality of life for residents. However, the lake's environment has been degraded due to rapid urbanization, population growth, and unregulated waste disposal. Therefore, this study aims to evaluate the current state of Lake Hawassa's waterfront development and suggest strategic alternatives to improve livability and urban tourism. To achieve the study's objectives, both quantitative and qualitative methods were employed. A total of 392 questionnaire surveys were conducted using purposive and simple random sampling techniques. The survey data analyzed existing waterfront features in relation to physical, functional, economic, political, environmental, and cultural aspects based on the observation method. Additionally, GIS software was utilized to examine the relationship between land use and waterfront changes within a ten-year interval, and the current potential of urban tourism was assessed using a Likert scale questionnaire and Spss with descriptive and inferential data analysis technique based on the waterfront development principles. The study identified numerous problems with the existing waterfront conditions, including accessibility, facilities and amenities, safety and security, pollution, and the presence of local businesses in the main waterfront corridor, which negatively impacts attractiveness. Moreover, there were significant changes in land use over the years, including increased settlements around the lake and decreased forest and water areas. Consequently, unplanned land use development has resulted in various issues related to improper land uses. The study revealed that the area faced challenges in terms of waterfront development principles such as cultural protection, creative environment, innovation and technology, functional diversity, entrepreneurship promotion, quality of life and physical comfort, social cohesion, economic contribution, and awareness. The study highlighted each waterfront development principle's impact factor and provided a comprehensive understanding of existing problems. Based on the findings, the study proposes strategic recommendations and design interventions for various waterfront development aspects and principles. It is crucial to consider the existing waterfront conditions, land use relations, and the current state of urban tourism. An inclusive, resilient, and vibrant waterfront can be achieved by meeting the diverse needs and perspectives of all user groups and making efficient use of existing resources. This benefits the city, its people, and the environment.

Key words: waterfront, waterfront development, livability and urban tourism

CHAPTER ONE: INTRODUCTION

1.1 Background

Water, as a dominant element, influences the physical layout of cities, while the city's structure and social aspects shape the presence and flow of water, resulting in the creation of waterfronts (Othman, Al-Hagla et al. 2021). Waterfronts are areas where land meets water, characterized by a water's edge and surrounded by water, serving as centers of human activity and interaction. These dynamic urban spaces require attention to connectivity, transportation, functionality, and integration with the surrounding city to enhance public use. Urban waterfront development yields numerous benefits, including increased property value, socioeconomic revitalization, new visitor markets, job opportunities, environmental improvements, preservation of heritage, city and regional promotion, enhanced infrastructure, destination branding, cultural innovation, and the establishment of innovative districts(Üzümcüoğlu and Polay 2022).

Urban waterfronts offer valuable insights when analyzed from various perspectives, enhancing their functionality and potential for improvement. Spatial analysis focuses on their physical layout and connectivity to the city, considering size, shape, buildings, infrastructure, and transportation. Functional analysis examines usage and activities, encompassing businesses, industries, and recreational pursuits. Aesthetic analysis emphasizes visual appeal and contribution to the city's character through design, public spaces, and natural features. Socio-cultural, environmental, and economic perspectives are vital, ensuring community engagement, historical context, cultural significance, sustainability, resilience, and economic opportunities. By integrating these perspectives, vibrant and sustainable urban waterfront spaces can be created. Comprehensive analysis enables informed decision-making for accessibility and enjoyment, benefiting residents and visitors. (Üzümcüoğlu and Polay 2022).

Waterfront planning principles and elements encompass environmental sustainability, social inclusivity, economic vitality, and mixed-use development to create vibrant and accessible public spaces. Integration of urban and natural elements involves continuous waterfront promenades, cycling pathways, and green corridors connected to surrounding neighborhoods. Flexible zoning, public-private partnerships, and innovative financing mechanisms facilitate revitalization for lasting community and environmental benefits (Yıldıza, Şenlierb et al. 2015).

Developed countries face challenges in waterfront development, including brownfield sites and contaminated land, requiring remediation for successful regeneration. Balancing stakeholder needs is crucial for creating inclusive waterfronts. Developing countries encounter hurdles like inadequate infrastructure, limited finances, and weak regulations, hindering sustainable waterfront management. Rapid urbanization and population growth strain coastal resources, necessitating an integrated and adaptable approach to waterfront planning (Pramesti 2017).

Ethiopia has a surface area of approximately 1,127,000 km2, with 7,444 km2 covered by water, according to (Abunie 2001). The country possesses a diverse range of wetlands, estimated to be more than 58 different types, covering an estimated area of 18,587 km2 (1.5-2%) of the total land mass(Giweta and Worku 2018). Wetlands in Ethiopia, such as those in Bahirdar, Hawassa, Rift Valley areas, and Arba Minch, often experience high concentrations of population settlements (Giweta and Worku 2018). However, these valuable wetland resources are currently facing challenges due to overutilization and unregulated management. (Abunie 2001).

Lake Hawassa, located in the southern part of Ethiopia within the city of Hawassa, is a freshwater lake of ecological significance. It supports diverse birdlife, fish species, including hippopotamuses, and serves as a hub for local tourism and fishing activities (Graichen 2011). However, the Lake Hawassa waterfront is facing environmental degradation due to rapid urbanization, population growth, and unregulated waste disposal. This has led to declining water quality, posing risks to the aquatic ecosystem and communities reliant on the lake for their livelihoods. Deforestation, agricultural encroachment, and construction activities have also contributed to soil erosion and sedimentation, emphasizing the necessity for sustainable development planning and effective environmental management to safeguard the lake's resources and biodiversity (Graichen 2011).

The research aims to provide up-to-date information on the current status and trends of degradation in Hawassa waterfront, outlining major threats and proposing alternative management and protection options. The findings will assist policymakers, researchers, and executing institutions in rehabilitating and conserving the degraded waterfront while wisely utilizing Lake Hawassa as a valuable resource. Successful waterfront development requires incorporating physical, functional, social, economic, cultural, and political elements. While regeneration entails risks, the benefits outweigh them, making it necessary for sound decision-making and implementation.

1.2 Problem statement

Ethiopia is often referred to as the water tower of Africa, as it is richly endowed with abundant water resources including rivers, lakes, streams, and scenic valley waterfalls that are spread throughout the nation. Hawassa is one such city that has been blessed by nature, being surrounded by the beautiful Lake Hawassa. This city possesses a significant waterfront resource that can serve various purposes. However, despite its potential, the development of this waterfront area to maximize its environmental, socio-cultural, and economic benefits is currently in its infancy, with many gaps that need to be addressed. As waterfronts with high livability and environmental standards become increasingly rare and difficult to find. It is important to note that not all cities have access to waterfront resources, making Hawassa's lake a truly precious asset. Unfortunately, at present, the relevant authorities at different levels are not giving the necessary attention to the development and conservation of Hawassa's waterfront resource.

The waterfront of Lake Hawassa is currently facing numerous challenges, including water pollution, overcrowding, urbanization, climate change, inadequate waste management, illegal activities, unregulated tourism, erosion, and land loss. These issues pose significant threats to human health, ecosystems, and the overall stability of shoreline communities. Factors contributing to these problems include population pressure, rapid urbanization, industrialization, over-exploitation of resources, unsustainable land-use practices, insufficient inter-sectoral planning among relevant institutions, agricultural intensification, expansion of illegal agriculture, lack of incentives, climate change, and a shortage of public awareness, knowledge, and capacity regarding the conservation and economic value of the waterfront. If these trends continue unchecked, the waterfront is likely to lose its functionality, biodiversity, and potential for restoration.

Currently. The waterfront area around the lake has been negatively impacted by various factors. These include the increase in illegal settlements encroaching upon the lake buffer zone, leading to unauthorized occupation of land. Additionally, there has been a decrease in forest and buffer zones, resulting from deforestation and land encroachment. The expansion of urban areas towards the water buffer zone has further intensified these issues. Consequently, there has been a decrease in the size of the water body and a decline in its quality.

In many developing countries, there is a research gap and a lack of focus on incorporating livability elements and principles in waterfront development. Instead, the emphasis is often placed on addressing social and economic challenges. These countries may face significant issues such as inadequate infrastructure, including sanitation and clean water, and limited access to essential services. Additionally, existing research often proposes a standardized model for waterfront development without considering the diverse geographical conditions and cultural backgrounds of different regions. This gap in research and approach hinders the effective redevelopment of deteriorated waterfront areas and fails to address the specific needs and context of each location.

Additionally, there is a noticeable gap between the various stakeholders of the city and the inhabitants when it comes to utilizing the waterfront. As a result of these shortcomings, the current condition of the Lake Hawassa waterfront calls for a redevelopment strategy and design solution to address these gaps and ensure a more comprehensive understanding and utilization of the waterfront.

As a result, the city is currently struggling with the proper utilization and development of its waterfront, which in turn negatively impacts the urban quality of life, livability, and tourism potential. It is evident that the Lake Hawassa waterfront is facing substantial challenges, and the attention from stakeholders in the area is insufficient to address these emerging issues. To prevent irreparable damage to this valuable resource, it is crucial that we take action now and not wait until the situation becomes irreversible.

1.3 Research Objective

1.3.1 General Objective

- ✓ The general objective of this research is to assess the existing condition of the waterfront development of lake Hawassa to suggest alternative strategic approaches with design solutions that overcome the current problem for improving the livability of environment and increase urban tourism in the city.

1.3.2 Specific Objective

- ✓ To assess the current existing features and the livability of the waterfront.
- ✓ To examine the relationship between the waterfront and the land use.
- ✓ To examine the present potential of the urban waterfront for tourism development.
- ✓ To suggest implementing responsive design techniques to enhance the area's livability and promote urban tourism.

1.4 Research Question

- ✓ Is the waterfront in Hawassa livable?
- ✓ What is the relationship between the waterfront and land use?
- ✓ What is the present potential of the urban waterfront for tourism development?
- ✓ what kinds of responsive design can solve the planning problem of lake hawassa?

1.5 Significance of the Study

Waterfronts are crucial for maintaining ecological balance, conserving biodiversity, and promoting human well-being, as they provide economic and sociocultural benefits(Woldemariam, Mekonnen et al. 2018). Evaluating the current state of waterfront development at Lake Hawassa is of significant importance for various sectors, including ecological conservation, sustainable urban planning, and environmental protection. Waterfront tourism development is emerging as a popular trend, with waterfront areas becoming attractive destinations. In this context, Lake Hawassa, with its unique qualities, offers excellent potential for successful waterfront development.

Efficient wetland management and policy support are lacking in Ethiopia, leading to the degradation of wetlands and a shortage of skilled manpower (Abebe and Geheb 2003). This research aims to address the issues and mitigate the degradation and unplanned development of the Hawassa waterfront. It emphasizes the importance of providing information to decision-makers at various levels to raise awareness, promote conservation, and restore degraded waterfronts. The research also aims to fill knowledge gaps and highlight the economic value of waterfronts.

1.6. Scope of the study

1.6.1. Thematic scope

Our waterfronts have not been adequately studied and regularly monitored. As a result, we lack the basis to talk about their futures in relation to human activities in the catchment. While we face constraints to the regular monitoring of our waterfronts.(Seid 2017) As a result, this study's primary focus is to assess the current state of waterfront development and its impact on communities and cities in terms of social, economic, and environmental factors. The ultimate objective of this analysis is to offer a platform for critically examining the value and implications of waterfront zones, as well as presenting innovative perspectives and design suggestions that could be beneficial to future research endeavors.(Seid 2017)

Therefore, the thematic scope of this study focuses on assessing the existed condition of waterfront development and the effect of this waterfront in the community and city level by different division like socially, economically and environmentally. The purpose of this analysis is ultimately to provide an opportunity to critically examine the value and impact of waterfront areas, and to articulate novel perspectives and design recommendation that could be useful to future studies.

1.6.2. Spatial Scope

The geographic scope of this research is delimited to in Hawassa city by targeting the waterfront of lake hawassa. The motivation of this spatial scope is the current existing condition of the waterfront of the lake. The lake Hawassa is suffering with unwise use of the water resource and lacks attention with its waterfront development from different bodies. The research focus on increasing in creating livable environment and urban tourism activity around the waterfront that involves local and international tourists, a culture experiencing stage for the community, and city image building at Lake Hawassa. The city is bounded by the lake in the west, Oromia region in the north, Wondogenet woreda in the east and Shebedino woreda in the south. The study covers an area starting from Amora gedel to Tikur weha covering major areas like Lewi resort, Gudumale, Fekir Hayk, and Haile Resort areas which lie on three sub-cities in Hawassa lakefront. This paper reviews the main values of waterfront of lake hawassa, examines the major reasons of the losses and recommends alternative approaches to the effective management.

1.7. Limitation of the study

The study faces several limitations, including the lack of high-resolution digital images, the absence of a previous land use map for Hawassa unwillingness of respondents in different level. The unavailability of high-resolution digital satellite images hinders the quality of the findings, particularly in the analysis of land use changes. Despite attempts to enhance the existing data through image improvement techniques, there remain issues with the results. Another limitation is the lack of a land use land cover map for Hawassa city, which could have been helpful in analyzing the impacts of each land use plan on the lake. Additionally, there was an unwillingness among government offices to provide data and a disinterest in respondents in completing the questionnaire.

1.8. Operational Definitions

- **Development**- is a process that creates growth, progress, positive change or the addition of physical, economic, environmental, social and demographic components
- **Lake-** A lake is a body of water that is surrounded by land.
- **Livability**- Livability is the sum of the factors that add up to a community's quality of life — including the built and natural environments, economic prosperity, social stability and equity, educational opportunity, and cultural, entertainment and recreation possibilities. And describes the frame conditions of a decent life for all inhabitants of cities, regions and communities including their physical and mental well-being.
- **Urban Tourism**-(Jansen-Verbeke 1988)defines an inner-city tourist and characterizes this type of tourist "as a visitor coming from outside the service area of the town and visiting the inner-city predominantly for leisure reasons" .
- **Water**- Water is needed in all aspects of life. Water obtained from rivers, lakes, springs and wells has been used for drinking, washing, agriculture, and manufacturing.
- **Waterfront**- Breen and Rigby (1994) define an urban waterfront as the water's edge in cities and towns of various sizes for various purpose.

1.9. Organization of the study

The study is categorized into five chapters

Chapter one: Deals with introducing the study, the problem statement, the research questions, research objectives, limitation and significance of the study.

Chapter two: Reviews some of the major theories related to the study particularly the basics of waterfront and waterfront development, land use and water quality, threats and challenges of urban waterfront development, urban waterfront development and the evolution of waterfront development are also included.

Chapter three: Describes the research methods and techniques, while chapter four will discuss with land use land cover change of Hawassa waterfront and its impact on Lake Hawassa.

Chapter Four: Waterfront land use planning and management, the character of the current existed waterfront planning and also their impacts, major problems within the waterfront and management issues are also result and discussion with the responsive design is forwarded in this chapter.

Chapter five: Comprises the conclusion and recommendation parts.

CHAPTER TWO: LITERATURE REVIEW

2.1 Waterfront

Waterfront is an area where water and land meet. Specifically, there is a water's edge, and part of the land should be surrounded by water(Dong 2004). This area contains the most human activities as well as the most varied elements. Both have a significant impact on each other. The waterfront areas are generally arranged in a belt along the coastline. Therefore, planners find ways to make these areas more attractive to the public so that people will use them. Connecting traffic, setting up different functions, and communicating with the inner city are the main challenges.(Porteous 2013)

Waterfront also indicated as the land alongside a body of water, be it an ocean, lake, river or stream. (Dong 2004). (Moretti 2008),the word "waterfront" means "*the urban area in direct contact with water"*.

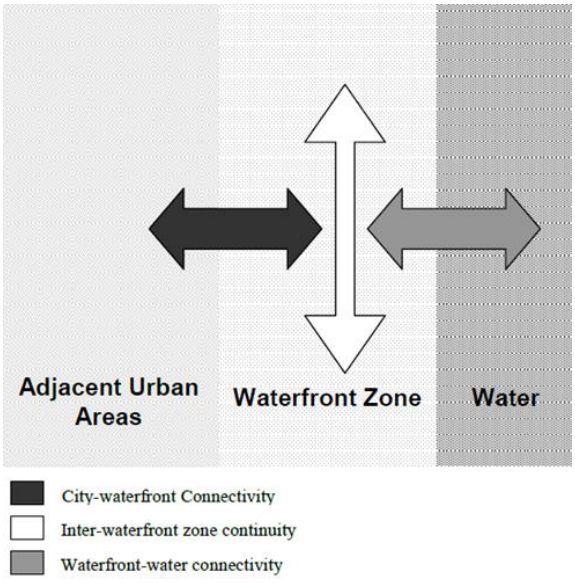

Figure 2 1:The form of waterfront

(Timur 2013)"the urban waterfront development is widely regarded as a frontier on contemporary urban development, attracting investment and publicity. (Yassin, Bond et al. 2012), defined ideally as "a development directly fronting on water for any purposes and the water components can include river delta, coastal plains, wetlands, beached and dunes, lagoon, and other water features".

2.2. Waterfront Development

Waterfront development refers to the planning, design, and management of land adjacent to bodies of water, such as lakes, rivers, or oceans, with the objective of creating vibrant and

sustainable urban spaces that integrate natural, cultural, and recreational elements (UN-Habitat, 2019).

2.3. Types of Waterfront based on function

Cultural Waterfront: sense of community, festivity, artistic expression, recreation, commercial bustle.

Environmental Waterfront: Design with nature. Might include shore stabilization, wetland preservation, and restoration.

Historic Waterfront- A sense of uniqueness and character to a place. Provide a special experience by preserving the cultural heritage of place.

Mixed- use waterfront: dynamic space containing various activities blended to complement each other.

Recreational Waterfront: the place of community gathering. Parks, gardens, picnic areas, walking, cycling and water related activities including boating, fishing, etc.

Residential Waterfronts: Housings, creates opportunity for other activities like retail, recreation, restaurants.

Working waterfront: River related activity such as fishing, boat repair, etc.

2.4. Advantage of waterfront Development

Waterfront development offers numerous benefits across economic, environmental, and social aspects. It generates employment through commercial activities, provides revenue for the government, and supports tourism with a variety of attractions. It also boosts property values and triggers redevelopment in surrounding areas. Moreover, it contributes to habitat conservation, human-environmental connections, and the preservation of biodiversity. Maintenance of riverbanks, flood control measures, and the provision of open spaces for leisure and recreation enhance the overall neighborhood revitalization. Ultimately, waterfront development creates a thriving and healthy urban environment.

2.5. Elements for Successful Waterfront Development

Waterfront plans are essential for successful developments, focusing on public access, urban design, and land use along the water's edge (Timur 2013). To achieve the goals of a successful waterfront development, ten elements should be considered(Huang, Mao et al. 2019).

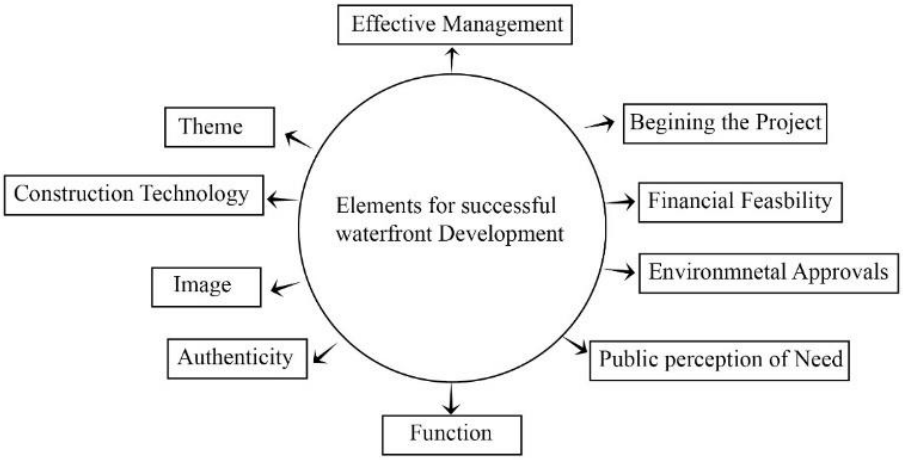

Figure 2 2:Elements for successful waterfront development (Yassin et al., 2012)

2.6. The effects of waterfront as a planning element in urban area

Achieving a sustainable development in cities requires a harmonious balance between nature and social life. Urban natural water elements play a pivotal role in establishing this equilibrium. Water, being an essential planning element, provides physical and psychological comfort to humans. Furthermore, it enhances the environment through its aesthetic and functional qualities, contributing to the overall well-being of the urban landscape(Timur 2013).

Table 2. 1:Effects of Waterfront as Planning Element

Effects of Waterfront as Planning Element	
Aesthetic Effect	**Functional Effect**
Visual Effects	Climatic Comfort
Audial Effects	circulation
Tactual Effect	Noise control
Psychological Effects	Recreational

Source (Urban waterfront regeneration, (Timur 2013))

2.7. Qualities of Waterfront

2.7.1. Surrounding buildings enhance public space

Waterfront buildings should enhance public activity and promote interaction between indoor and outdoor spaces. High-rise towers without ground-floor public uses create a barrier between the waterfront and surrounding neighborhoods.

Figure 2 3:Building on harbor in Auckland, New Zealand

2.7.2. Limits are placed on residential development

Waterfronts thrive on diverse activities and vibrant gatherings, which are hindered by excessive residential development. Concentrating solely on housing limits the range of uses and inhibits nighttime vitality.

2.7.3. Activities go on round-the-clock and throughout the year

Active waterfronts year-round bring community and economic benefits. Weather should not deter usage. Creative programming and amenities offer protection. Well-lit and welcoming waterfronts attract people at night.

Figure 2 4:Shows the activity

2.7.4. Flexible design fosters adaptability

Successful waterfronts adapt to changing user needs. For seasonal variations, a retractable or temporary stage can be utilized. On-site storage allows for easy access to movable furniture and recreational items.

Figure 2 5:Flexible design

2.7.5. Creative amenities boost everyone's enjoyment

Well-placed amenities enhance waterfront experiences. Thoughtfully positioned benches and waste receptacles contribute to the overall usage of a space. Strategic lighting highlights key areas and activities. Public art attracts people, fostering social connections. Temporary or permanent amenities create a welcoming environment for social interaction.

Figure 2 6:public Amenities

2.7.6. Access made easy by boat, bike and foot

Diverse transportation options, including walking and cycling, contribute to thriving waterfronts. Reduced reliance on private vehicles creates a more pleasant and vibrant environment, allowing for a wide range of waterfront activities.

Figure 2 7:Access by boat

2.7.7. Local identity is showcased

Embracing local identity, history, and culture enhances the waterfront's appeal and fosters a strong sense of place. Engaging in local art, music, and theater brings the community together.

2.7.8. Good management maintains community vision

Management is essential to ensure that a successful waterfront stays that way.

2.8. Threats and challenges of urban lakes

Table 2 2:Threats and challenges of Urban Lakes(Gebretsadik and Mereke 2017)

Threats and challenges	Description
Draining for agriculture	Excessive drainage hampers the ecological recovery of wetlands and accelerates their desiccation.
Over grazing	Year-round grazing poses a threat by preventing the ecological recovery period of wetlands, resulting in the loss of biodiversity.
Deforestation, siltation and soil erosion	The loss of vegetation primarily results from the removal of buffering vegetation and degradation of upland forests.
Urbanization and industrialization	Urban centers are often situated near wetlands due to the availability of natural resources. These areas can be affected by various pollutants, including sediment, fertilizer, human sewage, animal waste, pesticides, and heavy metals.
Overfishing	Overfishing can lead to fish species loss.
Demographic pressure	High population density is observed in the vicinity of the lake.

(Source: Urban Lakes (Gebretsadik and Mereke 2017)

2.9. The Impact of Waterfront in a city and inhabitants

(i)Tourism and recreation impacts

Waterfront cities worldwide are being redeveloped with a focus on leisure, recreation, and conservation. While recreation and tourism can drive redevelopment, it is crucial to ensure a balanced approach that considers other aspects of waterfront development(Craig-Smith 1995). Investment in information technologies and global promotion is needed to establish cities as attractive tourist destinations. Enhancing the role of recreation and tourism in waterfront development is a challenge for both the private and public sectors. It is important to assess whether the increasing demand for urban waterfronts for tourism and recreation will benefit the environment and the local community (Lagarense and Walansendow 2013).

(ii)Economic and social impacts

Waterfront development in urban tourism benefits the local community and economy by creating a vibrant hub for business and leisure. It generates employment opportunities, economic diversity, tax revenues, and business prospects. The development also enhances the quality of life through outdoor recreation options. The range of employment opportunities positively impacts the well-being of the community (Lagarense and Walansendow 2013).

(iii)Environmental impacts

Waterfront development brings both positive opportunities and unavoidable physical and environmental changes. The process of creating new land and enhancing the waterfront can lead to significant transformations in the surrounding environment (Lagarense and Walansendow 2013).

2.10. Livable Environment principles of Urban Waterfront Development

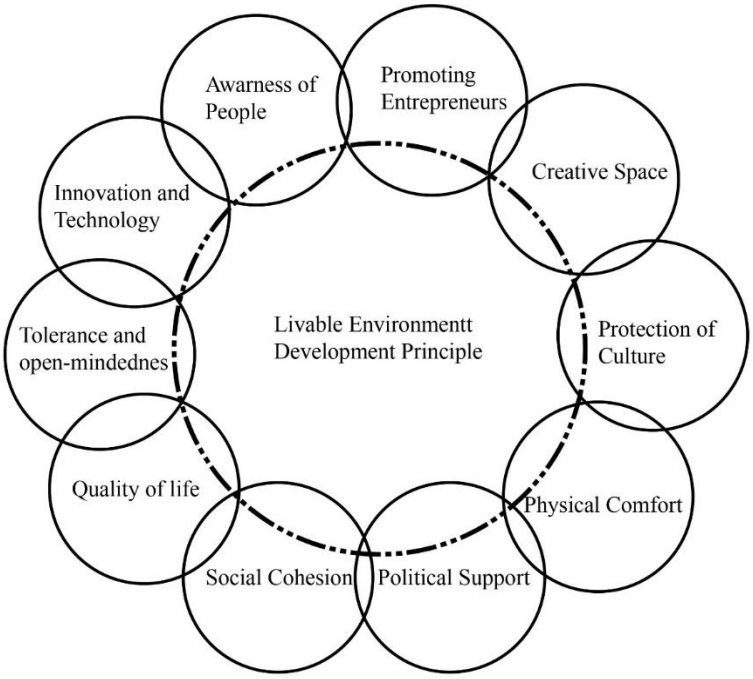

Figure 2 8: Livable Environment of waterfront development Principle

2.11. Aspects to consider for livability of Urban Waterfront Development

Establishing principles for effective urban waterfront development is essential for its sustained success, considering the influence of external factors like economic and political changes. This study aims to examine the physical, functional, social, economic, cultural, and

political dimensions of waterfront development, identifying critical components for establishing comprehensive assessment criteria (Norcliffe 1996).

2.11.1. Physical Quality Aspect

When considering sensory experiences in urban waterfront settings, there are two aspects of quality of life: physical and emotional(Carmona, Heath et al. 2003). The physical aspect encompasses tangible components of the built environment that can be touched and modified. Research indicates that factors such as pedestrian-orientedness, bicycle-orientedness, flexibility, legibility, variety, and place identity contribute to people's happiness in urban waterfront (Samavati and Ranjbar 2017, Üzümcüoğlu and Polay 2022). Place-based physical visions highlight attributes like livability, personality, connectedness, mobility, personal freedom, and diversity. The physical characteristics of an area, including its typology, density, block size, building height, architectural style, and street design, also shape the urban environment. Proper maintenance, aesthetic comfort, and accessibility are crucial for creating usable waterfronts, and authorities need to establish solutions to enhance pedestrian and public transportation access(Alsumsam 2017). Features such as visually appealing art pieces, urban furniture, and urban balconies can attract people to the waterfront, while a strong connection to central business districts and other activity hubs is important. Effective waterfront development requires considering public transportation options, facilitating interaction with nature, and understanding the morphological processes involved(Shah and Roy 2017).

2.11.2. Functional Aspects

(Gehl 2013)classifies outdoor activities in public spaces into three categories: necessary, optional, and social. Each category exerts different pressures on the physical environment. Necessary activities are essential for daily life and are performed regardless of the situation. Optional activities, such as walking, standing, or simply enjoying the surroundings, thrive in high-quality environments but suffer in low-quality ones. Social activities rely on the presence of people and involve communal interactions like playing, chatting, and meeting friends. Urban waterfront development authorities must provide a diverse range of accessible activities and functions to attract users (Zhao 2020). This includes amenities such as picnic areas, gathering spaces, fishing spots, and recreational facilities. Consideration should also be given to playgrounds, green spaces, lighting, and safety. Incorporating shoreline parks and promenades into waterfront development enhances the connection between people and

water, creating active and appealing environments that contribute to the vitality of the city(Steil and Delgado 2019).

2.11.3 Social Aspect

When developing an urban design, (Carmona 2021). underline the necessity of defining the interaction between people and their environment. They argue that the ideal approach to conceptualizing the relationship between people and their environment is as a continual two-way process in which individuals create and modify spaces while also being influenced by those spaces in a variety of ways. (Gehl 2013)

social interaction, social cohesion, communal attractiveness, cultural appeal, safety and security, openness, health and wellbeing, the variety of green and blue spaces, relaxation places, and socializing opportunities are significant issues for urban waterfront development. When social factors are not considered during the planning and implementation processes, there is a danger of gentrification and socioeconomic inequality(Wuijts, de Vries et al. 2022)

2.11.4. Economic Aspect

Leisure and tourism play a crucial role in contemporary urban economic development strategies. Urban blue spaces, such as waterfront areas, have gained popularity as tourist destinations and residential zones, leading to significant economic advantages(Nixon, Carlton et al. 2022). Effective waterfront management improves the local image, attracts more visitors, generates employment opportunities, fosters business growth, increases municipal revenue, and reduces operating expenses and rents. Despite challenges, studies indicate that urban blue regeneration can be profitable and beneficial for the environment and social well-being, particularly in resource-limited areas (Brückner, Falkenberg et al. 2022).

2.11.5. Cultural Aspect

Culture plays a crucial role in promoting social and human capital, enhancing life skills, and enabling organizations to adapt to changes. It fosters a shared identity and a sense of pride, fostering stability and cooperation within communities (Florida 2002). Effective urban waterfront development should incorporate historical references and cultural activities to attract people and create a vibrant atmosphere (Zhou 2020). Public spaces provide opportunities for community expression and contribute to a higher quality of life by reflecting diverse cultural influences (Porteous 2013). Considering existing cultural aspects

during the planning process helps create inclusive and sustainable transformations, preventing gentrification and ensuring proper social integration (Porteous 2013).

2.11.6 Political Aspect

Urban waterfront redevelopment initiatives are gaining political support as they offer the potential to create more efficient, productive, and socially sustainable cities in today's global context. Effective leadership and a well-designed development process are critical for successful urban waterfront development projects. Ongoing maintenance, knowledge, and support are also necessary to ensure a sustainable and desirable environment (Hoyle 2000). To achieve adequate waterfront development, local authorities, governments, and decision-makers should facilitate collaboration among all stakeholders. It is important to educate the local community about emerging social concerns and engage them in resolving local issues. Authorities involved in waterfront redevelopment have a responsibility to foster an engaged community that actively contributes to the development and improvement of their area (Brückner, Falkenberg et al. 2022).

2.12. Urban Tourism and waterfront development

Urban tourism has rapidly emerged as a vital component of thriving modern cities, transforming them into vibrant cultural, social, and economic centers. The rise of urban tourism and waterfront development are intrinsically linked, as their symbiotic relationship results in a vast range of benefits to cities, tourists, and residents alike. Waterfront areas, with their unique location at the intersection of land and water, offer unparalleled opportunities for the establishment of recreational, cultural, leisure, and residential facilities that attract both international tourists and local citizens. (Chang and Huang 2004)

Furthermore, waterfront development projects contribute significantly to urban beautification and environmental sustainability, generating substantial long-term economic rewards while preserving and enhancing local cultural heritage and natural resources. By harnessing the immense potential of waterfront areas and optimizing their use for tourism and leisure purposes, cities can achieve a harmonious and mutually beneficial union between urban tourism and waterfront development that promotes livability, sustainability, and quality of life for all.(Chang and Huang 2004)

2.13. The relation of Land-use land-cover change with waterfront

Land-use and land-cover change (LULC) plays a crucial role in monitoring environmental changes and managing natural resources. Anthropogenic activities have led to significant

alterations in the Earth's land surface, impacting global systems. Rapid LULC changes, especially in developing countries, have led to the depletion of important resources such as water, soil, and vegetation (Twisa and Buchroithner 2019)

2.13.1. Land-use and urban waterfront tourism

The evolution of waterfront tourism is influenced by various factors, including demographic changes, consumer behavior, technology, transport, governance, and policies (Organization 2017). Tourism land uses are characterized by temporal variations, spatial diversity, non-exclusive use, public goods, and the blurred nature of activities(Shaw and Williams 1994). Lakefronts offer diverse activities and bring economic, social, and environmental benefits, particularly through tourism. However, developing waterfront areas poses challenges related to demand, human and environmental factors, land competition, and population growth. Successful waterfront development requires a balanced approach that considers people, nature, and technology.

2.14. Waterfront development and sustainable environmental planning

As waterfront rehabilitation gains traction in developed cities, its environmental benefits may not always be evident. However, it is crucial for developing cities to adopt strategies that minimize environmental impacts and promote economic development, breaking away from the traditional approach of pollution followed by cleanup. While waterways may not be fully restored, incremental improvements serve as a vital catalyst for sustainable urban development (Robinson 2009).

2.14.1. Riparian ecology and the lake

Riparian vegetation plays a crucial role as a buffer zone between terrestrial and aquatic ecosystems, helping mitigate the effects of land use on river health(Herron and Hairsine 1998).. A healthy riparian community acts as a natural filter, reducing the impact of particulate matter from the surrounding catchment area. Efforts have been made to design filter strips to protect stream values, and the exclusion of domestic livestock grazing from riparian areas is often the initial step in stream restoration (Jansen and Robertson 2001).

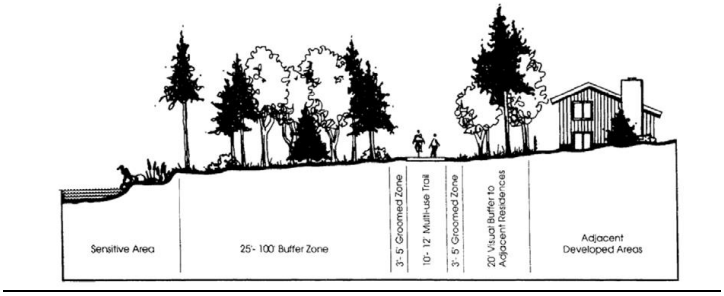

Figure 2 9:Typical cross section of near shore area adapted from (source: Frank Mitchell, 2002)

2.15. An evolution of waterfront development

Waterfronts have served as vital hubs for commerce, transportation, and manufacturing in cities. However, shifts in transportation and industry have caused a decline in their significance. (Wrenn 1983) categorizes the historical evolution of waterfronts into four periods.

(i) Emergence of Waterfront Cities

In early American settlements, waterfronts played a vital role in meeting needs, trade, and transportation. They served as entry points for immigrants and witnessed rapid development. Waterway transportation remained essential for these communities (Wrenn 1983).

(ii) Growth of Waterfronts

Waterfront settlements grew into cities with trading activity, leading to building development. Congestion and alternative transportation methods shifted the city center away from the shoreline. Elevated highways and industrial pollution affected the waterfront, reducing its appeal to residents (Wrenn 1983).

(iii) Deterioration of Waterfronts

Technological changes, improved transportation, and environmental concerns caused the decline of old ports as transportation and industry centers. Highways replaced railroads, leading to the deterioration of waterfront areas. Pollution controls and public awareness also contributed to the neglect of waterfronts, making them inaccessible and unsafe (Wrenn 1983).

(iv) Re-discovery of Waterfronts

Obsolete ports, pollution, and decreased aesthetic appeal led to the revitalization efforts of waterfront areas in the 1960s. Governments aimed to reconnect waterfronts with downtown areas and introduce a mix of recreational, residential, and commercial uses. This led to the

conversion of land for public use and the establishment of container ports outside the city. Urban waterfronts have undergone significant transformations influenced by social and technological factors, although each city's waterfront has its unique characteristics(Wrenn 1983).

2.16. Empirical literature review: the case of Bahir Dar waterfront planning

2.16.1. A Case Study of Bahary in Alexandria, Egypt

Table 2 3: A Case Study of Bahary in Alexandria, Egypt

Site Name and Location	**Bahary in Alexandria, Egypt**
Author	Riham A. Ragheb
Physical Character of the Area	The waterfront in Alexandria stretches for 900m along the sea, varying in width from 25m to 37m. It serves as a crucial link connecting El Gish Road in the east to the narrow streets of the old city in the west, providing the primary connection for the surrounding area to the rest of Alexandria. The southern perimeter is characterized by more than 30 T-intersections and secondary streets like Sidi El-Hagary Street, Safr Basha Street, and Sidi Yacout Street, which are of poor quality. While there is a sea-side promenade featuring palm trees, safety railings, and lighting, it does not effectively encourage public access and utilization (Ragheb 2017).
	The waterfront offers various transportation options, including public buses, private cars, horse carts, bicycles, and boats. The city tram, which serves the old city, operates alongside other traffic in the middle of its designated path. Tourists have the opportunity to hire boats or horse carts, adding to the attractions of the area(Ragheb 2017).
The area Gap	The waterfront faces several challenges in terms of sociability, lack of waterfront views and public art, comfort and image, uses and activities, and access and linkages. These issues hinder the overall experience and usability of the waterfront area.(Ragheb 2017).

Source (Sustainable Waterfront Development—A Case Study of Bahary in Alexandria, Egypt)

2.16.2. A Case Study of Sylhet City Bangladesh

Table 2 4:A Case Study of Sylhet City Bangladesh

Site Name and Location	**Rethinking Urban Waterfront: A Case Study of Sylhet City Bangladesh**
Author	Tanjima Siddika

Physical Character of the Area	The study area in Sylhet city has the potential to become a central hub due to its strategic connections to local and cross-country networks, such as the Sylhet-Tamabil highway that links to India. However, the slow pace of development has resulted in inadequate road networks and large blocks of undeveloped land. Within a 5km radius, there are nearby transits, including a railway station, bus terminal, and river port, which enhance the area's accessibility and connectivity.(Siddika 2020). The study area is predominantly characterized by residential land use, with commercial areas primarily located along main roads.(Siddika 2020).
The area Gap	The study area analysis highlights urban design opportunities and challenges. It has abundant land, road infrastructure, transit, and administrative land use, making it a potential city center for the southern part of the city. However, the area lacks secondary and tertiary roads, posing a challenge for creating walkable neighborhoods. There are also unused open spaces along the waterfront that could be repurposed for public recreation and other purposes.(Siddika 2020).

Source (Rethinking Urban Waterfront: A Case Study of Sylhet City Bangladesh)

2.16.3. The case study of Lake Tana

Table 2 5:The decline of the lake Tana (Ethiopia) fisheries: causes and possible solutions

Site Name and Location	**The decline of the lake Tana (Ethiopia) fisheries: causes and possible solutions**
Author	Eshete Dejen1 , Wassie Anteneh2 * , Jacobus Vijverberg3
Character of the Area	For increasing urban waterfront tourism urgent actions are required to address these issues, including effective land use management and soil conservation practices such as afforestation and zero-grazing. The decline in fish populations is primarily attributed to overfishing, the use of illegal fishing gear, and habitat destruction. To protect Lake Tana fisheries from further decline, it is crucial to enforce existing legislation, develop management plans, and implement measures in the lake's catchment area
The area Gap	Lake Tana faces several critical challenges that endanger its well-being in urban tourism. The major sources of pollution include agricultural activities, improper management of solid and liquid waste, and industrial pollution. Furthermore, the encroachment of the waterfront, environmental hazards like floods, contaminated ponds resulting from urban waste and quarries, as well as the pollution and encroachment of threatened wetlands, pose significant environmental threats. The proliferation of invasive plants, such as eucalyptus groves, further exacerbates the environmental problems faced by the lake..(Dejen, Anteneh et al. 2017)

Source (The decline of the lake Tana (Ethiopia) fisheries: causes and possible solutions

2.17. Summary and Research Gap

One potential research gap in the field of urban waterfront development and increasing urban tourism potential is the need for comprehensive studies on the sustainable management and utilization of waterfront spaces. While there has been considerable research on the economic and social benefits of waterfront development for tourism, there is a lack of research focusing on long-term sustainability and balancing the needs of tourism with environmental conservation (Smith, 2009).

One potential research gap in the field of urban waterfront development and increasing livability in the area is the need for studies that explore the social and cultural aspects of waterfront revitalization projects. While many studies have focused on the economic and environmental impacts of such developments, there is a limited understanding of how these projects influence the well-being, sense of community, and quality of life for residents in the surrounding areas (Beatley, 2011).

One research gap in the study of urban waterfront development and its relation to land use and land cover is the need for more comprehensive assessments of the long-term impacts on the ecological dynamics of these areas. While there have been studies examining the immediate effects of waterfront development on land use and land cover, there is a lack of research that investigates the cumulative and lasting effects on the surrounding environment, including changes in vegetation patterns, biodiversity, and ecosystem services (Alberti et al., 2003).

Empirical case studies and theoretical research on Lake Hawassa are insufficient to fully understand its ecological, economic, and social importance. While some Ethiopian lakes, such as Lake Tana, Lake Abaya, and Lake Zway, have been studied more extensively, the research remains limited in scope and insufficient in covering various aspects. In the case of Lake Hawassa, most existing studies focus primarily on the diversity of species and fail to consider important factors like physical, social, cultural, economic, and political aspects of its surrounding environment. Furthermore, there is limited exploration of the potential use of the waterfront for urban tourism, which warrants further investigation.

Another notable gap in research is the lack of stakeholder engagement in using and managing the waterfront. Based on site surveys and observations, differences in stakeholder priorities and needs have emerged, emphasizing the importance of collaborative decision-making for waterfront redevelopment. Given these gaps, there is an urgent need for a comprehensive,

multidisciplinary approach to studying Lake Hawassa and other Ethiopian lakes to better understand their significance and formulate effective strategies for waterfront redevelopment and sustainable tourism initiatives.

2.18. Conceptual Framework

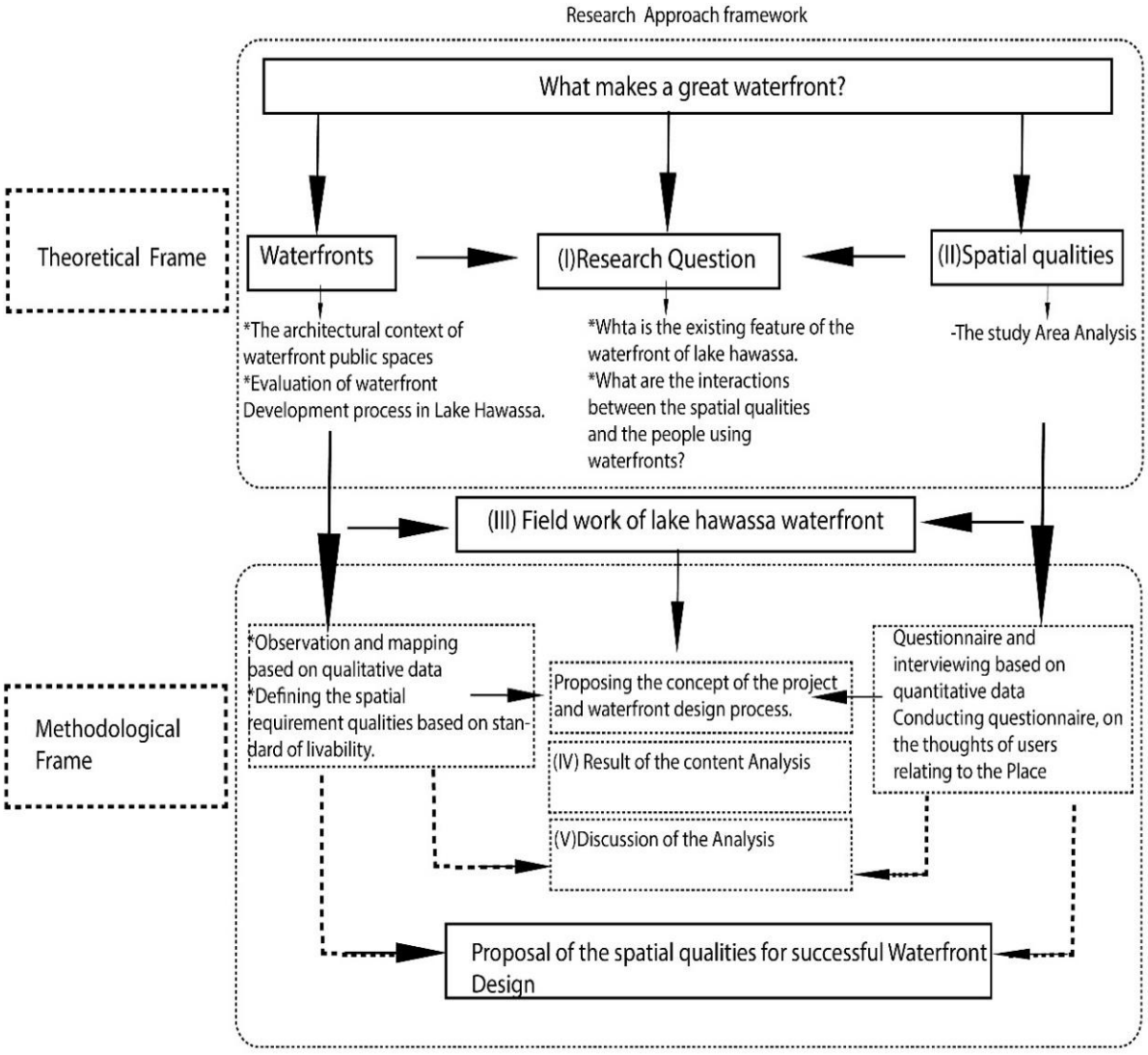

Figure 2. 10:conceptual map

CHAPTER THREE: MATERIALS AND METHODS

This chapter provides details of the study area, the kinds of information required for the study, sampling techniques, and also the methods that were used for gathering the assorted data together with the tools employed. The chapter also addresses and describes the techniques used to analyze the information that yields to answers the research questions and realize the objectives of the research.

3.1 Description of the study area

The study area is found in Hawassa town around the waterfront of lake Hawassa consisting of different activities like resorts, recreational areas, residential blocks, and fishery. Hawassa is a town in Ethiopia, on the shores of Lake Hawassa in the great Rift Valley. It is located 273 km south of Addis Ababa. The town serves as the capital of the Sidama Region. The city is bounded by the lake in the west, Oromiya region in the north, Wondogenet woreda in the east and Shebedino woreda in the south. The city administration is divided into 8 sub-cities and 32 kebeles (20 Urban and 12 Rural). The administrative land of Hawassa is 15,720 ha, with the municipal boundary (i.e., urban kebeles) covering 65 km2(Misiker, 2018). these eight sub cities are Hayek dare, Meneharia, Tabore, Misrak, Bahil Adarash, Addis ketema, Hawela-tulla and Mehal ketema.

According to projections of the central statistics authority of Ethiopia, Hawassa's population is estimated to be 436,992 in 2012E.C. Out of the total number of the Population of the city administration 292,525 people live in urban area, while the remaining 144,467 peoples live in the rural area of the administration. The Populations of sub cities in the study area are 22,297 in Hayek dar sub city, 22,867 in Addis Ketema sub city and 55,901 in tabor sub city. The number of rural population for male is 59,393 and for females is 56,422 with a total population of 115,576. Therefore, the total urban and rural population of Hawassa is 316,842.

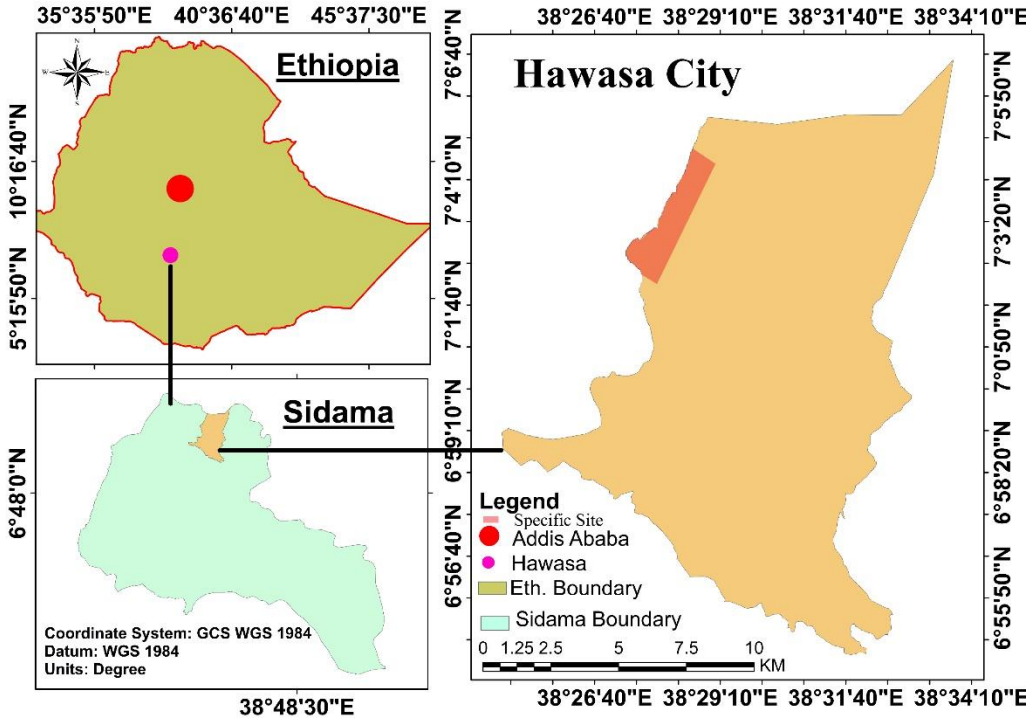

Figure 3 1:Location Map

Lake Hawassa is the smallest of all major lakes south of Awash basin. The catchment has no surface outlet it is about 15 km long and 5.5 km wide with a maximum depth of 22m (NUPI, 1994). Lake Hawassa is one of the few fresh water lakes that may be used for irrigation. The maximum depth is 18-22m. The shoreline length of the lake is 50-65 km. It is a small closed system but fresh and has high productivity.

Lake Hawassa is a major source of fish for the local community. The fishing shore at Hawassa town, especially when the commercial fish catch is being landed and sold, is dramatic and beautiful place to see. In the western shore areas, the lake is being used for drinking by the local community. The littoral zone is extensive and has abundant aquatic vegetation. It is feeding ground for many species of water birds that are extraordinarily abundant (WWSDE, 2001)

3.2 Criteria for selecting the study area

In order to select the study area for this research, the study established various criteria and principles focused on the livability of waterfront development. Lake Hawassa was chosen as the study area due to its unique features as a lake, a resource not available in every city and its impact in development.

Thus, Lake Hawassa was selected for this study because it currently lacks the ability to provide satisfactory services to all users. Additionally, its potential for urban tourism is quite low, and unplanned development is negatively affecting its growth in various aspects. Based on these criteria, observations were made to assess the area.

This observation investigated the factors contributing to the livability of the waterfront, including physical, socio-economic, cultural, and political factors. Furthermore, the study recognized Lake Hawassa as a valuable tourism resource for the city, offering numerous opportunities for activities and events.

The study takes place in Hayek Dar sub city which have Gudumale and Gebeya dar kebeles, Addis Ketema which include Daka and Philadelphia kebeles. and part of Hogane wacho and Tilte kebeles from Tabor sub-sity.

3.4. Research Design

A research design is the ‘procedure for collecting, analyzing, interpreting and reporting data in research studies (Yu, 2009) it's the general plan for connecting the conceptual research problems with the pertinent (and achievable) inquiry. In other words, the research design sets the procedure for the specified data, the methods to be applied to gather and analyze this data, and the way all of this is often visiting to answer the research question (Wilkerson, 2014). A descriptive research design was employed for the study to research the situations thoroughly.

The research utilized a descriptive research design to examine and describe the current state and features of waterfront development. This approach allowed for the evaluation of issues related to waterfront tourism development, assessment of existing accommodation facilities, and identification of the impacts of the Lake Hawassa waterfront area, leading to the development of a responsive design. The purposive sampling technique was chosen to gather valid and reliable responses from various respondents who have a connection to the lake, ensuring accurate conclusions are drawn based on their insights.

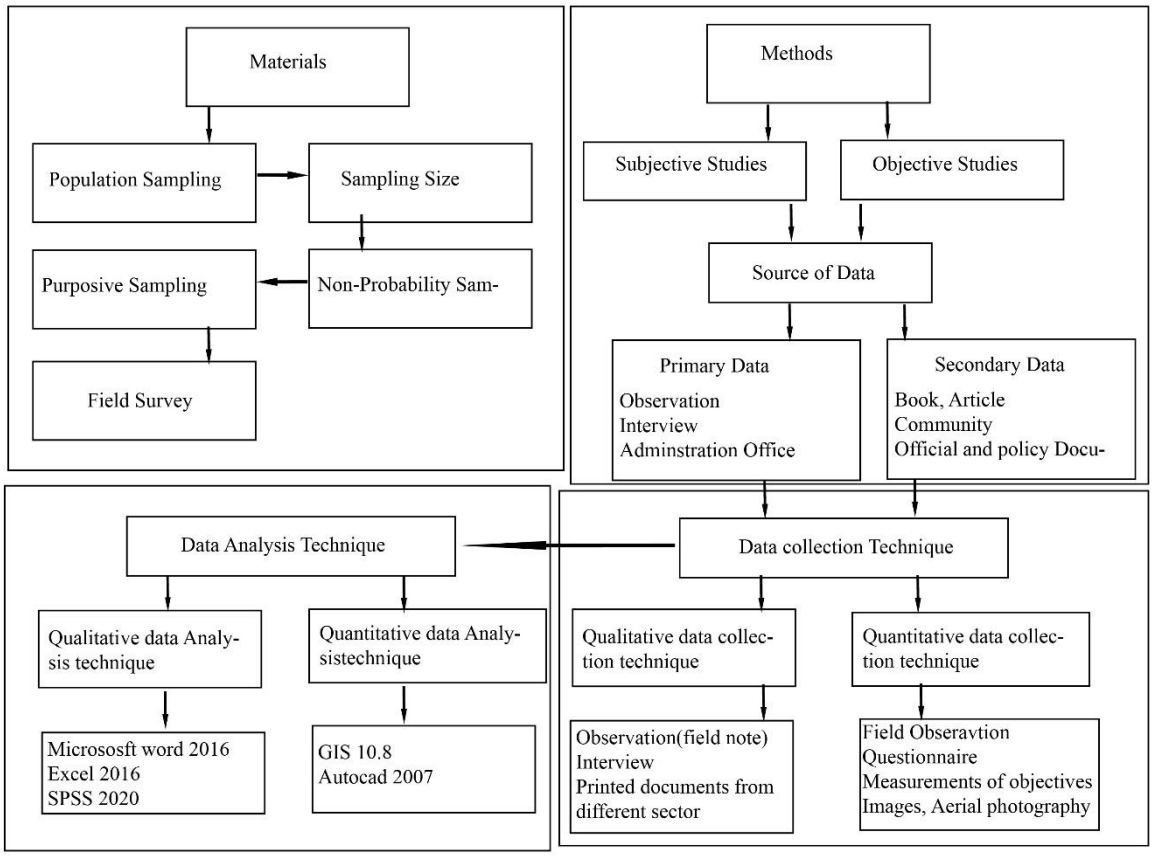

Figure 3. 2: Research Design

3.5. Research approaches

To accomplish the objectives of this study, a combination of quantitative and qualitative research approach was used. The qualitative method was employed to assess the present state and quality of waterfront facilities, along with the connection between the waterfront and its residents in terms of livability and urban tourism. On the other hand, the quantitative method was adopted to gauge the range of services provided by these facilities and the corresponding demand from residents and tourists. This evaluation was carried out by examining the quality level and different livability aspects according to their reaction to the waterfront service, using a grading scale.

In this study, primary data sources were utilized to collect information about various aspects of the subject matter. The focus was on examining the features, conditions, and range of services offered by different facilities. This was achieved by conducting field surveys, which involved observing and measuring these elements directly in their real-world context. To evaluate demand for these facilities, the study looked at the frequency with which they were used and how close the residents lived to these locations. This allowed for a reliable assessment of the actual demand for these facilities and services.

They were considered to be of particular interest and relevance for this study, as their unique characteristics make them ideal spots for tourists and locals to visit and enjoy. By analyzing and collecting data from primary sources, examining both the supply and demand aspects of the subject matter, and focusing on strategic locations with high potential for urban tourism, this research aims to provide valuable insights for the development and promotion of these resource areas within the city. The ultimate goal is to stimulate local economic growth and enhance the overall livability and attractiveness of the urban environment.

3.6. Data Types and Source of Data

3.6.1 Data Source

Data gathering is necessary to accomplish a research's goals and objectives. (Naoum 2013) asserts that there are two methods for gathering data: primary data collection (fieldwork) and secondary data collection (desk study). Utilizing many data gathering techniques helps to enhance and validate the study. Multiple sources of information are added to enhance the data's veracity. The strategy used to gather the data for this study is split into two categories: primary and secondary.

3.6.2. Primary Data Source

The primary source of data is connected to three practical approaches: the survey method, structured interview, the case study approach, and the problem-solving methodology (Naoum 2013). Both the survey and the structured interviews methodologies are used in this study from respondents.

3.6.3. Secondary Data Sources

The secondary source is the literature review, which includes a data from the Hawassa city municipality office, reports from corresponding sub-city offices, government documents, books, journals, and published and/or unpublished research papers addressing the livability of the waterfront in different perspective and the potential of urban tourism.

3.6.1 The existing conditions of the feature and the livability of the waterfront

3.6.1.1. Observation method

For the first objective of site survey analysis, direct site observation, photography, and checklist observation was used as the primary data collection methods. The initial data collection approach was a direct and controlled observation, taking site photos and filling

out prepared checklists in which the physical qualities and characters of the waterfront from Hayik dar sub-city to the Adis ketema were assessed.

The checklists were created based on general elements and principle of livable environment in the waterfront, location and Accessibility, current land use, natural features, built environment, human activity and use pattern, safety and regulatory compliance. The checklists were used for two consecutive days on April 15 and 18. The current physical character of the waterfront was documented based on those approaches. This method was applied and used in this research to deeply understand the extent of the existing physical condition of the waterfront services and facilities.

3.6.1.2. Built Environment analysis of the study Area

Direct site observation the means of photography and checklist observation were used because the main data collection methods for the primary objective. The initial data collection approach was directed by taking site photos and by filling prepared checklists during which the physical qualities and characters of the lake within the study area were assessed using the checklist the present waterfront facilities were evaluated. The checklists were prepared and supported general waterfront elements, Accessibility, land use, natural feature, built environment, human activity and use pattern, and safety and regulatory compliance.

Qualitative data does not necessarily have a specific grading scale, as it primarily deals with non-numerical values or categories, such as colors, emotions, opinions, or labels that cannot be directly compared or ranked. However, some research methods employ a Likert Scale for evaluating qualitative data involving opinions or attitudes. Likert scales usually work with five or seven-point scales, ranging from 'strongly disagree' to 'strongly agree' or 'not at all' to 'very much.'

The 5-point Likert scale is widely used to gauge attitudes or opinions on various topics. It allows individuals to express their level of agreement, satisfaction, or endorsement regarding specific statements, policies, beliefs, or values. This scale provides clear and distinct response categories, while also allowing for some degree of nuance in respondents' answers. It's important to acknowledge that the specific wording and number of response options may vary depending on the particular scale being used(Nemoto and Beglar 2014).

Therefore; the following Likert scale was Considered. 5-point Likert scale from 'strongly disagree' to 'strongly agree:

Table 3 1: Likert Scale

Based on Agreement	**Based on condition**
1 - Strongly disagree	- Very bad (1) (awful)
2 - Disagree	- Bad (2)(many problems)
3 - Neither agree nor disagree	- Needs improvement (3)(some problems)
4 - Agree	- Good (4)
5 - Strongly agree	- Very good (5)

Source((Joshi, Kale et al. 2015)

3.6.2 Examining the relationship of the waterfront and the resident, LULC and investigating the current potential of the waterfront in urban tourism

3.6.2.1. Land use land cover change

To analyze the spatial and temporal changes in the waterfront digital land-sat images from USGS were used and vector and raster data of Hawassa are collected from SNNPR planning and design office. The years are selected within 10-year difference to analyze in deep the change of the land use land cover. Therefore; the 29 years' difference are analyzed and interpreted based on their area change in result section.

Table 3 2:list of landsat-4,5 TM and Landsat 8 OLI images

Year	**Month**	**Cloud cover**
1994	December	0%
2004	January	0%
2014	January	0%
2023	January	0%

(source: USGS land sat look viewer)

The years mentioned for analyzing Land Use and Land Cover (LULC) are important because they provide a historical perspective on how land use and land cover have changed over time. By analyzing LULC data across multiple years, researchers can monitor and assess significant changes in land use patterns, vegetation, urban expansion, and other land-related factors that have environmental, economic, and social implications. These snapshots in time help inform decisions about sustainable land management and planning.

In this specific case, having cloud-free imagery (0% cloud cover) ensures accurate and high-quality data interpretation. Since such cloud-free images can be infrequent, the selected years represent instances where clear imagery for that specific location was available.

The overall procedures of digital analysis of the waterfront are presented as follows: -

1. Data procurement: This step involves the collection of relevant data required for the digital analysis of the waterfront, such as satellite imagery, topographic maps, and GIS data. This data serves as the foundation for the whole analysis process.

2. Geo-referencing of map: Geo-referencing is the process of assigning real-world coordinates to the map data. This step allows the map to be correctly situated in relation to the Earth's surface and ensures that any measurements or analysis carried out on the map will be accurate and relevant.

3. Digitization of city and sub-city boundary maps: This process involves converting the paper-based or raster maps into a digital vector format, which can be easily manipulated and analyzed in GIS software. Digitization allows for the accurate representation of the city and sub-city boundaries and the ability to analyze spatial relationships between different areas.

4. Overlay of vector layer onto the satellite imagery: This step involves superimposing vector data (such as the digitized city and sub-city boundaries) onto the satellite imagery. The combination of these layers allows for better visualization and understanding of the spatial relationships between different features in the study area.

5.Classification Techniques: A supervised or unsupervised classification algorithm was applied to classify the satellite images into different LULC categories. Supervised classification requires training data, where a set of reference samples is used to train the algorithm, while unsupervised classification relies on the statistical properties of the image data to identify and delineate LULC classes.

6. Extraction of the area of interest from the entire satellite data: In order to focus the analysis on the specific waterfront area, it is necessary to extract the relevant portion of the satellite imagery. This can be done using various selection and clipping tools available in GIS software to isolate the area of interest.

7. Formulation of land use and land cover maps with different time frame: To analyze changes in the waterfront area over time, land use and land cover maps are created for different time periods using the collected satellite imagery. These maps help in

understanding the historical trends and current patterns of land use and land cover, informing decision-making for future development and management of the waterfront area.

3.6.2.2. Questionnaire and survey method

In order to fulfill the study's second and third goal, a combination of a questionnaire survey and an interview was employed. A total of 392 questionnaires were printed and distributed to respondents with the assistance of 6 data collectors. The target respondents included residents, Associations in the waterfront, and domestic tourists, as they have regular and daily interactions with the waterfront and are highly exposed to issues arising from unplanned land use distribution and improper utilization of waterfront resources.

The questionnaires mainly focused on accessibility, amenities, facility features, land use change, and current threats to the waterfront. This series of questionnaires aimed to provide a clearer understanding of the present challenges faced by the lake and gather insight into the respondents' vision for the waterfront's future.

3.6.2.3. Semi-structure interview method

In the study, semi-structured interviews were utilized to engage directly with tourists at the waterfront and professionals, such as urban planners, in the Hawassa city municipality office. This method allowed for a deeper understanding of the reasons behind the unplanned waterfront and provided insights into the approaches used for controlling waterfront development through judgment sampling techniques. Additionally, the interviews helped uncover the government's future outlook on the lake conditions at the waterfront.

On the other hand, data was collected from various published and conventional sources, including journals, articles, and reports. These resources were employed to analyze and discuss the findings obtained from the questionnaires and interviews.

3.6.7. The material used to achieve the second objective for the study area

Materials used during the interview include an A4-sized printed questionnaire, a cell phone, an audio recorder, and notebooks. Microsoft Excel were used to analyze the valid questionnaires after they were collected.

3.8. Study Population

The waterfront of Hawassa constituting some portion of three sub- cities identified. These areas are located in a place has a connection with the waterfront where it has a lot of opportunity for Tourism and there are also a lot of people being dependent on the lake in this

site. There are different flora and fauna that are an opportunity for the lake but threatened due to lack of better urban planning and design interventions. Therefore, with these criteria, the site is selected.

There are three sub-cities adjacent to lake Hawassa which are Tabor, Hayk-dar, and Addis-ketema. Under the three sub-cities, Tabor sub-city consists of a specific area which is under selected site known as Hayk-dar sub-city consists of a specific area which is under selected site known as Fekir Hayk and Addis Ketema sub-city consists of the specific area under selected site the resorts area as shown below in Table 2.

Table 3. 3:Study Population Focus Group

No.	Name of sub-city adjacent to the lakefront	the selected area under the sub-city	Population in sub-city adjacent to the lakefront.	Percent
1	Tabor	Amora Gedel	55,901	55.3
2	Hayk dar	Fekir Hayk	22,297	22.1
3	Addis Ketema	Around resorts area	22,867	22.6
	Total		101065	100

Source (Sub-city, Own design)

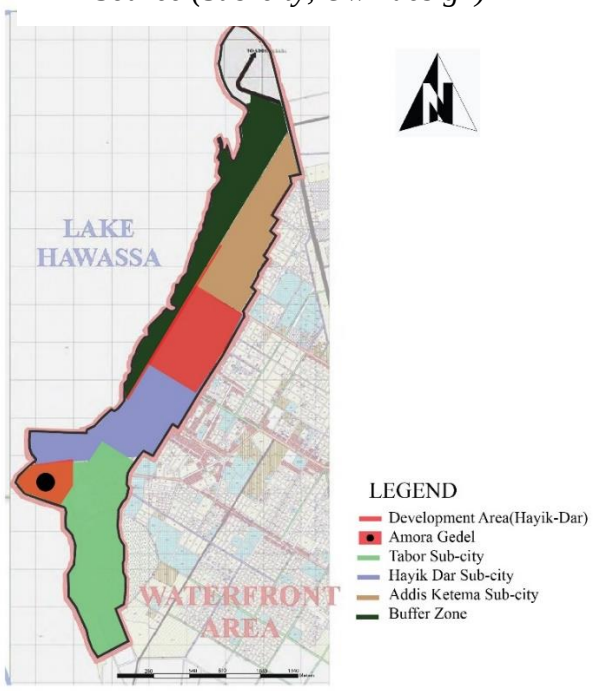

Figure 3 3: Location Map of sub-city

In addition, the places mentioned (Amora Gedel, Fekir Hayk, around resort (shebelle II) is considered appropriate as specific places to be mentioned because they constitute the major activities taking place around the lakefront. Amora Gedel is a place in which different parts of the community as well as tourists from different place come and enjoy watching different birds and natural features, make social gatherings for their different ceremonies and experience different outcomes of food from fish. Fekir Hayk is a place known for giving the community in the city and Tourists from the country and abroad boat experience in Lake Hawassa; this is done by different groups of the youth from the city making organizations. Resort's area is a place consisting of different birds' life, resorts, a hotel, and a place for different entertainment activities for more than Fifty (50) years. They have been there for several years as a core place for these activities to take place. Therefore, they are the best places to consider with the information needed to answer the research question of the study.(Tekalign 2013)

3.9. Sample size and Sampling techniques

Two specific areas were chosen for this research: the waterfront area of Hayik Dar sub-city and Adis Ketema sub-city. These areas were selected due to their significance and potential as primary resource areas for urban tourism in the city.

To make it simpler to compute the sample size without over estimating it when the population is known Yamane (1967) proposed the following formula. Yemane's formula is used to determine the sample size for a survey, given certain total households. The formula is as follows:

$$n = N / (1 + N * e^2)$$

Where n is the sample size needed, N is the total population or total households, and e is the desired level of precision or margin of error (typically assumed at 0.05 for a 95% confidence level).

In this case, the total households (N) is given as 20,213 and we assume the desired level of precision (e) to be 0.05. Now we can calculate the sample size (n):

$$n = 20213 / (1 + 20213 * 0.05^2)$$

$$n = 20213 / (1 + 20213 * 0.0025)$$

$$n = 20213 / (1 + 50.5325)$$

$$n = 20213 / 51.5325$$

$$n \approx 392$$

Using Yemane's formula, a sample size of approximately 392 households would be needed for the survey. Therefore, the purposive sampling technique is used to take a sample in the study area from the study of population. A sample is taken based on who is fit considering what they do and where do they live. Thus, the study conducted a 392-sample population size purposively for those who were convenient and willing to questionnaire. A total of 392 questionnaires were distributed, and 374 were usable for the final analysis. 18 respondents were removed due to appearing not to be engaged (they answered somewhat agree to every Likert-scale item)

According to Table 3.4, the population percentages for each sub-city are as follows: 55.5% for Tabor, 22.3% for Hayk Dar, and 22.6% for Addis Ketema. Based on these figures, the questionnaire distribution was 166 for Tabor sub-city, 67 for Hayk Dar sub-city, and 68 for Addis Ketema sub-city, making up a total of 392 questionnaires. 20 visitors are chosen to be interviewed to gather important information and insights based on when they come and the reason for their visit.

Table 3 4: Sample size determination for each sub-city

No.	Name of sub-city adjacent to the lakefront	Households in sub-city adjacent to the lakefront.	Percent	Sample Number of Household in each subcity
1	Tabor	11,180	55.3	217
2	Hayk dar	4459	22.1	87
3	Addis Ketema	4573	22.6	82
Total		101065	100	392

Source (Own design)

3.9. Data Analysis Technique

3.9.1. Qualitative Data Analysis Technique

The qualitative data interviews, notes, video, audio recordings, images, and text documents were analyzed as follows.

Table 3 5:Qualitative data analysis techniques.

Type	Description	Software used
	This is one of the most common methods to analyze qualitative data. It is used to analyze	

Content Analysis	documented information in the form of texts, media, or even physical items. When to use this method depends on the research questions. Content analysis is usually used to analyze responses from interviewees. this analysis particularly focused on the first objective	Excel, spss and Word 2016 were used to analyze interviews, surveys, and videos)
Narrative analysis	This method is used to analyze content from various sources, such as interviews of respondents, observations from the field, or surveys. It focuses on using the stories and experiences shared by people to answer the research questions.	
Discourse analysis	The interviews and all forms of text data Were analyzed. mainly for the second objective	
Framework analysis	Finally, formalization, identifying a thematic framework, coding, charting, mapping, and interpretation were employed.	

3.9.2. Quantitative data analysis techniques

The data like measurements, statics, and numerical data collected through census, questionnaires, and surveys have been analyzed through descriptive analysis quantitatively using, Excel software to analyze and describe the data, maps, diagrams, charts, graphs, text, figures, and tables. Furthermore, the study used GIS 10.5 and AutoCAD 2016 software for working on the general spatial analysis of the study area. Moreover, Revit 2020 is used for some detailed 3D designs, and others like Microsoft office word 2016, and PowerPoint 2016 are used for documentation and presentation.

Furthermore, the qualitative and quantitative data are examined using the Relative Importance Index (RII) analysis method. This method utilizes the data generated from the survey on determinant factors and analyzes them using the relative importance index. This type of analysis technique demonstrates the relative importance of predictors (independent variables) when these variables are correlated with each other.(Somiah, Osei-Poku et al. 2015). The given RII ranges can be summarized as follows: $0 \leq RII < 0.20$: Very Low Level, $0.21 \leq RII \leq 0.50$: Low Level, $0.51 \leq RII \leq 0.60$: Moderate Level, $0.61 \leq RII \leq 0.80$: High Level, $0.81 \leq RII \leq 1.00$: Very High Level. These ranges represent different levels of relative importance or significance. The higher the RII value, the greater the importance within the given context.

$$\text{RII} = \frac{\sum W}{A * N}$$

Where, W – weighing is given to each statement by respondents and ranges from 1 to 5; A – higher response integer (5); and N – total number of respondents.

In addition, a Kruskal-Wallis test was conducted to compare the mean differences between age user groups and significant variables. This analysis assists in prioritizing the impact of these variables, allowing for a better understanding of respondents' preferences concerning potential solutions. The study also identifies the most important variables based on a five-point scale (1- strongly disagree, 2- disagree, 3-neither, 4- agree, and 5 – strongly agree) using the responses of the interviewees. This approach helps in uncovering the factors contributing to various problems related to livability and urban tourism around waterfront areas.

3.10. Perception Data Analysis.

After the data collection, the variables are coded on spss software and a reliability test is made to check the consistency of the data.

3.11 Validity and Reliability of the Data

Validity refers to the accuracy and meaningfulness of a measuring instrument, as defined by (Kimberlin and Winterstein 2008). To ensure the validity of the research instrument, steps were taken, including a pre-testing phase to address any issues with questions or techniques. Feedback from a sample group was collected to make necessary improvements. The instrument also underwent review by experts, resulting in refinements and exclusions. Statistical validity, including internal and structural validity by checking its significant in correlating dependent and independent variables with p-value should be less than 0.05 , was used to assess the questionnaire's validity (Drost 2011).

3.11.1 Internal Validity

One way to assess the validity of a questionnaire is through the use of statistical tests, with internal validity being the first such test. This test involves measuring the correlation coefficients between each item within a given field and the entire field as a whole. By examining the strength and direction of these correlations, researchers can determine whether the questions accurately capture the intended construct and whether there are any potential biases or extraneous influences that may affect the results.

3.11.2 structural validity

In this study, the second statistical test used to evaluate the validity of the questionnaire was structure validity. This test involved assessing the validity of each field as well as the questionnaire as a whole, by measuring the correlation coefficient between one field and all other fields in the questionnaire that shared the same level of Likert scale. By examining these correlation coefficients, researchers could determine whether the structure of the questionnaire accurately represented the intended constructs and whether the questions were organized in a clear and meaningful way.

3.11.3. Reliability

The internal consistency and reliability of the gathered data were assessed using Cronbach's alpha (α) (Field, 2005). A value between 0.70 and 1 for Cronbach's α is deemed reliable (Field, 2005). In this study, the Cronbach's α value is greater than 0.7, which is considered acceptable for further analysis. This statement suggests that the significance level of six main aspects and their sub factors was determined using the mean score.

3.12 Ethical Consideration

Before beginning data collection, different participants were provided a consent letter to conduct the research. The study was extremely sensitive to the emotions, opinions, and dignity of the participants. The study purpose was thoroughly stated to the participants, together with how the data obtained from them was employed in this study. The knowledge gathered from the participants was only used for this specific research, and therefore the study kept the confidentiality of all individuals who participated in the study.

3.13 Summary of methods

Table 3. 6:Summary of method (source :own design)

Specific objective	Data used	Source of data	Method of collection	Instrument used	Analysis software
To evaluate the existing feature of the waterfront	Structural plan Site Photo	Municipality and the existing condition of the feature in the area	Observation method	Tally records Samsung cell phone	GIS and AutoCAD2016 Microsoft Word
To examine the relationship	The existing situation in the study area	Sampled residents	questionnaire survey and interview	A4 Paper Cell phone	

between the waterfront and the land use	Responses of the residents based on the prepared questionnaire Secondary data			Notebook	2016, Spss and Excel 2016
To investigate the current potential of the waterfront in urban tourism	Responses of the tourists based on the prepared questionnaire	sampled Households and Visitors	Interview	A4 Paper Cell phone Notebook	
To suggest implementing responsive design strategies to enhance the livability of the waterfront and to promote urban tourism	Urban planning norms and standard Element of Waterfront development Livability principle	Addis Ababa urban planning norms and standards. Research Journals and articles by scholars Case study	Interview Secondary data assessment Googling	computer	

(Source: Own design, 2023)

CHAPTER FOUR: RESULT AND DISCUSSION

This chapter is structured according to the objectives and research questions outlined earlier, focusing on the methods and approaches used to achieve the specific goals established in the preceding chapters. The background of the selected site, as well as its current conditions, are detailed in this chapter.

Data was collected and analyzed from various sources, including questionnaires completed by regular waterfront users and professionals, interviews with experts and tourists, and direct site observations. The findings from these sources are discussed in this chapter, providing insights into the perspectives and experiences of different stakeholders and shedding light on the site's unique characteristics.

4.1 Socio-demographic characteristics of respondents

The profiles of the respondents are presented in Table 4.6. The results of the descriptive analysis of the gender variable of the respondents was male (69.78), female (30.21). The majority of the respondents were 18 to 44 years old (82.8%). The majority of the respondents were from Ethiopia (98.39%. The findings also show that the majority of respondents were educated at the university level (58.2%), and a similar proportion were employed (42.24%), while about a third were currently students (36.36%). Furthermore, the majority of respondents were residents of Hawassa (44.9%) or local people.

Table 4. 1:Socio-demographic characteristics and general perceptions of Households at the lake Hawassa

Profile category		Frequency(374)	Percentage
Gender	Female	113	30.21
	Male	261	69.78
Age	18-24	101	27
	25-34	136	36.36
	35-44	73	19.51
	45-54	34	9.09
	55-64	18	4.81
	65 and above	12	3.21

(Source: Respondent survey data)

Table 4. 2 Socio-demographic characteristics and general perceptions of Visitors at the lake Hawassa:

Profile category		Frequency(30)	Percentage (%)
Gender	Female	13	43.3
	Male	17	56.6
Age	18-24	9	30
	25-34	11	36.6
	35-44	2	6.6
	45-54	1	3.3
	55-64	4	13.3
	65 and above	3	10

Source (Field Survey)

4.2. The existing conditions of the features in the waterfront

To analyze the current livability condition of the waterfront feature a Likert scale grading method is used. The average score for each waterfront element depicts the conditions at Lake Hawassa. Therefore, an average score of 26-30 signifies an excellent waterfront in every aspect, while 21-25 indicates a fairly good one. A score of 16-20 means the waterfronts aspect is satisfactory but requires maintenance, 11-15 suggests significant improvements are needed, and 5-10 implies a disastrous situation in various aspects. The current status of the study area is assessed based on this standard score using a checklist.

A. Land use Map

The land use map illustrates varying land use distributions in the lake area, with a noticeable lack of integration among them. The area is predominantly characterized by commercial and residential land use.

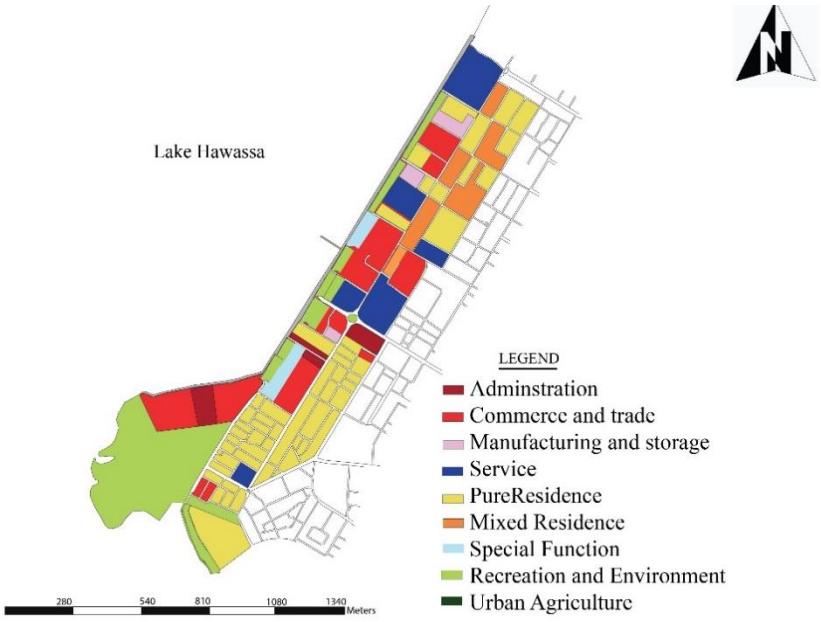

Figure 4. 1:Land use map of Study Area

C. Street Map

The street map displays various road types within the specified Action area but lacks continuity and visual clarity. The Arterial roads measure 12 meters in wide. The collector roads are 6m and the local roads are 4m in width.

Figure 4. 2: Street Map of the Study Area

4.2.2. Accessibility

Accessibility in waterfront development ensures equal access for all individuals, regardless of their abilities or age, through the creation of inclusive infrastructure and amenities.

Table 4. 3:Accessibility based on site observation

Attribute	Score	Grand total Score
Connectivity to nearby residential and commercial areas	3	12
Availability of public transportation to reach the waterfront	3	
Adequate pedestrian and bicycle pathways leading to the waterfront	2	
Clear signage and information for easy navigation	1	

(Source: site observation. 2023)

The waterfront has good overall accessibility with a score of 12 out of 20. It is well-connected to surrounding areas and offers various transportation options. Improvements can be made to pedestrian and bicycle pathways, signage, and information for better navigation. Enhancing these aspects will further improve the waterfront's accessibility and user experience.

4.2.3. Facilities and amenities

Facilities and amenities in waterfront development enhance the overall experience and attract residents, visitors, and businesses. They include infrastructure, services, and features that create vibrant and accessible waterfront spaces, promoting a high quality of life and economic growth.

Table 4. 4:Facilities and amenities analysis by observation

Attribute	Score	Grand Score
Adequate number of public restrooms near the waterfront	1	
Availability of drinking water facilities	2	
Sufficient seating and shaded areas for relaxation	2	

Availability of recreational facilities (e.g. playground, sports facilities)	1	
Availability of dining options and food vending stalls	2	
Total	7	7

(Source: site observation. 2023)

Figure 4. 3: Activity on the lake (Source: Site Photo)

The waterfront development currently lacks adequate facilities and amenities, including dining options, seating areas, shaded areas, public restrooms, recreational facilities, and drinking water facilities. With a score of 7, there is a need for significant improvement to enhance the visitor experience. Priority should be given to improving public restrooms, recreational facilities, and drinking water infrastructure to ensure a more comfortable and enjoyable visit.

4.2.4. Safety and security

Safety and security in waterfront development involve measures to protect people, property, and the environment from risks and hazards. This includes planning, infrastructure improvements, emergency preparedness, and community engagement to ensure a secure living environment.

Table 4. 5:safety and security analysis based on observation

Attribute	Score	Grand Score
Well-maintained and safe environment for visitors	2	
Adequate lighting in the waterfront area for evening and night visits	1	
Presence of security personnel and monitoring	1	

Availability of emergency facilities	1	
Safe and secure parking facilities	2	
Total	7	7

(Source: site observation. 2023)

Figure 4. 4:The lack of lights in the evening and on-street random parking in the front of the entrance(source: Site Photo)

The assessment indicates that the waterfront area has inadequate maintenance, lighting, security, emergency facilities, and parking. As a result, the area's safety and security score is low at 5 points, which may negatively impact visitor confidence and comfort.

4.2.5. Environmental aspects

Environmental considerations in waterfront development involve minimizing impacts on water quality, coastal ecosystems, and marine life. This includes sustainable land use planning, responsible resource management, and resilience to climate change. The goal is to create environmentally friendly and resilient waterfront spaces.

Table 4. 6:Environmental aspect analysis based on observation

Attribute	Score	Grand Score
Clean and well-maintained waterfront	1	
Adequate waste disposal facilities	1	
Sustainable practices and eco-friendly initiatives on the waterfront	1	
Integration of waterfront with surrounding nature and ecosystem	1	
Protection and conservation of local flora and fauna	1	
	5	5

(Source: site observation. 2023)

Figure 4. 5: Lacks a clean and Integration with the surrounding(Source: Site Photo)

In conclusion, the waterfront scored low with a total score of 5 out of 25, indicating room for improvement in cleanliness, waste disposal, sustainability, integration with nature, and protection of flora and fauna.

4.2.6. Social and cultural aspects

Social and cultural aspects refer to the beliefs, values, customs, traditions, and practices shared by a group of people or society, which shape their interactions, behaviors, and way of life.

Table 4. 7:Social and cultural aspects based on observation

Attribute	Score	Grand Score
Availability of public spaces for cultural and community activities	1	
Integration of local history and culture in the waterfront design	1	
Inclusiveness and accessibility for people of all ages and abilities	1	
Presence of public art installations or cultural landmarks	1	
Opportunities for social interaction and community building	1	
Total	5	5

(Source: site observation. 2023)

Based on the evidence, the waterfront scores low in social and cultural aspects, with an average score of 5 out of 25. Improvement is needed in public spaces, local history integration, inclusiveness, public art, and opportunities for social interaction. This indicates a need to foster community, support cultural activity, and create an inclusive environment. Further development is necessary to enhance the waterfront area.

4.2.7. Economic Aspect: Economic development potential

Economic development potential refers to a region's ability to grow its economy through factors like resources, infrastructure, workforce, and business environment. It attracts investments, creates jobs, and boosts productivity and wealth.

Table 4. 8:Economic aspect analysis based on observation

Attribute	Score	Grand Score
Potential for job creation in the waterfront area	3	
Availability of investment and business opportunities	2	
Presence of thriving local businesses and industries	2	
Opportunities for tourism development and revenue generation	2	
Total	9	9

(Source: site observation. 2023)

Figure 4. 6: On-street local business(Source: Site Photo)

The economic development potential in the region appears to be low, with ratings of 1 out of 5 for job creation, investment opportunities, local businesses, industries, and tourism

development. Improvements and strategic planning are necessary to enhance the area's economic prospects.

4.2.8. Real estate and property values

Real estate refers to the land, buildings, and natural resources on that land, while property values indicate the worth or monetary value of those real estate assets in the market.

Table 4. 9:Real estate and property value

Attribute	Score	Grand Score
Impact of waterfront development on surrounding property values	3	
Availability of affordable housing near the waterfront area	3	
Presence of a diverse mix of residential, commercial, and recreational properties	4	
Total	10	10

(Source: site observation. 2023)

Overall, the grand score for these three attributes is 10 out of 15, suggesting that the real estate and property value situation in the given area is fairly well-rounded, but there is some room for improvement, particularly in terms of affordable housing availability and the impact of waterfront development on property values.

4.2.9. Economic resilience

Economic resilience is the capacity of an economy to withstand and adapt to shocks and changes while maintaining stability.

Table 4. 10:Economic resilience

Attribute	Score	Grand Score
Ability of the waterfront area to adapt and recover from economic challenges	1	
Diversification of revenue streams and economic activities	1	

Creation of long-term and sustainable employment opportunities	1	
Total	3	3

(Source: site observation. 2023)

The waterfront area has low ability to adapt and recover from economic challenges, diversify revenue streams, and create long-term sustainable employment opportunities, with a score of 1 out of 5 for each attribute.

4.2.10. Physical Aspects: Infrastructure and utilities

Infrastructure and utilities encompass essential physical and organizational structures and services necessary for a community's functioning, including transport, communication, water supply, electricity, and public institutions.

Table 4. 11:Physical aspect analysis based on observation

Attribute	Score	Grand Score
Availability of essential utilities	4	
Adequate storm water management and flood protection systems	1	
Quality and maintenance of roads, and pathways in the waterfront area	1	
Total	3	3

(Source: site observation. 2023)

The assessed area has good availability of essential utilities (4 out of 5). However, improvements are needed for storm water management, flood protection systems, road quality, and pathway maintenance (1 out of 5).

4.2.11. Urban design and aesthetics

Infrastructure encompasses the necessary structures and systems for a community's functioning, including transportation, communication, water supply, electricity, and public institutions. Utilities are companies that provide essential services like water, electricity, and gas, ensuring accessibility, affordability, and reliability.

Table 4. 12:Urban design and aesthetics analysis based on observation

Attribute	Score	Grand Score
Attractive and visually appealing waterfront environment	2	
Cohesive and context-sensitive urban design	1	
Integration of green spaces and natural elements in the waterfront area	1	
Total	4	4

(Source: site observation. 2023)

Figure 4. 7: Lacks visually appealing and attractive waterfront(Source: Site Photo)

The waterfront area's current aesthetics and urban design are lacking, with a low score of 2 out of 5 in attractiveness. There is a clear need for improved integration of green spaces and natural elements, as well as cohesive and context-sensitive urban design. Enhancements are necessary to create a visually appealing and desirable waterfront environment.

4.2.12. Adaptive reuse and redevelopment

Adaptive reuse repurposes existing structures for new functions, conserving resources and preserving history and culture.

Table 4. 13:Adaptive reuse and redevelopment analysis based on observation

Attribute	Score	Grand Score
Incorporation of historic and cultural elements in the waterfront design	1	

Revitalization of underused or abandoned properties	1	
Flexibility in design to accommodate future changes in land use or user needs	1	
Total	3	3

(Source: site observation. 2023)

Adaptive reuse and redevelopment are important for integrating history and culture, revitalizing properties, and accommodating future changes. However, there is room for improvement in these aspects, scoring low in each attribute. Prioritizing repairs and enhancements can lead to higher scores and promote sustainable urban development.

4.3. Final summary for the observation method of the first objective

Therefore, for a conclusion of the above observation analysis the following grading scale of Likert scale is used and it interpreted as follow:

Table 4. 14:summary for observation analysis

Aspect	**Attribute**	**Grand score**
Physical	Accessibility	12/25
	Facilities and Amenities	7/25
	Urban design aesthetics	4/20
	Safety and security	7/25
	infrastructure and utilities	3/15
	adaptive reuse	3/15
Economic	economic resilience	3/15
	Real estate and property value	10/15
	economic development potential	9/20
Social and cultural	social and cultural aspect	5/25
Environmental	Environmental Aspect	5/25

(Source: site observation. 2023)

According to the checklist grading scale, the current state of the waterfront requires significant improvements, as some aspects are at a disastrous level. This situation demands increased attention and the implementation of new developments to address these issues effectively.

4.2. Existing Aspects of waterfront development Analysis based on the livability principle

4.2.1 Functional Aspect

The data provides descriptive statistics for three functional aspects of the waterfront: functional opportunities, joyful areas, and water-based activities. The scores for each aspect range from 1 (minimum) to 5 (maximum). The sample size (N) for each aspect is 374.

Table 4. 15:Descriptive statistics of questionnaire variables—Waterfront Development

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Functional	the waterfront has various functional opportunities	374	1.89	1.136	0.378	1	5
	the waterfront provides joyful areas with music, food, literature, dance, and maritime heritage	374	1.78	1.317	0.356	1	5
	Different types of water based activities can be seen	374	1.89	1.136	0.378	1	5

The waterfront's functional opportunities received a mean score of 1.89 and an RII of 0.378, suggesting an average level of agreement among respondents. There is significant variation in responses, with a standard deviation of 1.136. The waterfront's provision of joyful areas obtained a mean score of 1.78 and an RII of 0.356, indicating slightly lower agreement among respondents. The standard deviation is higher at 1.317, highlighting diverse perceptions. The availability of different water-based activities scored the same mean value as functional opportunities, 1.89, with an RII of 0.378. There is variability in responses, as shown by the standard deviation of 1.136. Overall, the results indicate moderately low scores and RII values for the three aspects, suggesting mixed opinions among respondents. The high standard deviations indicate varying perceptions of the waterfront's offerings.

4.2.2. Physical Aspect

A physical aspect in waterfront development refers to the design and construction elements that shape the spatial layout, infrastructure, and built environment of an area along a waterbody.

Table 4. 16:Descriptive statistics of questionnaire variables—Waterfront Development

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max

Physical	the waterfront is well maintained	374	1.19	0.511	0.23	1	3
	The place possesses various art objects in good physical condition	374	2.00	.000	0.4	2	3
	Urban furniture is in good physical condition.	374	1.89	1.136	0.38	1	4
	The waterfront is accessible for able and disabled people.	374	1.26	1.26	0.25	1	2
	the area has easy access to other public environments.	374	3.61	1.107	0.72	2	5
	It is easy to reach the waterfront via pedestrian access, bicycle lanes, and/or public transportation.	374	3.61	1.107	0.72	2	5
	Traffic condition is proper.	374	3.48	0.878	0.69	2	4
	Parking conditions are adequate	374	1.27	0.864	0.25	1	4

Improvements are needed in several aspects of the area. The availability of well-maintained art objects received a low mean score of 2.00, indicating the need for preservation and addition of art pieces. Accessibility for all individuals also requires attention, with a low mean score of 1.26. On a positive note, the connectivity of the waterfront to other public environments and transportation options scored relatively well, with a mean score of 3.61. However, adequate parking conditions scored poorly, with a mean score of 1.27. Overall, focusing on enhancing art objects, improving accessibility, and addressing parking concerns will contribute to a more attractive and accessible waterfront area.

4.2.3 Social Aspect

Social aspect in waterfront development refers to the consideration and integration of community needs, public access, recreational opportunities, and social interaction spaces to promote a vibrant, inclusive, and sustainable waterfront area.

Table 4. 17:Descriptive statistics of questionnaire variables—Waterfront Development

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Social	The environment is attractive.	374	3.79	.405	0.75	3	4
	People with different education levels, age groups, ethnicities, and income levels can enjoy the place.	374	4.91	.288	0.98	4	5

	It is a good experience to spend time in the place.	374	3.91	.288	0.78	3	4

The results show positive perceptions of the environment's attractiveness, inclusiveness, and overall enjoyment. The mean score for attractiveness is 3.79, indicating a generally positive perception. Inclusiveness received a high mean score of 4.91, suggesting people feel welcomed and included. Overall enjoyment scored 3.91, indicating a good experience for most respondents. These findings highlight the importance of creating inclusive and enjoyable social spaces for a diverse range of visitors.

4.2.4. Economic Aspect

Economic Aspect in waterfront development refers to the financial considerations, investment opportunities, and potential revenue generation associated with the revitalization and sustainable growth of coastal areas.

Table 4. 18:Descriptive statistics of questionnaire variables—Waterfront Development

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Economic	The economic and nature-friendly design approach was considered during the development process.	374	2.44	0.779	0.488	2	4
	The area provides good economic income.	374	2.34	0.616	0.468	2	5
	I like to visit here frequently.	374	2.47	1.207	0.494	1	4

(Source: spss data of questionnaire. 2023)

The table shows the results of an analysis on three aspects: economic and nature-friendly design approach, economic income, and frequency of visits. The mean scores suggest a moderately positive perception for each aspect, with scores of 2.44, 2.34, and 2.47 respectively. The standard deviations indicate some variance in opinions, but not too significant. The relative importance index (RII) values highlight the significance of each aspect, with values of 0.488, 0.468, and 0.494. Overall, respondents have a moderately positive perception of the design approach, believe the area provides reasonable economic income, and enjoy visiting the location relatively frequently. Individual preferences may influence perceptions and decisions.

4.2.5 Cultural Aspect

Cultural aspect in waterfront development refers to the incorporation and preservation of the local history, heritage, and traditions in the design and planning of waterfront spaces, aiming to create a sense of identity, celebrate diversity, and foster a sense of belonging within the community.

Table 4. 19:Descriptive statistics of questionnaire variables—Waterfront Development

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Cultural	Historical references are protected and/or reflected in the waterfront.	374	2.15	1.051	0.43	1	4
	There are cultural and art activities in the place.	374	1.34	0.621	0.27	1	3
	The unique image has been protected and the image has developed.	374	1.88	0.945	0.38	1	4

(Source: spss data of questionnaire. 2023)

The data shows the results of a study on the cultural aspect of waterfronts. Three variables were analyzed: protection and reflection of historical references, cultural and art activities, and preservation and development of a unique image. The mean scores for these variables are 2.15, 1.34, and 1.88 respectively. The standard deviations indicate some variability in responses. The relative importance index (RII) values are 0.43, 0.27, and 0.38, highlighting the importance of each aspect. Overall, the data suggests that historical references are somewhat protected and reflected, cultural and art activities are limited and need further development, and efforts to protect and develop a unique image are still ongoing.

4.2.5. Political Aspect

A political aspect in waterfront development refers to the influence of government policies, regulations, and stakeholder interests in shaping the planning, decision-making, and implementation of projects along coastal areas.

Table 4. 20:Descriptive statistics of questionnaire variables—Waterfront Development

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max

Political	The development process has been done with a successful cooperation process with related stakeholders..	374	2.15	1.051	0.43	1	4
	Creativity, innovation, and/or social well-being policies were well considered during the development process.	374	1.74	0.621	0.34	1	2
	Proper regulations are adopted by politicians to provide continuous maintenance.	374	2.81	0.945	0.56	2	4

The table summarizes data on three variables related to the political aspect of development. stakeholder cooperation, creativity and innovation policies, and regulations for maintenance.

In stakeholder cooperation moderately successful (mean: 2.15) with some variability, creativity and innovation policies less consideration (mean: 1.74) with less variation, and in regulations for maintenance consistent adoption (mean: 2.81) with some variability.

In summary, stakeholder cooperation is moderately successful, creativity and innovation policies receive less consideration, and there is consistent adoption of regulations for maintenance.

4.3. The relation of waterfront with land use and land cover change

Hawassa, an Ethiopian city, has experienced rapid growth compared to other cities in the country. Land use and land cover changes, particularly in waterfront areas, have occurred over the past 60 years. This study analyzed changes from 1984 to 2023, focusing on development, forest cover, wetlands, grasslands, bare land, water, and agricultural land. The city's development has sparked interest in developing the waterfront for hotels and other purposes. Forest cover distribution has shown positive changes, concentrating in two areas, but has steadily declined from 2003 to 2023 due to settlement expansion.

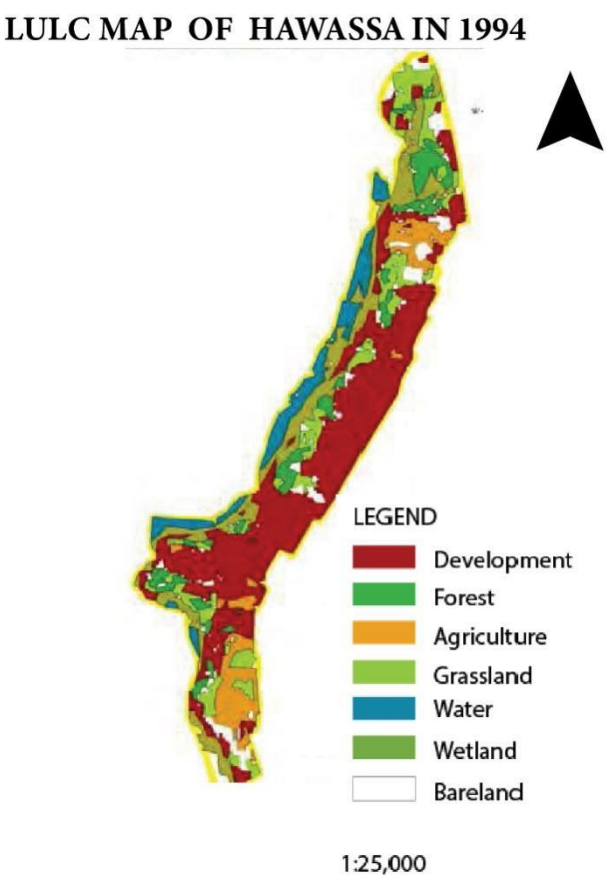

Figure 4. 9:LULC of 1994(source : processed digital image procured from USGS)

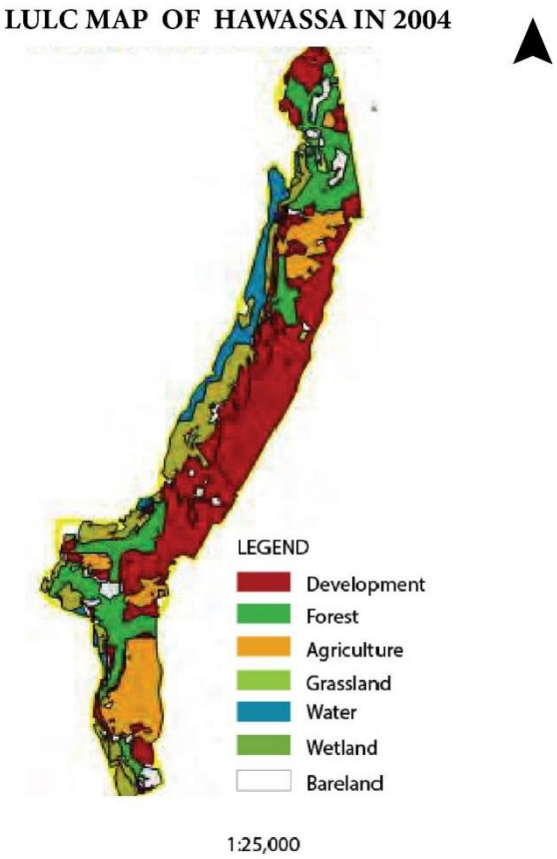

Figure 4. 8:LULC of 2004(source : processed digital image procured from USGS)

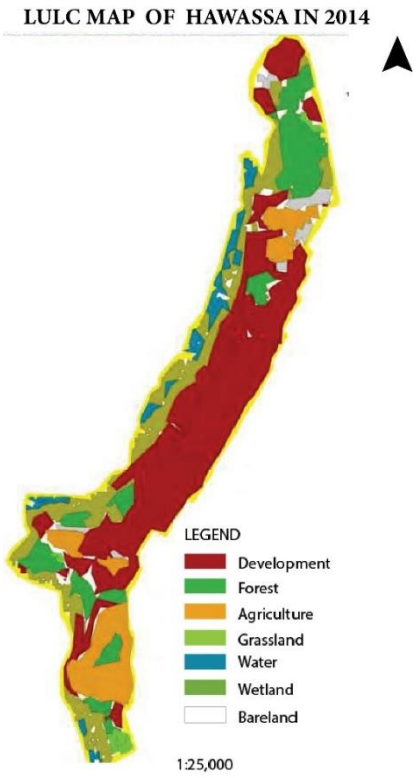

Figure 4. 11:LULC of 2014 (source : processed digital image procured from USGS)

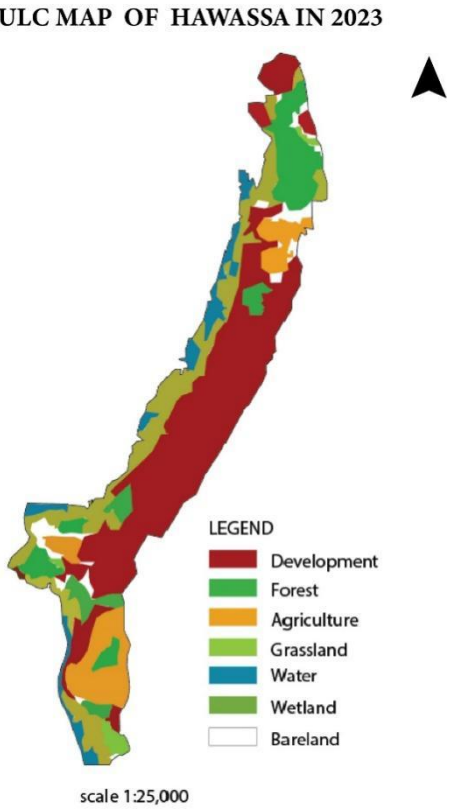

Figure 4. 10:LULC of 20234(source : processed digital image procured from USGS)

Table 4.24 displays the seven land use and land cover spatial dynamics in the study area, as well as the annual percentage change in land use during the specified time frame. Spatial dynamics of land use types involve the alteration in size, number, shape, adjacency, and closeness of patches within a landscape over time. Before 1994, there has been a positive shift in development along the waterfront. This development was particularly dramatic from 1994 to 2004, with an annual rate of change at 2.44%. The growth slowed down to 0.47% from 1994 to 2004 and then accelerated at a rate of 1.42% from 2004 to 2014.

Forest coverage experienced a slight increase before 1994, and then grew significantly by 9.32% from 1994 to 2004. However, it decreased by 6.4% from 2004 to 2014. On the other hand, grasslands or grazing lands saw a decline of 0.56% in 1994, followed by a steeper decrease of 39.72% up to 2004, and then increased slightly by 1% from 2004 to 2014.

Table 4. 21:land uses and land cover change within the waterfront in area and its yearly percentage of change from 1994 to 2023.

No.	Land use	Area in 1994	Area in 2004	Area in 2014	Area in 2023
1	Settlement	3,571,878	3,725,077	4,175,420	4,365,145
2	Forest	614382	1421105	851517	426344
3	Wetland	1101649	1036599	1007389	1347322
4	Bare land	127361	221743	244186	235726
5	Grass land	858134	23840	25011	24942
6	Agriculture	631985	604590	851517	723204
7	Water	555351	427786	305700	324202

4.3.2.1 Land use land cover change graph

Settlement **Forest**

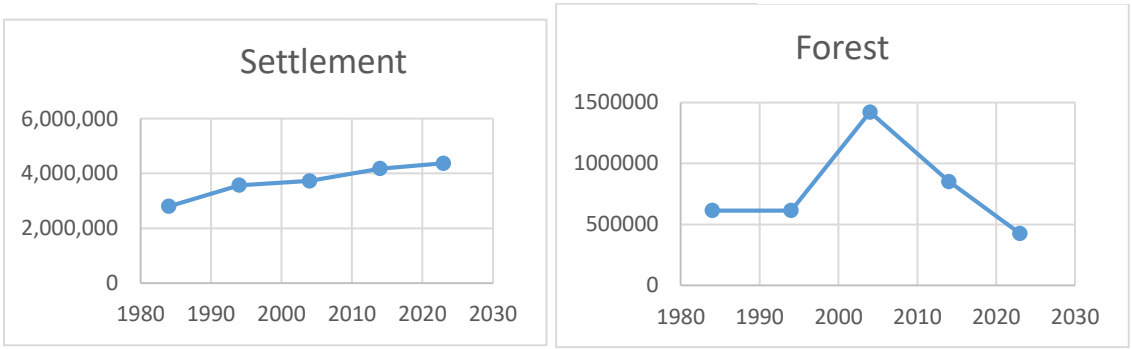

Figure 4. 12:Land area change of settlement and forest

Wetland **Bare land**

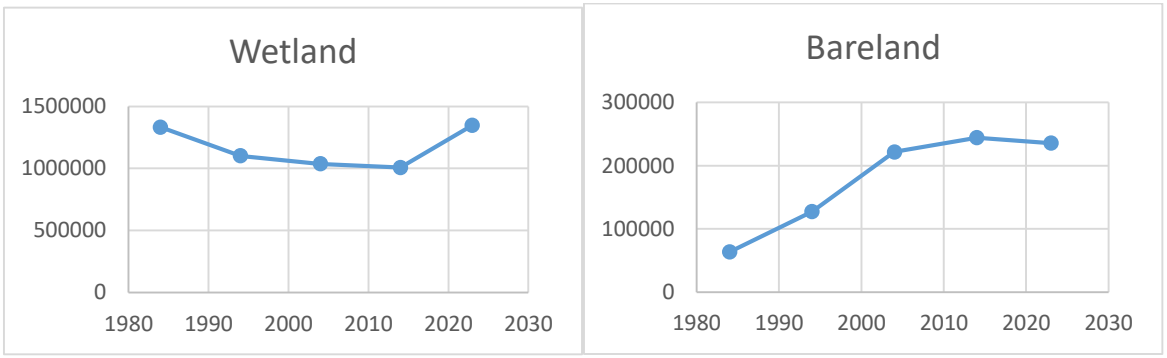

Figure 4. 13:Land area change of wetland and bare land

Grass land **Agriculture**

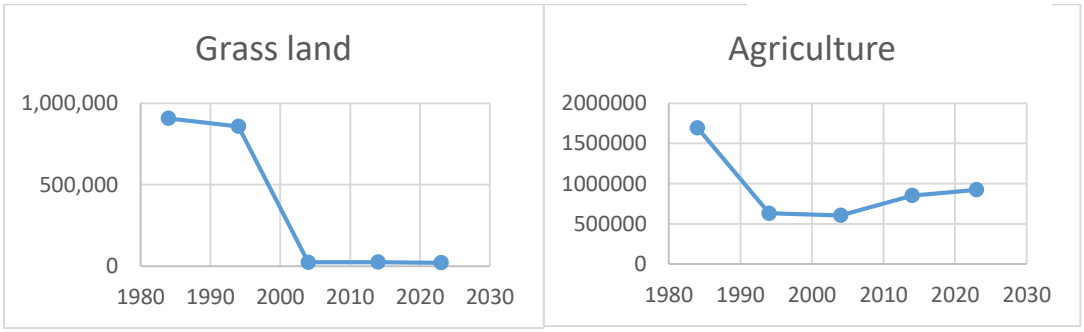

Figure 4. 14:Land area change of grass land and agriculture

Water

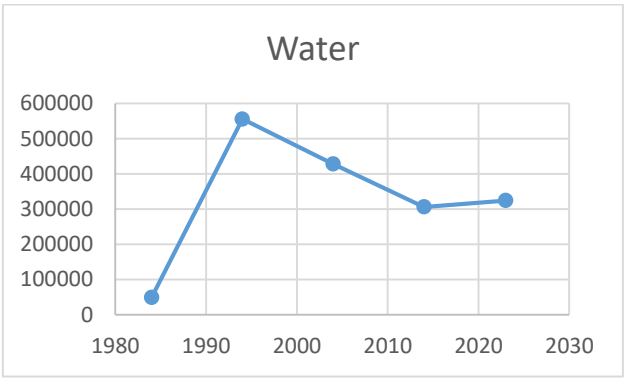

Figure 4. 15:Area change of water

The forest area showed a slight increase before 1994. However, from 1994 to 2004, there was a significant growth, more than doubling the forest area to 1,421,105 square meters. From 2004 to 2014, there was a substantial decrease, reaching 851,517 square meters. This decline continued until 2023, with the forest area reducing to 426,344 square meters. Overall, the data indicates a concerning decrease in the forest area, particularly after 2004.

Conservation efforts are necessary to address this issue and restore environmental sustainability.

Between 1994 and 2004, the settlement area grew by 153,199 m², a growth rate of approximately 4.3% over 10 years. From 2004 to 2014, the settlement area increased by 450,343 m², a growth rate of around 12.1% over 10 years. Between 2014 and 2023, there was an additional growth of 189,725 m², approximately 4.5% over 9 years. Followed by a slowdown between 1994 and 2004. Growth rates increased again between 2004 and 2014 but did not reach the levels of the previous period. The growth rate seemed to slow down once more from 2014 to 2023.

Regarding the wetland area, there was a decline from 1994 to 2014. By 1994, it decreased to 1,101,649 square meters, a reduction of approximately 17.3%. The decline continued to 1,036,599 square meters in 2004, a 5.9% decrease from 1994. In 2014, the wetland area further decreased to 1,007,389 square meters, a 2.8% decrease from 2004. However, the data for 2023 shows a significant increase to 1,347,322 square meters, a 33.7% increase from 2014 and a 1.1% increase from 1994. Overall, there was a decline in the wetland area from 1994 to 2014, but by 2023, there was a substantial increase, indicating successful conservation efforts and a net increase of 1.1% over the entire time span from 1994 to 2023.

The grassland area data shows a decline from 858,134 square meters in 1994 to 23,840 square meters in 2004, a loss of 834,294 square meters over a decade. However, there was a slight increase to 25,011 square meters between 2004 and 2014, indicating a small recovery. Overall, the trend suggests a shrinking grassland area, potentially indicating habitat loss and negative environmental impacts.

For the bare land area, there was a significant increase of 94,382 square meters (a 74% increase) from 1994 to 2004. From 2004 to 2014, there was a smaller increase of 22,443 square meters (a 10% increase). However, from 2014 to 2023, the bare land area decreased by 8,460 square meters (a 3.5% decrease). This suggests a notable growth in bare land area between 1994 and 2004, followed by slower growth and a slight decline in the subsequent years. Possible factors influencing these changes could be land use policies, natural events, or other external factors.

In summary, the grassland area experienced a significant decline, while the bare land area showed an initial increase followed by slower growth and a slight decrease.

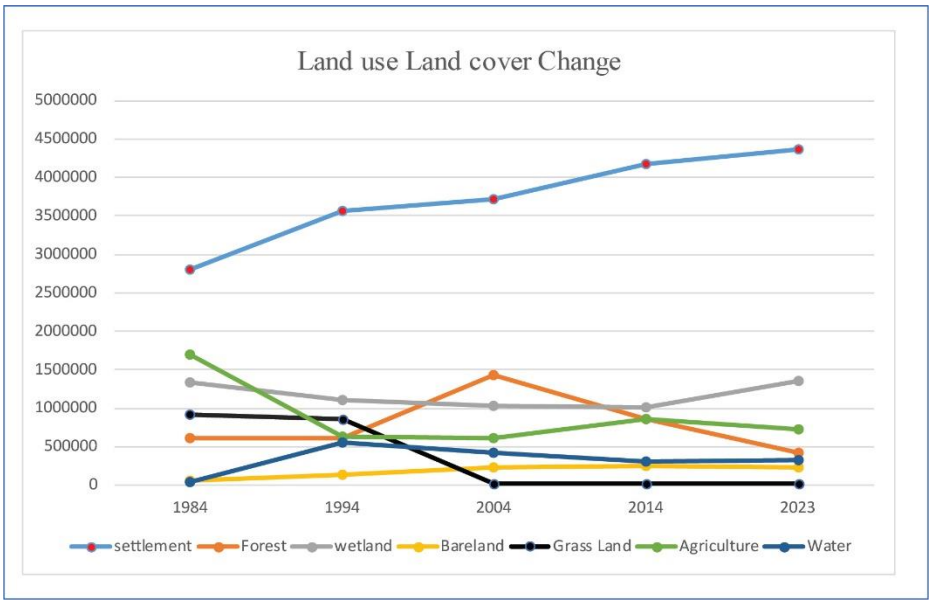

Figure 4. 16: Land use land cover change

Over a 70-year period from 1953 to 2023, significant land use changes occurred in Lake Hawassa's waterfront. The dominant landscape shifted from agriculture to urbanization, with the city expanding and engulfing the entire area by 2023. The appeal of the waterfront for hotels and recreation increased alongside the city's growth. Previously unused land near the shoreline, once prone to flooding, has now been developed, resulting in decreased wetlands and flood-prone areas.

The developmental stages of Lake Hawassa's waterfront can be categorized into three periods. The pre-development stage, before the 1990s, saw the waterfront primarily used for fisheries and served as the city's backyard. From 1990 to 2003, there were human-induced changes such as residential and agricultural expansion towards the waterfront, as well as natural changes due to flooding, which limited further development.

Since 2003, there has been significant redevelopment in the waterfront, particularly in the hotel and ecotourism industries. However, proper and sustainable waterfront planning and management have not been fully considered, posing a risk of ecological deterioration in the aquatic and surrounding areas.

4.4. Land use analysis

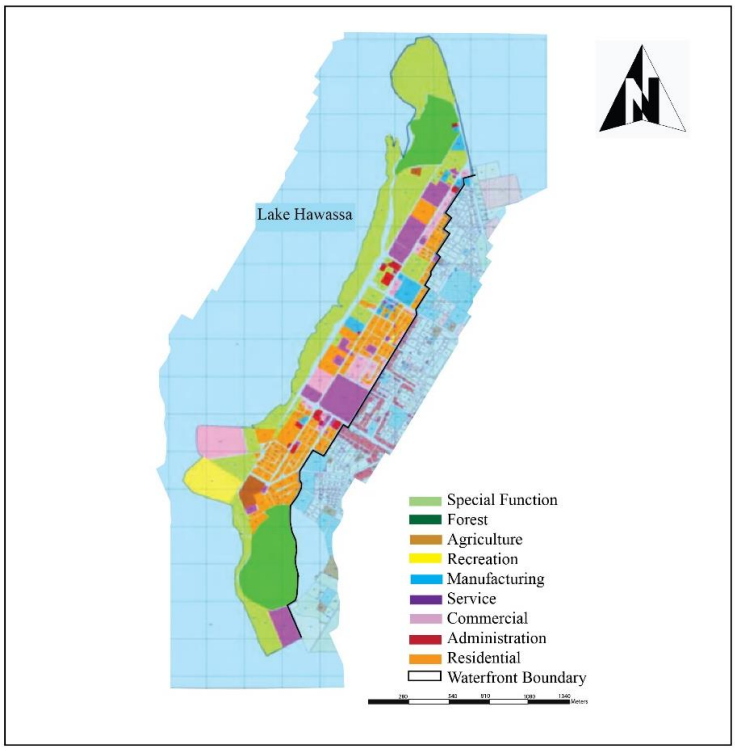

Figure 4. 17;land use plan of Hawassa city, source Hawassa city administration

Table 4. 22:land use area distribution and their code

No.	Land use	Area (ha)	Percent(%)	Code
1	Special function	165.8330	**21.7**	
2	Forest	42.6344	**5.6**	
3	Agriculture	92.3204	**12**	
4	Recreation	12.1044	**1.6**	
5	Manufacturing and storage	14.4366	**1.9**	
6	Services	52.4322	**6.9**	
7	Commerce and trade	102.1716	**13.3**	
8	Administrations	72.4115	**9.4**	
9	Residential	210.3444	**27.6**	
10	Waterfront boundary	764.6885	**100**	

The lakefront area is primarily used for residential purposes, accounting for 27.6% of the land, with most households owning land exceeding 500 square meters. Additionally, there are residential buildings occupying approximately 10.3503 Ha of land in the buffer area of the waterfront.

A stream buffer is a protected area along a watercourse, safeguarding riparian ecosystems and reducing hazards. A stream setback is a minimum distance between development and riparian areas to preserve the buffer zone. These measures limit development adjacent to riparian and wetland zones, minimizing flood risk and preserving ecological processes.

The second-largest land use is a special function area, covering approximately 21.7% of the waterfront. This area is challenging for construction due to its vulnerability to lake overflow during rainy seasons, and informal activities often occur here without legal authorization.

Commerce and trade occupy a significant portion of the land, accounting for 13.3% of the waterfront area. Informal commerce and trade activities further cover 53% of the land in immediate proximity to the lake, in addition to the formal land use.

Agriculture is another activity in the waterfront area, primarily found around Bishan Guracha and the Tabor Mountain area. Agricultural land encompasses 12% of the land use, but proper consideration for the lake's overflow during rainy seasons and the use of buffer zones is necessary to mitigate potential damage.

Administration lands, including offices such as waterworks, Hawassa city administration, and the Ethiopian electric corporation building, occupy approximately 9.4% of the waterfront area. These lands owned by the government often have unused open spaces accounting for 56% of their total land ownership. Service giving areas, such as schools and health institutions, cover 6.9% of the waterfront area. Notably, the SOS schools occupy a significant portion of the service land use.

The waterfront area has forest coverage, with approximately 5.6% of the land covered by forests, mainly around the Bishan-Guaracha and Tabor Mountain areas. Manufacturing and storage activities occupy 1.9% of the land, while recreational areas account for 1.6% of the waterfront area.

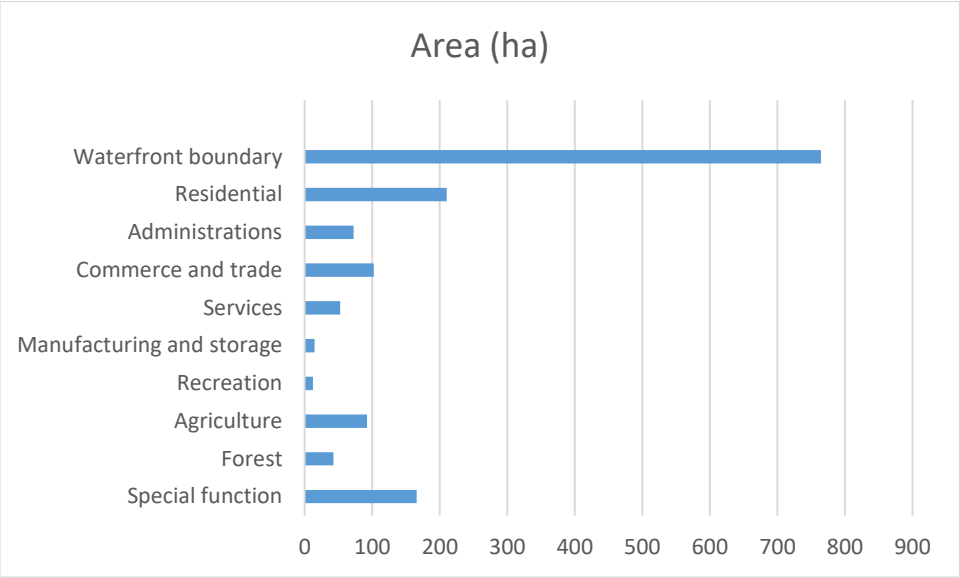

Figure 4. 18:land use area distribution

The waterfront of Lake Hawassa has undergone significant land-use changes, transitioning from agriculture to residential, commercial, manufacturing, and recreational areas. The landscape has transformed from natural vegetation to manmade developments, including economic activity sites and large hotel and resort investments. Additionally, cultural activities, markets, and institutions have emerged in the area.

Effective spatial planning and sustainable management practices to mitigate the negative impacts of land-use changes in the waterfront area of Lake Hawassa. It is crucial to consider global trends and adopt strategies that promote responsible development and balanced environmental stewardship.

4.4.1. Types of land use and their specific impacts on the lake

4.4.1.1 Residential area

Residential include both pure and mixed-use, account for 19% of the waterfront area, which are primarily concentrated in the middle. It might be challenging for these communities to engage in conservation and environmental protection efforts. In the southeast, residential zones have encroached upon the delicate shoreline, affecting the natural buffer zone vegetation.

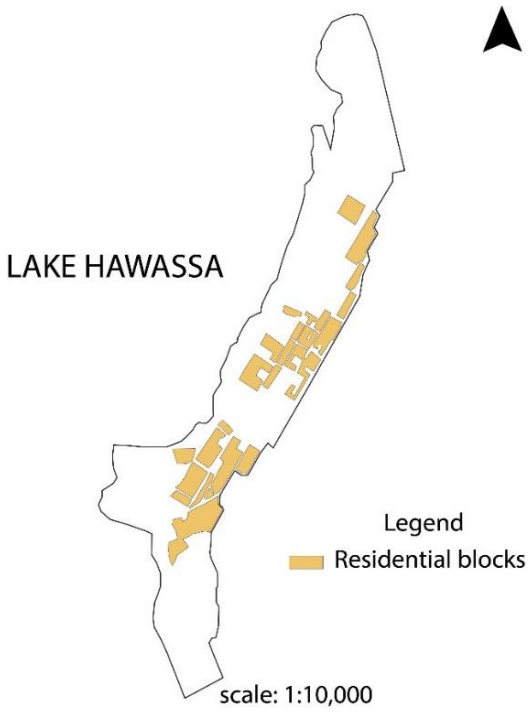

Figure 4. 19:Residential land use plan within the waterfront

Residential development along the waterfront is rapidly expanding both vertically and horizontally, with condominium buildings being constructed to accommodate the growing population. Unfortunately, this development has resulted in the loss of natural forests and habitats for various species of animals and birds. The lack of sustainable waterfront planning and limited community participation in conservation efforts contribute to these problems. Additionally, there is a lack of strategic planning by the government that takes into account the lake's importance, focusing primarily on immediate residential solutions like building condominiums. Responsible stakeholders and awareness are crucial for the conservation and protection of urban waterfront development.

The study on residential development reveals that the average household size within the waterfront is larger, with an average of six people per household compared to the city's average of 4.22 persons. The primary sources of income for the population are commerce (60.86%), employment (18.47%), urban agriculture (14.13%), and other sources (6.52%).

As the population increases, people living near the lake turn to urban agriculture to meet their water and land demands. This conversion of land for agricultural purposes may have negative consequences on the lake's ecosystem, posing potential environmental challenges.

In summary, the waterfront's residential development faces challenges related to sustainable planning, community involvement, and the preservation of natural resources. It is crucial to consider the long-term impacts and promote responsible practices to ensure the protection of the waterfront and its ecosystem.

Table 4. 23:Source of income of peoples living in the study area

Source of income	**Commercial Activity**	**Employment**	**Agriculture**	**Other**
Number of household	238	73	55	26
Percentage	60.86	18.47	14.13	6.52

Settlers in the area employ various methods to manage their solid and liquid waste. A solid waste collection crew collects 46.6% of household solid waste, while 30.6% is openly dumped and an additional 16.6% is disposed of in open pits. Other methods account for the remaining 6.2%. Unfortunately, solid waste that is dumped on-site often ends up in the lake through natural mechanisms.

The management of household liquid waste presents a significant problem, as only 20% of households use septic tanks. The remaining 80% release their non-excretory liquid waste into drainage lines. Since there are no municipal waste treatment facilities, organic waste from households eventually enters the lake, leading to eutrophication. This process results in an increase of dissolved nutrients from sewage, promoting the growth and decomposition of plant life that depletes oxygen and harms other organisms.

It is important to note that Ethiopian Solid and Liquid Waste Proclamation No. 513/2007 prohibits the disposal of litter in water bodies, parks, waterways, and other public places where litter bins are available.

4.4.1.2 Commerce and manufacturing

4.4.2.1.1. Commerce and trade

The hotel industry in Hawassa is rapidly growing within the commercial land-use category, particularly along the waterfront, and this expansion has significant implications for the lake compared to other types of land use. The hotels heavily rely on ecotourism activities associated with the lake. The development pace near the lake is remarkably fast, with nearly all shoreline areas being claimed by investors for the construction of luxury resorts and

hotels. Unfortunately, there is a lack of a comprehensive local development plan that promotes sustainable waterfront growth, which may result in future complexities related to land allocation and construction. It is worth noting that many hotels in Hawassa's waterfront have been built without adhering to waterfront development principles or lakeside development regulations.

Table 4. 24:Land use Area allocation

Commerce and trade	**Area in ha**	**Percentage**
Commercial Activities	72.2235	71
Financial Institutions	3.3231	3.25
Market Place	1.3424	1.31
Other	25.2826	25
Total	102.1716	**100%**

Out of the 102.1716 ha of commercial and trade activities, around 71% is dedicated to hotels and urban markets, serving as important sites for sustainable urban waterfront management. Grand hotels in Hawassa employ an average of 50 to 230 employees each, with many located near the shoreline. Regarding waste management, approximately 80% of hotels dispose of solid waste through collection by crews, while the remaining 20% use alternative methods like pit dumping and burning. For liquid waste, about 87% of hotels utilize septic tanks, while the remaining 13% release it into drainage lines. However, septic tanks are not frequently inspected or maintained, with emptying occurring every three to five months. The lack of clear guidance from relevant environmental agencies has created challenges in waste management for hotels. In terms of storm water management, approximately 79% of hotels use diversion methods, while others allow natural landscape infiltration. As the hotel business depends on the lake and its surroundings, proper storm water management is vital for sustaining the waterfront. Allowing storm water infiltration is an effective approach to manage runoff and reduce pollution in urban lakes.

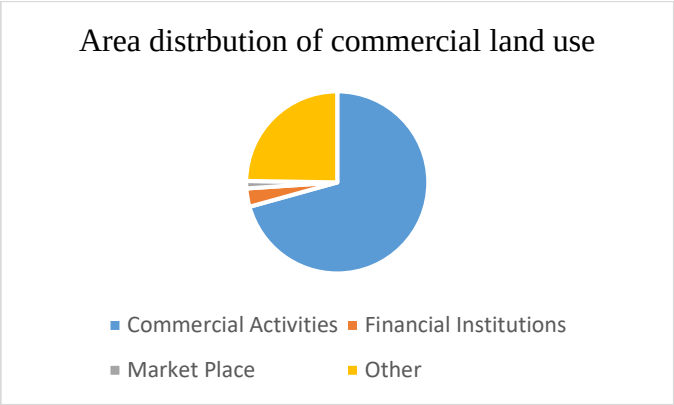

Figure 4. 20:Area distribution of commercial land use

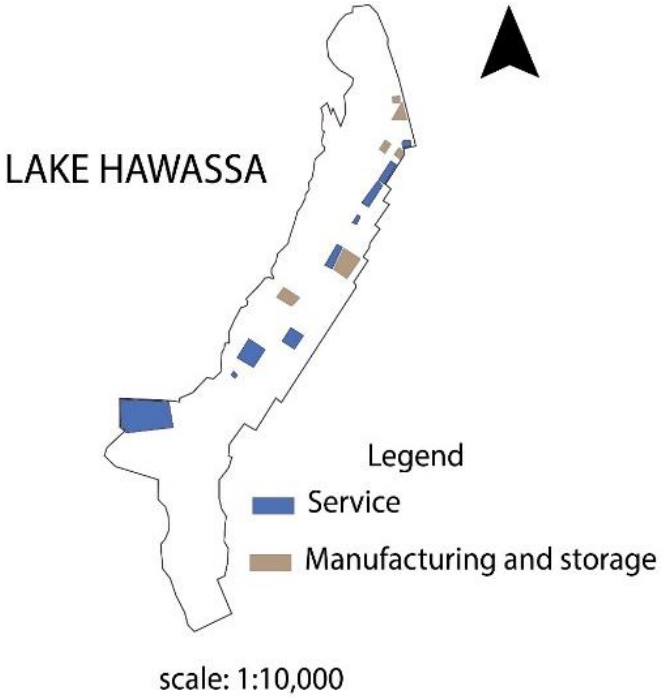

Figure 4. 21:manufacturing and commercial land uses

4.4.1.3. Manufacturing

Industries play a significant role in the waterfront area, particularly in the production of construction materials, auto mechanics, woodworks, and metalworks. These industries employ 5 to 45 full-time employees. Waste management practices show that 83% of industries manage solid waste through onsite dumping and recycling, while the remaining industries use landfill methods. Unfortunately, none of the industries have a proper liquid waste treatment system, leading to the release of liquid waste through drainage lines. This can have cumulative effects on the aquatic ecology, especially when it comes to hazardous wastes from garages. In terms of water sources, 9% of industries rely on tap water, while the remaining 91% use groundwater or directly extract water from the lake. Some industries,

particularly those involved in construction material production, consume significant amounts of water from the lake.

Table 4. 25:Manufacturing land use allocation

Manufacturing	Area in meter square	Percent
Building material	30,848	16
Garage and workshops	9,842	5
Ware house	14,708	7.5
Manufacturing	130,950	67.5
Other	8,002	4
Total	194,349	

Finally, economic growth is a crucial aspect in waterfront development. Manufacturing and commerce can play a significant role in boosting the local economy, creating job opportunities, and attracting investment. However, if not regulated and controlled, these activities can result in economic inequality, with some individuals and businesses benefitting disproportionately from the development.

To address these issues in waterfront land-use development, it is essential to have a comprehensive control mechanism in place. This should include proper planning, zoning, and regulatory measures, as well as environmental assessments and regular monitoring. Stakeholder consultation is also important, as this helps to ensure that all interested parties are involved in decision-making and that their concerns are addressed. By adopting a well-managed and controlled approach to manufacturing and commerce in waterfront development, we can strike a balance between economic growth, environmental conservation, and social well-being.

4.4.1.4 Services

Health institutes, government higher institutions, schools, and government institutes are the main service providers in the waterfront area. Solid waste management practices among these services show that 12% is collected by a crew, 75% is dumped onsite, and the remaining 13% is incinerated. In terms of liquid waste management, 86% utilize septic systems, 9% employ liquid waste treatment methods, and the rest simply release the waste through drainage systems. Ground and tap water are the primary sources of water for these services, with a significant reliance on groundwater. It is important to note that wastes from hospitals can be chemically and biologically hazardous to the aquatic ecology. However, there is a lack of strong control mechanisms for managing effluents from health institutes,

and the substandard effluents from the Hawassa Regional Hospital are directly released into the lake after treatment in a waste treatment pond. Proper measurement and management of effluent chemical and biological parameters are necessary to mitigate the negative impact of the pond on the lake.

Table 4. 26:service land use allocation

Service	**Area in meter square**	**Percentage**
Civic, Cultural And Social Welfare	42,329	5.7
Education	446,968	61
Health	183,553	25
Public Worship	41,065	5.6
Utility Service	5,091	0.7
Others	18,072	2
Total	737,078	

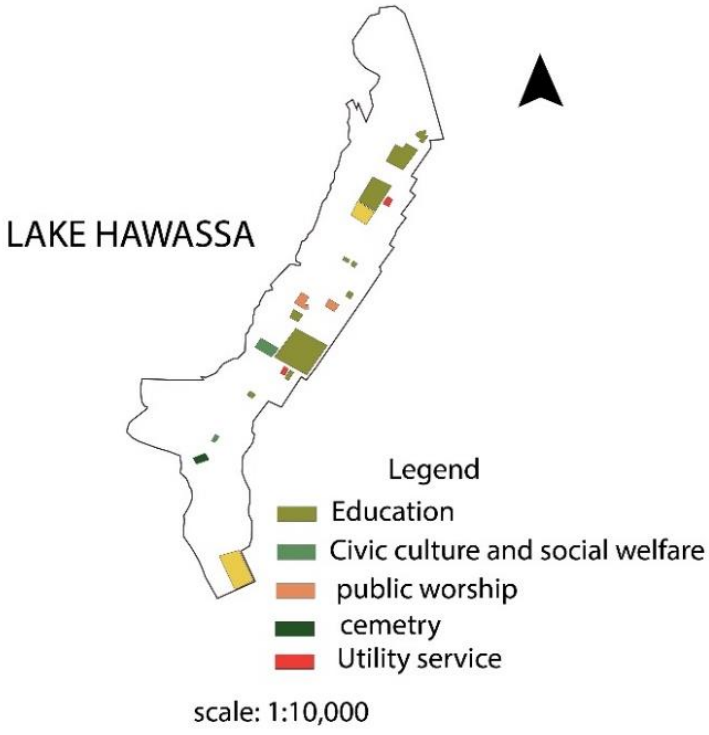

Figure 4. 22:land use of services within the waterfront

4.4.1.5. Recreational Area

The interviews assessed the significance of the waterfront, involving recreational youth groups and boating/fishery associations. Discussions centered around land use, unplanned urban development, and its effects on the lake ecosystem. Solutions were suggested. Participants included leaders from six youth recreational associations and two fishery

associations. Activities were conducted in designated areas, such as vacant spaces, wetlands, and military camps.

Table 4. 27:Land use allocated for special function

Special function	Area in meter square	Percent
Marshy Area	877,568	47.8
Military Camp	174,417	9.5
Vacant Land	786,888	42.7
Total	1,838,873	

Around 2000 E.C., there were 15 recreational associations operating along the waterfront, offering diverse services such as cultural restaurants, games, boating, and more. However, due to government redevelopment strategies, only five associations are currently active. The waterfront area also faces issues with illegal small businesses causing congestion and restricted access for visitors. These unauthorized activities have a negative impact on the waterfront. There are approximately six fishery associations, but many illegal fishing groups depend on the lake for their livelihood. One notable fishery association in Amora Gedel has 270 members and over 1000 individuals engaged in related businesses at the fish market. This association generates an average daily fish production of 3000.

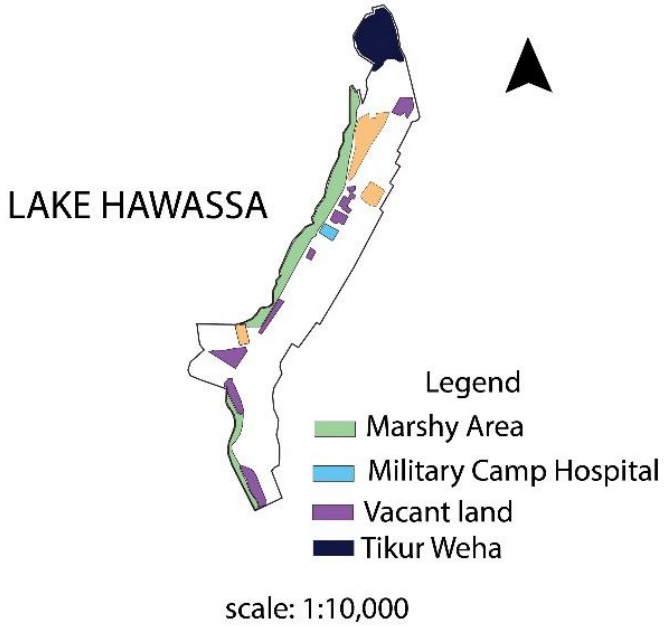

Figure 4. 23:Land allocated for special functions within the waterfront

4.5. Urban tourism and waterfront

Geographical boundary of the specific urban tourism area

The geographical boundary of the specific redeveloping area is found in Hawassa city of two sub-cities, which are Hayik dar and Addis ketema Sub-city. The redeveloped hayik dar Area is estimated around 34 hectares and the redeveloping Gudumale area estimated around 5 hectare.

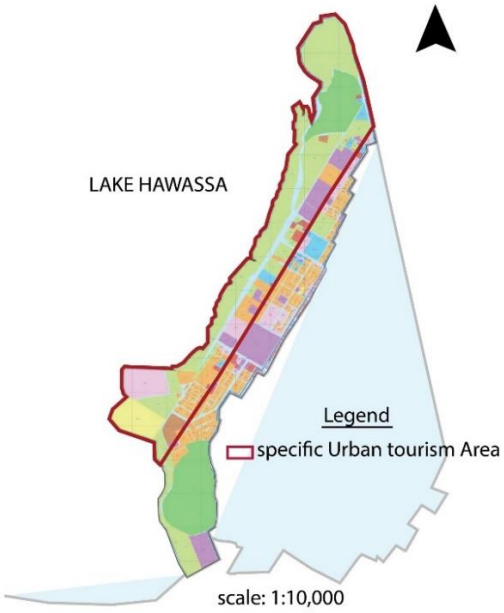

Figure 4. 24: Specific Urban Tourism Area

4.6.1 Existing urban waterfront attractions

4.6.1.1 Boat tour and recreational service

Since 2002, boat tour activities have been popular among tourists, both domestic and foreign, in the area. Initially, there were fifteen stakeholders in the sector, but due to government redevelopment policies, many services have ceased. Currently, seven boat tour service providers are active: Kalamo Tour Recreation Center, Mekilit Tour Recreation Center, Lewi PLC Boat Service, Alemayehu Tour and Boat Service, Hawassa Green and Clean Boat Service, Haik Boat and Another Service Center, and Haile Resort Boat Service. Alemayehu Boat Tour Recreation Center operates in the Amora Gedel area, while Lewi PLC Boat Service is owned by Lewi Resort. Kalamo Tour and Boat Service, Meklit Tour and Boat Service, and Hawassa Green and Clean Boat Service operate around the Fekir Hayk area. Haik Boat and Another Service Center and Haile Resort Boat Service are active in the Fekir Hayk vicinity. Among these associations, only three operate fish markets in the waterfront area, while the other four primarily focus on boat and tour services.

Table 4. 28:Recreational boat services

No.	Boat tour service giving organization	Location	Type	Users in week days	Users in weekend	Birr per 100m
1	Kalamo tour and boat service	Haik dar	Owned by associations	20-30	80-100	100
2	Mekliit floating boat service	Haik dar	Owned by associations	20-30	60-80	50
3	Alemayehu boat service	Amora gedel	Owned by association	10-20	50-75	50
4	Lewi tour and boat service	Lewi resort	Owned by Lewi resort	10-20	30-40	150
5	Haile resort tour and boat service	Haile resort	Owned by Haile resort	20-30	45-60	150
6	Hawassa green and clean boat service	Haik dar	Owned by associations	10-20	70-90	50
7	Haik boat and another service center	Haik dar	Owned by associations	10-20	30-50	50

In the area, tour boats are made from various materials. Local youth associations predominantly use wood sourced from the Tekur Weha forest, with the boats being constructed by the youth themselves. Resorts, on the other hand, utilize steel and plastic boats imported from other countries.

4.6.2 Tourists and the waterfront

4.6.2.1 cultural attractions

Cultural activity at the Hawassa lakefront, particularly the celebration of the Sidama nation's new year known as Fiche, provides insights into tourism-related issues. Fiche is celebrated for two weeks each year and falls on the first day of the week according to the Sidama calendar, determined by astrology. The celebration takes place at Gudumale on the shore of Lake Hawassa, attracting thousands of Sidama and people from other ethnic groups. During Fiche, families create wooden arches called "Huluqa" in front of their houses for family members and even cattle to pass through, symbolizing the transition process. The evening of Fiche involves cultural meals and gatherings, while the following day, known as Cambalala, involves the family head wearing traditional attire and tending to cattle in a protected pasture area called "Callo." These ceremonies occur once a year near Lewi Resort in the city of Hawassa.

4.6.2.2 Tourists in celebration of cambalala

During the yearly celebration of Cambalala, a lot of tourists from the country and outside the country attend the celebration. The number of tourists increases from time to time but at a decreasing rate. In 2005 the number of domestic tourists was 9,420 the number of foreigners was 232, in 2014 the number domestic tourists are 1104 and the number of foreigners was 57.

Table 4. 29:the tourist data from 2005-2014

Year in E.C	Domestic tourist	Foreigners	Total	Domestic tourist change in percent	Foreign tourist change in percent
2005	9420	232	9652	0	0
2006	10203	197	10400	-8.31	15.08
2007	12040	237	12,277	17.9	30.4
2008	10322	250	10,572	14.26	-5.48
2009	6022	16	6038	41.6	93.6
2010	5023	21	5044	16.58	-31.25
2011	1500	0	1500	70.1	100
2012	1050	0	1050	30	0
2013	2105	0	2105	-100.4	0
2014	1104	57	1161	47.5	

Figure 4. 25: Data of domestic tourist

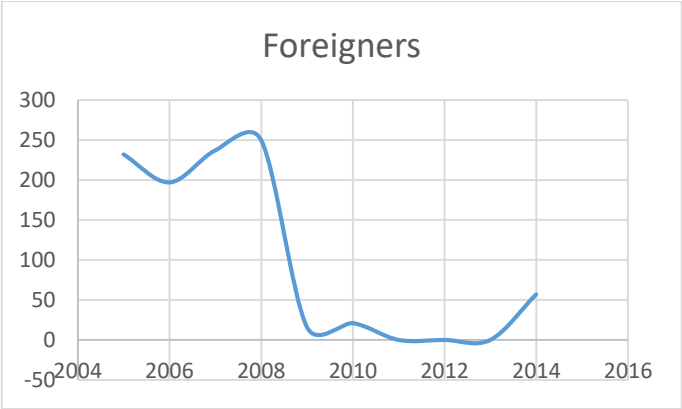

Figure 4. 26:Data of foreign tourist

4.6.2.3 Tourists in a week

A significant number of tourists opt to visit their chosen destinations during weekends instead of weekdays. This preference can be attributed to various factors, such as work commitments and convenience. As a result, weekends often experience a higher influx of tourists, while weekdays see a relatively lower number of visitors. Consequently, there is a noticeable variation in the tourist population for different days within a single week. This uneven distribution of tourists throughout the week can impact various sectors, such as hospitality, transportation, and local businesses that rely on tourism for their revenue. By understanding these trends, these industries can better prepare for and cater to the fluctuating demands of tourists across the week, ensuring a more enjoyable experience for their visitors and maximizing their own business potential.

Table 4. 30:Tourists in week days and weekend

Days	No. of local tourist	Foreign tourist
Monday	120-200	2-5
Tuesday	120-200	2-5
Wednesday	120-200	2-5
Thursday	120-200	2-5
Friday	150-300	2-5
Saturday	200-400	10-20
Sunday	200-400	10-20

4.7. Potential of Urban Tourism Analysis Based on livable environment development principle

To optimize the urban potential of waterfronts, adherence to the livability principle is crucial. This principle ensures that developments contribute positively to the well-being of residents,

visitors, and the environment. Cultural protection plays a key role in preserving the area's identity and attracting tourists seeking authentic experiences. Tolerance fosters a harmonious environment for diverse individuals to enjoy the waterfront. Promoting entrepreneurship and creative activities drives innovation and economic growth. Integration of innovation and technology ensures sustainable resource use. Providing green spaces and amenities enhances quality of life. Political support and adherence to regulations are essential. Social cohesion cultivates a sense of community. Diversity of function and economic contribution attracts a wide range of visitors. By focusing on these factors, waterfronts can maximize their potential as vibrant and attractive urban tourism destinations.

4.7.1. Analysis based on livable urban waterfront development principle

4.7.1.1 Protection of culture

Protection of culture in waterfront development refers to the preservation and promotion of a community's cultural identity, heritage, and traditions while planning and executing the development of coastal areas.

Table 4. 31:Descriptive statistics of questionnaire variables—livable Environment.

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Protection of culture	Adequacy of cultural promotion.	374	2.44	1.08	0.48	1	4
	competence of cultural space	374	2.74	1.21	0.54	1	4
	The capability of contextual protection (historic and/or cultural heritage).	374	3.12	1.37	0.62	1	4
	Protection level of an existing unique culture.	374	3.12	1.37	0.62	1	4
	Festival opportunities in the place.	374	2.87	1.19	0.57	1	4
	Access to local foods.	374	4.26	0.44	0.85	4	5
	Access to local arts	374	1.23	0.42	0.24	1	2
	Adequacy of art activities	374	2.09	0.29	0.41	2	3

The data above indicates mixed perceptions regarding cultural protection. The aspect of "Access to local foods" received the highest average score of 4.26, suggesting excellent access, while "Access to local arts" received the lowest average score of 1.23, indicating poor access. The aspect of "competence of cultural space" showed varying opinions with a

high standard deviation of 1.21 and a moderate mean score of 2.74, suggesting potential for improvement. The aspects of "Protection level of an existing unique culture" and "The capability of contextual protection" both scored a mean of 3.12, indicating room for improvement in preserving cultural heritage. "Festival opportunities in the place" scored a mean of 2.87, with a standard deviation of 1.19, reflecting varying opinions on the abundance or quality of festivals. Overall, there is a need to enhance local arts, cultural spaces, and the preservation of cultural heritage.

4.7.1.2 Tolerance

Tolerance in waterfront development refers to the ability to accommodate and adapt to varying environmental, social, and economic factors while creating sustainable and inclusive coastal infrastructure.

Table 4. 32:Descriptive statistics of questionnaire variables—livable Environment.

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Tolerance	Adequacy of cultural promotion.	374	2.44	1.08	0.48	1	4
	competence of cultural space	374	2.74	1.21	0.54	1	4
	The capability of contextual protection (historic and/or cultural heritage).	374	3.12	1.37	0.62	1	4

The data represents three aspects of a place: welcoming level, sufficiency of open-minded people, and freedom level, measured on a scale from 1 to 5. The average welcoming level is 3.52, indicating moderate levels of welcoming, with some variability (Standard Deviation = 0.804). The sufficiency of open-minded people has an average score of 4.10, suggesting a high level of open-mindedness, and low variability (Standard Deviation = 0.519). The average freedom level is 3.85, indicating relatively high levels of freedom, with significant variability (Standard Deviation = 1.265). These aspects contribute to tolerance, with open-minded people being the most consistent and important factor. The data shows no extreme values in any aspect, suggesting that places generally fall within a moderate range of tolerance.

4.7.1.3 Promoting Entrepreneurship

Promoting Entrepreneurship in waterfront development refers to encouraging and supporting the creation and growth of innovative businesses in areas located along coastal or shoreline zones, fostering economic growth, job creation, and sustainable development.

Table 4. 33:Descriptive statistics of questionnaire variables—livable Environment.

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Promoting Entrepreneurship	Competence of consultancy and/or funding opportunities.	374	3.22	0.841	0.64	2	4
	Competence of collaborative discussion spaces for stakeholders	374	2.19	0.402	0.43	2	4
	Adequacy of investment activities.	374	4.26	0.439	0.85	4	5

The data reveals insights about entrepreneurship promotion in the waterfront area. The competence of consultancy and funding opportunities has a mean score of 3.22, indicating a moderate level of competence with some variability (Standard Deviation = 0.84). The RII score of 0.64 suggests room for improvement in providing more consistent support. The competence of collaborative discussion spaces for stakeholders has a mean score of 2.19, indicating a lack of effectiveness in fostering collaboration (RII = 0.43). There is low variability (Standard Deviation = 0.40) in this aspect. The adequacy of investment activities has a high mean score of 4.26, suggesting strong investment support (Standard Deviation = 0.44). The RII score of 0.85 reinforces this observation. In conclusion, the waterfront area has strong investment activities but needs improvement in consultancy and funding opportunities as well as collaborative spaces to create a balanced entrepreneurial ecosystem.

4.7.1.4 creative Environment

Creative environment in waterfront development refers to the innovative integration of cultural, ecological, and social elements to enhance public spaces, promote sustainability, and foster vibrant communities along waterfront areas.

Table 4. 34:Descriptive statistics of questionnaire variables—livable Environment

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Creative Enviro	The capability of exhibition spaces..	374	1.74	0.44	0.34	1	2

	Adequacy of open and/or close spaces, which are motivating for creative productivity.	374	1.64	0.48	0.32	1	2
	Adequacy of open and/or close spaces, which are motivating for creative productivity	374	2.64	0.48	0.52	2	3

The data provides insights into the current state of the waterfront in terms of promoting a creative environment. In the capability of exhibition spaces, the mean score is 1.74, indicating a slightly below-average perception. The standard deviation of 0.44 suggests consistent responses with some variability. The suitability of performance areas has a mean score of 1.64 and a standard deviation of 0.48, indicating a need for improvement. The adequacy of open/close spaces for creative productivity has a mean score of 2.64, indicating perceived value. The RII scores range from 0.32 to 0.52, with the highest value for open/close spaces. In conclusion, open/close spaces for creative productivity appear to be the most influential aspect, while exhibition spaces and performance areas require further attention for improvement.

4.7.1.5. Innovation and technology

Innovation and technology in waterfront development refers to the creative integration of advanced technologies to enhance the overall functionality, sustainability, and vitality of waterfront spaces and their surrounding environments.

Table 4. 35:Descriptive statistics of questionnaire variables—livable Environment

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Innovation and technology	Sufficiency of innovative ideas, which come true.	374	2.65	0.624	0.53	2	4
	Sufficiency of technological ideas, which come true.	374	2.75	0.818	0.55	2	4
	Adequacy of information tools for visitors.	374	2.30	0.641	1.47	2	4
	Existence of energy consumption via water	374	2.002	0.354	0.4	1	3
	Access to the Internet.	374	3.97	0.176	0.79	3	4

Based on the analysis of the data, respondents had moderate satisfaction with the sufficiency of innovative and technological ideas (mean = 2.65) and the adequacy of information tools for visitors (mean = 2.3). These aspects showed moderate variability and importance based

on the standard deviation and RII values. Respondents expressed lower satisfaction with energy consumption via water (mean = 2.002), but this aspect was considered less important (RII = 0.4). The most notable result was the high satisfaction and importance assigned to access to the internet (mean = 3.97, RII = 0.79). Therefore, maintaining and improving internet accessibility should be a priority based on these findings. Additionally, efforts should be made to enhance the adequacy of information tools for visitors, as this aspect was rated lower in satisfaction but had higher importance.

4.7.1.5. Awareness

Awareness in waterfront development refers to the consideration and understanding of environmental, social, economic, and cultural factors when planning, designing, and managing coastal areas for sustainable growth and community benefits.

Table 4. 36:Descriptive statistics of questionnaire variables—livable Environment

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Awareness	Adequacy of motivated people to keep the place clean.	374	2.33	0.624	0.46	2	4
	Adequacy of responsive people for their environment and society	374	2.26	0.818	0.52	2	3
	Adequacy of motivated people to promote their art, music, and literature in the place.	374	3.16	0.641	0.62	2	4

The table presents survey results on three aspects of awareness: adequacy of motivated people for cleanliness, responsiveness to environment and society, and promotion of art, music, and literature. The study involved 374 participants. Mean scores indicate that individuals are somewhat motivated for cleanliness (2.33) and responsiveness (2.26), while they are more motivated for promoting art, music, and literature (3.16). Overall, the results show stronger motivation for promoting art, music, and literature compared to cleanliness and responsiveness. However, all three areas exhibit some level of motivation and awareness. Responses are relatively consistent, indicating a consensus among participants. RII values suggest that promoting art, music, and literature has the greatest impact on awareness, followed by responsiveness to environment and society, while motivation for cleanliness has the least impact.

4.7.1.6. Quality of Life and Physical Comfort

Quality of Life in waterfront areas refers to the overall well-being, satisfaction, and happiness experienced by individuals living near water bodies, while Physical Comfort pertains to the amenities, infrastructure, and environmental conditions that contribute to a comfortable and healthy living experience in such areas

Table 4. 37:Descriptive statistics of questionnaire variables—livable Environment

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Quality of Life and Physical Comfort	The efficiency of protection of natural spaces..	374	2.52	0.878	0.5	2	4
	Suitability of accessibility.	374	2.95	0.959	0.59	2	3
	Appropriateness of functional variety.	374	2.68	0.641	0.53	2	4
	Adequacy of architecture quality.		3.74	0.439	0.74	3	4
	Adequacy of urban design quality.		3.74	0.439	0.74	3	4
	Sufficiency of traffic, and access to car parking		3.03	1.425	0.6	2	5
	Sufficiency of transportation.		3.11	1.110	0.6	2	5
	Possibility of relaxation.		3.88	0.790	0.7	2	5
	Adequacy of access for disabled.		1.06	0.236	0.2	1	2
	Access to cycling.		1.94	0.236	0.38	1	2
	Access for pedestrians.		3.32	.950	0.6	2	4
	Adequacy of safety.		1.42	.956	0.2	1	4
	Suitability of urban furniture (seating, lighting, shading, plantings, etc.) and harmony between each other.		2.12	.471	0.4	2	4
	Adequacy of cleanliness.		1.51	1.131	0.3	1	4

The table presents efficiency of protection of natural spaces has a mean of 2.52 and a standard deviation of 0.878, indicating moderate satisfaction. Suitability of accessibility is rated at 2.95 with a standard deviation of 0.959, suggesting positive perceptions. Appropriateness of functional variety receives a mean of 2.68 and a low standard deviation of 0.641, indicating moderate diversity. Architecture quality and urban design quality both score high mean values of 3.74 with a low standard deviation of 0.439, indicating high satisfaction levels. Traffic and access to car parking show moderate satisfaction, with a mean of 3.03 and a high standard deviation of 1.425. Transportation receives a mean value of 3.11

and a standard deviation of 1.110, indicating moderate satisfaction. Possibility of relaxation scores high with a mean of 3.88 and a standard deviation of 0.790. Accessibility for disabled people receives low satisfaction with a mean of 1.06 and a low standard deviation of 0.236. Access to cycling scores a mean of 1.94, while access for pedestrians receives a mean of 3.32, indicating a greater focus on pedestrian-friendly infrastructure. Adequacy of safety receives a low mean of 1.42 and a high standard deviation of 0.956, pointing to significant safety concerns. Suitability of urban furniture is moderately satisfactory with a mean of 2.12 and a low standard deviation of 0.471. Adequacy of cleanliness receives a low mean of 1.51 and a high standard deviation of 1.131, highlighting concerns in this area. In conclusion, respondents generally express moderate satisfaction with architecture, urban design, relaxation opportunities, and pedestrian accessibility. However, concerns arise regarding safety, cleanliness, and accessibility for disabled individuals. Urban planners and policymakers should address these areas to enhance overall quality of life and physical comfort in the urban area.

4.7.1.6. Politic Support to Relevant Authorities

In waterfront development, political support involves government representatives backing projects, endorsing policy changes, obtaining funding, and collaborating with stakeholders to achieve sustainable coastal area growth.

Table 4. 38:Descriptive statistics of questionnaire variables—livable Environment

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Politic Support to Relevant Authorities	Sufficiency of rules and regulations, which were adapted into the place	374	2.39	0.712	0.47	2	4
	Competence of funding opportunities for the development of the place	374	2.06	0.236	0.41	2	3
	Adequacy of political support for the arrangement of a platform for stakeholders and/or investors.	374	3.11	1.11	0.62	2	5

The data provides descriptive statistics for three aspects of political support. The sample size for each aspect is 374. For sufficiency of rules and regulations, the mean score is 2.39 with a standard deviation of 0.712. The RII value is 0.47, suggesting moderate to low importance. Scores range from 2 to 4, indicating varying perceptions of sufficiency. In competence of funding opportunities, the mean score is 2.06 with a low standard deviation of 0.236. The

RII value is 0.41, indicating relatively low importance. Scores range from 2 to 3, indicating moderate sufficiency. In adequacy of political support for creating a platform for stakeholders and/or investors, the mean score is 3.11 with a higher standard deviation of 1.11. The RII value is 0.62, suggesting greater importance. Scores range from 2 to 5, indicating diverse opinions on adequacy. In conclusion, the data reveals that respondents perceive the adequacy of political support for creating a platform as the most important and variable aspect. Competence of funding opportunities is considered of relatively low importance and shows less variability. Sufficiency of rules and regulations falls in between, with moderate importance and variability.

4.7.1.7. social cohesion

Social cohesion in the waterfront refers to the sense of unity, shared values, and cooperation among diverse community members living and interacting in a coastal area.

Table 4. 39:Descriptive statistics of questionnaire variables—livable Environment

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Social cohesion	Sufficiency of attractiveness.	374	2.77	1.099	0.55	1	4
	Existence of different age groups.	374	2.54	1.501	0.5	1	4
	Existence of different ethnicities.	374	2.95	0.959	0.59	2	4
	Existence of different educational levels.	374	4.94	0.236	0.98	4	5
	Existence of different genders.	374	4.83	0.377	0.97	4	5

The data provides insights into public support for relevant authorities, including attractiveness sufficiency, age group diversity, ethnic representation, educational level representation, and gender representation. The sample size is 374 participants, with mean scores, standard deviations, relative importance indices (RIIs), minimum and maximum values presented for each aspect. Participants perceive moderate attractiveness support, higher existence of diverse age groups, moderate representation of different ethnicities, high representation of various educational levels, and high gender representation among relevant authorities. There is considerable inequality in attractiveness support and age group representation, while educational levels and gender representation exhibit lower inequality. These findings highlight the need for further attention and improvement in areas such as attractiveness sufficiency and age group representation to enhance public support for relevant authorities.

4.7.1.8. Diversity of Function

Diversity of Function in the waterfront refers to the variety of activities, uses, and purposes that a waterfront area supports, promoting economic, social, and ecological vibrancy in coastal spaces.

Table 4. 40:Descriptive statistics of questionnaire variables—livable Environment

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max
Diversity of Function	Adequacy of accommodation opportunities.	374	1.13	0.332	0.22	1	2
	Existence of water-based activities.	374	3.21	1.091	0.64	2	5
	Variety of activities.	374	2.38	1.497	0.4	1	4
	Access to the other functions	374	3.75	0.664	0.75	2	4
	Access to recreational facilities.	374	4.94	0.236	0.97	4	5
	Sufficiency of shopping opportunities.	374	3.03	1.941	0.6	1	5
	Eligibility for sports activities.	374	1.06	0.236	0.2	1	2

The descriptive statistics provide an overview of respondents' views on various aspects of diversity of function. The variables assessed include accommodation opportunities, water-based activities, variety of activities, access to functions, recreational facilities, shopping opportunities, and eligibility for sports activities. Among the participants, there is generally low satisfaction with the adequacy of accommodation and eligibility for sports activities, while high satisfaction is observed for access to other functions and recreational facilities. The importance placed on these aspects aligns with their satisfaction levels. The variety of activities, existence of water-based activities, and sufficiency of shopping opportunities are moderately satisfying, with varying degrees of importance. These findings offer insights into the diversity of function and can inform future improvements in the surveyed area.

4.7.1.9. Economic Contribution

Waterfront economic contribution refers to economic growth from jobs, tourism, local businesses, and taxes in waterfront areas, ultimately promoting investment and enhancing quality of life.

Table 4. 41:Descriptive statistics of questionnaire variables—livable Environment

Aspect	Variable	N	Mean	Std. Dev.	RII	Min	Max

Economic Contribution	Welcoming level of the environment.	374	3.11	0.954	0.62	2	4
	The efficiency level of increased visitor numbers.	374	3.43	0.905	0.68	2	4
	Sufficiency of investment.	374	1.93	0.449	0.38	1	3
	Competence of employment opportunities.	374	2.86	1.564	0.57	1	5
	Acceptable cost of transportation.	374	3.41	1.029	0.68	1	4
	The sufficiency of tourist attraction level.	374	1.18	0.707	0.23	1	4

The table above provides descriptive statistics for various aspects related to the economic contribution of the environment based on questionnaire data. The respondents rated the welcoming level of the environment at an average of 3.11, indicating a relatively hospitable environment. The efficiency level of accommodating increased visitor numbers received an average rating of 3.43, suggesting moderate satisfaction. However, the sufficiency of investment and competence of employment opportunities scored lower, indicating respondents' perception of inadequate investment and unsatisfactory employment prospects. The acceptable cost of transportation was generally rated positively, while the sufficiency of tourist attraction level received the lowest rating, indicating a lack of satisfactory tourist attractions. In summary, improvements are needed in investment, employment opportunities, and tourist attractions, despite positive ratings for the welcoming environment, efficiency with increased visitors, and acceptable transportation costs.

4.8. Analysis based on Visitors response

In order to incorporate an additional value in the previous analysis, 30 visitors are interviewed about their satisfaction regarding the waterfront. This approach enables the conclusion to be based on the perspectives of both households and visitors, ensuring a more comprehensive understanding of the overall satisfaction for the waterfront area.

Table 4. 42: Visitors response

Visitor type	Foreign tourist	5	16.6
	Local tourist	4	13.3
	Residents of Hawassa	16	53.3
	Other(unplanned arrival)	5	16.6

Visit frequency	Everyday	12	40
	Weekly	8	26.6
	Monthly	4	13.3
	Seasonal	6	20
Like to spend time	Yes	13	43.3
	No	15	50
	Neither	2	6.6
Suggesting to others	Yes	10	33.3
	No	17	56.3
	Neither	3	10
Well satisfied	Yes	7	23.3
	No	23	76.6
Easily accessible	Yes	13	43.3
	No	17	56.3

A survey of visitors revealed mixed feelings towards a particular location, with 43.3% enjoying the time spent there, yet 50% disagreeing, and 6.6% remaining neutral. The majority (56.3%) would not suggest the location to others, with only 33.3% recommending it and 10% expressing neutrality. Satisfaction levels remained low, as only 23.3% reported being well-satisfied and a significant 76.6% were not. Furthermore, the location's accessibility posed a problem for 56.3% of the visitors, with only 43.3% experiencing no issues. Ultimately, while some visitors were content, overall satisfaction and recommendations remained scarce, while accessibility challenges persisted.

4.9. Results of the Kruskal-Wallis Test

A mean comparison of the variables obtained using Kruskal-Wallis Test was conducted, since all of the data had a relatively normal distribution.

The results of the Kruskal-Wallis Test show there was a significant difference between the responding user age groups in terms of the all variables. This result indicates that there is a significant difference between the respondents' perceptions of each variable for different user age groups based on mean rank value and P-Value.

4.10. Comparing means of all livable waterfront variables and user age groups.

The table provides information about the mean ranks for different age groups in relation to various aspects of waterfront development. Let's analyze the meaning of each result and draw conclusions based on the information provided:

1. Adequacy of cultural promotion:
    - The 18-24 age group has the highest mean rank (320.42), indicating that they perceive cultural promotion to be more adequate compared to other age groups.
2. Protection of culture:
    - The 18-24 age group has the highest mean rank (323.09), suggesting that they prioritize the protection of cultural aspects in waterfront development.
3. Creative environment:
    - The 18-24 and 25-34 age groups have the same mean rank (254.50), indicating that both groups share similar perspectives on the importance of a creative environment in waterfront development.
4. Tolerance:
    - The 18-24 age group has the highest mean rank (292.00), suggesting a higher emphasis on tolerance compared to other age groups.
5. Promoting entrepreneurship:
    - The 44-54, 55-64, and 65 and above age groups share the highest mean rank (339.50), indicating their collective focus on promoting entrepreneurship in waterfront development.
6. Innovation and technology:
    - The 55-64 age group has the highest mean rank (353.50), suggesting their emphasis on incorporating innovation and technology in waterfront development.
7. Awareness:

- The 65 and above age group has the highest mean rank (360.50), indicating their strong awareness of the importance of waterfront development aspects.

8. Quality of life:

    - The 65 and above age group has the highest mean rank (360.75), emphasizing their emphasis on improving the quality of life through waterfront development.

9. Social cohesion:

    - The 18-24 age group has the highest mean rank (288.50), indicating their priority on fostering social cohesion in waterfront development.

10. Diversity of function:

    - The 55-64 age group has the highest mean rank (180.44), suggesting their focus on incorporating diverse functions in waterfront development.

11. Economic contribution:

    - The 65 and above age group has the highest mean rank (323.50), emphasizing their recognition of the economic contribution aspect in waterfront development.

Overall, the results indicate that different age groups hold varying perceptions and priorities regarding different aspects of waterfront development. This suggests the importance of considering the preferences and needs of different age groups when planning and designing waterfront projects. By taking into account the diverse perspectives, waterfront development can be more inclusive, sustainable, and responsive to the needs of the community.

Kruskal-Wallis Test results show that all the livable waterfront variables considered in this analysis are statistically significant with a p-value less than 0.001. This means that there are significant differences in means for all the variables analyzed when comparing across user age groups. In particular, we can see that variables such as "protection of culture," "creative environment," and "quality of life" have the highest mean rank values, indicating that these factors are potentially the most important when considering livable waterfronts for different age groups.

The results of the Kruskal-Wallis Test results can be ranked based on the mean rank, which indicates the significance of the impact of each factor on the dependent variable. The higher the mean rank, the higher the significance of the impact.

Based on the mean rank, the ranking of the factors from highest significant impact to lowest significant impact is as follows:

a. Creative Environment
b. Protection of Culture
c. Quality of Life
d. Innovation and Technology
e. Social Cohesion
f. Tolerance
g. Diversity of Function
h. Economic Contribution
i. Awareness
j. Promoting Entrepreneurship

It's important to note that all factors have a Sig. value of .000, which means they all have a significant impact on the dependent variable. However, as indicated by their respective mean rank values, some factors have a higher significant impact than others.

4.11. Discussion on analyzing the existing feature of waterfront based on the observation and waterfront development principle

A waterfront should fulfill several key criteria in terms of physical, functional, and aesthetic aspects to create an ideal and sustainable public space for the community. These standards are designed to enhance the overall attractiveness, usability, and sustainability of the waterfront area(Breen 1996). In the first objective, various aspects like Physical, Economic, Social & Cultural, and Environmental were analyzed, with specific attributes for each. The overall score and percentages were calculated based on observations. Problems identified under each aspect and attribute are discussed in detail.

Accessibility is somewhat sufficient but could improve, especially for those with disabilities. The area also lacks necessary facilities and amenities, which, if developed, could enhance the quality of life and attract more people. The area's aesthetic appeal is poor, with issues in building design, public art, and landscaping. Improving urban design can boost attractiveness. Low safety scores suggest high crime rates and insufficient lighting, requiring

increased police presence, security cameras, and better lighting. The area struggles with adaptive reuse of old structures, which, if done well, could boost economic growth while maintaining historical character.

The area's low economic score shows vulnerability to shocks and needs diversification and support for small businesses. Moderate development potential can be enhanced by improving accessibility, infrastructure, and safety. Low scores in social and cultural aspects imply limited cultural offerings and social opportunities. Improving community vibrancy can be achieved through promoting local culture and heritage via various programs and facilities. The low environmental score suggests poor conditions possibly due to pollution or lack of green spaces. Solutions include promoting sustainability, green building standards, and creating more green spaces. The area faces issues like poor accessibility, limited facilities, and weak urban design. Economic, social, and environmental concerns also call for comprehensive development efforts. Addressing these challenges through effective strategies will enhance the area's appeal and prosperity for both residents and visitors.

In short, prioritize access to public spaces, cultural offerings, and a resilient local economy to create a connected and thriving community focused on diversity, sustainability, and livability. Inclusive decision-making and strategic planning will lead to long-term improvements and growth.

4.12. Discussion on examining the relationship between the waterfront and land use land cover

he importance of preserving and revitalizing urban waterfront spaces has gained significant attention as cities seek to balance economic development, environmental protection, and social well-being. Waterfront development requires an integrated planning approach that considers diverse factors, such as land-use policies, infrastructure, ecological conservation, and community engagement(Desfor and Jørgensen 2004). By creating waterfront environments that are both vibrant and sustainable, cities can enhance residents' quality of life and contribute to long-term urban resilience.

Lake Hawassa's waterfront has seen significant land use changes in recent years, with increasing different illegal settlements, natural effects and urban tourism development. Developed land, forest cover, bare land, and flooded areas have grown, while wetland, grassland, and agricultural land have decreased. This growing development is encroaching on natural land covers, reducing vital ecosystem services and negatively impacting the lake.

Hawassa had four master plans since its establishment, with no specific focus on waterfront development. The current plan allocates 30% of land for special functions, with various percentages for residential, urban forest, services, and other uses. The lack of comprehensive waterfront planning has caused negative impacts.

The increased forest coverage around Tikur Wuha and Mount Tabor from 1998 to 2003 positively supports the waterfront and urban lake protection. This growth on public and private lands is crucial to maintaining the area, but rising development and deforestation could threaten it. Waterfront residential growth and hotel tourism also contribute to pollution, land degradation, and shoreline disruption. Hotels can positively impact waterfronts by preserving nature, aiding environmental efforts, regulating illegal activities, conserving vegetation, and collecting waste. Thousands depend on Lake Hawassa's shoreline for recreation and fishing industries. The government lacks control over the land, but recreational associations promote eco-friendly management and protect the shoreline from pollution and degradation. The Lake Hawassa waterfront has seen significant land use changes due to urban tourism development, bringing both pros and cons. To protect the area sustainably, a comprehensive waterfront master plan focusing on preserving natural landscapes, eco-friendly practices, and stakeholder engagement in environmental protection is needed. This will ensure the long-term health of the lake ecosystem and benefit those depending on it.

4.13. Discussion on investigating the potential of urban tourism based on the waterfront development principle

A standard for investigating the potential of urban tourism based on the waterfront development principle can be found in the work of Breen and Rigby (1996). They emphasize the importance of creating a vibrant and diverse waterfront environment that promotes economic activity, social interaction, and cultural enrichment. This should be achieved through the integration of public spaces, recreational areas, commercial establishments, and cultural attractions, as well as the provision of accessible transportation options and proper infrastructure. Waterfront development should also prioritize sustainability and consider the unique environmental and heritage aspects of the area to ensure long-term success and preserve the waterfront's unique character(Breen 1996).

Waterfronts play a crucial role in city development, providing transportation, economic activities, and cultural exchange. As urban tourism gains importance for economic growth

and revitalization, it's essential to explore how waterfront development can create attractive destinations. This paper aims to discuss the potential of urban tourism through a comprehensive approach to waterfront planning, considering physical, functional, social, economic, ecological, and aesthetic aspects. Tourist numbers at the lakefront are declining due to poor waste management, pollution, and disorganized local programs. To rejuvenate tourism, waste systems, pollution control, and local program planning must be improved. Developing cultural spaces, enhancing safety, and creating enjoyable local experiences will also attract more visitors and benefit the local community. Tackling issues such as informal service providers and fish overexploitation can contribute to a more positive atmosphere and aid in restoring the lakefront's appeal.

Unsustainable fishing practices harm the ecosystem and local fish market, crucial for tourism. The waterfront design needs improvement to attract tourists, and issues like job creation, urban planning, pollution, and segregation must be addressed. Hotels and resorts alone are insufficient to create a vibrant experience. Cultural protection, more access to arts, and preserving local heritage are essential, as well as promoting tolerance, inclusivity, and diversity. The waterfront offers entrepreneurial potential, but needs to strengthen consulting, funding, and collaboration opportunities.

By addressing gaps in exhibition spaces, performance areas, and open/close spaces, waterfront urban tourism destinations can create thriving entrepreneurial ecosystems and boost economic growth. Enhancing the creative environment increases visitor satisfaction, promotes longer stays, and stimulates cultural and economic development. Prioritizing internet accessibility, enhancing information tools, and considering energy consumption will help adapt successfully to the modern world. The survey results show overall satisfaction with the studied urban area's accessibility, architecture, and relaxation options, but improvements are needed in disabled access, safety, and cleanliness. Diverse opinions exist regarding traffic, parking, and nature spaces. The area is more pedestrian-friendly than cyclist-friendly. Recreational facilities' access contributes to community satisfaction, while accommodation, sports eligibility, and activity diversity require improvement. Findings show the environment is welcoming and has adequate transportation costs, but needs better investment, job opportunities, and tourist attractions. These insights can guide improvements to urban planning, community development, and tourism growth.

The study shows in the analysis of Kruskal-Wallis Test that age plays a significant role in the perception of social cohesion and priorities in waterfront areas. Older people tend to value social cohesion and the protection of culture more than younger people, which should be considered by policymakers and urban planners when designing these areas.

The quality of life also seems to decrease with age become increase, suggesting that waterfront areas might be more suitable for younger individuals concerning factors like accessibility, recreation, and amenities. The differences in perceptions between age groups highlight the importance of considering various needs and preferences when creating livable waterfront spaces.

In particular, older age groups prioritize the "protection of culture." This finding can help inform communication strategies and policy-making to cater to different age groups' priorities in preserving cultural aspects and enhancing waterfront livability. Overall, understanding the varying perspectives of different age groups can contribute to designing waterfront areas that cater to diverse needs and preferences, creating more inclusive and enjoyable spaces for all.

In summary, the factors influencing livable waterfront development principles are categorized according to their impact in mean rank, assisting urban planners, designers, and various stakeholders in prioritizing these factors based on statistical value. The Kruskal-Wallis Test results analysis reveals that the most significant factors include protection of culture, fostering a creative environment, and improving the quality of life for various age groups. Additionally, responsive design should take into account the needs of users of all age groups.

CHAPTER: FIVE: CONCLUSION AND RECOMMENDATION

5.1 Conclusion

Urban waterfronts serve as essential spaces that cater to the needs of users and contribute to the overall vitality of a city. For waterfront enhancement projects to be successful, it is crucial to consider the opinions and requirements of stakeholders, public, and private authorities. This research aimed to examine Lake Hawassa from the perspective of key urban waterfront development criteria. By conducting a comprehensive evaluation, this study highlights the importance of addressing broader aspects of waterfront development to ensure the successful progression and establishment of an ideal waterfront.

Numerous factors contribute to the effective use and success of urban waterfronts. The main strengths of this research stem from three interconnected objectives: examining an evaluation method that combines quantitative and qualitative approaches, with a focus on the principles of waterfront development.

The success of waterfront development is influenced by various elements, including physical quality, functional aspects, social factors, economic factors, cultural characteristics, and political issues. Successful waterfront development encompasses aesthetically pleasing and creative spaces and activities, as well as suitable rules and regulations, driven entrepreneurs, ongoing funding opportunities, and the conservation of historical context, cultural heritage, and unique values. Additionally, it involves modern physical adequacy and the promotion of social well-being.

This study evaluates the suitability of Lake Hawassa in terms of physical, functional, social, economic, cultural, and political aspects based on users' feedback regarding waterfront development concepts. The findings reveal that the lake area's functions and opportunities are considered insufficient by its users, who primarily belong to the creative class and demand new, technologically advanced facilities and prospects. The physical environment needs improvements, as the current state of street furniture is lacking, and the pavements are not suitable for safe use by individuals with disabilities. The area is also not conducive for cyclists and pedestrians.

However, users find the environment socially acceptable, as it accommodates people of different education levels, ages, ethnicities, and socioeconomic statuses. Citizens appreciate the inclusive nature of the site, which allows everyone to access its facilities. Lake Hawassa

is the most alluring location in the Sidama Region, attracting tourists, locals, and residents. Nonetheless, the area's financial contributions remain insufficient.

Additionally, the majority of participants believe that political support is inadequate. Relevant legislation and policies must be established to encourage ongoing investment opportunities and ensure the region's long-term development. Furthermore, regular maintenance is necessary to ensure safety and cleanliness within the area.

In summary, our analysis of livable waterfronts focused on several key variables, including protection of culture, creative environment, and quality of life, among others. The Kruskal-Wallis Test results demonstrated a strong statistical significance across all variables when comparing different age groups, indicating that these factors play a crucial role in shaping user preferences for waterfront living. By understanding these preferences, urban planners and policymakers can better design waterfront areas that cater to the needs and desires of various age groups, ultimately promoting inclusive, sustainable, and attractive environments for residents and visitors alike.

5.2 Recommendation

After analyzing the results, several suggestions can be provided for upcoming development.

Physical

- The upkeep of the waterfront should be ensured, and additional seating areas should be provided to accommodate all users.
- There is a need for afforestation and the implementation of environmental landscaping.
- Installation of recycle bins is necessary.
- Tracing bike paths is required.
- Sufficient seating options should be made available for users.
- The issues related to infrastructure need to be addressed by creating a plan that takes into account projected population growth in the upcoming years.
- Encouraging the use of public transportation can help alleviate traffic congestion.
- Installing adequate drainage systems is crucial in preventing flooding in waterfront and nearby areas during periods of heavy rainfall or high tides.
- To maintain a clean and enjoyable environment for waterfront users, it is important to perform routine cleaning and maintenance tasks, such as regular removal of trash and debris.
- It is advisable to include shaded spaces, such as gazebos or clusters of palm trees, to offer respite from the sun and high temperatures, particularly for vulnerable groups like children, and individuals with specific needs.
- To provide equal access to the waterfront for people of all physical abilities, it is important to construct ramps and pathways that are accessible for individuals with disabilities.
- To ensure user safety and distinguish them from boating or other activities, it is important to establish clearly defined zones or areas.
- To improve safety and usability during the evening, it is advisable to install lighting in prominent locations along the waterfront.
- To promote physical activity and recreation among users, it is recommended to offer outdoor fitness equipment and sports facilities, such as courts for volleyball or basketball.

- Ensuring that public restrooms are readily accessible and well-maintained to cater to increasing populations and seasonal visitors.
- Offer sufficient and specifically designated parking spaces to meet the needs of users, ensuring their satisfaction.
- Ensure prominently displayed signs that clearly communicate the regulations and instructions for the waterfront area, including responsibilities, guidelines, and prohibited actions.

Functional

- It is important to explore new projects that take into account the potential of alternative tourism.
- Encouraging the utilization of creative and beneficial spaces, along with the provision of free internet connectivity.
- Improving the convenience of reaching tourist attractions by enhancing accessibility and transportation options, such as expanding public transportation networks, establishing dedicated bike lanes, and creating pedestrian pathways, to ensure that all visitors can easily access these destinations.
- Ensuring the long-term preservation of local ecosystems and minimizing negative impacts through sustainable development and management of resources, including water and energy, within tourist facilities and attractions.
- Promoting cultural exchange and understanding between visitors and residents by incorporating local culture, heritage, and traditions into tourism experiences.
- Encouraging collaboration between local businesses, communities, and tourism providers to develop and promote authentic and memorable experiences for tourists.
- Putting in place efficient policies, regulations, and infrastructure to guarantee the safety and security of tourists, encompassing properly maintained roads, public areas, and emergency response services.
- Facilities with multiple functions, opportunities for water access and recreation, and the availability of water-related recreational activities.

Social

- Organizing training sessions and workshops can help enhance environmental consciousness.
- It is important to promote a greater awareness of recycling practices.

- Decision-making processes should involve the participation of individuals with creative and business acumen.

Economic

- When undertaking development projects, it is important to prioritize designs that are both cost-effective and environmentally sustainable.
- Enhancing economic opportunities by exploring alternative tourism options

Cultural

- There is a need to enhance the promotion of historical buildings and increase cultural and artistic engagements.
- Safeguarding the distinctiveness of the image is necessary, and it is essential to adhere to modern standards of visual representation.

Politics

- Government and municipal authorities should allocate funds for the advancement and growth.
- Municipalities, governments, urban planners, architects, and the public should come together and collaborate.
- It is important for local authorities to identify the most pressing issues, raise awareness about them, and subsequently develop projects in response.
- The public and relevant institutions and organizations should join forces and cooperate for collective action.

Recommendation for Further Research

In this research, various issues are examined based on the principle of livable waterfronts and the potential of urban tourism in waterfront areas. The analysis includes a study of land use/land cover (LULC) and the use of closed-ended questions. The Likert scale and SPSS software were utilized to analyze the data. However, due to time constraints, a more comprehensive investigation into the existing conditions of the waterfront, LULC change, its impact, and the principle of livable waterfronts in relation to different factors was not possible.

The findings of this research underscore the need for additional studies to deepen our understanding of the principles of livable waterfront development in relation to urban resilience. This includes exploring its physical, functional, economic, cultural, political, and

social dimensions. Moreover, it is crucial to examine its impact on sustainable tourism and socio-economic prosperity:

- Longitudinal studies to examine the impacts of waterfront development over time.
- Investigate the role of public-private partnerships in successful waterfront development projects.
- Examine the long-term impacts of climate change on waterfront developments and their implications for urban resilience.
- A comparative study of waterfront development models from different cities across the world to establish best practices, identify potential pitfalls, and suggest mitigation strategies.
- Develop environmental impact assessment frameworks tailored to waterfront developments, taking into account various ecosystems, local communities, and economic activities.

Design Recommendation

Depending on the result and discussion the following Design recommendation was made. The development of the design is based on the Hawassa city structural plan. Depending on the land use the following basic program developed and designed for the area.

1.Program for Gudumale Convocation Space

Table 4. 43: Program Development for Gudumale convocation space

Space program	Unit Area	Description
Biking racks	1049 m^2	For training motor bikes and bicycles
Charging station	1222 m^2	For digital device users
Wi-Fi seat / cyber park	180.30 m^2	For digital device users
Flexible plaza/ pavilion	3310 m^2	For expos and exhibitions
Versatile public seat	1612 m^2	Sitting decks and different position sittings and sleeping as well
Mass convocation space	14740 m^2	For mass meetings in time of protest, peaceful propagations, demonstration
Skate boarding	1350 m^2	Young people, children who are interested in skateboarding sport
Dancing plaza	1964 m^2	For dancing and cultural activates
Biotic forest	1075 m^2	Small diverse vegetated home for birds
Children playground	1520.5 m^2	Secures and safe playing area for children
Basketball court	1520 m^2	For youths to develop their sport skills and stay healthy and productive.
Photographic landscape		
Public toilet	45 m^2	
Cinema	395.64 m^2	

Exhibition center	1900 m^2	
Café and restaurant	422 m^2	
Offices	88.5 m^2	
Over all site area	49,800 m^2	

Zoning

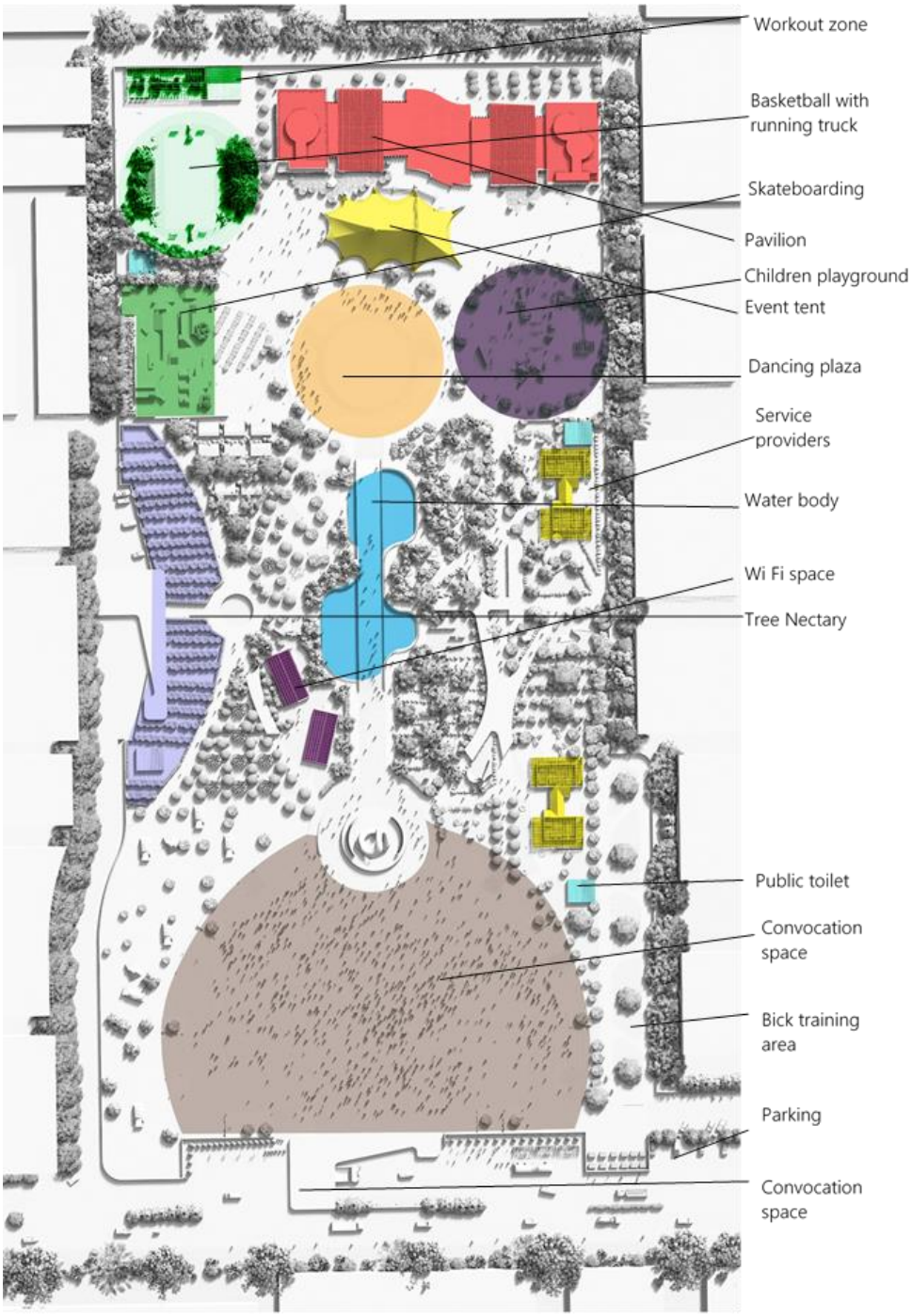

Figure 4. 27: Zoning

Aerial View of the Whole Site

Figure 4. 28: Aerial View of the whole site

2.Lake Hawassa promenade and Redevelopment Site Plan

This redevelopment focus on rearranging the area with a new zoning and land use allocation.

Program Development

Function	Type		frequency
Residential	Type 1	G+2,G+1	44

Function	Type		frequency
Retail	Type 1	G+2,G+3	10

Function	Type		frequency
Mixed use	Type 1	G+5	4
	Type 2	G+4	5

Function	Type		frequency
Indoor parking	Type 1	G+0	4

Function	Type		frequency
Community center	Type 1	G+3	2

Function	Type		frequency
Commercial	Type 1	G+1	4
	Type 2	G+2	3
	Type 3	G+3	5
	Type 4	G+4	4
	Type 5	G+5	3

The essential program development for the site according to the land use characteristics ,here is the proposed program list with its number and type and story.

-Retail
-business
-Residential
-Commercial
-Mixed use
-Community center
Indoor parking

Figure 4. 29:Program Development

Proposed Land Use Site Plan

Figure 4. 30: Site Plan for Lake Side Development

Aerial View of the whole site of Lake Hawassa and the Redevelopment Action Area

Figure 4. 31: Aerial View of the whole site of Lake Hawassa and the Redevelopment Action Area

3D

Figure 4. 32: Long and wide Promenade of the waterfront

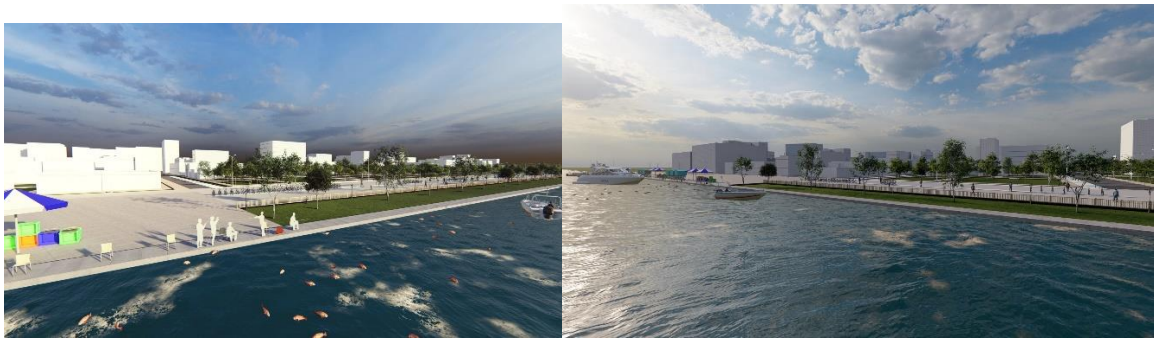

Figure 4. 33: Fisheries area and the boat service

Pavilion

Working Out Area

Figure 4. 34: Pavilion and Work Out Area

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APPENDIX

Appendix 1- Questionnaire for Residents of three sub-cities, tourists, and Experts

Target Group: Tourists, residents and peoples who use the waterfront area for different purpose

The questionnaire is prepared to conduct a study on ‘‘Waterfront development in the case of Hawassa lake”: for the partial fulfillment of MSc degree in Urban Planning and Design that is given by Adama Science and Technology University. So, you are selected to give your answer and opinion for the questions.

Please, note that the information you provided is only used for academic purposes and is confidential. Besides, no reference will be made to you in particular. Therefore, feel free to respond to the questions to the best of your knowledge to realize the objective of this study.

Thank you

Lensa Endale

MSc Candidate in Urban Planning and Design

Adama Science and Technology University, Adama, Ethiopia

1. Date _____

2. Name of interviewer _____

Demography and socio-economic data of respondent

3. Name of respondent (optional) _____

4. Place (where they are from) _____

5. Age?

A. 15-20 B. 21-30 C. 31-40 D. 41-50 E. 51-60 F. 61 and above

6. Gender

A. Male B. Female

7. Kebele _____

8. Marital status

A. Married B. single C. Widowed D. Divorced

9. Did you attend formal school?

A. Yes B. No

10. Educational level

A. University/college B. secondary C. primary D. Never attended school

11. What do you do?

A. Government worker B. Private C. NGO D. Student E. Nothing F. other

The following questions are in the forms of Likert scale and use the grading scale when answering your response.

Table 1: The Likert scale based on the agreement and condition

Based on Agreement	Baes on condition
1 - Strongly disagree	- Very bad (1) (awful)
2 - Disagree	- Bad (2)(many problems)
3 - Neither agree nor disagree	- Needs improvement (3)(some problems)
4 - Agree	- Good (4)
5 - Strongly agree	- Very good (5)

NB. The grade you give determines the level of your agreement to the variable.

Functional Aspect

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Functional	the waterfront has various functional opportunities						
	the waterfront provides joyful areas with music, food, literature, dance, and maritime heritage						

	Different types of water based activities can be seen						

Physical Aspect

Aspect	Variable	1	2	3	4	5	Grand score
Physical	the waterfront is well maintained						
	The place possesses various art objects in good physical condition						
	Urban furniture is in good physical condition.						
	The waterfront is accessible for able and disabled people.						
	the area has easy access to other public environments.						
	It is easy to reach the waterfront via pedestrian access, bicycle lanes, and/or public transportation.						
	Traffic condition is proper.						
	Parking conditions are adequate						

Social Aspect

Aspect	Variable	1	2	3	4	5	Grand score
Social	The environment is attractive.						
	People with different education levels, age groups, ethnicities, and income levels can enjoy the place.						
	It is a good experience to spend time in the place.						

Economic Aspect

Aspect	Variable	1	2	3	4	5	Grand score

Economic	The economic and nature-friendly design approach was considered during the development process.						
	The area provides good economic income.						
	I like to visit here frequently.						

Cultural Aspect

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Cultural	Historical references are protected and/or reflected in the waterfront.						
	There are cultural and art activities in the place.						
	The unique image has been protected and the image has developed.						

Political Aspect

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Political	The development process has been done with a successful cooperation process with related stakeholders..						
	Creativity, innovation, and/or social well-being policies were well considered during the development process.						
	Proper regulations are adopted by politicians to provide continuous maintenance.						

Analysis based on livable environment development principle for investigating the potential of urban tourism.

Protection of culture

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Protection of culture	Adequacy of cultural promotion.						

	competence of cultural space						
	The capability of contextual protection (historic and/or cultural heritage).						
	Protection level of an existing unique culture.						
	Festival opportunities in the place.						
	Access to local foods.						
	Access to local arts						
	Adequacy of art activities						

Tolerance

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Tolerance	Adequacy of cultural promotion.						
	competence of cultural space						
	The capability of contextual protection (historic and/or cultural heritage).						

Promoting Entrepreneurship

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Promoting Entrepreneurship	Competence of consultancy and/or funding opportunities.						
	Competence of collaborative discussion spaces for stakeholders						
	Adequacy of investment activities.						

creative Environment

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Creative Enviro	The capability of exhibition spaces..						

	Adequacy of open and/or close spaces, which are motivating for creative productivity.						
	Adequacy of open and/or close spaces, which are motivating for creative productivity						

Innovation and technology

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Innovation and technology	Sufficiency of innovative ideas, which come true.						
	Sufficiency of technological ideas, which come true.						
	Adequacy of information tools for visitors.						
	Existence of energy consumption via water						
	Access to the Internet.						

Awareness

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Awareness	Adequacy of motivated people to keep the place clean.						
	Adequacy of responsive people for their environment and society						
	Adequacy of motivated people to promote their art, music, and literature in the place.						

Quality of Life and Physical Comfort

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Quality of Life and Physical Comfort	The efficiency of protection of natural spaces..						
	Suitability of accessibility.						
	Appropriateness of functional variety.						

	Adequacy of architecture quality.						
	Adequacy of urban design quality.						
	Sufficiency of traffic, and access to car parking						
	Sufficiency of transportation.						
	Possibility of relaxation.						
	Adequacy of access for disabled.						
	Access to cycling.						
	Access for pedestrians.						
	Adequacy of safety.						
	Suitability of urban furniture (seating, lighting, shading, plantings, etc.) and harmony between each other.						
	Adequacy of cleanliness.						

Politic Support to Relevant Authorities

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Politic Support to Relevant Authorities	Sufficiency of rules and regulations, which were adapted into the place						
	Competence of funding opportunities for the development of the place						
	Adequacy of political support for the arrangement of a platform for stakeholders and/or investors.						

social cohesion

Aspect	**Variable**	**1**	**2**	**3**	**4**	**5**	**Grand score**
Social cohesion	Sufficiency of attractiveness.						
	Existence of different age groups.						
	Existence of different ethnicities.						

	Existence of different educational levels.						
	Existence of different genders.						

Diversity of Function

Aspect	Variable	1	2	3	4	5	Grand score
Diversity of Function	Adequacy of accommodation opportunities.						
	Existence of water-based activities.						
	Variety of activities.						
	Access to the other functions						
	Access to recreational facilities.						
	Sufficiency of shopping opportunities.						
	Eligibility for sports activities.						

Economic Contribution

Aspect	Variable	1	2	3	4	5	Grand score
Economic Contribution	Welcoming level of the environment.						
	The efficiency level of increased visitor numbers.						
	Sufficiency of investment.						
	Competence of employment opportunities.						
	Acceptable cost of transportation.						
	The sufficiency of tourist attraction level.						

Appendix 2- Interview for Residents who are dependent economically on the waterfront

1. How long have you been living in the waterfront area, and what initially drew you to this location?
2. In what ways does your livelihood depend on the waterfront's economic activities?
3. What types of jobs or businesses related to the waterfront are most prominent in your community?
4. How has the waterfront area's economy changed over the years, and how has this impacted you and your family?
5. What challenges do you and other waterfront community members face in terms of sustaining your income or businesses?
6. Are there any local initiatives, projects, or organizations aimed at improving the waterfront area's economy and livelihood for residents? Please share some examples.
7. How do seasonal changes, weather events, or climate change affect the waterfront economy and your day-to-day life?
8. Are there any specific skills or qualifications that you believe are essential for someone to thrive economically in a waterfront community?
9. How do you envision the future of the waterfront economy and its impact on your life and the community?
10. What strategies or changes do you believe need to be implemented to ensure the sustainability and growth of the waterfront area's economy for the benefit of the residents?

Appendix 3- Interview for Experts (Hawassa city municipality)

1. How many associations are there currently registered and get in to business?
    a. Fisheries ----------
    b. Urban agriculture----------
    c. Youth association working along the shore line ----------
    d. Boating associations---------
    e. other-------

2. What are the property types and measure of the waterfront land? Is it private or public?
3. Evaluate land use policy and investment policy?
4. How is the land use land cover of Lake Hawassa waterfront made and managed?
5. Is there any legislation concerning tourism and tourism infrastructure development?
6. Is there any measure for the treatment of municipal solid and liquid waste?
7. How are the effects of pollution and waste management, including plastic debris and industrial waste, being addressed in waterfront communities?
8. What measures are being taken to ensure public safety and preparedness in the event of a natural disaster or emergency in waterfront areas, such as flooding or storm-related damage?
9. How do the municipality and other government body protect and conserve Lake Hawassa and the surrounding ecosystem including bio-diversity?
10. Is there any system of protecting wildlife within the waterfront?
11. What strategies are being implemented to promote sustainable development and eco-tourism in waterfront areas, while minimizing the disruption of natural habitats?