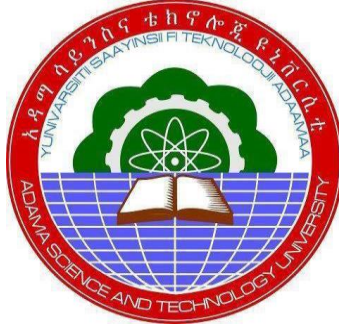


**Riverside Development: in the case of Laga Tafo River in Laga Tafo Laga
Dadi Sub City, Shegere City**



Solomon Shiferaw

A Thesis Submitted to the School of Civil Engineering and Architecture

Department of Architecture

Presented in Partial Fulfillment of the Requirement for the Degree of

Masters of Science in Urban Planning and Design

Office of Graduate Studies

Adama Science and Technology University

January, 2024

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APPROVAL SHEET

I, the advisors of the thesis entitled “**Riverside Development: in the case of Laga Tafo River in Laga Tafo Laga Dadi Sub City, Shegere City**” and developed by Solomon Shiferaw, hereby certify that the recommendation and suggestions made by the board of examiners are appropriately incorporated into the final version of the thesis.

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We, the undersigned, members of the Board of Examiners of the thesis by Solomon Shiferaw have read and evaluated the thesis entitled “**Riverside Development: in the case of Laga Tafo River in Laga Tafo Laga Dadi Sub City, Shegere City**” and examined the candidate during 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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Finally, approval and acceptance of the thesis is contingent upon submission of its final copy to the Office of Postgraduate Studies (OPGS) through the Department Graduate Council (DGC) and School Graduate Committee (SGC).

Department Head

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Date

School Dean

Signature

Date

Office of Postgraduate Studies, Dean.

Signature

Date

DECLARATION

I hereby declare that this Master Thesis entitled “**Riverside Development: in the case of Laga Tafo River in Laga Tafo Laga Dadi Sub City, Shegere City**” 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 duly acknowledged through citation.

Solomon Shiferaw

Name of the student

Signature

Date

RECOMMENDATION

I, the advisor of this thesis, hereby certify that I have read the revised version of the thesis entitled **“Riverside Development: in the case of Laga Tafo River in Laga Tafo Laga Dadi Sub City, Shegere City”** prepared under my guidance by Solomon Shiferaw submitted in partial fulfillment of the requirements for the degree of Master’s in Urban Planning and Design. Therefore, I recommend the submission of revised version of the thesis to the department following the applicable procedures.

Yared Girma (PhD)

Major Advisor

Signature

Date

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TABLE OF CONTENTS

ACKNOWLEDGMENTS	v
LIST OF FIGURES	x
LIST OF TABLES	xi
ACRONYMS	xii
ABSTRACT	xiii
CHAPTER ONE	1
1. Introduction.....	1
1.1 Background of the Study	2
1.2 Statement of the Problems.....	3
1.3 Objectives of the Study	5
1.3.1 General Objectives	5
1.3.2 Specific Objectives	5
1.4 Research Questions	5
1.5 Significant of the Study.....	5
1.6 Scope of the Study.....	6
1.7 Limitation of the Study	7
1.8 Organization of the Study	8
1.9 Operational definitions of the study	8
CHAPTER TWO	9
2. Literature Review.....	9
2.1 Theoretical Literature Review.....	9
2.1.1. Historical background of development along a riverside	9
2.1.2 The Relationship of River and Urban Built Environment.....	11
2.1.3 Developments along a riverside	13

2.1.4 Challenging facing on the development of riversides	14
2.1.5. Principles for successful water front development.....	15
2.1.6 Benefits of Riverside Development.....	17
2.2. Empirical Literature Review	19
2.2.1. Introduction	19
2.2.2. Empirical Review Related to Social.....	19
2.2.3. Empirical Review Related to Economic.....	20
2.2.4. Empirical Review Related to Environmental	20
2.3 Summary of Both the Theoretical and Empirical Literature.....	20
2.4 Lesson Learned From the Theoretical and Empirical Literature	23
2.5 The Research Gap and Expected Solution	23
CHAPTER THREE	24
3. Material and Methods	24
3.1 Description of the Study Area	24
3.1.1 The Existing Situation of Riverside.....	25
3.2 Research design.....	26
3.3 Data Type and Sources.....	27
3.4. Target Population	27
3.5. Sample technique and Sample Size.....	28
3.6 Data Collection Tools.....	30
3.6.1. Interviews and Questioners	30
3.5. 2 Observation.....	31
3.7 Data Analysis methods.....	32
3.8 Ethical Consideration	32
CHAPTER FOUR.....	33

4. Result and Discussion	33
4.1 Introduction	33
4.2 Background of the Respondents.....	33
4.2.1. Sex composition of the respondents	33
4.2.2 Age Composition of Respondent.....	34
4.2.3. Marital Status of Respondents	35
4.2.4. Educational Level of Respondents	36
4.2.5. Occupation of the respondents	37
4.2.6 Living experience in adjacent kebeles to the study area	38
4.3 Analyses Physical Context of the Site.....	39
4.3.1 Land Use.....	39
4.3.2 Street Network.....	41
4.3.3 Natural Vegetation.....	43
4.3.4. Land Use/Land Cover Change and Urban Expansion around the Laga Tafo River ...	44
4.4. The Existing Activities along Laga Tafo Riversides	46
4.4.1. Time it takes to reach Laga Tafo riversides	48
4.4.2. The frequency to visit Laga Tafo River.....	49
4.4.3. Times spent for recreation around Laga Tafo riverside	51
4.4.4. The Causes of Discomfort for Recreational Activities.....	52
4.5 The Major Challenges of River Side Development	53
4.5.1 River Pollution.....	53
4.5.2 Environmental Degradation.....	54
4.5.3 Economic Challenges	55
4.5.4 Social Challenges	56
4.6 Factors Contributing to Poor Development of the Riverside.....	57

4.6.1 Absences Plan Implementation	58
4.6.2 Informal Riverside Settlement.....	59
4.6.3 Lack of Sewerage Systems and Inadequate Waste Disposal.....	60
4.6.4 Absences of Buffer Zone	61
CHAPTER FIVE	63
5. Conclusions and Recommendation.....	63
5.1 Conclusions	63
5.2 Recommendation.....	65
5.2.1 For Urban Planners.....	66
5.2.2 For The Government	66
5.2.3. For the Community.....	67
5.2.4 Design Guidelines Recommendation	67
5.2.5 Design Recommendation.....	68
REFERENCE.....	71
APPENDIX- I	75

LIST OF FIGURES

Figure 1-location of the study area	7
Figure 2 Principles for successful water development (Sources; (Nasution & Alvan, 2017).	15
Figure 3 Location Map of the study area	24
Figure 4 Location map of the study area	25
Figure 5: Sex composition of the respondents.....	34
Figure 6: Age Composition of Respondents.....	35
Figure 7:- Marital status of the respondents	36
Figure 8. The education status of the respondents.....	37
Figure 9: The occupation of the respondents.....	38
Figure 10: The respondents living years	39
Figure 11: Existing land use of the study area.....	40
Figure 12: land use by percentage	40
Figure 13: Existing street network of the study area	42
Figure 14: Existing streets in the study area	43
Figure 15: Vegetation in the site.....	43
Figure 16: Current condition of Laga Tafo riversides	46
Figure 17: The respondent's activities along Laga Tafo River.....	47
Figure 18: The respondent's time it takes to reach Laga Tafo riversides	49
Figure 19: The frequency to visit Laga Tafo river.....	50
Figure 20: Times spent for recreation around Laga Tafo riverside	51
Figure 21: The reason discomfort for recreation to visitors	52
Figure 22: Show river pollution.....	53
Figure 23: Show Environmental degradation	54
Figure 24: shows peoples in downstream use the polluted river	57
Figure 25: The informal settlement along river	60
Figure 26: Waste disposed around the riverside	61
Figure 27: Absences of Buffer Zone and it effect.....	62
Figure 28: Network of pedestrian linkage	69
Figure 29: Low Rise Commercial Development	69
Figure 30: Instillation of Vibrant Environment	70

LIST OF TABLES

Table 1 Principles for a sustainable riversides development	17
Table 2 The Sample size taken in the kebeles	30
Table 3: LULCC pattern in Laga Tafo riverside from 2006 -2022	44
Table 4: LULCC change in Laga Tafo riverside from 2006 -2022	44

ACRONYMS

ASTU- Adama Science and Technology University
AAEPA - Addis Ababa Environment Protection Authority
CAD - Computer Aided Design
CSA - Central Statistical Agency
EPA - Environmental Protection Authority
GIS - Geographic Information System
LDP - Local Development Plan
LTLD - Laga Tafo Laga Dadi
LULC - Land Use Land Cover
NDP - Neighborhood Development Plan
NUPI - National Urban Planning Institute
OEPA - Oromia Environmental Protection Office
ONRS - Oromia National Regional State
RF - Riverfront
RS - Riverside
RSD - Riverside Development
UGI - Urban Green Infrastructure

ABSTRACT

Riverside development is defined as any development in front of water or a body of water. The Laga Tafo River is one of the rivers that exist in Laga Tafo Laga Dadi sub-city, Sheger city, and serves as the sub-city's identity. Water contamination from industrial wastewater disposal is becoming a major environmental hazard in Laga Tafo Laga Dadi and its surrounding regions. Due to the improper development plans and implementation in the sub-city, the river and the areas near it occasionally face challenges like river pollution, environmental degradation, and social and economic issues. Hence, the main objective of this paper is to assess the development along a riverside and to provide recommendations that address the challenges. In order to achieve this objective, a combination of qualitative and quantitative research approaches was employed. Structured open-ended and close-ended purposeful interviews, secondary data, and observations were utilized in the study. The study identified practices like illegal slaughter services and indiscriminate waste disposal that contribute to river pollution. Based on the finding of the study, patterns of riverside usage, including physical exercise and leisure activities, face challenges such as discomfort, indicating the necessity for environmental improvements. Major challenges identified include river pollution, environmental degradation, economic disparities, and social tensions. River pollution, evidenced by discolored water and contamination, poses health risks to downstream communities, necessitating pollution control measures. Environmental degradation, observed in 75% of the riverside area, highlights the vulnerability of riverside habitats and the need for conservation efforts. Factors contributing to poor riverside development include ineffective plan implementation, informal settlements, inadequate waste disposal, and the absence of buffer zones. Addressing these challenges requires coordinated efforts and integrated land-use planning for sustainable riverside development. Recommendations include upgrading and maintaining riversides through the development of plans, implementing stormwater management, providing buffer zones, maintaining settlements along riversides, and incorporating riverside potentials in planning and design. Stakeholder participation is crucial, and education initiatives are recommended to raise awareness and protect the natural environment. Government stakeholders, planners, architects, engineers, and environmentalists are urged to prioritize riverside development and environmental aspects in planning, design, and construction projects.

Key Word: GIS, Laga Tafo River, Riverside Development, Pollution,

CHAPTER ONE

1. Introduction

This paper is written as part of a study conducted in the Laga Tafo Laga Dadi sub-city, Ethiopia, to fulfill the requirements for a Master's Degree in Urban Planning and Design at Adama Science and Technology University. The study focuses on evaluating the current state and challenges associated with riverside development, specifically examining the conditions surrounding the Laga Tafo River. Its overarching goal is to present recommendations aimed at overcoming these challenges.

The positive impact of well-planned riverfront development on urban life and the city's economic vitality is well-established. Unfortunately, the riverside areas, which serve as both development zones and residential settlements, have become significant sources of pollution, adversely affecting the river and the broader water and green infrastructure of the town. The contamination is notably high, with rivers and riverbanks serving as hotspots for the disposal of household waste and sewage from various sources. Activities such as defecation, residential solid waste disposal, and the release of animal waste contribute to the pollution of the Laga Tafo River.

Despite the critical environmental issues at hand, there has been a dearth of studies addressing riverside development in Laga Tafo Laga Dadi. Moreover, the study fails to explore alternative design options, strategies, and techniques to tackle prevailing riverside concerns. This lack of comprehensive focus hinders the formulation of effective measures to address challenges and promote sustainable urban riverfront development. Consequently, the researcher was driven by these factors to delve into a deeper understanding of the existing conditions surrounding Laga Tafo river development and to propose viable solutions to mitigate potential threats.

This chapter encompasses various essential components, including the background of the study, the statement of the problem, objectives, research questions, the significance of conducting the study, the scope of the study, and limitations.

1.1 Background of the Study

Water has been a precious natural resource since the emergence of early settlements and remains invaluable for urban areas as an ecological, recreational, and economic asset. Well-executed riverside development, as noted by Yassin (2011), plays a pivotal role in enhancing urban life quality and positively impacting the city's economy. However, riverside areas, defined as the zone between the river edge and the main city lane or at least six meters from the nearest mainland to the river's edge, often become neglected and harm both the environment and the community (Redzuan et al., 2016).

While the term 'riverside' is clear, some researchers prefer alternative words like riverfront, river edge, waterfront, city port, and harbor front (Yassin et al., 2015). Generally, a riverside serves as the zone of interaction between urban developments and water, considered a unique and irreplaceable resource that interfaces with land, water, air, sun, and productive plants (Azlina et al., 2016). Characterized as a place integrating land with water, the riverside has a natural attraction for people. Seashores and riverfronts are, in fact, the most attractive water features for human settlement, often developed earlier than inland areas in most countries (Zhang et al., 2002).

Riverside development offers a multitude of benefits, acting as a multi-pronged solution for urban challenges. It can reduce cooling demands in buildings, cutting energy usage (Gaffen & Köhler, 2012), enhance ecology and biodiversity by restoring natural habitats (Bingham et al., 2014), and improve air and water quality (Nowak et al., 2013; Vymazal, 2010). Moreover, it reduces noise pollution through natural sound barriers (van den Bosch & de Jong, 2017). Well-designed riverside areas can also alleviate and manage floods through natural retention and infrastructure (Ahern, 2011), adapting to and mitigating climate change through carbon sequestration and flood resilience (Palmer et al., 2014; Wolff et al., 2013). Ultimately, riverside development fosters sustainable and livable cities by enhancing land and biodiversity, improving air and water quality, reducing noise, and providing climate change adaptation and mitigation, making it a valuable tool for urban planning.

Rapid development and urbanization, especially in riverside areas, cause deteriorations in the natural environment, such as flooding, pollution, and drought (Wrenn, 1983). These problems disturb economic growth and life activities, leading to the loss of property and lives (Yassin et al., 2015). In some cases, riverside projects were driven more by investment needs than community

and environmental needs. Inadequate regulation for controlling riverside development globally has led to environmental and social effects, such as increases in riverside pollution indexes and rates of social problems (Yassin et al., 2001).

The history of riverside development began in North America during the 1960s, later becoming models for revitalization projects in Europe and North America. In recent years, urban industrial transformation has provided opportunities for riverfront development. Successful cases of earlier riverside development in Europe and America highlight the enormous social and economic value of such projects (Randhawa & Chandra, 2017).

In many cities worldwide, riverside areas initially served as commercial centers, transportation hubs, and manufacturing centers. However, due to technological changes, the historic preservation movement, increased environmental awareness, and urban renewal, these areas transformed into large spaces for various purposes in the last thirty years (Stevens, 2021). Urban riverside development in developed countries, like North America and Europe, involves larger-scale, mixed-use development, small stream and canal bankside development, historic restoration and imitation, the blossoming of people-places, world exposition development on the waterfront, integration of environmental art and lighting, the growth of festivals and other ephemeral events, and increased regulation of waterfront site development (Perk, 2012).

In contrast, there is little or no river development in developing countries, particularly in Africa. However, in Zanzibar City's Stone Town of Tanzania, there is a more versatile approach to riverside development (Munir, 2012). Riverside development in Ethiopia was not a focal point for a long time; recently, however, there has been a paradigm shift in the concepts of riverside development, as demonstrated by the three-year project along the two longest and widest rivers from Entoto-Akaki, spanning 56 km.

1.2 Statement of the Problems

Riverside development is widely recognized as a versatile and beneficial tool in urban planning, offering cities and towns various advantages, including economic growth, improved environmental quality, and enhanced ecological systems (Pancewicz, 2019). However, the potential benefits of riverside development are often compromised by environmental degradation

and missed opportunities, particularly in vulnerable areas influenced by human activities and natural forces.

In the case of Laga Tafo Laga Dadi sub-city, specifically along the Laga Tafo River, the current state of riverside development reveals significant shortcomings. The existing design lacks consideration for the potential of the riverside, with both sides of the river being utilized as waste sites and hosting informal, unauthorized settlements. The absence of delineated green buffer zones further exacerbates the challenges. Additionally, the area faces issues such as the loss of indigenous forests dominated by eucalyptus trees, security concerns, and illegal activities like slaughter and meat disposal, posing a physical and psychological threat to the urban community.

Urban dwellers in this region encounter difficulties due to poor accessibility to public and semi-private spaces along the riverside, hindering interactions during various occasions. Despite the formal land-use plan for Laga Tafo Laga Dadi Town proposing a mandatory minimum 30-meter setback as a buffer zone on both sides of the river edges in 2008, pollution and degradation persist due to improper waste disposal from households and factories.

Existing studies on riverside development in Laga Tafo Laga Dadi sub-city, such as those by Girma et al. (2019) and Worku and Dadi (2021), have focused on aspects like urban green infrastructure, heavy metal pollution, and microbial water quality. However, these studies did not delve into the comprehensive development and management of the riverside area. Moreover, alternative design solutions, strategies, and approaches to address existing problems were not adequately explored.

This research aims to bridge these gaps by conducting a comprehensive study of the current state of Laga Tafo's riverside. The primary focus is on exploring innovative design options that unlock the riverside's potential as a vibrant urban oasis, addressing environmental concerns and creating space for recreation, community interaction, and economic prosperity. This study seeks to provide valuable insights and recommendations for sustainable urban riverside development in Laga Tafo Laga Dadi sub-city.

1.3 Objectives of the Study

1.3.1 General Objectives

The main objective of the study is to assess the existing condition of riverside development and provide alternative strategic approaches and design solutions to overcome the current challenges of the riverside.

1.3.2 Specific Objectives

- To assess existing situation of riverside in study area
- To identify the major challenges of riverside development in study area.
- To develop alternative strategic approaches and design solutions for sustainable riverside development in Laga Tafo river.

1.4 Research Questions

- What is the current situation of the riverside in the study area?
- What are the major challenges encountered in the development of the riverside in the study area?
- What are alternative strategic approaches and design solutions that help to ensure sustainable riverside development in Laga Tafo river?

1.5 Significant of the Study

The significance of this research is multifaceted, encompassing academic, theoretical, and practical dimensions. Academically, the study addresses a critical gap in the literature by conducting a thorough assessment of the existing condition of riverside development in the specific context of Laga Tafo. This contributes valuable insights to the broader field of urban planning and environmental studies, enhancing our understanding of the complexities and challenges associated with riverside development in similar settings.

From a theoretical standpoint, the research advances the theoretical framework related to sustainable urban development, particularly in the context of riverside areas. By identifying and examining the major challenges faced in riverside development, the study contributes to theoretical discussions on environmental conservation, community well-being, and the integration of strategic approaches in urban planning.

The practical implications of this research are significant for both local communities and urban planners. Assessing the existing situation of riverside development and identifying major challenges directly informs practical decision-making processes. The alternative strategic approaches and design solutions proposed in the study have the potential to guide urban planners, policymakers, and community stakeholders in transforming the current challenges into opportunities for sustainable riverside development in Laga Tafo. This practical dimension is crucial for addressing real-world issues, promoting environmental sustainability, enhancing the quality of urban life, and fostering economic prosperity in the studied area. Overall, this research serves as a comprehensive and practical resource for academics, theorists, and practitioners engaged in the field of urban planning and environmental studies.

1.6 Scope of the Study

The research is focused on the thematic and spatial aspects related to the Laga Tafo River and riverside development. Thematic scope specifically delves into the conditions and challenges associated with the Laga Tafo River and its immediate surroundings. The spatial scope is limited to the study area, concentrating on the riverside along the Laga Tafo River. This location was chosen due to its direct exposure to both positive and negative impacts from the river, with a high concentration of residential areas and economic activities leading to issues like informal settlements and river pollution.

Moreover, the chosen area is situated in the central district of the town, influencing both positively and negatively the local population. Given the prevalence of informal settlements and pollution, the study aims to provide a viable solution that benefits the town community. The pollution of many rivers and streams flowing through towns has become a pressing issue, resulting in adverse impacts on social, economic, and environmental conditions. The discharge of strong toxic waste effluents has been observed to cause harm to plant and animal life in the affected streams.

The study area, positioned to the west of the Laga Tafo Laga Dadi sub-city in the 01 kebele administration, forms the geographical backdrop for the research. The sequential scope of the study involves analyzing land use and land cover changes, particularly their correlation with the effects of such changes. Additionally, the study employs a spatial modeling approach based on a multi-criteria method to identify suitable sites for riverside development in the study area. This analysis, drawing from both local and international criteria, emphasizes the spatial expansion of the sub-

city, its directional trends, and proposes appropriate locations for riverside development based on experiences from other regions.

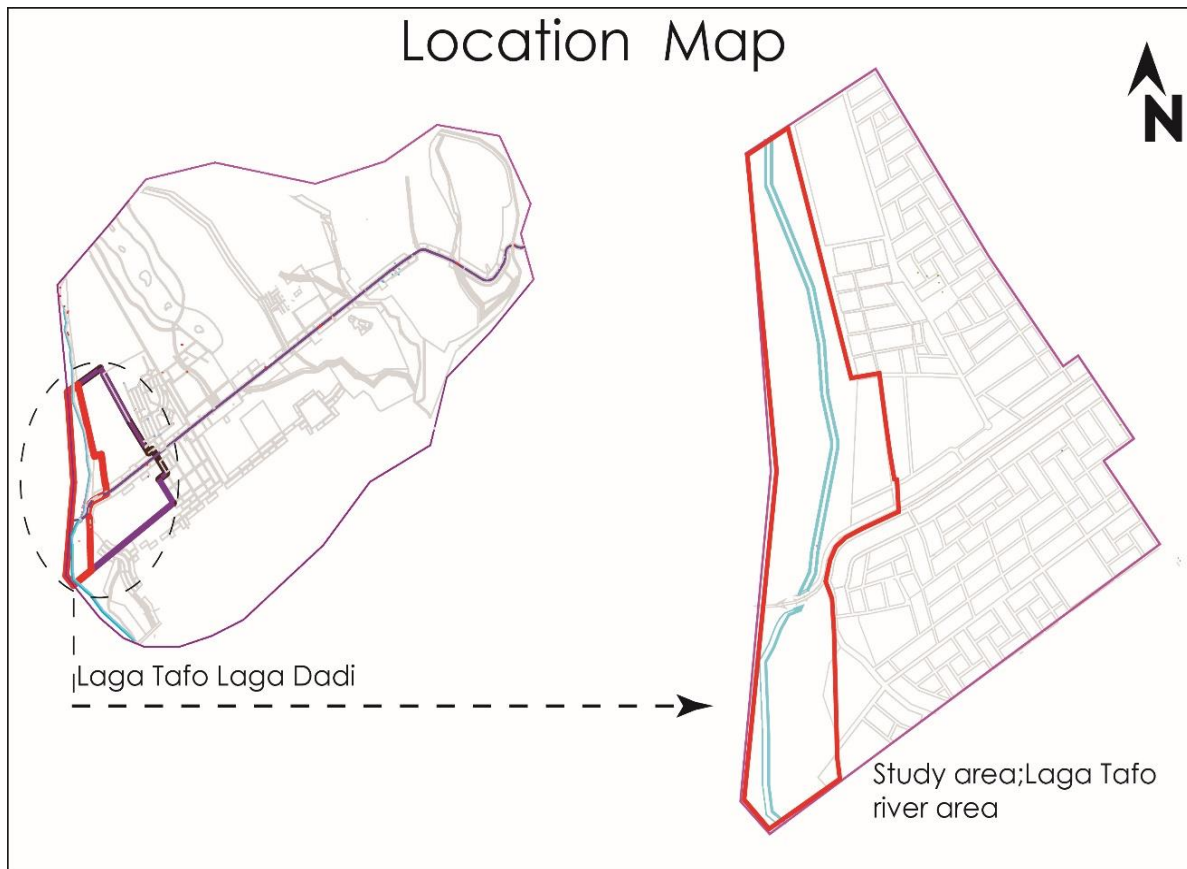


Figure 1-location of the study area

1.7 Limitation of the Study

Different problems were faced when the study was conducted. There were limitations due to the absence of well-organized data in offices inaccessibility of recent line maps. The research paper is conducted in one semester only /time given for the study is very limited / so it is very difficult to assess all the riverside area, because it need more time to study development of the area with different development issues and unwillingness to give genuine responses to the interview and questionnaires. Other limitations faced during the process of study on this research paper are; lack of research budget, shortage of available document to the study deals with development along riverside and absence of latest written document by the municipality and others.

1.8 Organization of the Study

The research paper contains five chapters. The first chapter deal with the introduction part such as; background of the study, statement of the problem, objective of the study, significance of the study, scope of the study, limitation of the study , and organization of the study. The second chapter discusses the theoretical and empirical literature about river side development. The third chapter is about the method of the research and so on the fourth chapter deal about data analysis and presentation and fifth chapter presents summary of finding, conclusion and recommendation.

1.9 Operational definitions of the study

Riverside is the area of land by the banks of a river. They walked back along the riverside (Mark McCracken, 2005).

Waterfront development refers to any development in front of water and a water body; a river, lake, ocean, bay, creek or canal (Diyun, 2009).

Waterfront planning is an aspect of conventional land use planning with the focus on community use of surface water and uses of the land which will take most advantage of access to the water and water-frontage (Stevenson, 1973).

Green infrastructure or blue-green infrastructure is a network providing the “ingredients” for solving urban and climatic challenges by building with nature (Timur, 2013).

Channel (Watercourse): An open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of water (Immoor, 2006).

Discharge: the volume of water the flowing stream that passes a given location in the unit of time. Frequently expressed in cubic feet per second or cubic meters per second (Immoor, 2006).

Riverfront: the relations between rivers or other water sources and cities often show a complex interaction of various elements, including the development of tourism around the river Jones, 2007).

CHAPTER TWO

2. Literature Review

2.1 Theoretical Literature Review

2.1.1. Historical background of development along a riverside

As a result of the City Beautiful Movement and the transformation of city's economy from industrial to service during the middle of the 20th century, many of industrial activities and port facilities in cities centers moved to outside and left vast urban lands especially along waterfronts after the decline of old harbor sites (Gospodini, 2001). These lands are suitable urban areas to redevelop and redesign as new public open spaces to reflect a new image of these cities through providing public spaces for recreational and tourism activities (Stevens, 2021). The first attempts of redeveloping riverside begun in North America during the 1960s in Baltimore and Boston, then in San Francisco. Where, these projects became later models for the following revitalization projects developed in Europe and North America (Al-shams et al., 2017). In the 1970s this kind of development gradually spread to the other parts of the world (Gospodini, 2001).

In addition, the increasing of competition between cities across the world led for improving the urban image as stated by Short "What sells the city is the image of the city" (Short, 1996). Therefore, many cities decided to reestablish their image of postindustrial city on riverside. Sydney and Bilbao are two good examples of promoting their riverside, and became worldwide known. Where, around 15 million people visit Sydney's waterfront every year (Al-shams et al., 2017) (Butuner, 2006). Eventually, the riverside development emerged as one of the most important issues of urban design and planning disciplines, because it became an opportunity to improve social, physical and economical condition of cities (Al-shams et al., 2017).

Many problems concerning riverside can be traced back to their historical development. As riverside developed in the tide of commercialism, they seem to have lost their civic qualities. Court squares, parks, plazas and other public areas, once used as places for public assembly, exhibiting purposes, passing the time of the day, and meeting and conversing with friends and acquaintances, have gradually given way to parking lots and expansion of commercial activities.

These areas that made each city distinctive expressed the character of the community as a whole ((*Wrenn D. M., 1983*). .

Traditionally riverside development and growth has been disjointed and incremental, characterized by a web of loosely related decisions and actions by dozens of political jurisdictions and hundreds of entrepreneurs" (Planning et al., 2019).

In the evolution of most of our cities, the fact that the river flowed through the center of the business district encouraged location of prime activities along the banks of the river. Initially produce was dumped from canoes and freight boats upon a muddy bank. As demand for water transportation increased, river slopes were roughly paved, with rock if available, or in some cases with timber (Ofori, 1980).

According to, (Riverside, n.d.) throughout history, waterfronts went through three major phases of transition: "The first transition came about with the enlargement of urban scale. With the expansion of the region, and industry, with its pollution, trouble occurred when everyone wanted to do something at the same place, namely the waterfront". Every person had the priority to be closer to the waterfront. As congestion increased and pollution became unbearable, people who could finance an industry without water dependence moved farther inland.

The second transition occurred along with reforms in transportation techniques. According to (Ofori, 1980), "Water transport maintained its supremacy over all other types. However, the appearance of the railroad in the 19th Century, followed by the motorcar at the beginning of the 20th Century, brought about a relative decline in the importance of water transportation and the priority of the waterfront declined".

The third change according to (Riverside, n.d.). was brought about with the transition in industry itself: "Centers of industry moved away from the iron and steel or chemical industries, which rely on the existence of the seaport or harbor of some kind, towards the electrical and mechanical industries". These mechanized industries did not require waterfronts, and moved farther inland nearer to the interchanges of motorways, railroads or airports.

All the above mentioned factors directly affected in reducing land values along the riverfronts. Cheap manufacturing establishments grasped the opportunity to occupy these lands and started dumping their industrial wastes into the river itself (Planning et al., 2019).

2.1.2 The Relationship of River and Urban Built Environment

From the very early beginning of human life, a river has played an essential role in the naissance and the development of societies. All the biggest civilizations such as the Ancient Egyptians or Indians have settled along the biggest rivers (Nile and Ganges). The rivers provide not only a water source and rich alluvium for the cultivation and transport, but they also contribute to form the very specific characteristics of these cities. These characteristics are based on the natural particulars of the region where the water stream flows across and on the ways people utilize and treat the water (Hathway & Sharples, 2012).

The river is on one hand a natural element, which connects cities and nature as well. The two have a very special relationship in. The riverside site should be enhanced by the building, and the building derives its form partially from the nature of the site and cities. Sometimes this is done by similarity (prairie house and prairie landscape), sometimes by contrast (Falling water and a forest glen). In natural settings, the buildings may open out (Usonian houses), and in urban settings, turn inward (the Larkin and Johnson Wax Buildings). The building grows out of the landscape as naturally as any plant; its relationship to the site is so unique that it would be out of place elsewhere (Hathway & Sharples, 2012).

A building and infrastructure connect cities and riverside are should convey a sense of identity of the town, the elements durable and resistance of environmental impacts. Its inhabitants should never lack privacy or feel exposed and unprotected (Hathway & Sharples, 2012).

2.1.2.1 Connection between the City's Settlers and Riversides Comfort

Comfort is a prerequisite of successful public spaces. The length of time people stay in a public space is a function and an indicator of its comfort. According to Carmona, the dimensions of a sense of comfort comprise environmental (relief from sun, wind, etc.) physical comfort (sufficient seating, lighting etc.) social and psychological comfort (a sense of security) and by quality of design and management (Nasution & Alvan, 2017).

Relaxation

Relaxation is a more developed state with the 'body and mind at ease. In public space the most vital things that make it easier to be relaxed are natural elements - trees, greenery, water bodies and separation of the place from vehicular traffic. However, such features also obstruct visual access (visual permeability), creating safety problems and sometimes discouraging use. As in all aspects of design, it is necessary to achieve a balanced whole (London, n.d. 2019).

Passive engagement

It needs to come across with the setting, even if without becoming actively involved. The prime form of passive engagement is people-watching other people and the life and activity that they bring (Nasution & Alvan, 2017a). Opportunities for passive engagement are also provided by fountains, views, public art, performances, and so forth. Passive activities are like watching and hearing other people watching children, vegetation, water, wildlife, activities, and other people reading, meeting friends or visiting the garden are some of them (Hathway & Sharples, 2012).

Active engagement

It involves a more direct experience with a place and the people within it. The coincidence of people in space and time provide opportunities for contact and social interaction. In this case how the design of public space supports interaction. Gehl refer to the „varied transitional forms between being alone and being together' and suggests a scale of 'intensity of contact' ranging from close friendships,, to 'friends', 'acquaintances', 'chance contacts,, and 'passive contacts'. Gehl also suggested that design of the public realm can create or inhibit opportunities for contact. Those community primary needs are necessary to create health connection between the city settlers and riversides. The above mention riparian zones, flood control and water quality improvement mechanism also contribute to healthy relationship between city's settlers and riverbanks as it provides solution to misused rivers (Nasution & Alvan, 2017a).

2.1.3 Developments along a riverside

Urban Agriculture

Is the practice of cultivating, processing and distributing food in or around a village, town, or cities? The concepts in UA and the associated facilities have received significant attention and popularity in the last 8 years, and are growing to meet the needs of the ever-developing urban life. According to (De, 2020), “a variety of systems may fall under UA concept in different scale and possession, ranging from a personal or local community gardens for social and self-sufficiency purposes inside factories that are capable of controlling the climate to produce sensitive plants and Its favorable in riverside area (Pattacini, 2021).

Public urban open space

Form riverside area development public open space is one ,Apart from being aesthetic value for our cityscape, trees and green areas play vital role in protecting our urban environment (*National Planning Policy Framework*, 2010.).

Buffer zones

There are many ways of defining a buffer zone. Generally the idea of the buffer zone is a green belt between the problematic area and the water. This green area is to protect the water from different types of negative impacts like pollution, nutrient loads and sediments. According to (*No Title*, 2012) and Environment Protection Authority (2010), the buffer delineation is further classified in to different zones. The first zone consists at edge of the river were the water flows. In this zone planting of shrubs and indigenous trees is necessary so as to prevent landslide as well as to protect and sustain flora and fauna of the city (C. Development, 2012).

The second zone is delineated for vegetation which purifies and protects underground water while small size vegetation and lawn planted at the end of the bank to allow rain water infiltration and to sieve aggregates from the water representing the third zone (De, 2020).

Mixed use development

Riverside area are mostly they dominate mixed use developments should be done keeping in mind the ongoing activities like resorts, hotels, mixed use buildings and offices. These activities provide a character to the river. New activities should be incorporated to have a fresh mix of tasks which can attract tourists and activity the riverside areas (Clements, 2007).

2.1.4 Challenging facing on the development of riversides

There are challenging face riverside development been concerns expressed that pressure, particularly from, private and public developers has often led to the short term exploitation and over-development of some city riverside, with little or no provision for environmental and social safeguards. In a similar vein several conflicts have also emerged which highlight several challenges that have confronted many riverside development projects. These too, for example have included: Problems associated with reductions in waterfront project funding, the loss of waterfront character, the difficulties associated with private sector interests competing with public access needs, the removal of traditional working and living waterfront practices, commercial failure, the over reliance on the public provision of infrastructure, environmental damage, social exclusion and gentrification (Nasution & Alvan, 2017).

Other authors have also raised concerns on these lines which often highlight emerging conflicts between profit orientated development and interrelated concerns for social equity, heritage and conservation (Bailey, n.d.).

Hambleton's earlier interpretations of such problems (1990/1991) indicated that existing evidence pointed to the domination of the private sector with deprived or community groups gaining little from the riverside development process. As an interesting social insight and lesson, his review of Levine's work showed that many down-town developments, taking Baltimore as an example, have helped to create a dual city of "haves" and "have nots". As a consequence he implied that city neighborhoods had continued to deteriorate and, for local communities, public interest had been unable to secure, quality employment and city public space. He surmised that development interests had largely been restructured to meet the various interests of developers, tourists and upper income consumers have also expressed more contemporary analysis and conclusions in similar terms (Nasution & Alvan, 2017b).

Despite the attention that has been paid to development riverside, but the urban areas is still unable to utilize it in terms of (spatial design, urban morphology and services) due to: Uncompleted and unrealistic plans that has been made for the riverside, absence of mixed use along the riverside, missing connections between city water and lack of proper development policies (Chen et al., 2012).

2.1.5. Principles for successful water front development

Determined that the success of riverside development is only achieved once it can function on all levels and benefits all stakeholders Expressed his views on successful riverside development as follows (Nasution & Alvan, 2018).

“No matter how unique or exciting is a riverfront development; it can only be successful if it functions on all levels. From regional access and circulation, to adequate parking capacity, to ease and comfort of pedestrian movement, to the visitors overall experience, all levels must sequences successfully as well as meeting the capacities on peak activity days (Nasution & Alvan, 2017).

Therefore, in order to achieve the specific aims of a successful riverside development identified 10 elements recommended to taken into consideration while planning a riverside development as presented in figure (Torre, 1989).

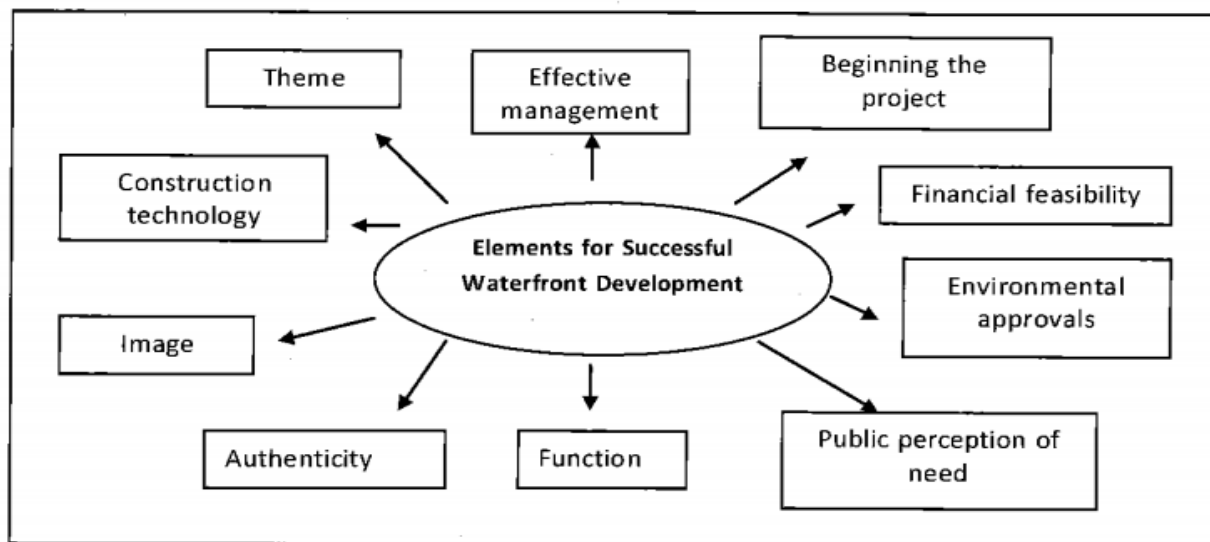


Figure 2 Principles for successful water development (Sources; (Nasution & Alvan, 2017).

In addition (Elhalaby & Attia, 2017), recommended several principles that must be included while developing plans for riverside areas, as follows:-

Accessibility: - the riverside should not be isolated or separated from the development, so that the public can access the riverside easily.

Integrated: - integration of the history, culture and existing architecture are recommended for a new riverside development (Randhawa & Chandra, 2017).

Sharing benefits: - a balance between public benefits and developer profitability must be found. A public-private partnership is essential for realizing the inspiration of the design.

Stakeholders participation: - the involvement of multitudes of interested parties is compulsory: government agencies, developers, community organizations, environmental groups and the public all have a stake in the development of a riverside property and all must be involved in the process (Brultomesso, 2006).

Construction phase: - breaking down a huge project into several phases and allowing all stakeholders and the general public to see this provides a vision for the future

Thus, apparently, the harmonies of riverside development could be achieved through combinations of people, nature and technology (Mann, 1973).

To secured long terms growth of the resources, it important for waterfront areas to be used strategically to maintain their economic value and enhances their specific features or image (Randhawa & Chandra, 2017). For this reasons, (Brultomesso, 2006) recommended 10 principles for securing excellence in riverside development project. The sustainable principles are presented in table below

Table 1 Principles for a sustainable riversides development

Principles for a sustainable riversides development	Secure the quality of water and the environment
	Riversides are part of the existing urban fabric.
	The historic identity give characters
	Mixed-use is a priority
	Public access is a prerequisite
	Planning in public-private partnerships speeds the process
	Public participation is an element of sustainability
	Riversides are long term projects
	Revitalization is an ongoing process
	Riversides profits from international networking

2.1.6 Benefits of Riverside Development

Evidence to evaluate riverside development projects is now both extensive but disparate. Research has tended to center on the scale and commercial success generated by new projects. In some, the impact developments have had upon the social and physical environments in which they are placed have also been assessed (Royal et al., 1988).

There is much evidence that predates 2000 but much less so post this date, perhaps illustrating less interest in the subject matter or a focus on other urban issues. Nonetheless despite the recent dearth in contemporary literature the scale of, and number of riverside development projects remains impressive. Much existing data implies or suggests that there are still real returns to be had from investing in riverside-related projects (Places, n.d.).

There are several sources of literature that outline the advantages that such riverside development projects can offer to an area in decline. For example research by have certainly provided a

framework for some of the more positive outcomes as well as highlighting some of the more pressing challenges. With this in mind, it is clear that there are many tangible, although usually fiscal, benefits that riverside development projects have made.

Riverside development is more than just beautifying riverbanks; it's a strategic urban planning tool that unlocks a treasure trove of advantages for cities and communities. Several studies have documented the multifaceted benefits of this approach, from boosted real estate values (Grant & De Lisle, 2012) to thriving local economies fueled by increased visitor expenditure (Wolff & Mitchell, 2018).

Perhaps most transformative is the potential for riverside development to revitalize neglected inner-city environments. Derelict land can be cleared and repurposed, paving the way for parks, public spaces, and vibrant cultural hubs (Barton & Pretty, 2010). This leads to a more sustainable and efficient use of urban resources, maximizing the potential of every corner of the city.

Beyond aesthetics, riverside projects often embrace historical and cultural elements. The conservation and reuse of historic buildings along riverbanks adds character and charm, while fostering a sense of connection to the city's heritage (Rydin & Smith, 2012). Additionally, these developments prioritize improved public access to the waterfront, creating accessible pathways, parks, and recreational areas that enhance the quality of life for residents and visitors alike (Tzoulas et al., 2007).

The ripple effects of successful riverside development extend far beyond the water's edge. Boosted inward investment and visitor numbers often follow, leading to economic growth and job creation (Wolff & Mitchell, 2018). Moreover, these projects can become catalysts for improved social and community provision, as parks and communal spaces foster interaction and strengthen social bonds (Hough, 2015).

In conclusion, riverside development transcends mere beautification. It's a holistic approach that unlocks a wealth of benefits for cities, enriching both the environment and the lives of the people who call them home. From economic revival to improved social connectivity and a renewed sense of place, the potential of this strategy is as vast as the rivers themselves.

2.2. Empirical Literature Review

2.2.1. Introduction

The empirical review chapter provides an overview of the studies conducted by various researchers in the subject fields. It describes the studies of many researchers regarding the riverside development project's social, economic, and environmental consequences. First, it presents an empirical analysis of the social, economic, and environmental consequences, and then summarizes and identifies the gaps.

2.2.2. Empirical Review Related to Social

Various studies suggest that the RSD initiative has a significant societal influence, for example:

1) According to Cristina Vert, Gloria Carrasco-Turigas, Wilma Zijlema, Ana Espinosa, Lia Cano-Riu, Lewis R. Elliotte, Jill Litt, Mark J. Nieuwenhuijsen, and Mireia Gascon all agree (2019) The impact of a riverside accessibility intervention on usage, physical activity, and well-being: In a research conducted in Barcelona, Spain, a mixed methods pre-post evaluation on access to natural outdoor spaces can increase physical activity, social cohesiveness, and better psychological well-being. Nature-based initiatives in socioeconomically disadvantaged communities may eliminate inequities in access to natural areas, establish appealing destinations for inhabitants, stimulate physical activity and/or social contacts, and enhance their health and well-being. As per the study's objective, the study fills the gap that having access to natural outdoor places might promote physical activity, social cohesion, and psychological well-being (Humanist & Lectures, 2003).

2) "Riverside Neighborhood Development: The Case of Awash Melkasa Town, Oromia," Abdulmenan Abdusalam Sani (2020). The study in Awash Melkasa, which is located along the Awash River, specifically on the artificial lake of the Awash Hydroelectric II dam, assessed the existing riverside development conditions and explored a design solution that overcomes the current challenges, and the proposed solution was a new development riverside neighborhood is required; the local government should develop rules and regulations to properly implement the riverside development plan. Aside from that, true public engagement is strongly advised at many levels to maintain the buffer zone issues. Furthermore, by improving riverbank activities for the unemployed, work possibilities can be established. As per the study's objective, the study fills a

gap by improving riverbank activities for the unemployed, work possibilities can be established (C. Development, 2012)

2.2.3. Empirical Review Related to Economic

Various studies suggest that the RSD initiative has a significant economic influence, for example: (1) According to Endashaw (2016), in "Impacts of Urban Renewal Induced Displacement and Resettlement on the Economic and Social Life of Displaced People: The Case of YekaAyat 2 Condominium, Addis Abeba, Ethiopia," most displaced people had a lower living standard, most of them lost their jobs, especially private employees after displacement, low social and neighborhood activities in the new resettlement site, infrastructural problems, being displaced by force. As per the study's objective, the study fills the gap that people who move from one place to another lose their social and economic value.

2.2.4. Empirical Review Related to Environmental

Various studies suggest that the RSD initiative has a significant environmental influence, both positive and bad outcomes, for example: Prabu P.C. (2009) studied "the impact of heavy metal contamination of Ethiopia's Akaki river on soil and metal toxicity on planted vegetable crops." Untreated sewage and industrial effluents were discovered to be the main sources of pollution to the Laga Tafo water body, and irrigation with contaminated river water containing variable amounts of heavy metals leads to an increase in metal concentrations in soil and vegetables grown with the polluted water. As per the study's objective, the study fills a gap that contaminated rivers cause several health issues (C. Development, 2012).

2.3 Summary of Both the Theoretical and Empirical Literature

A study conduct a concept of the Development of Riverside Embankment in the Context of Cracow (A Local Centre). The subject of this article is the presentation of site conditions and the authors' concept of the development of the degraded riverside area located in the city of Cracow-Kraków Zabłocie. The concept transforms the above-named area into a multifunctional complex including museum, coworking, business and hotel functions. The area subject to development borders three important districts of Cracow: Old Town (Stare Miasto), Grzegórzki and Podgórze on the bank of the Vistula (Wisła) river. In the land development and urban planning documents of the city of

Cracow this area has been marked as the public space which is to become a local focal point or a local centre (Pattacini, 2021).

The main objective of this work was to find answers to the posed research questions concerning the historic context, formal and legal state, and significance for the community as well as economic and ecological implications of the area to be developed. The main purpose was to properly develop the degraded riverside embankment in the downtown environment. The research method was based on own mixed method which encompassed the studies of historical literature and the legal-formal status as well as in situ examinations, including the analyses of the condition of the built and natural environment, traffic and circulation as well as photographic documentation. The authors also familiarized themselves with the activities undertaken by the local community with a view to the area's regeneration. On the grounds of initial investigations, the SWOT analysis was performed and the evaluation of groups of prospective users was conducted. Comparative studies were conducted including selected examples of European riverside development projects. In its assumptions, the proposed concept of the riverside development in Kraków-Zabłocie is to meet the needs of the local community, enable further development of tourism, which is very important to Cracow, and satisfy the paradigm of sustainable development. The effect is a multi-functional complex that becomes an inherent part of the existing context (Elżbieta Latusek, 2020).

A study of cisadane riverside on riverbank development towards urban sustainability. Rivers have immense benefits for the environment and community. They become one of the water resources for the community and an option for community recreation area. Rivers also provide habitat and balance the ecosystem for the environment. Currently, the community is neglecting many rivers in that their water becomes polluted and unusable. This is the reason behind the existence of riverbank development, including in Cisadane Riverside located in Tangerang, Indonesia. This study was carried out in Cisadane Riverside to observe and analyze the elements that constructed the riverbank as public facilities toward sustainable pillars: environment, social and economy for urban sustainability. Observation and interview were conducted in six zones along the Cisadane Riverside. Regarding the riverbank development, it is important to pay attention to the environmental aspect to maintain the urban ecology while achieving the social and economic aspects. In conclusion, the riverbank development that considered the integrated environment, social and economic aspects would create the activity and interaction space for supporting both

the urban sustainability particularly for the riverbank itself. The result of this study would be used as the reference for riverfront development towards urban sustainability in Indonesia (Ova Candra Dewi, 2019).

According to Hailu Worku et.al (2021) a study conducted on to assess Integrating river restoration goals with urban planning practices in Kebena River, Addis Ababa. In the urban environment, rivers are most affected by development mismanagement to the extent that some of the essential services such as habitat for biodiversity conservation, recreation and domestic uses to communities are critically impaired. Consequently, river restoration is presented as practical solution to address urban river degradation issues and to revitalize urban rivers and river buffers. Goal setting along with clear and measurable goals in urban river restoration processes is one of the critical tools to guide restoration activities. This study aims to assess the qualitative effects of clearly defined river restoration goals and analyze their tangible effects on river restoration efforts in Kebena river watershed, Addis Ababa. Qualitative data from expert interviews, stakeholders' consultation, document review and institutional analysis are used to inform this research. The results show that the Environmental Protection Authority and Structural plan of the city have vaguely defined river restoration goal in the planning and implementation phases of river restoration projects. On the other hand, the goals of different institutions varied in context, while others were redundant and lacked synergy. As a result, urban rivers and river buffers accommodate various land uses that are negatively affecting the potential of rivers and river buffers in benefiting communities.

A study conducted on River Restoration Integrated with Sustainable Urban Water Management for Resilient Cities. Urban floods can threaten citizens' quality of life, produce socioeconomic losses, and act as an urban degradation driver. Restoring urban rivers, however, is not simple and its results are usually limited. It would be desirable to enhance urban fluvial systems, control flood risks, and increase city resilience while improving the city itself. This work suggests that river restoration, when applied to an urban watershed, should be supported by sustainable urban drainage measures to compensate for the negative effects induced by city growth in the water cycle, in a systemic approach to the entire watershed. A methodological framework is proposed to verify this hypothesis intending to assess urban flooding projects in a wide sense. This framework uses a hydrodynamic mathematical model and a set of multi criteria indices. A case study in Dona Eugenia Watershed, in Brazil, was developed. Two different design concepts were considered: the

usual drainage design and the river restoration combined with sustainable urban drainage. Both solutions were designed to completely solve the problems, leading to virtually zero flooding in the present situation; however, environmental and urban gains were greater when using the proposed combination. Besides, when testing resilience behavior, it was also shown to be more consistent over time (João Paulo Rebechi Fraga, 2020).

2.4 Lesson Learned From the Theoretical and Empirical Literature

Lesson learnt from both theoretical and empirical literature are; the themes identified during the review of the texts are concerned with the various scales of intervention in urbanism referring to urban development and planning. At the planning level, the references deal with the river valley as a whole and the position of towns and cities along rivers. The role played by rivers in the development of cities is also considered. At the scale of the city, they relate to movement patterns, access to the river, orientation and the arrangement of buildings as well as open space networks. While at the scale of a specific riverside site, the references touch upon design principles including streetscape, types and forms of open spaces as well as the profile of the river corridors (Pattacini, 2021).

2.5 The Research Gap and Expected Solution

Laga Tafo Laga Dadi will be made more habitable, not just by securing the river banks to prevent floods, but also by creating public green areas, Cafes and restaurants, together with the riverbank, will attract future real estate development and encourage international and domestic tourism in the town. According to my investigation, there are few local studies on riverbank development projects. There are only a few studies that discuss the social, and the majority of them focus on the effect of river pollution. The study's findings indicate that the government's influence in resolving these issues was negligible. The completion of the project is expected a town beautification or improvement: This is mostly motivated by politicians' conviction that only new and contemporary housing is worthwhile.

CHAPTER THREE

3. Material and Methods

3.1 Description of the Study Area

Laga Tafo-Laga Dadhi town (Sub-city) is located in Oromia National Regional State, Oromia special Zone, Berek District, along the road to Debre Berhan at a distance of 21 km North East of Addis Ababa. It is located between 9°01'29" N - 9°06' N Latitude and between 38 ° 53'42" E - 38 ° 55'30" E longitude. The town is bordered by Addis Ababa city and Sululta Wereda from the west and Northwest, by Berek Aleltu Wereda from the North, East and South.

The town has ten Kebeles with a total area of 7444.53 hectares. Laga Tafo Laga Dadi town is found at an average elevation of 2350 meters above sea level; the mean annual maximum and minimum temperatures of the town are 23.76°C and 10.67°C, respectively with the Mean Annual Rainfall of 1,223.54 mms.

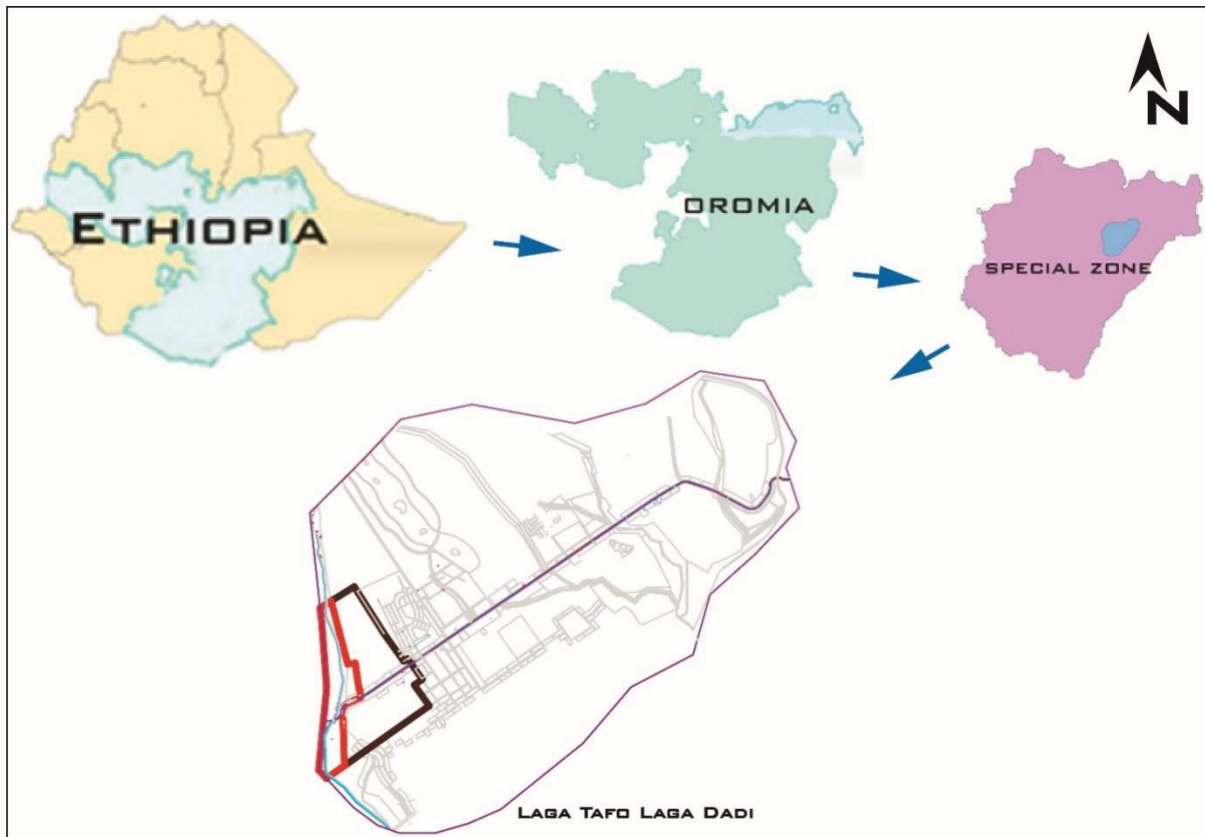


Figure 3 Location Map of the study area

3.1.1 The Existing Situation of Riverside

The study area (Laga Tafo River) is located on the west direction of the Laga Tafo Laga Dadi sub city (town) in 01, and 02 kebele administration with total area 193.8 hectares and the action area is located on the boundary of Laga Tafo Laga Dadi in western direction which bound Addis Ababa city and they cover 60.93 hectare which contain the water body and the riverside areas.

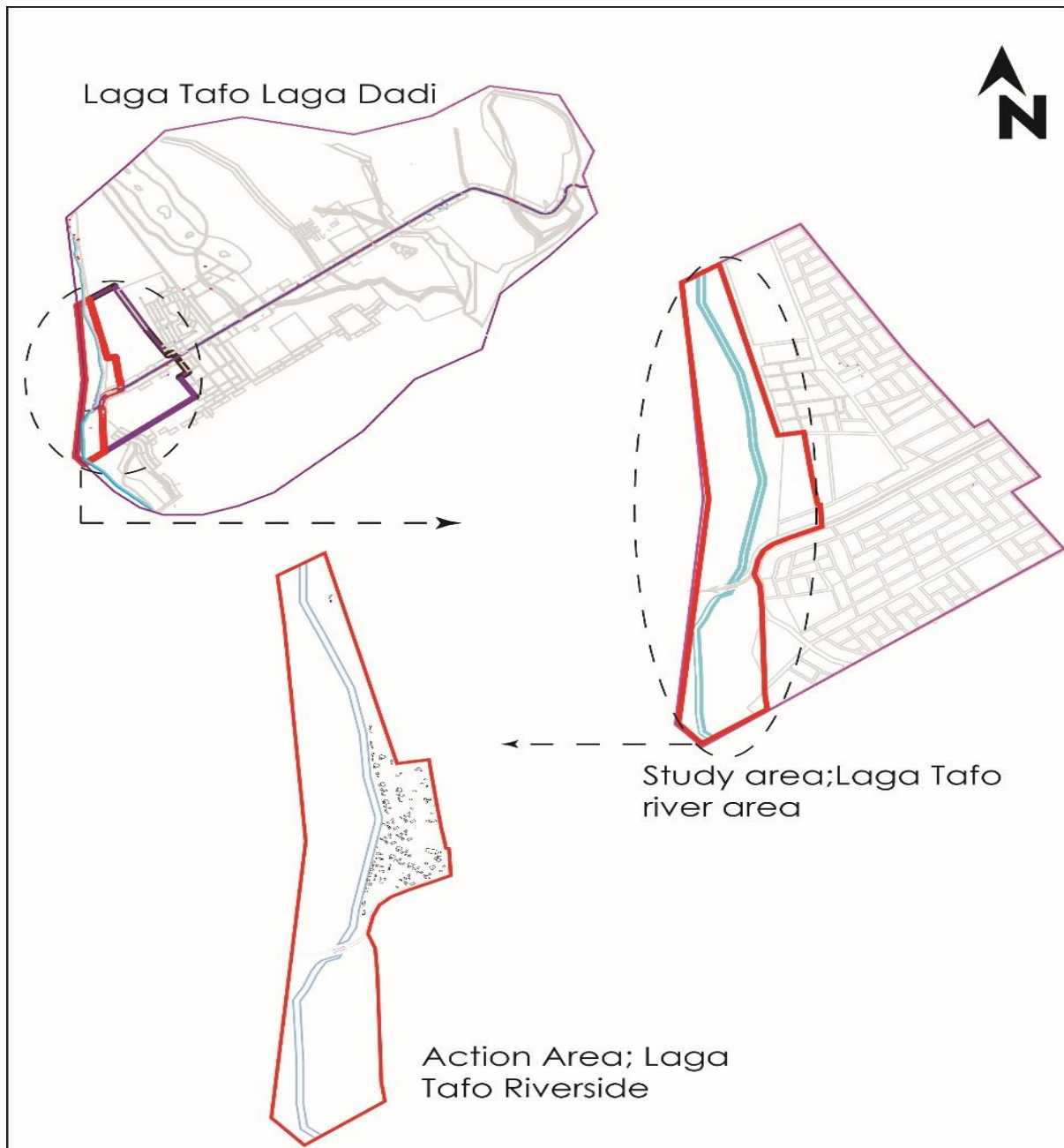


Figure 4 Location map of the study area

The selection of Lege Tafo River as the focus of this research is grounded in several key considerations. Primarily, this location was chosen due to its direct exposure to both positive and negative impacts stemming from the river's influence. The area exhibits a high concentration of residential zones and significant economic activities, contributing to the emergence of challenges such as informal settlements and river pollution.

Furthermore, the chosen area is strategically positioned within the central district of the town, making it a focal point that significantly influences the local population both positively and negatively. The central district's dynamics intensify the impact of riverside conditions on the community. The prevalence of informal settlements and the escalation of pollution in this region necessitate a comprehensive study aimed at providing viable solutions that directly benefit the town community.

The critical environmental issues, particularly pollution in rivers and streams flowing through towns, have become urgent concerns with far-reaching implications for social, economic, and environmental conditions. Lege Tafo River, being a representative case, exemplifies the challenges faced by urban water bodies. The study recognizes the pressing need to address these challenges and aims to contribute valuable insights and solutions that not only mitigate the negative impacts but also promote sustainable development. The observed discharge of strong toxic waste effluents, causing harm to plant and animal life in the affected streams, underscores the urgency of the research to implement effective measures and ensure the well-being of both the environment and the local population.

3.2 Research design

When the research objective is to explore the social, environmental, and economic dimensions of a riverside development project using qualitative methods, a descriptive and explanatory design is a suitable approach. Descriptive research is aimed at providing a comprehensive understanding of a phenomenon or situation, while explanatory research seeks to uncover causal relationships or develop hypotheses for further testing (Diem, 2002). In this context, the researcher advocates for the use of a descriptive research design to evaluate the impact of the riverside development project on economic, environmental, and social aspects. This approach enables a thorough examination of the project's effects and facilitates the identification of key factors influencing its outcomes.

3.3 Data Type and Sources

In pursuit of the research objectives, a comprehensive dataset has been compiled by gathering information from both primary and secondary sources. Secondary data primarily comprised books, journal articles, official documents, and governmental reports, which served as foundational resources. Extensive literature review was conducted to glean insights from international experiences regarding the significance of Riverside Development. Additionally, primary data were acquired through the distribution of questionnaires and conducting interviews with pertinent respondents and authoritative experts. These combined methodologies facilitated a thorough examination of the subject matter and ensured a well-rounded analysis.

3.4. Target Population

The study's target population encompassed various groups within the vicinity of Laga Tafo river in Laga Tafo Laga Dadi sub-city. This included the residents residing along the banks of the Laga Tafo river, specifically chosen from selected kebeles. Additionally, individuals in key positions such as management and technical heads of the municipality, as well as kebele officials and experts, were considered part of the target population due to their significant relevance to the study.

The inclusion of kebele dwellers ensured representation from the local community directly affected by the riverside conditions. Their perspectives and experiences were deemed crucial in understanding the on-the-ground implications of riverside development. On the other hand, involving management and technical heads of the municipality, along with kebele officials and experts, was essential to gather comprehensive insights and information relevant to the study's objectives. These individuals held valuable knowledge and expertise that could contribute to a thorough understanding of the current state of riverside development and its associated challenges in the study area.

In summary, the target population consisted of a diverse group, including local residents, municipal management and technical heads, as well as kebele officials and experts, all selected based on their direct relevance to the study's focus on Laga Tafo river and riverside development in Laga Tafo Laga Dadi sub-city.

3.5. Sample technique and Sample Size

Both probability and non-probability sampling techniques were employed in this study. Systematic random sampling, a probability sampling method, was specifically utilized to select households living around the riverside and include them in the sample. On the other hand, purposive sampling was applied intentionally to enhance the viability and reliability of the research data. The researcher chose this purposive sampling technique as a deliberate means of obtaining information that would be more relevant and reliable for the research.

Out of the total of 10 kebeles in the town (Sub-city), those with potentially and practically significant influence (kebeles) were purposively selected first. Subsequently, respondents were selected from two kebeles using systematic random sampling. The choice of Kebele 01 and Kebele 02 out of the ten kebeles in Laga Tafo Laga Dadi town was deliberate. These two kebeles are adjacent to Laga Tafo River, and as the river passes through Kebele 01 and Kebele 02, they are either directly or indirectly impacted by Laga Tafo River more than the other remaining eight kebeles. Consequently, kebeles (Kebele 01 and Kebele 02) were chosen for this study. From the total 390 households in the selected kebeles, 268 households from Kebele 01 and 122 households from Kebele 02 were identified based on the municipality's document list.

The sample size was determined following the method outlined by Singh & Masuku (2014), as cited in Gosaye B (2007), and Kotari (2014). The computation of the sample size was conducted using the method below, considering that the intended research population (N) is less than 10,000 (the total number of households is 390).

Formula 1: $N_t = n/1 + n/N$ (1)..... Estimated household size (Singh & Masuku, 2014).

Where: n = the desired sample of household, (when the population is less than 10,000)

N = total households of kebeles, is (390)

N_t = Estimated household size.

Formula 2: $n = (Z^2 * p * q) / d^2$ (2).....The desired sample of households (Singh & Masuku, 2014)

Where: Z = standard normal variable at the required confidence level 90% ($Z=1.96$),

p = estimated characteristics of target population that is 0.50,

d= level of statistical significance (i.e. 10%),

q= maximum standard deviation.

Formula 3: $q = 1 - p$ (3)..... Maximum standard deviation (Singh & Masuku, 2014).

$$q = 1 - 0.5 = 0.5,$$

$$n = ((1.96)^2 * 0.5 * 0.5) / (0.1)^2 = 96,$$

$$N_t = 96 / 1 + 390 / 96$$

$$= 96 + 4.06$$

$$= 100.06 \approx 100 \text{ (household sample size)}$$

A sample of 100 households ($n=100$) is selected from a total household of $N=390$, within the kebeles housing. The sample households are chosen using a stratified random sampling method. A stratified random sampling method is used to select the sample houses.

Formula 4: $S = n \cdot P_i$, $P_i = n_i / N_t$ (4) Sample size for each building (per kebeles) (Kotari, 2004)

Where S is the sample size for each kebele,

n is the total sample size,

N_t is the total households and

n_i is the household of each kebele.

That is, if P_i represents the proportion of households included in different stratum i , and n represents the total sample size, the number of elements selected from the stratum is $n \cdot P_i$. Accordingly, out of 390 households, 100 sample informants were selected for household surveys. A proportional to size allocation method was employed to obtain a representative sample size for each kebele from selected. In proportional to size sampling, subjects are selected in proportion to their occurrence in the population (Girma, 2019). This means that the sample per kebele was determined by the percentage contribution of households by each kebele to the total number of households (390) in the two kebeles.

Table 2 The Sample size taken in the kebeles

Name of Towns	Selected kebeles	No_ of Households	Sample size used
Laga Tafo Laga Dadi town	Kebele 01	ni= 268 households in each kebeles	n=69 households from each kebeles
	Kebele 02	ni= 122 households in each kebeles	n=31 households from each kebeles
Total		Ni= 390	N= 100

Therefore, the sample size from each kebele was taken proportionally 100 sample households from kebele 01, 69 sample households from 02 kebele 31 sample households. To make the data more viable and reliable purposively important governmental organizations and staff members were included in the sample; five kebele officials and experts five professionals from six kebele (a total of 10), 5 municipal officials and experts, 30 individual peoples, and 3 from health office and 2 research experts. The sample households were selected using, systematic random sampling method. Accordingly, households from each kebeles were selected systematically by using a table of 16th interval numbers from the registered list of households in each of the kebeles. For the implementation of systematic interval selection, a number was assigned to each household head name on the list, and then the households were selected from the registered sampling frame using interval numbers. After the necessary sample unit n were drawn, one mature member of members from the household (age,>18) was invited to respond to the questions.

3.6 Data Collection Tools

3.6.1. Interviews and Questioners

Semi-structured interviews are commonly accepted as the best data collecting approach because they allow for the collection of material of sufficient depth and quality to offer a full picture of participants' experiences. The face-to-face interview, according to De Vos (1998), helps

researchers understand the closed worlds of individuals, families, organizations, institutions, and communities. The goal of the in-depth, face-to-face interview is therefore to comprehend the interviewee's life experience or circumstance as articulated in his or her own words (De Vos, 1998). According to Kruger (1988), the spoken interview allows participants to get as close to each other as possible. Possible about their real experience as a flexible guide during interviews, the researcher strategically designed semi-structured open-ended questions.

For households a set of structured questions was designed to assess the existing situation of riverside development. Topics covered include demographics, housing conditions, awareness of riverside issues, and perspectives on challenges and potential solutions. For officials and experts specific questions related to institutional arrangements, policies, and strategies for riverside development was included to gather insights from key informants.

3.5. 2 Observation

One of the oldest methods of data collecting is observation. It is an indirect type of data collecting since, in most cases, it captures information without the respondents' full understanding. Observation is often regarded as having the following advantages over other techniques of data collecting. When other approaches are ineffective, this method provides information. Use topic selection processes that are less difficult and take less time. When respondents are unable or unwilling to collaborate or provide information, offer data. Approaches reality in its natural structures and analyses events as they unfold. Provides personal information rather than depending on other people's reports and allows for the collecting of a wide variety of information, even if this information is useless at the time of research.

1) Behavioral Mapping

The behavioral mapping employed in this research centers on observing and analyzing people's activities along the Laga Tafo River over specific time intervals, simultaneously mapping the physical characteristics of these spaces. This method was applied during various hours of the day, including weekends and ceremonial occasions, to capture a comprehensive view. Through this technique, a detailed examination of people's activities in selected areas was conducted, encompassing both stationary behaviors such as washing, sitting, talking, and reading, as well as activities in motion like walking and playing. Additionally, the physical settings of the study areas,

including trees, footpaths, and other relevant features, were meticulously mapped to enhance the overall understanding of the observed behaviors.

II) Trace Measures

By systematically observing and documenting the remnants resulting from human activities along the riverside, this method aids in collecting data on the types of activities occurring in the chosen areas. This phase primarily entails tracking residual physical evidence, such as dirt smears and various natural features of the riverside.

3.7 Data Analysis methods

The collected raw data, sourced from questionnaires, interviews, and observations, underwent meticulous processing to ensure accuracy and coherence. Employing a dual analytical approach, both quantitative and qualitative methodologies were utilized for a comprehensive understanding of the research findings. The qualitative method served to provide nuanced descriptions and interpretations of the data, capturing the richness of the participants' perspectives. Concurrently, the quantitative data underwent thorough analysis using Microsoft Excel 2016 and the SPSS software package, facilitating statistical examination and numerical insights. The presentation of results was diverse, employing various visual aids such as tables, charts, graphs, percentages, ratios, figures, and photographs. These visual elements played a crucial role in interpreting and summarizing the research findings, enhancing the communicative power of the data and ensuring clarity in conveying the outcomes of the study.

3.8 Ethical Consideration

During the study period, stringent ethical guidelines were established to uphold the integrity and ethical standards of the research. Ensuring the dignity and wellbeing of the respondents was a paramount consideration throughout the study. Measures were implemented to safeguard the confidentiality of research data, maintaining the privacy of participants and the sensitive information they shared. Prior to their involvement, explicit permission was sought from each participant, emphasizing the voluntary nature of their participation. This ensured that individuals willingly engaged in the study without any form of coercion. Additionally, the research study adhered to principles of independence and impartiality, guaranteeing an unbiased exploration of the subject matter. These ethical safeguards were integral to maintaining the credibility and ethical soundness of the research endeavor.

CHAPTER FOUR

4. Result and Discussion

4.1 Introduction

This chapter presents the information processed from data collected from respondents on the riverside development project in Laga Tafo Laga Dadi sub-city, focusing on the Laga Tafo River. Primary data was gathered through administered questionnaires. Subsequently, the data was analyzed based on the study's objectives, and the findings are presented in tables and in text. The first section of this chapter provides detailed information about the riverside development project for the town's administrative attachments.

4.2 Background of the Respondents

This section summarizes the background of the respondents, including address, occupation, sex, age, number of family members, and education. The survey results explored the following data items, with acceptable outcomes as follows:

4.2.1. Sex composition of the respondents

The data pertaining to the sex composition of the respondents in the research on Riverside Development in the case of Laga Tafo River in Laga Tafo Laga Dadi Sub City, Shegere City, reveals insightful patterns. Among the selected respondents it was observed that 58% of the participants identified as male. In contrast, the remaining 42% constituted the female demographic. This breakdown highlights the gender distribution within the respondent pool, providing a nuanced understanding of the perspectives and insights gathered for the study. The substantial representation of both male and female respondents contributes to the comprehensive nature of the research findings, ensuring a diverse range of voices and experiences are considered in the analysis of Riverside Development in the specified urban context.

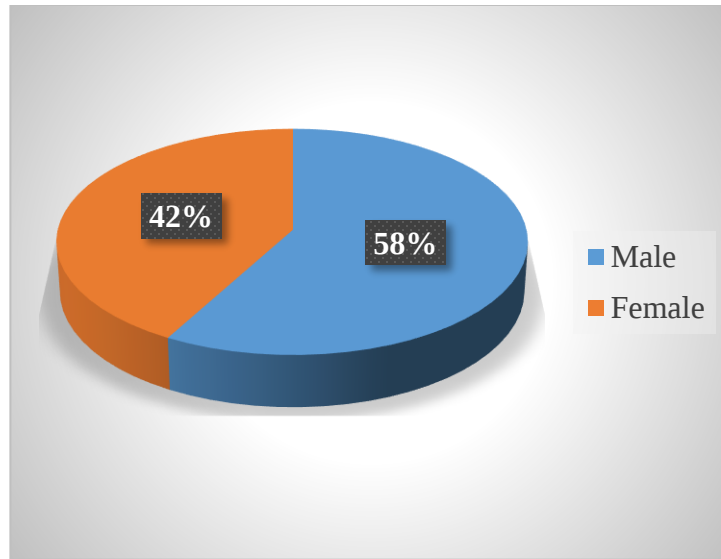


Figure 5: Sex composition of the respondents

4.2.2 Age Composition of Respondent

The age distribution of the household heads in the study area was relatively even, with most respondents falling between the ages of 30 and 60 (81.6%). There was a smaller percentage of respondents under the age of 30 (4.3%) and over the age of 60 (13.98%) (Figure 6). This suggests that the majority of respondents are economically productive and have a good understanding of the challenges and the existing conditions around Laga Tafo River. In other words, the data shows that the study area has a diverse population of household heads of all ages, but most are economically productive and have a good understanding of the challenges of riverside development. This is important because it means that the respondents have a wide range of perspectives and experiences that can be drawn on to inform the research project.

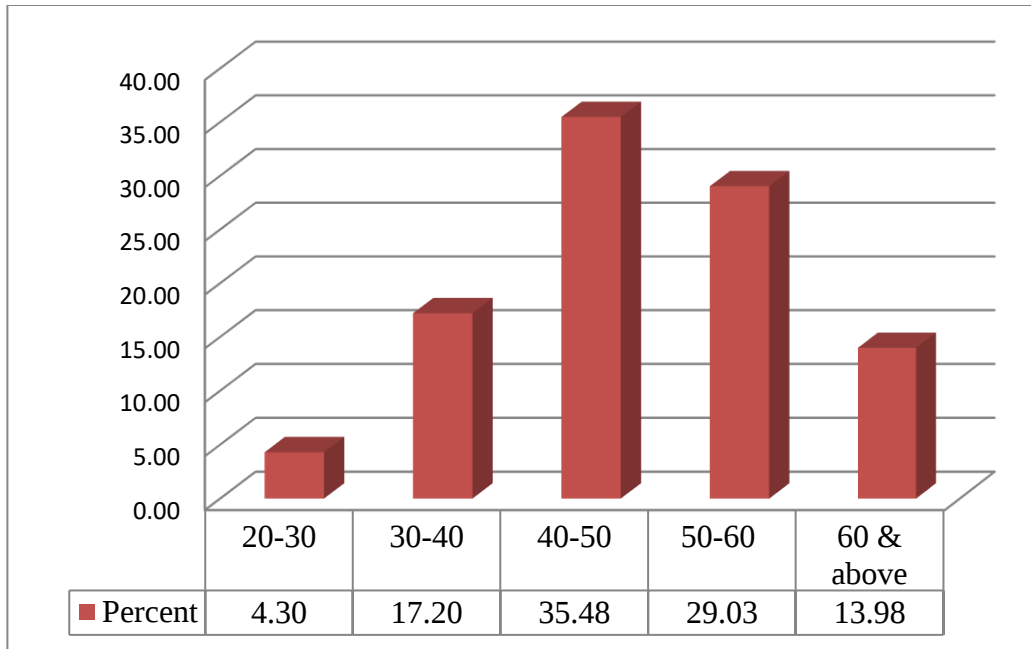


Figure 6: Age Composition of Respondents

4.2.3. Marital Status of Respondents

Figure 7 indicate that among the whole respondents, 79% were married, 16% respondents were single and 14%were divorced, this shows majority of respondents were married. The rest 1%were widowed. This profile shows majority of the respondents were who take responsibility of leading family and understand environmental and socioeconomic problems related to the riverside development in the study area.

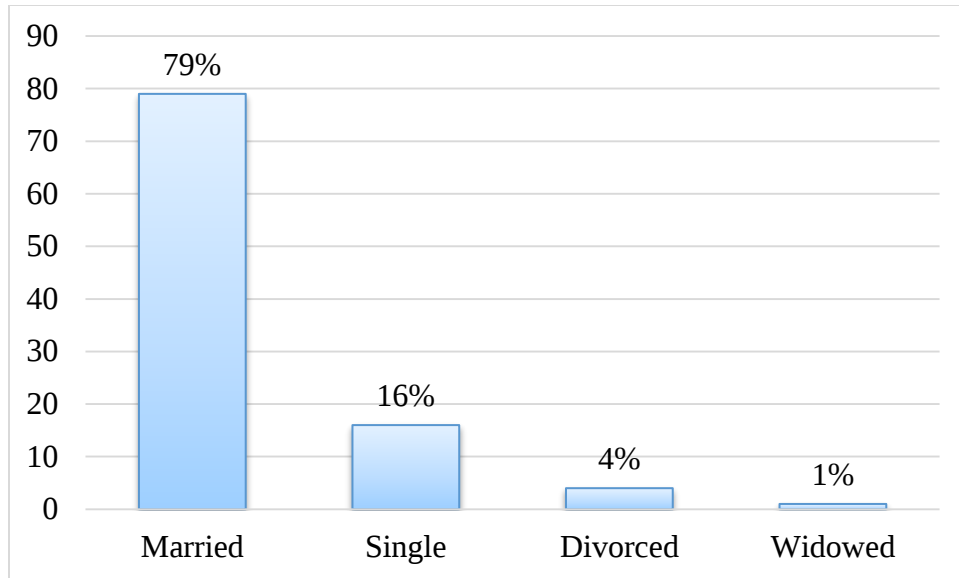


Figure 7:- Marital status of the respondents

4.2.4. Educational Level of Respondents

The educational status data of the respondents, illustrates a diverse range of academic backgrounds among the participants. Among the respondents, 6% identified as illiterate, reflecting a segment of the population with limited formal education. The distribution continues with 9% having completed education up to Grade 1-4 and 17% up to Grade 5-8, representing individuals with primary and lower-secondary education, respectively.

Moving up the educational ladder, 14% of respondents completed education at the Grade 9-12 level, indicating a portion with secondary education. A substantial portion, 23%, holds a diploma, signifying a specialized and practical educational attainment. Furthermore, 28% of the respondents have attained a degree, reflecting a higher level of academic achievement. The data also highlights a notable 3% of respondents with a master's degree and above, representing individuals with advanced education levels.

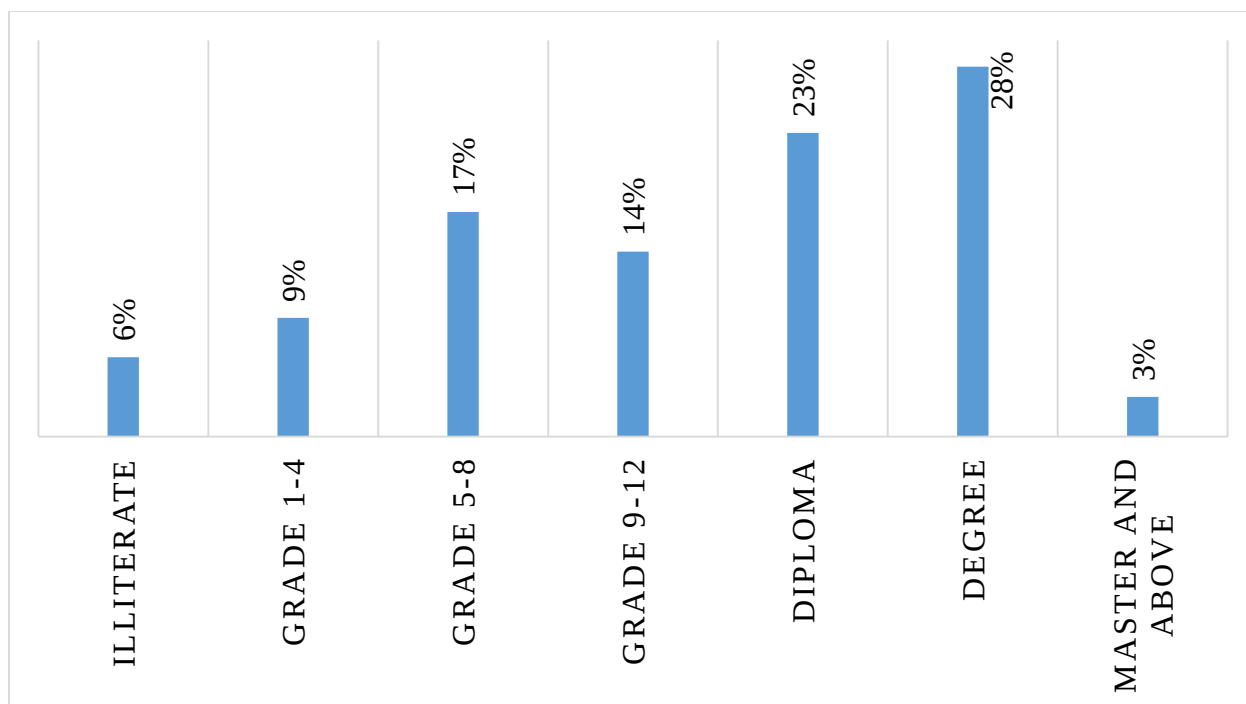


Figure 8. The education status of the respondents

This diversified educational background among the respondents contributes to the richness and inclusivity of perspectives in the study. The varying educational levels ensure a comprehensive analysis of Riverside Development, considering insights from individuals with different educational experiences and expertise.

4.2.5. Occupation of the respondents

The employment status of the respondents in the study area, reflects a diverse occupational landscape. The majority of respondents, constituting 33%, identified as self-employed individuals. This group encompasses a range of professions and businesses where individuals manage their own enterprises. Private employees represented 23% of the respondents, indicating a substantial presence of those engaged in various private sector activities. Government employees accounted for 20% of the respondents, reflecting a segment of the population contributing to public service. Additionally, 17% of the participants reported being unemployed, shedding light on the challenges within the community's employment landscape. Furthermore, 7% of respondents were associated with Non-Governmental Organizations (NGOs), highlighting the involvement of individuals in the non-profit sector. This comprehensive breakdown of the respondents' employment status provides valuable insights into the occupational diversity within the community, offering a nuanced

perspective for analyzing the implications of Riverside Development in the specified urban context.

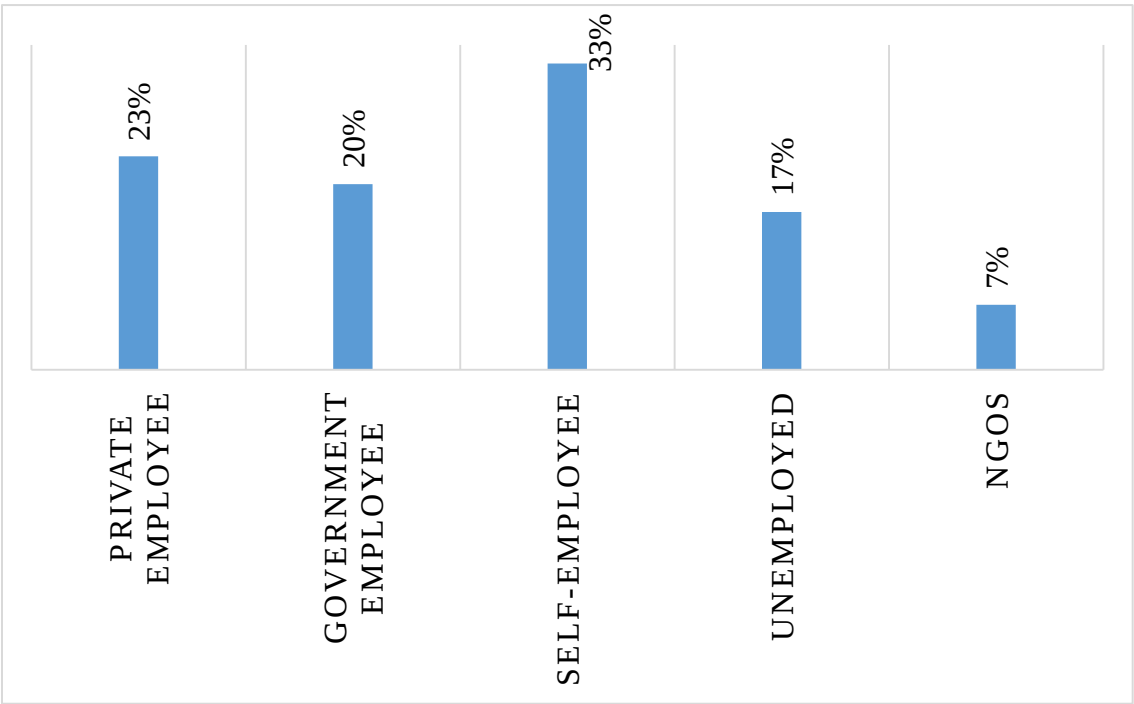


Figure 9: The occupation of the respondents

4.2.6 Living experience in adjacent kebeles to the study area

The analysis of respondents' duration of residence in the study area, reveals diverse tenure patterns among the participants. A significant portion, constituting 33% of the respondents, has resided in the area for more than 20 years, reflecting a longstanding and possibly deep-rooted connection to the locality. Following closely, 29% of participants have a residential duration ranging between 15 and 20 years, indicating a substantial segment with a considerable history of residence. Additionally, 13% of respondents have a tenure of 10-15 years, while 20% fall within the 5-10 years range. This distribution suggests a mix of relatively newer residents alongside those with more established roots. Notably, a smaller but noteworthy 5% of participants have been living in the study area for less than 5 years. This diverse range of residence durations among the respondents enriches the study by incorporating perspectives from individuals with varying degrees of familiarity and experience within the Laga Tafo River vicinity.

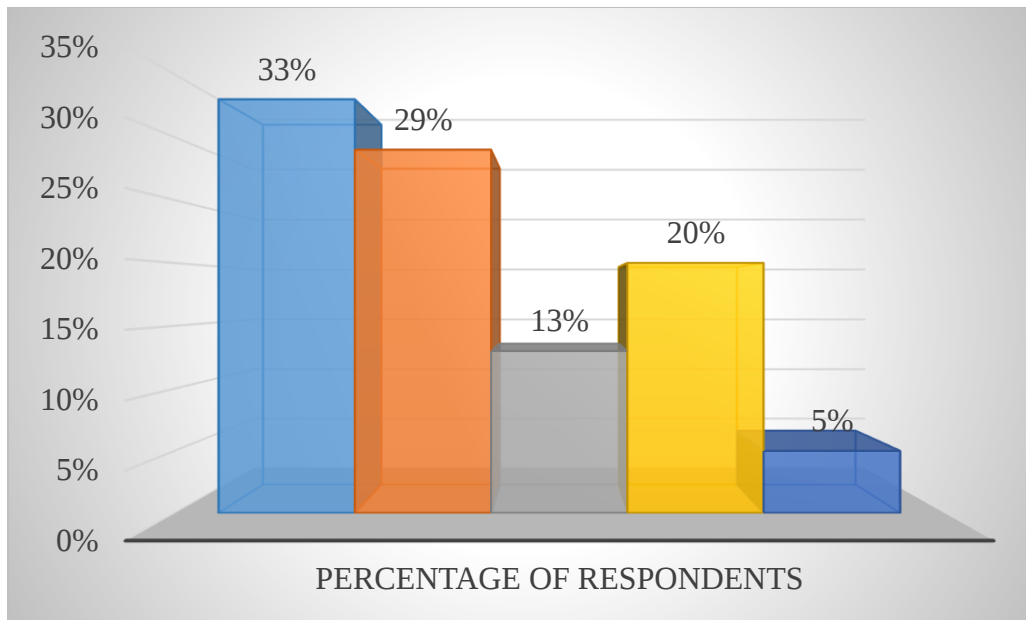


Figure 10: The respondents living years

4.3 Analyses Physical Context of the Site

4.3.1 Land Use

Based on the gathered data, an in-depth examination of the physical condition of the sampled area reveals a multifaceted land use scenario characterized by diverse purposes and functions. The predominant land use in the region is residential, yet it is marked by substandard housing conditions and the utilization of less durable construction materials. Notably, a mix of land uses coexists within the area, encompassing residential spaces coupled with urban agriculture practices such as cattle fattening, along with a blend of residential and commercial spaces, warehouses, and the presence of rivers.

A critical observation indicates that the allocation of land use in the area deviates from the prescribed norms and standards outlined in both the structural plan of Laga Tafo Laga Dadi sub-city (Town) and international benchmarks. The analysis further brings to light the presence of incompatible land uses concerning both the local environment and other existing land use types. This disparity in land use allocation underscores the need for a more comprehensive and harmonized approach to ensure that land utilization aligns with established standards and promotes environmental sustainability.



Figure 11: Existing land use of the study area

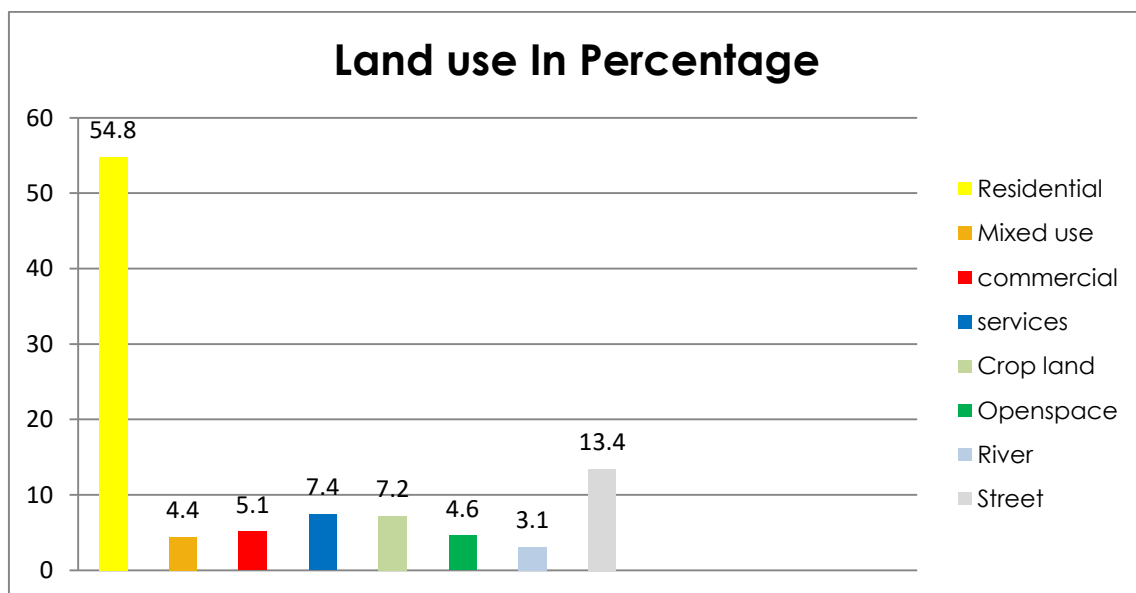


Figure 12: land use by percentage

The depicted figure illustrates a predominant occupancy of the study area by residential zones characterized by substandard housing conditions. It is noteworthy that a significant proportion of inhabitants within this residential landscape fall within the low-income bracket, rendering them financially incapable of constructing septic tanks within their compounds or implementing stormwater harvesting measures. This financial constraint contributes to the prevalent challenges faced by the river and its adjoining riverside area. The difficulties primarily manifest in the form of pollution and flooding, attributable to the lack of adequate wastewater management infrastructure and stormwater control mechanisms. In essence, the existing socio-economic conditions of the residents significantly impact the environmental quality of the river and its adjacent areas, creating a complex interplay between housing affordability, infrastructure development, and environmental sustainability.

4.3.2 Street Network

Based on the information obtained from field observation, the current road infrastructure in the study area is characterized by deficiencies in quality, standards, and connectivity, as evidenced by on-site observations. The majority of the street network within the study area is predominantly composed of naturally formed earthen surfaces, with certain sections covered by stones. Approximately 86% of the study area is enveloped by earthen surfaces, contributing to challenges such as overflow issues in the region. The composition of the street surfaces impedes ease of movement, lacking permeability. Moreover, the streets are devoid of essential amenities such as street lights, pedestrian walkways, public seating, and public telephones. This absence of infrastructure not only hinders accessibility but also compromises safety and overall street quality. The deficiencies in the existing street network underscore the need for comprehensive improvements to enhance functionality, safety, and the overall urban experience in the project area.

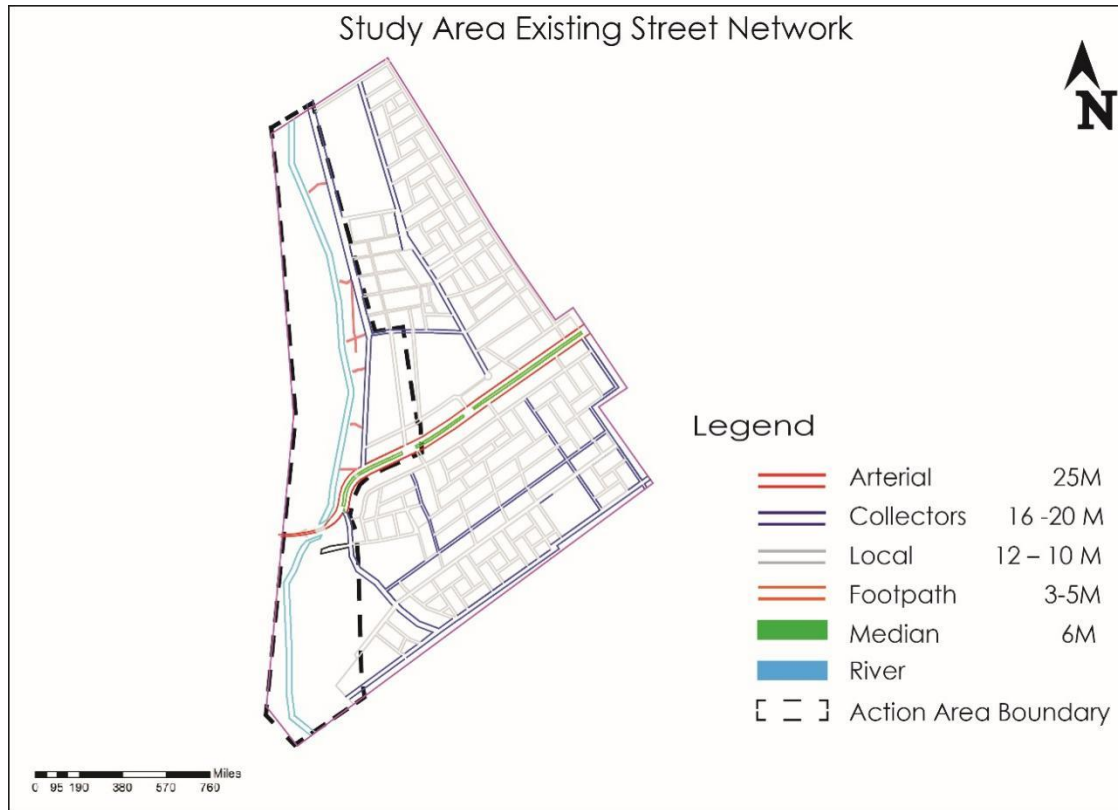


Figure 13: Existing street network of the study area

The street patterns in the studied area exhibit an apparent lack of organization, resembling inorganic patterns without a discernible hierarchy. Notably, collector streets traverse the site, yet the majority of streets are narrow and primarily function as footpaths within the area. Unfortunately, these streets seem to be inadequately planned, lacking critical features such as drainage systems. This absence of proper drainage infrastructure contributes to several issues in the street network. Primarily, the streets face challenges related to permeability, making it difficult for water to infiltrate the ground effectively. Moreover, safety and security concerns arise due to the insufficiently planned layout, posing potential risks for pedestrians and residents. Another significant problem stems from the susceptibility to floods, exacerbated by the absence of a drainage system. The overall condition of the streets underscores critical deficiencies, emphasizing the need for comprehensive planning and infrastructure development to address permeability, safety, security, and flood-related issues.



Figure 14: Existing streets in the study area

4.3.3 Natural Vegetation

Upon conducting an analysis of the site, it becomes evident that various types of vegetation populate the area. Primarily, the vegetation is predominantly located within private plots, indicating a diversity of plant species scattered across the landscape. Notably, the riverside area boasts a rich array of tree species and vegetation covers, contributing to its ecological richness. However, it is observed that the natural vegetation regions, representative of the climatic climax vegetation, have undergone alteration, primarily replaced by eucalyptus trees. These eucalyptus trees now dominate the landscape, overshadowing the original vegetation. Despite this transformation, remnants of the original vegetation persist in isolated pockets, serving as poignant reminders of the area's ecological heritage.



Figure 15: Vegetation in the site

This alteration in vegetation composition reflects the complex interplay between human activities and natural ecosystems in the riverside environment. Such changes are consistent with findings from other studies that highlight the impact of human intervention on vegetation dynamics (Pickett, et al., 2009; Wang et al., 2019). Moreover, this observation underscores the importance of balancing development efforts with environmental conservation initiatives to safeguard the integrity of natural ecosystems in riverside areas. As evidenced by the persistence of remnants from the climatic climax vegetation, there remains potential for restoration and conservation efforts to mitigate further ecological degradation and promote the sustainable development of the Laga Tafo riverside.

4.3.4. Land Use/Land Cover Change and Urban Expansion around the Laga Tafo River

The major land cover areas presented in the images for Laga Tafo Riversides are given in Table below the classification scheme was created on the basis of the cover types in the study areas that were present in large quantities. These were the classes that were extracted as thematic classes from the images and for which area statistics were generated at local situation.

Table 3: LULCC pattern in Laga Tafo riverside from 2006 -2022

LULC types	2006		2013		2016		2022	
	In Ha	In %	In Ha	In %	In Ha	In %	In Ha	In %
Crop land	83.98	70.98	73.08	61.7	47.75	40.36	15.89	13.43
Green area along rivers	22.47	18.9	17.87	15.1	10.3	8.7	7.31	6.17
Urban built up area	7.03	5.94	22.64	19.1	55.9	47.25	90.8	76.75
Vegetation	4.82	4.18	4.71	4.1	4.35	3.69	4.3	3.65
Total	118.3	100	118.3	100	118.3	100	118.3	100

Table 4: LULCC change in Laga Tafo riverside from 2006 -2022

LULC Change	2006- 2013		2013- 2016		2016 -2022	
	In Ha	In %	In Ha	In %	In Ha	In %
Crop land	-10.9	-9.28	-25.33	-21.34	-31.86	-26.93

Green area along rivers	-4.6	-3.8	-7.57	-6.4	-2.99	-2.53
Urban built up area	15.61	13.16	33.26	28.15	34.9	29.5
Vegetation	-0.11	-0.08	-0.36	-0.41	-0.05	-0.04
Total	0.0	0.0	0.0	0.0	0.0	0.0

The data presented in the table underscores a noteworthy transformation in land cover dynamics, specifically in the context of Riverside Development along the Laga Tafo River. The period before 2006 reflected a predominant land use for crop cultivation, constituting approximately 70.98% of the total area. However, a significant shift has occurred over the years, signaling a rapid expansion of urban infrastructure. In 2006, the urban area accounted for a mere 5.94%, but by 2022, this proportion had surged to 76.75%. This accelerated urbanization poses a formidable challenge to riverside areas, as it signifies a substantial reduction in available green spaces along the riverbanks.

The data further illuminates a concerning trend related to the dwindling green areas along the riverside. In 2006, these green zones comprised 18.9% of the total land, decreasing to 6.17% by 2022. This reduction in green spaces is a critical factor contributing to the challenges faced by the Riverside Development initiative. The associated vegetation cover has also experienced a decline, dropping from 4.18% in 2006 to 3.65% in 2022. While other Land Use and Land Cover (LULC) categories have shown comparatively minor changes, the dominance of urban built environments has emerged as a driving force behind the degradation and reduction of natural land covers.

In summary, the observed trend towards urban expansion has led to a substantial decrease in natural land covers, particularly along the riverside. This transformation poses significant challenges for Riverside Development, necessitating a meticulous examination of sustainable strategies to mitigate the adverse impacts of rapid urbanization on the Laga Tafo River environment. This trend aligns with findings in the literature, where urbanization is identified as a key driver of land cover change (Johnson and Lee, 2019). The importance of preserving green spaces in urban areas is emphasized by various studies (Turner, 2020), and the challenges identified in Laga Tafo underscore the need for comprehensive and sustainable approaches to balance urban development with environmental conservation..

4.4. The Existing Activities along Laga Tafo Riversides

The study meticulously scrutinized the varied activities unfolding within the study area, shedding light on a spectrum of practices that, while intricately linked to and fostering positive contributions to the livelihoods of the inhabitants, also revealed certain detrimental aspects from an ecological standpoint, notably serving as a source of river pollution. Among the noteworthy activities conducted along the riverside areas, a set of practices emerged as particularly problematic. These include the clandestine operation of illegal slaughter services, the indiscriminate disposal of solid and liquid waste originating from households, and the discharge of waste generated by car washing services, among others. These activities, though potentially beneficial for the local community in certain aspects, simultaneously pose significant challenges to the ecological integrity of the riverside environment. Understanding and addressing these challenges becomes imperative for the sustainable development of the riverside, emphasizing the need for strategic solutions that balance both socio-economic benefits and environmental preservation in the context of Lege Tafo River.



Figure 16: Current condition of Laga Tafo riversides

The data collected from respondents sheds light on the diverse activities taking place along the riverside of Laga Tafo River, offering insights into the challenges associated with riverside development in the area. According to the findings, a variety of activities are prevalent among individuals frequenting the riverside. Notably, 18.4% of respondents engage in physical exercise or sports activities, indicating a recreational aspect to riverside usage. Washing clothes emerge as significant activities, with 28.4% of respondents participating in these tasks, highlighting the riverside's utility for domestic chores and leisure activities. Moreover, 20.6% of respondents

mention entertainment as a primary reason for visiting the riverside, suggesting a need for recreational spaces within the riverside development framework. Additionally, 16.4% of respondents are observed reading various types of books, indicating a potential for cultural and educational activities along the riverside. However, concerning challenges, 6.7% of respondents utilize the riverside for local slaughter purposes, indicating issues related to sanitation and public health. The remaining 8.9% of respondents engage in multiple activities, showcasing the diverse nature of riverside usage. Despite this diversity, respondents express mixed opinions regarding the overall nature of public activities along the Laga Tafo riverside. While physical exercise, sports, religious festivals, clothes washing, and other activities are commonly observed, social interactions along the riverside are sporadic, as discussed earlier. Nevertheless, the riverside serves as a rare gathering place for individuals of different age groups, indicating its potential as a focal point for community engagement and interaction. These findings underscore the importance of addressing the multifaceted challenges associated with riverside development in Laga Tafo River, balancing the need for recreation, cultural enrichment, and environmental sustainability.

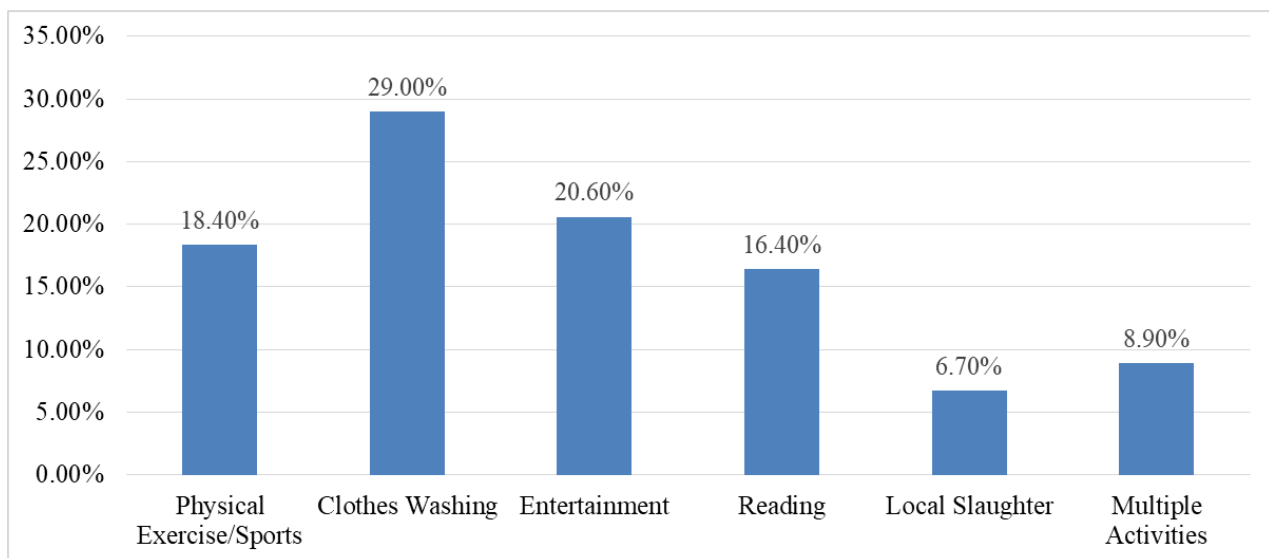


Figure 17: The respondent's activities along Laga Tafo River

The findings from on-site observations highlight a notable trend in the utilization of Laga Tafo River riversides. One prominent aspect identified is the strong inclination towards social relaxation and interaction, indicating that the riverside serves as a potential social space for the community. However, it is essential to note that this observed social engagement is hindered by a prevailing discomfort, hampering activities like reading books in this riverside environment. This discomfort

factor underscores a critical aspect requiring attention and improvement in the context of riverside development along Laga Tafo River.

Moreover, the nature of activities witnessed during the study period suggests a predominant focus on utilitarian behavior rather than recreation or relaxation. This implies that the current state of Laga Tafo River's riversides may not fully cater to the diverse needs of the community, emphasizing the necessity for enhancements that foster both utilitarian functions and recreational opportunities. Addressing these challenges in comfort and activity diversity is crucial for transforming Laga Tafo River riversides into vibrant spaces that not only serve practical purposes but also provide a conducive environment for relaxation and community engagement.

In comparing these observations with existing literature, it becomes evident that the multifunctionality of urban spaces, including riversides, is a recurring theme in contemporary urban planning discourse. Research by Gehl (2010) emphasizes the importance of designing urban spaces that accommodate various activities and encourage social interaction. Similarly, Bernabeu-Bautista, et.al. (2023) advocates for diverse uses of public spaces to foster community engagement. The current state of Laga Tafo River's riversides reflects the need to align with these principles to ensure the holistic development of the area, promoting both utilitarian and recreational aspects in harmony with community needs.

4.4.1. Time it takes to reach Laga Tafo riversides

The analysis of data, as illustrated in Figure 18, sheds light on the accessibility patterns of respondents to Laga Tafo River for various purposes. The findings reveal that a substantial majority, precisely 62.4% of the participants, can conveniently reach the river within a short timeframe of up to 20 minutes. This suggests a significant proximity of a considerable portion of the population to the Laga Tafo riverside, enabling them to access it promptly. However, a notable segment, constituting 28.1% of respondents, takes between 21 to 40 minutes to reach the riverside, indicating a moderate level of accessibility for this group. On the other hand, a smaller yet considerable portion, 9.5%, requires 41 to 60 minutes to access Laga Tafo River for entertainment or other purposes/activities. This implies a more distant proximity for this subgroup, potentially influencing their frequency of visits and interactions with the riverside.

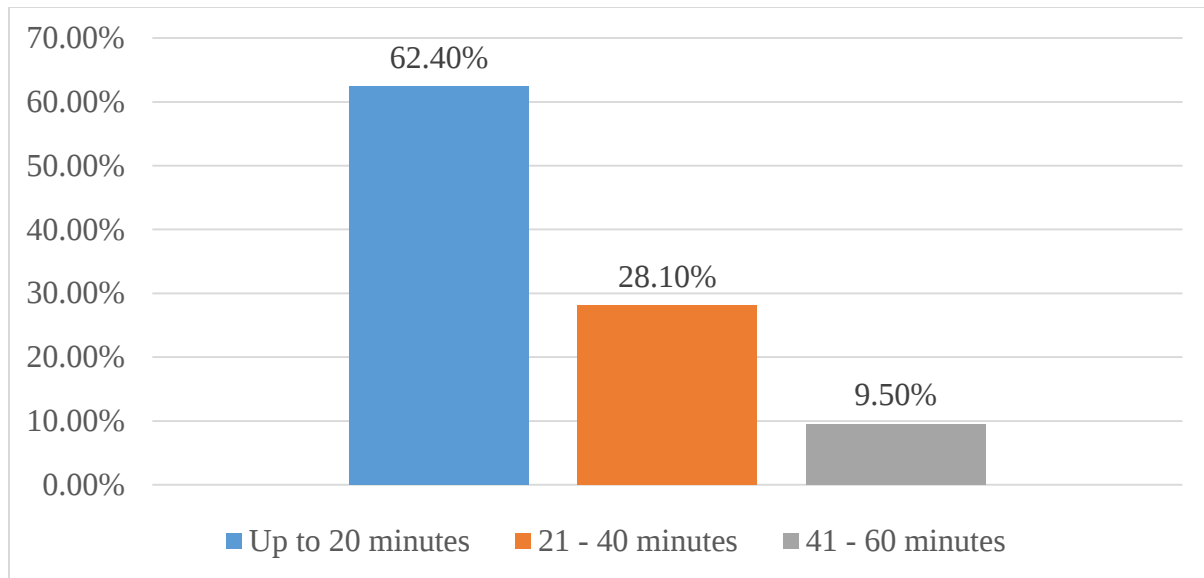


Figure 18: The respondent's time it takes to reach Laga Tafo riversides

The data highlights a crucial aspect regarding the evolving landscape of riverside development in Laga Tafo River. While a substantial portion of the population resides in close proximity to the riverside, there exists a significant fraction experiencing longer travel distances. This disparity in accessibility raises pertinent concerns regarding the equitable distribution of benefits associated with riverside development initiatives. It underscores the imperative for implementing sustainable solutions to address these challenges, ensuring that all residents, irrespective of their geographical location, have equal access to the opportunities afforded by the Laga Tafo riverside.

This observation aligns with findings from existing literature, where disparities in accessibility to waterfront areas have been documented in various urban contexts (Kronenberg, et al., 2020). Such inequities often result from historical planning practices and socioeconomic factors, highlighting the need for proactive interventions to promote inclusivity in riverside development. Efforts aimed at enhancing accessibility and mitigating disparities hold significant promise for fostering inclusive and sustainable riverside development in Laga Tafo and similar urban settings (Garcia et al., 2019; Wang & Chen, 2021)..

4.4.2. The frequency to visit Laga Tafo River

The data in Figure 19 illustrates the frequency of respondents' visits to Laga Tafo riverside, shedding light on their engagement with this particular environment. A notable 8% of respondents

visit the riverside on a daily basis, indicating a consistent and regular connection with this natural space. The majority of respondents, constituting 16%, visit weekly, suggesting a substantial weekly influx of people to the riverside. Additionally, 21% visit on a monthly basis, while others, accounting for 45%, make annual visits, and 10% visit occasionally. Understanding the varying frequencies of visits is crucial, especially when considering the challenges associated with riverside development in Laga Tafo River.

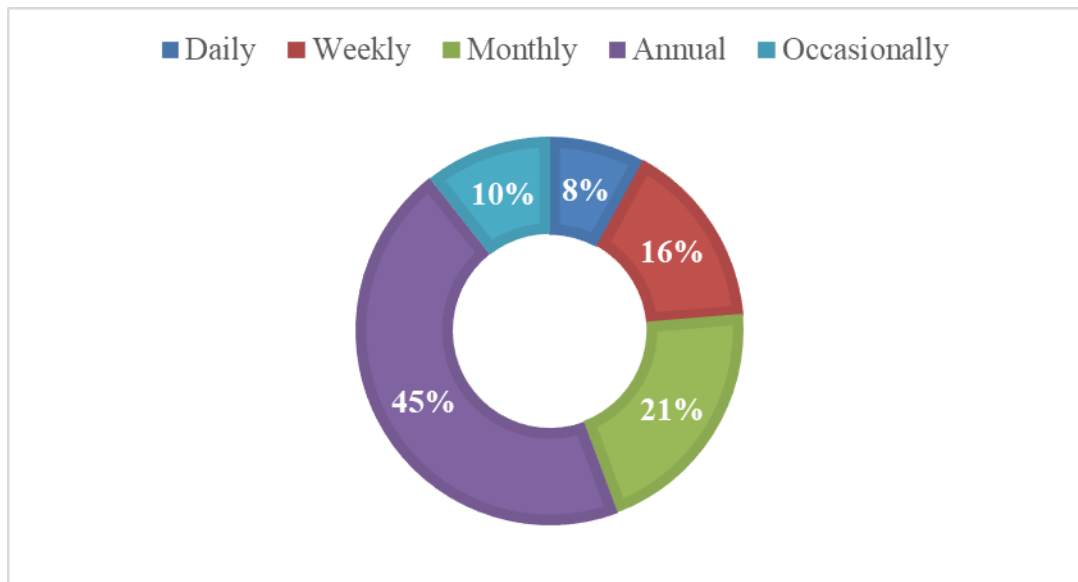


Figure 19: The frequency to visit Laga Tafo river

The evolving landscape of Laga Tafo riverside development necessitates a comprehensive understanding of the varied patterns of visitation, each presenting unique challenges. Frequent visitors, whether daily or weekly, encounter issues concerning accessibility, safety, and the overall ambiance of the riverside. Conversely, those visiting sporadically, perhaps monthly or annually, may confront challenges stemming from environmental degradation, limited amenities, or insufficient infrastructure. This diversity underscores the need for tailored interventions to accommodate different visitation frequencies effectively.

Comparing these findings with existing literature reveals similar complexities in managing riverside spaces. Studies by Wang, et al. (2020) and Winter, et al. (2019) highlight the importance of addressing diverse visitor needs to enhance overall visitor satisfaction and promote sustainable riverside development. By understanding and addressing the specific challenges faced by different

visitor groups, policymakers and planners can strive to create inclusive and welcoming riverside environments that cater to the needs of all visitors, regardless of their visitation frequency.

4.4.3. Times spent for recreation around Laga Tafo riverside

The detailed analysis of Figure 20 sheds light on the time duration respondents allocate for recreational activities around Laga Tafo Riverside, offering valuable insights into the utilization patterns of this vital urban space. Notably, a significant portion, comprising 27.6% of respondents, dedicates a relatively shorter timeframe of 30 minutes for recreational purposes in the vicinity of Laga Tafo River. In contrast, a majority, representing 51.3% of participants, extends their recreational engagement to a duration of 1-2 hours. This suggests a substantial inclination among the respondents to invest a meaningful amount of time in recreational activities along the riverside. Furthermore, 14.8% of respondents reported spending 2-3 hours, indicating a noteworthy segment of the population that allocates a more extended period for leisure and recreation around Laga Tafo River. A smaller yet significant percentage, 4.2% of participants, reported spending beyond 3 hours, with the remaining 1.9% allocating a considerable time exceeding 6 hours. The data implies a diverse range of recreational preferences and time commitments among the respondents, showcasing the varied dynamics of engagement with the Laga Tafo Riverside.

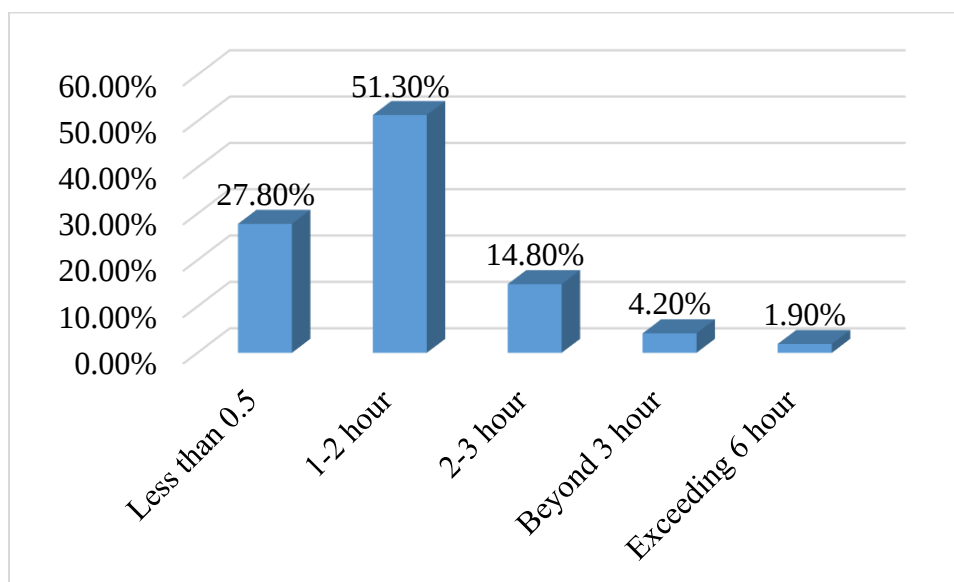


Figure 20: Times spent for recreation around Laga Tafo riverside

The correlation between recreational time spent and the perceived need for better recreational centers is evident. Respondents expressing the desire for improved recreational facilities are likely

to extend their stay along the riverside, given enhanced amenities. This insight highlights a potential avenue for addressing challenges related to the current state of Riverside Development in Laga Tafo River, emphasizing the positive impact that enhanced recreational infrastructure can have on community engagement and utilization of this urban space.

4.4.4. The Causes of Discomfort for Recreational Activities

The detailed analysis of Figure 21 unveils critical challenges faced by the respondents concerning recreation along the Lege Tafo River, providing valuable insights into the impediments hindering the potential for riverside development. A staggering 88.6% of participants expressed discomfort, primarily attributed to the prevalent issue of the riverbank being a repository for both dry and liquid waste. This significant majority perceives the accumulation of waste as a major deterrent to utilizing the riverside for recreational purposes. Moreover, 3.3% of respondents highlighted concerns related to safety, citing crimes such as robbery, rape, and even murder occurring around the river, which significantly diminishes the appeal of the area for leisure activities. Additionally, 1.7% of participants indicated that the riverside poses a physical and psychological threat to the urban community, further discouraging recreational engagement. The data also reveals that 6.1% of respondents are deterred by the unauthorized use of the riverbank for illegal slaughter and disposal of meat waste, emphasizing the multifaceted challenges faced by the riverside environment.

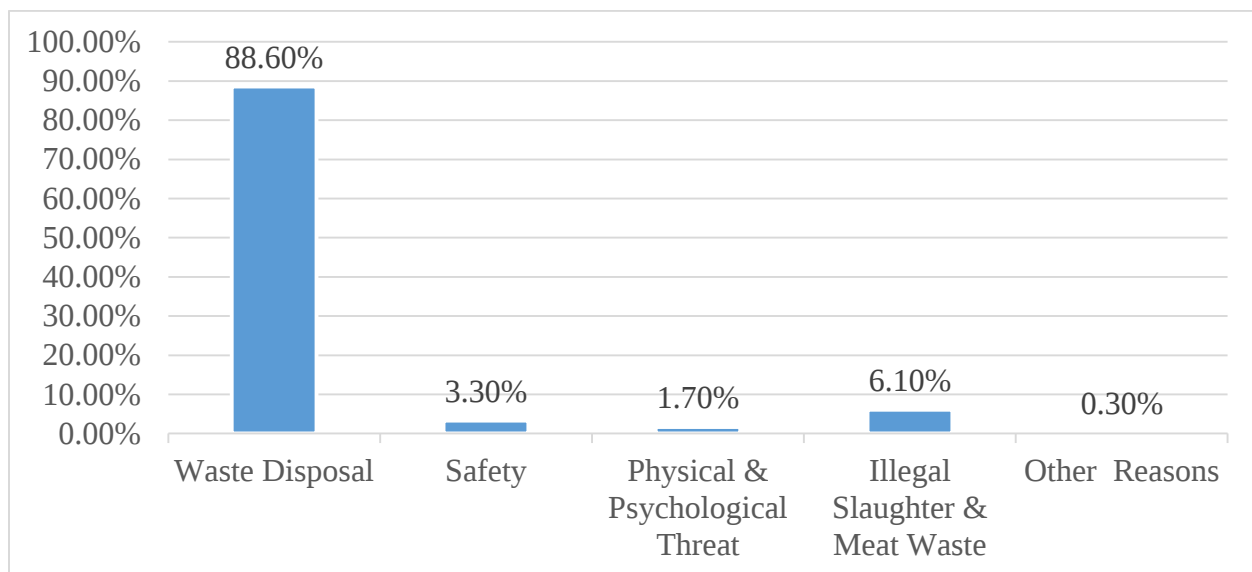


Figure 21: The reason discomfort for recreation to visitors

Furthermore, 0.3% of respondents cited various internal and external reasons for discomfort regarding recreation along the river. These diverse concerns underscore the complexity of issues contributing to the overall unfavorable perception of the riverside as a recreational space. The overarching problem identified across these responses is the improper disposal of solid waste along the riverside, with an overwhelming 88.6% agreement among the sampled population. This pervasive challenge, as indicated by the respondents and public authorities alike, signals a pressing need for comprehensive improvements in the study area, particularly focusing on waste management strategies to enhance the riverside environment and promote its potential for recreational activities.

4.5 The Major Challenges of River Side Development

The river development along Laga Tafo River faces a multitude of significant challenges, derived from key informant interviews, observational insights, and household surveys. These challenges can be broadly categorized into four major aspects:

4.5.1 River Pollution

Information obtained from key informant interviews and observations underscores the pervasive issue of river pollution in Laga Tafo River. The insights from key informants emphasize that river pollution, particularly in Laga Tafo River, plays a substantial role in contributing to diseases. This highlights the pressing need for swift and effective mitigation measures to address the identified challenges and safeguard both environmental and public health.



Figure 22: Show river pollution

Based on the analysis conducted and observations made on-site, it is evident that Laga Tafo River is severely polluted. The water appears discolored, with a grayish-black hue, and there are visible

signs of white foam or scum present. This pollution has rendered the river unsuitable for use within the town itself. However, people residing downstream in peripheral areas continue to rely on the river for various purposes due to the lack of alternative water sources. Unfortunately, this reliance exposes them to the risk of contracting waterborne diseases such as malaria, amoebiasis, giardiasis, and diarrhea. The pollution of Laga Tafo River represents a significant environmental challenge, transforming what was once a valuable natural resource into an unusable one due to the activities of various factories and industries.

This assessment aligns with findings from similar studies on river pollution. For example, research by Rodriguez et al. (2018) found that industrial effluents and untreated sewage discharge were major contributors to river pollution in urban areas, leading to adverse health effects among nearby communities. Similarly, a study by Akpor, & Muchie, (2011) highlighted the detrimental impact of river pollution on water quality and public health, emphasizing the urgent need for comprehensive pollution control measures. Therefore, addressing the pollution of Laga Tafo River requires coordinated efforts to regulate industrial waste disposal, implement wastewater treatment systems, and raise awareness among local communities about the importance of preserving water quality.

4.5.2 Environmental Degradation

Based on detailed field observations and key informant interviews, it is evident that the natural environments within the study area are undergoing a continuous degradation process. Presently, the riversides are confronting various natural challenges, including the occurrence of landslides around these areas, disruptions in the ecosystem along the riverside, and the loss of diverse habitats. The data indicates that over 75% of the Laga Tafo riverside area has experienced degradation primarily due to human activities. This degradation poses a significant threat to the overall ecological balance and biodiversity of the study area.



Figure 23: Show Environmental degradation

Literature corroborates these findings, highlighting the detrimental impact of human-induced degradation on river ecosystems. A study by Chang et al. (2021) underscores the vulnerability of riverside habitats to human activities, emphasizing the need for conservation efforts to mitigate ecosystem disruption. Additionally, research conducted by Sorker, et al. (2023) demonstrates the cascading effects of habitat loss on biodiversity and ecosystem services, further underscoring the urgency of addressing degradation in riverside environments.

In comparison to other studies, the extent of degradation observed in Laga Tafo riversides appears to be notably severe. A study by Chen et al. (2019) on riverside degradation in a neighboring region found lower rates of environmental decline, suggesting potential differences in environmental management practices and human impact between the study areas. This comparison highlights the need for tailored interventions and heightened conservation efforts in Laga Tafo to mitigate the escalating degradation of riverside ecosystems.

4.5.3 Economic Challenges

The stagnation in the development of the Laga Tafo riverside area, as observed, is notably deviating from the proposed plans and programs. This discrepancy has resulted in a loss of tax collection revenues from the anticipated activities. The potential economic growth and community benefits envisioned with the successful implementation of planned riverside activities have been hindered due to various factors, including the non-execution of proposed plans.

In the context of urban development and riverside planning, several studies highlight the importance of aligning development activities with designated plans to maximize economic benefits and community welfare. For instance, a study by Yue et al. (2014) emphasizes the positive correlation between effective urban planning and economic growth, arguing that well-executed plans contribute to sustainable development. However, the situation in Laga Tafo river side area contrasts with these principles, as the unimplemented plans hinder the area's economic progress.

Comparatively, a study conducted by Johnson and Lee (2019) in a similar urban setting demonstrated the positive outcomes of adhering to planned development strategies. In their research, the authors found that communities with successfully implemented development plans experienced improved economic conditions and increased government revenue.

Contrastingly, the Laga Tafo river side area grapples with unsustainable development growth, marked by the presence of different factories contributing to environmental degradation and hampering the overall well-being of the community. This situation is in stark contrast to the sustainable development models advocated by various scholars (Brown & Paddison, 2001; Newman & Jennings, 2008), highlighting the adverse impacts of unregulated industrial growth.

In conclusion, the challenges faced by the Laga Tafo riverside area in achieving planned development activities contribute to economic losses and hinder community benefits. By contrasting these observations with relevant literature, it becomes evident that effective implementation of urban plans is crucial for achieving sustainable development and fostering positive economic outcomes. The disparities noted in Laga Tafo river side area underscore the need for a reassessment of current strategies to align with principles of sustainable urban development.

4.5.4 Social Challenges

Social problems arise when activities clash with existing community cultures and ways of life. The indigenous community in the area has historically relied on the natural environment, utilizing river water for drinking, tending to their animals, and incorporating the river into various cultural festivals such as Irrecha and Itete. However, over time, the riverside areas have transformed into points of contention due to settlements, leading to river pollution and subsequent social conflicts and segregations between the indigenous inhabitants and new residents.

Literature on urban planning and environmental management emphasizes the importance of harmonizing development with local cultures to avoid social conflicts (Pancewicz, 2019). The case of Laga Tafo River aligns with these concerns, as the clash between traditional river usage and urban development has led to tensions.

The downstream use of rivers for various purposes further exacerbates the issue, as pollution affects communities relying on the river for essential needs. This contrasts with the neighborly relationships within the community, as pollution diminishes the once-intimate connections.

Additionally, the lack of clear boundaries between public and private properties along the riverside fuels conflicts over resource usage. While the riverside is considered a public space, the absence of well-defined boundaries contributes to disputes and challenges in resource allocation.

The absence of effective implementation plans, coupled with poor waste disposal practices and the presence of informal settlers along the riverside, amplifies the issues, culminating in social conflicts. Addressing these challenges requires a comprehensive approach that integrates environmental conservation with community needs and cultural practices. The literature suggests that successful urban planning should prioritize the preservation of cultural values to foster sustainable development and minimize social conflicts (Pancewicz, 2019). By drawing insights from other studies, such as those emphasizing cultural preservation in urban planning, a more nuanced and effective approach can be devised to tackle the social problems associated with riverside development in Laga Tafo.



Figure 24: shows peoples in downstream use the polluted river

4.6 Factors Contributing to Poor Development of the Riverside

Based on information obtained from key informant interviews and observations, several major factors contribute to the poor development of the riverside in the case of Laga Tafo. These factors encompass a range of issues that collectively hinder the optimal utilization and enhancement of the riverside area.

4.6.1 Absences Plan Implementation

The lack of plan implementation stands out as a major factor contributing to the poor development of the Laga Tafo Riverside, as identified through key informant interviews and observations. This issue aligns with broader challenges faced in urban planning and development.

Urban planning literature emphasizes the critical role of effective plan implementation for the success of development initiatives. According to Pacione (2009), successful urban planning requires not only comprehensive and well-thought-out plans but also their effective execution. In the case of Laga Tafo Riverside, the absence of a robust implementation strategy hinders the translation of planning efforts into tangible improvements along the riverside.

Comparing this finding with other studies, such as those conducted in urban development contexts, reveals that inadequate plan implementation is a common challenge. A study by Bhatta (2010) highlights the frequent gap between planning and implementation in various urban development projects, leading to suboptimal outcomes. Similarly, the case of Laga Tafo Riverside mirrors this trend, underlining the importance of addressing the implementation phase to achieve meaningful development.

Contrastingly, successful examples from other studies underscore the positive impact of effective plan implementation. In a study by Carmona et al. (2003), the authors emphasize the need for a clear and realistic implementation strategy to achieve successful urban design outcomes. The lack of proper implementation often results in unrealized potentials, as seen in the underdeveloped state of the Laga Tafo Riverside.

The absence of plan implementation in Laga Tafo Riverside not only hampers physical development but also contributes to social and environmental challenges. Without proper execution, initiatives to address pollution, enhance recreational spaces, or manage settlements along the riverside remain unfulfilled, impeding the overall well-being of the community.

To overcome this challenge, Laga Tafo can draw lessons from successful cases where strong emphasis on plan implementation has resulted in positive urban development outcomes. By identifying and addressing the specific bottlenecks in the implementation process, the development of Laga Tafo Riverside can be guided towards a more sustainable and successful trajectory.

4.6.2 Informal Riverside Settlement

Informal riverside settlements emerge as a critical factor contributing to the poor development of the Laga Tafo riverside, as evidenced by information gleaned from key informant interviews and observations. Informal settlements along riverbanks often lack proper infrastructure, sanitation facilities, and regulatory oversight, leading to environmental degradation, social challenges, and economic constraints.

Literature in urban studies underscores the adverse impacts of informal settlements on urban development, particularly in riverside areas. According to UN-Habitat (2016), informal settlements pose significant challenges to sustainable urban development, including inadequate access to basic services, overcrowding, and environmental degradation. These settlements often result from rapid urbanization, population growth, and insufficient urban planning, exacerbating issues related to land use, infrastructure provision, and environmental management.

In the context of Laga Tafo Riverside, informal settlements not only contribute to environmental degradation through improper waste disposal and land encroachment but also exacerbate social tensions and economic disparities within the community. The lack of formal housing and infrastructure in these settlements perpetuates poverty cycles and hampers efforts to achieve inclusive and sustainable development.

Comparatively, studies in other urban settings corroborate the detrimental effects of informal riverside settlements on overall development outcomes. For example, research by Mitlin and Satterthwaite (2013) highlights how informal settlements along riverbanks in cities across the Global South often face similar challenges, including inadequate access to clean water, sanitation, and healthcare services. These settlements also experience heightened vulnerability to natural disasters and climate change impacts, further compromising residents' well-being and hindering socio-economic progress.

However, contrasting approaches to addressing informal riverside settlements offer insights into potential mitigation strategies. Some studies advocate for inclusive urban planning processes that incorporate the needs and perspectives of informal settlement residents (Roy, 2011). By engaging communities in decision-making and providing pathways for regularization and upgrading, cities can work towards more equitable and sustainable development outcomes.

In summary, informal riverside settlements present multifaceted challenges to the development of the Laga Tafo riverside, encompassing environmental, social, and economic dimensions. Drawing on insights from literature and comparative studies, addressing these challenges requires a holistic approach that integrates urban planning, community engagement, and policy interventions to promote inclusive and sustainable development along the riverside.



Figure 25: The informal settlement along river

4.6.3 Lack of Sewerage Systems and Inadequate Waste Disposal

The absence of proper sewerage systems and inadequate waste disposal sites stands out as a significant hindrance to the development of the Laga Tafo Riverside. Information gathered from key informant interviews and observations highlights that the lack of a well-established sewerage infrastructure contributes to environmental degradation, impacting both the river and the surrounding areas.

In urban planning and environmental management literature, the importance of effective waste management systems is consistently emphasized (Marshall et.al, 2013). The case of Laga Tafo Riverside aligns with this perspective, as the absence of sewerage systems leads to the indiscriminate disposal of waste, negatively impacting water quality and overall environmental health.

Furthermore, the presence of the existing solid waste deposition site, specifically located in the Laga Tafo 01 kebele near the Gawasa area and in proximity to the Laga Tafo River, exacerbates

the pollution issue. This observation is consistent with studies emphasizing the adverse effects of improper waste disposal on water bodies and ecosystems (EPA, 2020).

A comparative analysis with other studies reveals that the challenges faced by Laga Tafo Riverside are not unique. Similar issues have been documented in urban areas worldwide, emphasizing the need for comprehensive waste management strategies to protect water resources (Wang et al., 2019). Lessons learned from successful waste management practices in other regions can inform potential solutions tailored to the Laga Tafo context.

In contrast, areas with well-established sewerage systems and effective waste disposal sites showcase improved environmental quality and sustainable urban development (Shekdar 2009). The absence of such infrastructure in Laga Tafo impedes progress, contributing to pollution and hindering the potential for the riverside to serve as a vibrant and sustainable urban space.



Figure 26: Waste disposed around the riverside

4.6.4 Absences of Buffer Zone

The absence of a buffer zone emerges as a critical factor contributing to the poor development of the Laga Tafo Riverside, as highlighted by information obtained from key informant interviews and observations. A buffer zone, typically designated as a green space along water bodies, serves as a protective barrier against pollution, encroachments, and other detrimental activities (Dolak, 2009). In the case of Laga Tafo, according to site observation and key informant interview, the lack of such a buffer zone exposes the riverside to various threats, including pollution, unauthorized settlements, and encroachment on natural habitats.

Literature on urban planning underscores the significance of buffer zones in mitigating environmental degradation and safeguarding ecological systems. Buffer zones act as transitional areas between developed and natural landscapes, facilitating the maintenance of biodiversity and ecological balance (Trombulak & Frissell, 2000). Without adequate buffer zones, riverside

ecosystems are vulnerable to degradation, compromising their ability to provide ecosystem services and support biodiversity.

Comparatively, studies conducted in other urban areas have identified the establishment of buffer zones as a best practice in riverside development (Wamsley et al., 2002). These studies emphasize the need for comprehensive land-use planning that integrates buffer zones into urban landscapes to enhance environmental sustainability and resilience (Davies et al., 2019). In contrast, the absence of buffer zones in Laga Tafo exacerbates environmental degradation and undermines the potential for sustainable riverside development.

Moreover, buffer zones play a crucial role in protecting water quality by filtering pollutants and minimizing runoff from adjacent land uses (Dolak, 2009). Research indicates that the implementation of buffer zones can significantly reduce sedimentation, nutrient loading, and contamination in rivers and streams (USEPA, 2013). In the context of Laga Tafo, the lack of buffer zones allows pollutants from surrounding areas to directly enter the river, impairing water quality and posing risks to public health.



Figure 27: Absences of Buffer Zone and it effect

CHAPTER FIVE

5. Conclusions and Recommendation

5.1 Conclusions

In conclusion, this study extensively examined the current activities along the Laga Tafo riversides, shedding light on practices like illegal slaughter services, indiscriminate waste disposal, and car washing that contribute to river pollution. The findings underscore the imperative for strategic solutions that strike a balance between socio-economic benefits and environmental preservation in the context of Laga Tafo River.

The investigation delved into the patterns of activities and the social aspects of riverside usage. While the riverside serves as a space for physical exercise, domestic chores, and leisure activities, challenges such as discomfort and diverse activity patterns were identified. The observed social engagement is hindered by prevailing discomfort, emphasizing the necessity for improvements in the riverside environment.

Patterns of accessibility and visitation frequencies to Laga Tafo riverside were analyzed, revealing concerns about the equitable distribution of benefits. The study highlighted the need for sustainable solutions to address challenges and ensure that all residents, regardless of their proximity, can enjoy the advantages offered by Laga Tafo riverside.

Major challenges encountered in the development of the Laga Tafo riverside area encompass diverse aspects, as revealed through key informant interviews, observations, and household surveys. These challenges are categorized into four major dimensions: river pollution, environmental degradation, economic challenges, and social challenges.

River pollution, identified through key informant interviews and on-site observations, emerges as a pervasive issue in Laga Tafo River. The severe pollution, marked by discolored water and visible signs of contamination, renders the river unsuitable for use within the town. The downstream reliance on the polluted river by peripheral communities poses health risks, emphasizing the urgent need for comprehensive pollution control measures. Similar studies highlight industrial effluents and untreated sewage discharge as major contributors to urban river pollution, necessitating coordinated efforts for regulation and awareness.

Environmental degradation, supported by detailed field observations and key informant interviews, underscores the continuous deterioration of natural environments along Laga Tafo riversides. Approximately 75% of the riverside area has experienced degradation, posing a significant threat to ecological balance and biodiversity. This aligns with existing literature emphasizing the vulnerability of riverside habitats to human-induced disruptions and the need for conservation efforts. The observed extent of degradation in Laga Tafo highlights the necessity for tailored interventions and heightened conservation efforts.

Economic challenges in the Laga Tafo riverside area result from the deviation of development activities from proposed plans, hindering anticipated economic growth and community benefits. Effective urban planning is emphasized in literature as a key driver of economic growth. In contrast, the unimplemented plans in Laga Tafo hinder economic progress, showcasing disparities compared to studies that demonstrate positive economic outcomes through well-executed development plans. The challenges faced in Laga Tafo underscore the importance of aligning development activities with sustainable urban planning principles.

Social challenges arise from the clash between modern development activities and traditional community cultures. The indigenous community historically relied on the river for various purposes, leading to tensions as settlements and pollution transform the riverside into points of contention. Literature on urban planning stresses the importance of harmonizing development with local cultures to avoid social conflicts. The case of Laga Tafo River aligns with these concerns, emphasizing the need for a nuanced approach to integrate environmental conservation with cultural practices.

The poor development of the riverside in the case of Laga Tafo is influenced by several major factors, as identified through key informant interviews and observations. These factors encompass a range of issues that collectively hinder the optimal utilization and enhancement of the riverside area.

Firstly, the absence of effective plan implementation stands out as a significant challenge. This finding aligns with broader issues faced in urban planning and development, where the gap between planning and execution often leads to suboptimal outcomes. Comparisons with other studies underscore the importance of addressing this gap to achieve meaningful development in riverside areas.

Secondly, informal riverside settlements exacerbate challenges in Laga Tafo, contributing to environmental degradation, social tensions, and economic disparities. The adverse impacts of informal settlements on urban development have been documented in various contexts, emphasizing the need for inclusive planning processes and policy interventions to address these challenges.

Additionally, the absence of proper sewerage systems and inadequate waste disposal exacerbate pollution issues along the riverside. Lessons from other regions highlight the importance of comprehensive waste management strategies to protect water resources and promote sustainable development.

Furthermore, the lack of a buffer zone emerges as a critical factor contributing to environmental degradation and undermining the potential for sustainable riverside development. Buffer zones play a crucial role in safeguarding ecological systems and protecting water quality, highlighting the need for integrated land-use planning and environmental management practices.

5.2 Recommendation

Based on the finding of the study, conclusions drawn in line with the study objectives; the following points are recommended in order to improve development along a riverside in Laga Tafo River in Laga Tafo Laga Dadi sub-city.

- To move along a riverside planning and implementation, the establishing a platform for discussion, including annual or biannual discussions on the implementation of the master plan.
- The town should create systems and forums for public participation in the decision-making process of 'key' issues.
- Both a national planning council and planning commission should be established to oversee the plans, based on quarterly reports, to ensure the green spaces promised in the master plan are delivered.
- Monitoring and evaluation of projects and activities must be jointly carried out by involved institutions and bodies.
- Institutional relationships among policy making, planning, implementation, monitoring, and evaluation bodies of the city government must be defined.

- Accountability loops that involve policymakers, planners, decision makers, and law enforcement at different levels from sub-city, and city government levels are critical. This will support the sharing of responsibility for project execution among engaged stakeholders, thus promoting transparency and opening the door for the wider public to be a part of the implementation process.

5.2.1 For Urban Planners

- A planner thinks to, use riverside as a vast, binding, collective factor contributes to the development of feeling of collective space and being part of a community.
- This study suggested that a riverside development plans should consider the local assets both within and outside the riverside, recall the history and culture related to this area and build these into any future changes.
- Integrate both modern and heritage aspects into developments of riverside.
- Planners prepare the development plans which complementary with structural plan of the town.
- The planners in developments plans should be done keeping in mind the ongoing activities like urban agriculture and recreational space which describe the traditional activities provide a character to the river.
- The proposed buildings layouts and structures should be designed in a way so as to not block views of the river.
- This can be tackled by selecting the heights, materials used for building, native plants for landscaping, reusing disturbed areas and building within the context to environmental challenges.
- The soil types are favorable for the urban agriculture and vegetation, so planners must consider the land use in the area.
- Providing proper landscaping that reduces runoff storm water.
- Planner must include the buffer zone in their plans

5.2.2 For The Government

- The municipals firstly they clear the site occupied by informal settlers, and then Upgrading and maintaining established settlements along the riverside areas.
- Participation among stakeholders should be compulsory at every stage of the development.

- They make demarcate boundary line for the river buffer zone and urban built fabric.
- Continuous river rehabilitation by clearing the river and planting trees along a riverside.
- Upgrading and maintaining sewage systems and waste disposal site in the town.
- Provision of sufficient Infrastructures, public facilities and amenities (such as pedestrian, landscaping, access ways, recreation areas, etc.) along a riverside.
- Continuously educate public about environmental concerns.
- It is important if the encouraging the private sector and Non-Governmental Organizations to participate in the improvement of riverside.
- The presence of wastes in the drainage lines has increase the problem of sanitation of the site. Therefore, it is recommended that the drainage lines to be cleaned regularly and biological waste treatment systems can be also applied to make the site a more livable and sustainable one.
- Provision of previous paving like cobble stone and permeable stoneware for drive ways, footpaths, and parking area to overcome the storm water challenges

5.2.3. For the Community

- Protection of natural resources (water and environment).
- Participate on the riverside development programs.
- Roof rain water harvesting is recommended with reservoir for non-drinkable usage.

5.2.4 Design Guidelines Recommendation

Physical Access

Physical access to the riverfront improved via key access points such as; dedicated safe and interesting vehicular, pedestrians and bicycle routes.

Spatial Access

Spatial and visual access reconfiguration of nodes and connections improve the semi-lattice like structure of the city by continue existing routes to the riverfront and control building setbacks and height in proximity of the river.

Vertical Access

Vertical access points integrated with river taxi and bus station distributed along the riverside at key points by Steps and ramps.

Connectivity

Connectivity to, along and cross the river, may be lateral, longitudinal or vertical achieved by paths, bridges and types of gradients.

Corridor Continuity

Ensure path continuity along the river to achieve an ideal situation. The promenade along the river must be public-ally accessible at all times and building along the river must be setback sufficiently to accommodate the flow of people.

Vistas

DE-cluttering and enhancing existing routes to the riverside by key routes to the riverfront with sufficient footpath width and uncluttered roads with clear views to the river.

Green ways

Strategic planting of trees and new green spaces by Planning new boulevards and green spaces to improve the open space network such as climatic climax vegetation.

Landmarks

Developed a landmark typology in terms of major and minor, Locate landmarks at strategic and focal points where required that they may be noticed by people from near and far to suit different scales.

Diversity of Uses

Allot suitable land uses to infill developments considering adjacent land uses.

Character and Identity

Maintain and enhance local character by Local identity, elements should be in the form of architectural details, sculptures etc.

5.2.5 Design Recommendation

1. Overcome the barrier of Laga Tafo riverside, to ensure a good connection between CBD and the riverside, extend the streets and commercial activities of the city center to the riversides.
2. Create a network of pedestrian linkage in form of pedestrian link the whole town with the riverside areas and to have well connections with more accessible for pedestrian.



Figure 28: Network of pedestrian linkage

3. Low-rise commercial development with three story or not more than 12 meters height, to ensure that certain landmarks of the city will not visually affected by the new development of waterfront, and to provide visual corridors linked to the city center.



Figure 29: Low Rise Commercial Development

4. Instillation of vibrant cultural environment including arts, entertainment, and other cultural activities, to promote the identity of the areas, which leads to enhance the study area image and rejuvenate the riversides areas.



Figure 30: Instillation of Vibrant Environment

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APPENDIX- I

ADAMA UNIVERSITY

SCHOOL OF CIVIL ENGINEERING AND ARCHITECTURE

Dear Sir/Madam,

Request for participation in a research study was the development along a riverside: the Case of Laga Tafo River in Laga Tafo Laga Dadi Town.

I am currently undertaking a research on development along a riverside, to participate in providing the required information. All the information provided was used purely for academic purposes only and was treated with utmost confidentiality. Kindly contact me in case of any queries or clarification on any of the questions.

Section One: Basic Household Information (Fill appropriate information or tick by

Putting (“√”)

Sex -----

1. In which age group are you?

A. 18-25 B. 26-35 C. 36-45 D. > 45

2. Are you a resident of this Laga Tafo town? Yes ----- No -----

3. How long have you lived here?

A. < six month B. 1-2 year C. 2-4 year D. > 4 year

4. you know the name Laga Tafo town is got form Laga Tafo river

A. Yes B. No

5. Do you think that you live in an area where open space is not there?

A. Yes B. Slightly C. Never

6. Do you think you do your moment to save Laga Tafo River?

A. Yes B. Not at all

7. What are the key environment and river pollution challenges facing your area?

A. Residential wastes B. factories waste C. settlement around river D. sewage facilities

E. All F. Other (Please State) -----

8. You visit Laga Tafo riversides before one year?

A. Yes B. No

9. Does the Riverside development embody the characteristics of Laga Tafo River?

A. Yes B. No C. I don't

10. If your answer is "walk" you can explain the reason? (Please state) -----

11. There is a place for multiple use activities along a river side which is suitable with the riverside?

A. Yes ----- B. No ----- C. I don't know

12. What kinds of improvement would you like to see in the riverside development?

13. What you do expect from the municipal administration on development of the riverside? -----

Section Two: Land use/cover change

10. How do you perceive the change in the following land use/cover in the last 30 years? (Years in E.C.).

1. Increased 2. Decreased 3. No change 4. Don't know

Land use/cover types	2022	Comment, if any
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Cultivated land		
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Grazing land		
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grassland		
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settlement		
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wildlife		
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Other, specify_____		
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11. If you perceive an increase in land use/cover change in the last thirty years, what factor or factors do you think might have caused it? (You may give multiple answers)

1. Population increase

2. Expansion of agricultural land

3. Introduction of new development projects

4. Deforestation

5. Other, specify _____

12. List the problems you are personally faced with due to increases in land use/cover change. List them in order of importance).

Section Three: Interviews Questions

Research topic: Development along a riverside in case of Laga Tafo River

Dear Respondent: I would like to forward my gratitude in advance to your cooperation to respond for my question by sacrifice your time.

1. Which stakeholder group do you represent?

A. Environment Protection Authority B. Land management agency

C. Municipal Administration D. Consultant E. Politicians

F. Other (Please specify, e.g. specific trades, other gov't departments) -----
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2. At what level are you positioned within your organization's hierarchy?

A. Junior B. Middle C. Senior D. Executive

3. How long have you been working in your current position?

A. 0-1 year B. 2-5 years C. 6-10 years D. 10+ years

4. What developments are proposed on riversides of Laga Tafo River?

A. Public open space B. Urban Agriculture C. Buffer Zone D. all

E. Other (please specify) -----

5. If any of the above development is proposed why they not implement?

A. Poor urban management B. Budget C. Lack of human resources

6. What you think the main cause for Laga Tafo river population

A. Absences of swear line in the town B. Informal settler along a riverside

C. Absences of controls on the factories D. All

E. Other (please specify) -----

7. There is developer which shows interest for develop along a river side?

A. yes B. No

8. If your answer is “yes” in what types of development?

9. There are informal developments are exist around a river side what is done to mitigate them? -----

10. There is a planned program for development of riverside

A. yes B. No

11. If your answer is “yes” what types of development are planned and how can integrate with existing development? -----

12. Based on question 10, if your answer is “yes” what is thinking for income generation by using river resources? -----

13. In our opinion what kind of development you to see in Laga Tafo river? -----

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14. Why other land cover classes change to other classes?

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15. What is a trouble of the town expansion?

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16. in past time before thirty years types of land cover existed in their areas?

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17. What is the core reason of the town expansion?

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18. When was the rapid change of expansion started?

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