

The effect of land use planning and implementation on the urban environment: The case of Dukem sub city, Bishoftu city; Ethiopia.



Fenet Kisi

**A Thesis Submitted to
The Department of Architecture and Urban Planning and Design**

School of Civil Engineering and Architecture

**Presented in Partial Fulfilment of the Requirement for the Degree of
Master's in Urban Planning and Design**

**Office of Graduate Studies
Adama Science and Technology University**

**May, 2024
Adama, Ethiopia.**

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Advisor (s): Dr. Belay Zeleqe

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Declaration

I at this moment declare that this Master Thesis entitled “The effect of land use planning and implementation on the urban environment: The case of Dukem sub city, Bishoftu town; Ethiopia.” 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

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Acronyms

AONBs	Areas of Outstanding Natural Beauty
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management System
EPE	Environmental Planning in Ethiopia
FAO	Food, Agricultural Organization
FGD	Focus Group Discussion
INTOSAI	International Organization of Supreme Audit Institutions
ISO	International Standard of Organization
LUP	Land Use Planning
LUPRD	Land Use Planning and Regulatory Department
MFUD	Ministry of Federal Urban Development Bureau
NGOs	Non-Governmental Organizations
NYC	New York City
OCED	Organization of Economy Co-Operation and Development
RUPI	Regional Urban Planning Institute
SEA	Strategic Environmental Assessment
SP	Structure Plan
UNEP	United Nations Environment Program
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America
WALGA	Western Australian Local Government Association
WGEA	Working Group on Environmental Auditing

ABSTRACT

Nowadays urbanization, environment, and climate changes are the main issues in developed and developing countries. Therefore, in any development planning of a given urban center considerations of environmental problems are mandatory. This study, therefore, is undertaken effect of land use planning and implementation on the urban environment: The case of Dukem sub-city, Bishoftu town; Ethiopia. The study used a descriptive research method. To undertake the study both primary and secondary data have been employed. As a primary data tool, a questionnaire for 60 households, interviewees for six professionals and officials, and two focus group discussions have been utilized. To analyse the effect of land use planning and implementation on the urban environment: The case of Dukem sub-city, the data will be, an aerial photograph from Bishoftu City Urban Land Development. The result of the study reveals that the land use planning and its implementation were ineffective as a result of the problems of the preparation of the plan due to lack of public participation, shortage of the given time in plan preparation, lack of commitment of officials, shortage of implementation tools, skill manpower, community awareness and lack of finance to implement the plan. These situations, in turn, have resulted in an unhealthy natural environment in the town through various urban development activities such as abattoirs, waste disposal, urban greenery, etc. Moreover, insufficient urban greenery coverage, poor waste disposal management, noise and air quality, and poor environmental management have led to several social and health problems, environmental pollution, and poor urban image. Among the recommendations forwarded by this study, due consideration should be given to entertaining the greenery areas sufficiently as per the planning, relocation of incompatibly and unsuitably implemented land uses, boosting the financial collection capacity of the municipality, and increasing all possible expenditures for plan implementation and facilitation can be mentioned.

Keywords: Dukem Sub City, Environmental Problem, Land Use Planning and Plan Implementation,

CHAPTER ONE

1.1 INTRODUCTION

This study is concerned with land use planning and implementation with Environmental issues of the basic plan of the Dukem sub-city Bishoftu town in Oromia region State whether it considers basic environmental issues or not, and what looks like its implementation about the conservation of the urban environment. Hence the first section of the study included the background of the study, problem statement, research objectives, research questions, definition of key terms, the significance of the study, the scope of the study, description of the study area, and methodology.

1.2 Background to the Study

Land-use planning is the process of guiding and controlling the development and use of land, to promote the health, safety, convenience, and general welfare of the community. It seeks to promote the right development in the right place and at the right time, and it represents a process of designing and re-designing the environment (Lam, 1997).

Protecting and improving the urban environment is becoming a necessity rather than a luxury because rapid urbanization in the developing world is threatening health, the urban environment, and urban productivity (Emanuel, 2010).

Urban land use decisions are critical determinants of environmental quality. Distortions in urban land markets and ineffective land management policies and practices in developing countries have resulted in air pollution; degradation of environmentally fragile land occupation of hazard-prone areas, and the loss of cultural resources, open space, and prime agricultural land (Emanuel, 2010).

According to Merga, 2012 population growth, industrialization, and urbanization are the three main causes of environmental problems. This is due to the introduction of undesirable materials into a physical environment like soil, water, and air may in turn interfere with human health, the quality of life, and nature.

Given sustainable development, land use planning is seen as a political and technical administrative decision-making process agreed with social, economic, political, and technical factors, for orderly occupation and sustainable use of the land under development. On the other hand, it seeks regulation and promotion of the location and sustainable development of human settlements, economic and social activities, and spatial physical development, based on the identification of potentialities and limitations that consider

environmental, economic, sociocultural, institutional, and geopolitical criteria. (Lee & Yeo, 2018; Von Haaren et al., 2016)

By and large, these parameters are put in place to make sure that the environment is protected during land use or land development. Indeed, based on the recommendations of the United Nations in its Habitat conference, the land is assigned high importance for the development of human life as it is the fundamental support for its permanence and development, this being the most important objective of the policy of human settlements. That is, the land resource is recognized as an essential element, which supports the social, political, and economic formation of society. As mentioned earlier, the use of land refers to the occupation of a certain area according to its agrological capacity and therefore its development potential, it is classified according to its location as urban or rural, and it represents a fundamental element for the development of the city and its inhabitants since it is from these that its urban structure is formed and therefore its functionality is defined. For this reason, there is a need to ensure sustainability to ensure that we continue to enjoy the benefits that come from urban planning and to ensure that future generations will continue enjoying these benefits.

To guarantee this, land use planning comes into the fold. In a broader sense, this is a tool through which the State defines the type of use land will have within a settlement, e.g. a city, while also determining the guidelines for its use to ensure effectiveness and sustainability. Land use, in this case, is assigned based on the physical and functional characteristics that they have in the urban structure, and to occupy the space in an orderly manner and according to their physical capacity (occupation of areas suitable for urban development and environmental sustainability), which finally it translates into a harmonious growth of the city. This tool is structured through a planning system at the national and local level, which establishes the general guidelines that should be taken into account for the development of urban development. Here, the authorities involved might formulate several restrictions to guarantee sustainability, for example, banning land development in riparian zones or national parks. The goal here is to protect the environment.

Throughout the world, there are rising levels of environmental degradation due to unclean energy usage in the development and powering of cities and neighbourhoods. In the 20th century, there was a global push to develop large cities quickly to accommodate the people who were migrating from

rural areas to cities for jobs. The type of energy used for this was either coal or oil fuel, which meant that the environment was disregarded and damaged by numerous urban development projects (Ziegler, Edward H. (2009-07-10)

Today, the United Nations has found that over half of the world's population lives in cities that are still growing. To create environmentally viable urban landscapes, the UN advocated for green energy use, as well as urban development that encouraged green-friendly transportation. In the United States, about 75% of the energy used is allocated to power buildings and modes of transportation; land use planning can be a useful tool in changing these aspects of energy usage in a way that would be beneficial to both residents and the ecology. (Mercier, Jean (June 2009)

If these problems are not well considered in urban plan preparation and implementation, they may be further intensified even beyond their surrounding area. Thus, bearing these environmental problems into consideration this particular study focuses on assessing environmental issues during land use plan preparation and its implementation in the study area. (Merga, 2012)

According to Abebe (2012), there are informal housing constructions and extensions in all areas of the town, especially at the peripheries. The population of the town has been raised and consequently, the need for residence homes has become serious. Since town growth is a continuous process, it is critical to stop its horizontal expansion using the spatial mapping of GIS and RS techniques. It is also important to quantify important driving factors and key players to determine the effects of urban sprawl on changes in land use and land cover.

Dukem sub city Bishoftu town in Oromia Regional State. Like other towns have a growing urban population, which has an impact on environmental management. Nowadays it is common to see open spaces changed for other land use, improper waste management, and pollution in the town. Hence environmental degradation is increasing from time to time. As the situation is getting worse, it needs great attention because environmental degradation may affect the recreational, aesthetic, ecological, economic, and social values of the natural environment which is directly related to human life. Taking the seriousness of environmental issues into consideration, this research proposal aimed to evaluate land use planning and implementation concerning environmental aspects of Dukem sub-city Bishoftu town. It is expected to identify major environmental problems and forward recommendations.

1.3 Statement of the Problem

Human activities have a profound effect on the natural environment. On the other hand, most land use plans have not been comprehensive enough to respond to the demands of urban people as they are becoming the main agents of environmental degradation for their survival. In this regard, the issues are common even in worse conditions in small urban centers of developing nations like the Dukam sub-city of Bishoftu town have been exposed to such environmental degradation. this is due to the rate of population growth, industrialization, and urbanization

According to EPE, 1997 currently the housing backlog in Ethiopia is very high, meaning that there is a low level of housing provision and the existing ones are of poor quality and are substandard. 48 percent of the houses in the urban centers other than Addis Ababa are not provided with sanitation facilities. The lack of such sanitation facilities and sewerage lines resulted in outdoor defecation creating serious environmental pollution and associated health impacts; rivers and streams, found in urban centers are thus becoming open sewers that cause infections due to diarrhea and other diseases.

Urban centers- developing countries have continued to experience bad and ugly urban situations such as air, noise, and water pollution, poor sanitation, ill-planned settlements when characterized by congestion, inaccessibly and weak drainage systems, and involved poor implementation of environmental land uses (Juilet A, 2007). Despite the existence of an approved plan for a Dukem town, these and other environmental problems are observable facts of the town and hence it becomes necessary and sufficient to assess what the basic plan contributes to alleviating such urban environmental problems because they are still posing a great challenge to the liveability and sustainability of the town.

Even though some academics have conducted prior research on the assessment of land use planning and implementation in various metropolitan areas, there is still work to be done in Dukem town. To examine two of them, let's start with Yohannes Dukalie's master's thesis at AAU, "Assessment of Urban Plan and Design, Implementation and Management in the Case of Dilla Towns." "Evaluation of Land Use Planning and Implementation Concerning Environmental Issues in Sululta Town" (Merga, 2012) is the title of Merge Mekonnen's second master's thesis at AAU.

These two studies were unable to assess the impact of changes in land use on land use functions assigned to environmental elements such as green spaces and open spaces, and

they were also unable to demonstrate. They only considered the degree to which land use in their study cities changed from one use to another, and how more open spaces are impacted by these changes than other land use functions. Furthermore, these two studies were unable to assess the town administration authorities' total institutional capacities and blamed a "lack of knowledge (skill)" as the only factor contributing to the institutions' inability to carry out urban plans effectively. Unlike these earlier studies, however, these aim to assess the effects of land use changes on those land use functions assigned for environmental uses as well as all other factors, such as a lack of funding, expertise, manpower, and logistics, that contribute to Dukem Town's inadequate environmental management and protection. It will also offer workable solutions for weak management and protection of the environment in Dukem town and will propose practicable solutions for those noted difficulties with environmental factors.

1.4 Objectives of the Research

1.4.1 General Objective

The general objective of this research is to evaluate the effect of land use planning and implementation on the urban environment: The case of Dukem sub-city, Bishoftu town; Ethiopia

1.4.2 Specific Objectives

In alignment with the aforementioned general objective, the specific objectives include:

- To assess the existence of environmental considerations during the preparation of the land use plan in the Dukem sub-city of Bishoftu Town;
- To evaluate the extent of plan implementation regarding environmental aspects;
- To examine the institutional capacity of concerned bodies in land use planning and implementation process and
- To suggest recommendations for the identified problems.

1.4.3 Research Questions

- To what extent does the land use plan preparation process consider environmental aspects?
- What is the extent of land use plan implementation regarding environmental aspects?
- What is the level of institutional capacity of concerned bodies in the planning and implementation process? And
- What should be done to solve the problems

1.4.4 Significance of the Study

The study generally gives due attention to land use plans and the implementation of basic plans for environmental issues in Dukam town. It furnishes the most important and first-hand information regarding issues of the environment resulting from land use planning and implementation in the study area.

Furthermore, the importance of the study is believed to identify areas of environmental sensitivity and exposure to conflict in the study area. This particular study is also helpful for the researcher in the area of academic performance as it is a prerequisite for the award of an MSc degree in urban planning and design

It also provides baseline knowledge for other researchers and policymakers serving as reference material for their further study.

1.4.5 Scope of the Study

The study thematically focuses on land use planning and implementation with environmental issues to which the plan addresses the real problems of the town. Spatially the study is limited to Dukam sub city Town. The temporal scope of the study will be limited to the year 2016_2023 which is 7 years back to the preparation of the basic plan

1.4.6 Limitation of study

Sufficient funds, time, disorganized data, and lack of awareness among government agencies and pedestrians all of which are main data sources will be some of the restrictions on this research. Nevertheless, the researcher made every effort to overcome these obstacles by setting up a series of awareness Focus Group members and conducting interviews with individuals before the real data collection period. The researcher triangulates data from multiple sources that it deems relevant to address the issue of disorganized data

1.4.7 Organization of the paper

The overall paper will be organized into four chapters. This was covered in the background to the study, the problem statement, the research objectives and questions, the significance, the scope, and organization of the paper. Chapter two was a Literature Review on Theories and practices of global and local approaches for integrating environmental issues into urban planning and implementation. Chapter Three the research methodology employed in undertaking the study. The data analysis and discussion of results was the subject matter of chapter four while the final chapter presented the major findings, recommendations, and conclusion of the study.

1.4.8. Conclusion

The main aspects that were addressed in chapter one includes the introduction, background, and problem statement of the study. The chapter also discussed the purposes, objectives, and questions of the study. Significance, scope, description of the study area, limitations of the study, and the mechanisms used to overcome the limitations are also presented in this chapter. Following this the theoretical and the empirical literature relevant to the objective of the study have been reviewed in the next chapter.

CHAPTER TWO

2. LITERATURE REVIEW

2.1. Introduction

This thesis's second portion is a review of relevant literature. The theoretical and empirical aspects of the literature were evaluated during the review process. In the theoretical review section, terms and concepts such as urban planning, land use, plan implementation, pollution, waste disposal, open space, land use planning, environmental planning, and environmental aspects of land use planning as well as current global environmental challenges were briefly discussed. The best ways other nations have addressed the negative effects of environmental issues and the policies and regulations that the Ethiopian government has supported intending to safeguard the environment are evaluated in the empirical review section. What can be learned from other nations, as indicated by the analysis of relevant literature?

2.2 Theoretical and Conceptual Literature Review

2.2.1. Definitions of Key Terms

Urban Planning: - This can be defined as the design and regulation of the uses of space that focus on the physical form, economic functions, and social impacts of the urban environment and the location of different activities within it (Woynishet, 2015).

Land use – Land use involves the management and modification of the natural environment or wilderness into built environments such as settlements and semi-natural habitats such as arable fields, pastures, and managed woods. Land use by humans has a long history, first emerging more than 10The process of managing and transforming the wild or natural environment into a built environment, which includes towns and semi-natural habitats like managed forests, pastures, and arable fields, is referred to as land use. The management of land for different uses, including mining, forestry, agriculture, and urbanization, is referred to as land use (Sinha et al., 2016). Land Use and Land Cover can be shortened to LULC. The term "LULC change" describes the detection and monitoring of long-term changes brought about by local, regional, or global human or climate-related factors. The goal of the plan is to provide a more thorough understanding of the information classes by developing a framework for classifying digital images,000 years ago (Zerboni, Andrea (2019-08-30)

Plan Implementation: -is a systematic process of transferring the prepared plan into practical action to produce the desired output (MUD, 2010)

Pollution: - can be defined as any action or condition interrupting on land, air, or water, which is detrimental to health, sanitation, or the public interest (Merga, 2012).

Urban Open Space: - is open space areas for parks, green spaces, and other open areas. The landscape of urban open spaces can range from playing fields to highly maintained environments to relatively natural landscapes

Environmental Aspects: – these are the municipal activities that have the potential to interact with the environment in some way, potentially posing a risk if they are not managed appropriately (Guidebooks, 2004).

CLASSES	DEFINITION
Water	Areas where water was predominantly present throughout the year; may not cover areas with sporadic or ephemeral water; contains little to no sparse vegetation, no rock outcrop nor built-up features like docks; examples: rivers, ponds, lakes, oceans, flooded salt plains.
Vegetation Area	These are areas dominated by densely populated trees and woodlands, in which the landscape is covered by small trees or urban green space vegetation. Examples: wooded vegetation, clusters of dense tall vegetation within savannas, plantations, swamps, or mangroves (dense/tall vegetation with ephemeral water or canopy too thick to detect water underneath).
Agriculture	Agricultural lands are land cover devoted to the representing cultivated crops or arable lands. It is land covered with various teff, corn, maize, beans, and other crop production. Examples: corn, wheat, soy, and fallow plots of structured land.
Bare Land	This land is covered with grasses (open area) or no grass and mainly covered with bare rock gravel pits pavement soils or other earthen material etc. it is a Vast portion of land (infertile) where plant growth may be spared, stunted, and /or contain limited biodiversity. It is also lands affected by toxic or infertile soil, mining areas, and climatic conditions are often key factors in poor plant growth and development. Areas of rock or soil with very sparse to no vegetation for the entire year; large areas of sand and deserts with no to little vegetation; examples: exposed rock or soil, desert, and dunes, dry salt flats/pans, dried lake beds, mines.
Built-up Areas	Human-made structures; major road and rail networks; large homogenous impervious surfaces including parking structures, office buildings, and residential housing; examples: houses, dense villages/towns/cities, paved roads, and asphalt.

Basic Plan: is one type of urban plan that can be held within the framework of the structural plan, a 10-year implementation-oriented urban plan that focuses on major spatial and infrastructure components while due attention is also paid to environmental, social, and economic issues both a document and maps which among others incorporates basic development direction of small towns and major land use activities (MUD, 2010).

Land cover: It is essential to comprehend the meaning of Land Cover (LC) dynamics before starting the study. The physical components of the Earth's surface, such as vegetation, water, bare land, built-up, agriculture, and man-made features, are referred to as land cover. Changes in land cover can occur over time as a result of both human and natural factors. The study of these alterations, their underlying causes, and their effects is known as land cover dynamics

Image analysis: Digital image processing was manipulated and interpretation of digital images with the aid of a computer. Therefore, this process analysis was commonly based on four image analysis processes used for analysis.

Land use Land cover (LULC) mapping: The actual modification of the world's earthbound surface because of human exercises is regularly the alleged Land use land cover (LULC) change all over the planet. This adjustment of land by people to acquire business and different basics has been there for millennia; the degree, power, and pace of LULCC are far more prominent now than were before. These progressions are the main impetuses for nearby, local, and worldwide level remarkable changes in biological systems and ecological cycles.

Land use land cover displaying is an interaction that measures the ebb and flow of land assets and how they are changing into a progression of topical classes, like woodland, water, vegetation, build, and cleared surface (YIRSAW, 2017). A few investigations have decided in favor of land use and land cover change displaying (Balakeristanan and said 2012: Rawat and Kumar, 2015: Butt, 2015 Cheruto, 2016. For example, to measure the nearby changes in Makueni country, Kenya from 2000-2016. Cheruto (2016) tracked down critical land change.

For the most part, land use and land cover changes affect natural and scene credits including the nature of water, land and air assets, environment cycles, and works (Rimal, 2011). Consequently, the utilization of remote detecting information and investigation procedures gives exact, opportune, and point-by-point data for recognizing and observing changes in land cover and land use.

Land use land cover (LULC) change detection: Following the supervised classification of imagery post-classification change detection Algorithm will be performed to determine changes in land cover. This post-classification approach provides statistical evidence on how land cover has changed and is used to calculate and map land cover changes over time. Support Vector Machine (SVM) Classification separates classes with a decision surface that maximizes the margin between classes and can function as a multiclass classifier by combining several binary SVM classifiers.

2.2.2 Land Use Planning

Land use planning is the preparation of a planning document it is a repetitive process that leads to an optimal and sustainable use of the land. The Use of the land is taking different forms. Concentrated uses are settlements and irrigated agriculture to less intensive uses such as livestock production, forestry, or nature reserves. The same piece of land can be used for more than one purpose at the same time like forestry and livestock production or have different uses during different periods of the year, rain-fed cropping during the wet season, followed by grazing during the dry season (Venema, 2009).

In other words, Urban land use is the spatial distribution or geographical pattern of urban land use functions, which includes residential, administrative, commercial, services, transportation and communication, industrial, recreation and formal-green, forest and informal green, urban agriculture, and special or other functions.

According to Babette, 2011 Land use planning is flexible and adaptive because its methods can be modified to suit particular circumstances. This means no blueprint approach defines the steps, procedures, and tools applied. Land use planning should rather be designed according to the needs, demands, capacities as well as the rules and institutional structures in place and follow the principles presented above.

The availability of urban land is potentially huge in almost all major cities in the world. Railways, public work, public utility properties, vacant lots, cemeteries, and industrial lands form a major proportion of built land that has been, and remains, ineffectively used. But the amount and type of land vary from the unexpected political, economic, and urban renewal condition of each place, and also provides the prerequisites for achieving a sustainable form of land use, which is acceptable as far as the social and environmental contexts are concerned and is desired by the society while making sound economic sense (WGILP, 1999).

To conclude Land use planning is a process of efficient and effective use of scarce resources for various urban activities evenly distributed through the urban centers to ensure accessibility for all urban dwellers which makes urban life easy. Even if, it is affected by several factors, planning professional abilities of our various models to develop urban land for optimal urban development would have a major contributing effect. On the other hand, uneconomical and the no sustainable use of urban land has been a negative influence on current and coming generations economically, socially, and environmentally.

2.2.3. Land Use Planning Considerations

There are different Land use considerations First, identifying objectives and principles about residential, administration, commercial, services, Transportation and formal green, forest and informal green, urban agriculture, and special or other functions; second focuses on the nature and pattern of development within the existing city boundaries; Third, looking at the area of land surrounding the community, area of influence, existing land uses and factors affecting the present and future land uses; Fourth integrating the analysis and findings of the proceeding sections and then exploring and identifying different tools which could be used to implement the proposed plan. Some of these land use plan implementation tools are standards, plans, date policies urban land-related regulations, and different actors who will participate at different stages in the process of operational functions (SP, 2011).

2.2. 4. Environmental Planning

Environmental planning is the process of helping the administration to carry out land growth accompanying concern given to the nature, and public, political, financial, and government determinants and provides a complete foundation to solve sustainable consequences. The main aim of the environmental preparation search is to design sustainable societies, that aim to conserve and safeguard immature land (Beathley and Timothy, 1995). Tangible planning concerns in the administrative processes are necessary for friendship management that lives inside and between natural orders and human arrangements. The tangible planning exercises to accomplish, these processes in a persuasive, orderly, see-through, and impartial manner for the benefit of all elements inside specific systems of the and the future. Existing material planning practices are the result of unending cleansing and growth of the scope of the aforementioned administrative processes. Public and economic happening, City development, Provincial growth, Raw material management& joint land use, Foundation schemes, and Governance foundations are a few of the main details of present-day incidental preparation (UC, 2015).

On account of this, the environmental preparation appraisals involve areas to a degree land use, socio-commerce, transportation, financial and place of accommodation traits, air pollution, loud noises, the wetlands, residence of the imperiled species, the area affected by a general disaster susceptible Ness, seaside zone deterioration, and ocular studies between others, and is referred to as a Joined environmental preparation amount. It is the strength to analyze material issues that will promote fault-finding decision-making. This incidental preparation is a key process to form a sustainable, liveable, and occupied society. It is the

base for all other happenings and guarantees for future creation. As a result, allure result in it demands cautious decisions in Referring to practices or policies that do not negatively affect the environment preparation process.

2.2.5 Guiding Principles for Environmental Planning

Leading Principles for Material Preparation Two principal incidental concerns during rebuilding: replacing damage to the atmosphere from a disaster and underrating the material impact of the rebuilding process itself. Ecological concerns concede the possibility of rule site preparation in new conclusions. Explanation methods, construction designs, and choice of fabrics all have a tangible impact; they should depend on local practices while being environmental. On any occasion, possible trouble debris can be reused during rebuilding. Still, materials that may be injurious to traders or the environment, to a degree resistant to burning or poisonous substances, must be trained cautiously. Accidents almost always have negative tangible impacts, from damage to the environment to the production of colossal quantities of waste. Post-accident rebuilding can either be an opportunity to address these impacts and existing for some time material problems in the trouble locale or it can cause a second wave of damage. The choice to be honest with decision-creators is the reason for the evaluation, planning, and exercise of rebuilding programs (Abhask and others, 2010). The assessment admits the trouble's incidental impacts to be recognized and arrangement areas for healing operation expected determined. Tangible and tangible preparation presents opportunities to resolve and rebalance the friendship between the built surroundings and nature. In the exercise, actions may be captured that aid incidental recovery, lighten the impacts of the rebuilding itself, and promote general tenable happening goals. Finishes for Referring to practices or policies that do not negatively affect the environment Preparation The importance of society's partnership in all stages of environmental preparation and estimate is definite. Public hearings, held to update the society on environmental evaluations and projected conduct, can bring together all colleagues, including project patrons, environmental instrumentalities, NGOs, residents, and project-overwhelmed persons (Abhas and others, 2010)

2.2.6. Tools for Environmental Planning

is a netting-located application providing a smooth approach to a range of relating to space data having to do with administration at local and more extensive scales. It has been created to support enough concern of environmental issues all along all steps of land use preparation. The purpose of the Environmental Preparation Form is to provide current, smooth-to-access

facts on material concerns, to inform land use preparation and calculated advantage management, Increase the moment of truth adeptness of Municipality officers when evaluating incident or land use change suggestions. This user guide takes consumers gradually through logging in and utilizing the main functions of the Material Preparation Tool (EPT). Counseling on by what method to define the spatial news feasible through the Tangible Planning Form is usable through the additional document, the Explanatory Outline. The Descriptive Outline collates dossier writings and interpretations for datasets illustrating a range of tangible issues. All dataset titles that are underlined in the EPT drawing sidebar or the Material Concerns Reports are connected to explanatory content inside this document. The Forms also bear be second hand as a conclusion support tool, planned to bring about more efficient personal computer amount of projected land use changes. It is not intended to expect a stand-unique, comprehensive environmental amount (WALGA, 2014).

2.2.7. Planning Tools

Echo and Hazard Mapping (EHM): Serves as a simple, systematic, and visual tool that aids in post-disaster reconstruction planning by using maps and plans of cities, neighborhoods, and buildings. The mapping process involves multi-stakeholder participation. Participants mark all environmental aspects, hazards, and risks on plans and maps that contribute to the formulation of post-disaster recovery plans (UN-HABITAT, 1998)

Environmental Profiles: is a specialized urban planning tool that focuses on the environment and it works to provide a common understanding of how a city's economic sector interacts with the environment in terms of resources and hazards; it provides information about the institutional framework of a city's management system; and helps both to identify and activate local stakeholders with interests in development and the environment. An environmental profile is normally quickly assembled from existing information and data, not through expensive and time-consuming research (Alliance, 2007).

2.2.8 Implementation Tools

Environmental Management System: Used as a problem-solving and problem-identification tool based on the concept of continual development. EMS forms the core of the international environmental standard ISO 14001. The EMS adopts the Plan-Do-Check-Act cycle to develop environmental policies; frame the EMS; and implement, review, and revise the performance (Abhas et al, 2010).

Environmental Management Plan: An Environmental Management Plan (EMP) is used to monitor the impacts and mitigation measures agreed to in the EIA of a specific project. How to Do It: Carrying out an Environmental Impact Assessment and Environmental Monitoring of Reconstruction Projects, for carrying out an EIA and implementing an EMP (Abhas et al, 2010).

2.2.9. Environmental Aspects of Land Use Planning

In the last few decades, important changes have occurred in the quality of the built environment. There have been serious effects on climate, biodiversity, and natural resources because of rapid industrialization and urbanization. With the pressure of development on green fields, urban green areas become small, scattered, and polluted. The development of transportation networks caused negative impacts such as energy consumption, emission of air pollutants, traffic congestion, and noise. On the other hand, the degradation and depletion of urban landscapes threaten the health-related quality of life of the population. Due to the causes of these environmental problems, revising the current urban policies and developing new planning models for sustainable urban development becomes necessary (Mersal 2015)

To achieve sustainable urban development, cities must be planned and managed to form a balance between human beings and the natural environment by using resources carefully and transferring them to the next generations. To protect and enhance the environmental conditions of future generations, it is essential to provide the sustainability of urban ecosystems. Therefore, the concept of ecological planning (eco-planning) becomes a functional requirement in achieving a sustainable built environment. It is an effective tool that aims to form an urban development in harmony with ecological, social, and economic values.

Environmental issues in land use are related to a combination of many complex natural and human-induced phenomena. The transformation of natural and semi-natural ecosystems by deforestation, cultivation, urbanization, intensification and mechanization of agricultural practices, overexploitation of animal populations, global warming, desertification, and general pollution are all direct and indirect causes of accelerated environmental degradation. (INTOSAI WGEA, 2013).

Conventional urban planning rests on a faith in growth and utilizes a mechanistic approach. Three important ideas seem to require rediscovery as part of town planning:

The positive qualities of density in walking-based centers and sub-centers linked by transit;

The positive qualities of mixed land use, as opposed to rigid and separated zoning; and

The positive qualities of natural processes and localized community are processes in the city.

The paradigm shift from economic development to sustainable development requires that cities be built on a more respectful interrelationship of economic, social, and environmental well-being.

Conventional planning is about nudging and accommodating prevailing trends, but ecosystem planning is about choosing and pursuing a desirable future (Marsala, 2015).

2.2.10 Current Global Environmental Problems

At this time, a powerful and complex web of interaction is contributing to unprecedented global trends in environmental degradation. These forces include rapid globalization and urbanization, pervasive poverty, unsustainable consumption patterns, and population growth. Often serving to compound the effects and intensity of the environmental problems described in the previous section, global environmental challenges require concerted responses on the part of the international community. Global climate change, the depletion of the ozone layer, desertification, deforestation, the loss of the planet's biological diversity, and the transboundary movements of hazardous wastes and chemicals are all environmental problems that touch every nation and adversely affect the lives and health of their populations (Anand, 2013).

According to Anand, 2013; even though there are various forms of environmental challenges in the world, the following are major issues that get due attention globally in this century. All these issues are related to each other in some or the other way, and hence, tackling them one by one has just become difficult.

Climate Change: Some of the most obvious signs of climate change include irregularities in weather, frequent storms, melting glaciers, rising levels of the sea, etc. Going by the prevailing conditions, it is not difficult to anticipate that the planet is heading for a dramatic climate change, somewhere in, the near, future (Zulfequar, 2013).

Conservation of Species: Over the last century or so, several plants and animal species have become extinct thus resulting in a major loss of the biodiversity of the planet (Anand, 2013).

Energy Crisis: The fact that we are largely dependent on fossil fuels for our energy requirements has made us significantly vulnerable to severe energy crisis. Though, quite a few renewable energy sources have been identified, none of them have been promising

enough when it comes to the replacement of fossil fuels as the major source of energy for mankind (Anand, 2013).

Exploitation of Natural Resources: is an essential condition of human existence, throughout the history of mankind; humans have manipulated natural resources to produce the materials they needed to sustain growing human populations. This refers primarily to food production and economic development, but many other entities from the natural environment have been extracted. Natural resources are an important material basis for a stable natural economy and social development, they can be divided into two; the exhaustible: such as minerals, and the inexhaustible: such as forests and grasslands, with industrialization and urbanization mankind's great demands for natural resources and their large-scale exploitation and their consumption has resulted in weakening, deterioration, and exhaustion of these resources (Bagana. G, et al., 2012).

Land Degradation

Land pollution, owing to human activities, and desertification, due to loss of vegetation have left the surface of the planet unsuitable for human use. Land degradation can be attributed to the fact that we have become too laid-back in terms of preservation of the nature. Improper soil use, haphazard waste disposal, large-scale deforestation, and other such human activities harmful to nature are on the rise, something which has invariably taken a toll on our natural surroundings (Zulfiqar, 2013)

Nuclear Issues: Nuclear power does have high potential, but the problems associated with it are no less. Radioactive waste from nuclear power plants is one of the major problems we are likely to face, especially if safety regulations are not followed properly (Anand, 2013).

Overpopulation: As the population of the world continues to soar at an alarming rate, the pressure on the resources of the planet is increasing. These problems associated with overpopulation range from food and water crisis to a lack of space for natural burial (Ibid).

Pollution: This is perhaps the most obvious, yet most ignored global environmental issue in this list of environmental problems. The term 'population' in itself has several other aspects, prominent ones among which include air pollution, water pollution, and land pollution (Ibid).

Waste Management: - is intended to reduce adverse effects of waste on health, the environment, or aesthetics. For all kinds of waste, whether generated during the extraction of raw materials, the processing of raw materials into intermediate and final products, the consumption of final products, or other human activities, including municipalities like;

residential, institutional, commercial, agricultural, and social like; health care, household hazardous waste, sewage sludge (Puopiel F, 2010)

These were some of the major global environmental issues and problems that have been threatening the planet for quite some time now. However, the environmental issues the planet faces today are not just restricted to the list given above. Several issues, including problems due to the construction of dams, genetic pollution, etc., are surfacing every other day, thus making the list of global environmental issues longer. If we don't start attending to these issues one by one, the moment is not far when we will have no option left but to surrender to these environmental issues (Anand, 2013).

2.3. Empirical Literature Review

Best Practices of Other Countries

2.3.1 Plans for USA Cities Considering Environmental Sustainability

Sustainability is explicitly considered in most plans of the USA. For instance, Atlanta Plan 2040 builds its entire plan around sustainability as the central focus point; Envision Utah's premise is a departure from business-as-usual and a focus on moving toward more compact and sustainable growth; the Brookings Metropolitan Plans identify the green business as the economic opportunities for the future; NYC is often referred to as a sustainability plan and it emphasizes transit, water and air quality; and so on. Even when sustainability is not the explicit focus, however, almost all the plans mention the importance of more compact growth, preventing sprawl, developing denser and more walkable neighborhoods, a greater emphasis on public transit, and preservation and conservation of natural resources. (For instance, the Chicago and Atlanta plans talk about the focus on water conservation.) All these references point to a nationwide trend of planners recognizing the residents' demand for denser urban environments and more green development (Shriya and Jorge, 2011).

2.3.2. New Zealand Land and Water Forum

One of the most important programs is the Land and Water Forum. The Government of New Zealand has been investigating new ways of making decisions about scarce resources. Funded by the Government, this is a collaborative approach comprising a diverse range of primary industry representatives, e.g., farming organizations, environmental and recreational NGOs, Kiwi groups representing indigenous people, and other organizations with an interest in freshwater and land management. These are joined by local and central government observers (INTOSAI WGEA, 2013).

In 2009, the Forum was asked by the Government to conduct a stakeholder-led collaborative process to recommend reform of New Zealand's freshwater management. In September 2010, the Forum reported back to Ministers identifying shared outcomes and goals, and options to achieve them. It then undertook a public consultation on its recommendations throughout New Zealand and in April 2011 provided Ministers with its findings, recommendations, and thoughts.

In response, the Government launched a package of water policy initiatives in May 2011 in line with the Forum's recommendations, to improve the way water is managed. These included the National Policy Statement for Freshwater Management (which provides central government direction to regional councils), a \$35 million Irrigation Acceleration Fund, and the \$15 million Freshwater Cleanup Fund. The Government also asked the Forum to continue its role as a consensus builder among water stakeholders and provide further, more detailed, recommendations on the remaining policy issues in 2012.

The Forum's work in 2012 was split into two reports. The first report advised on setting limits for water quality and quantity, and improvements to decision-making. The second report provides advice on how to manage to limit, including the allocation of freshwater resources, and additional tools to manage the effects of land use on the water. In early 2013, the Government began a further consultation process on options identified by the Forum.

2.2.3. Areas of Outstanding Natural Beauty (AONBs) in England, Wales and Northern Ireland

The primary purpose of the AONB designation is to conserve natural beauty – which by statute includes wildlife, physiographical features, and cultural heritage, as well as the more conventional concepts of landscape and scenery. Account is taken of the need to safeguard agriculture, forestry, and other rural industries and the economic and social needs of local communities. AONBs have equivalent status to National Parks as far as conservation is concerned (INTOSAI WGEA, 2013).

AONBs are designated under the National Parks and Access to the Countryside Act 1949, amended in the Environment Act 1995. The Countryside and Rights of Way Act 2000 clarifies the procedure and purpose of designating AONBs.

National Parks: - In England and Wales, the purpose of National Parks is to conserve and enhance landscapes within the countryside whilst promoting public enjoyment of them and having regard for the social and economic well-being of those living within them.

The National Parks and Access to the Countryside Act 1949 established the National Park designation in England and Wales. In addition, the Environment Act 1995 requires relevant authorities to have regard for nature conservation. Special Acts of Parliament may be used to establish statutory authorities for their management (e.g., the Broads Authority was set up through the Norfolk and Suffolk Broads Act 1988).

The National Parks (Scotland) Act 2000 enabled the establishment of National Parks in Scotland. In addition to the two purposes described above, National Parks in Scotland are designated to promote the sustainable use of an area's natural resources and the sustainable social and economic development of its communities. These purposes have equal weight and are to be pursued collectively unless conservation interests are threatened (INTOSAI WGEA, 2013).

2.3.4 National Action Program to Fight against Desertification in the Kingdom of Morocco

The National Action Program was established in 2001 with the goal, of overcoming desertification and becoming a theatre for 90% of the country. The program was designed to create strong interconnectedness among sectoral programs through actions driven upstream or downstream in the following issues:

Assist the effort made against desertification strengthening through institutional capacities and stakeholders;

Support efforts designed for revenue generation through building capacities of micro-credit institutions to finance local investment and through applying new modes of public participation;

Attention in local areas, encouraging rainwater harvesting practices and use of renewable energy sources, and expanding the coverage of pilot forest areas in an integrated manner to assist fight process against desertification and mitigate the harmful impact of drought;

Coming inventory of natural resources, widening network of ecological monitoring, creating and monitoring observatory drought to upgrade skill and monitoring methods;

Evaluation of the outcome of the program: the program has successfully resulted in fruitful effects and as a result, 579,000 ha of watershed have been facilitated, 36,000 ha of land allocated for reforestation and bank stabilization.

The program also enabled the establishment of 10 new national parks, 24 natural and biological reserves, 3 biosphere reserves, and the construction of 130 dams (INTOSAI WGEA, 2013).

2.3. 5 Integrated Land Use and Environmental Planning in Ethiopia

Until 1992, the Ministry of Agriculture had a Land Use Planning and Regulatory Department (LUPRD), which was responsible for setting up land use plans to regulate land management activities. Its priority was increasing crop productivity per unit area through the expansion of arable land into traditionally non-cultivated areas, particularly forests and grazing land. Studies were carried out in the specific disciplines of soil conservation and land resources. Seven areas-based land use planning studies encompassing a total area of 571,110 ha were successfully conducted to enhance both food self-sufficiency and the conservation and development of the natural resources of those areas. The land use planning studies conducted highlighted the degree of land pressure, the extent, the causes and processes of encroachment, and possible intervention scenarios to ease the pressure on steep to very steep lands.

The importance of utilizing indigenous knowledge to cope with land degradation is indisputable. In 2001, the government instituted a new department for Rural Development at the ministerial level with the mandate to guide the holistic development of rural Ethiopia, including resolving issues of land management. The government document on rural development is well thought out and its emphasis is on sound ecological management as the basis for soil fertility and improved agricultural production.

Now, the system has been decentralized, and Regional Land Use Planning Offices are striving to establish better institutional arrangements and develop land use policies and plans relevant to their particular conditions. These initiatives can provide a good start for achieving sustainable land use management as well as determining existing land use patterns in the various agro-climatic zones and applying suitable land use management systems.

High population growth has been and continues to be the major driving force in the exacerbation of agro ecological problems related to land use and land management. With a controlled growth of the population, family life can be improved and the pressure on the land eased. Possible intervention scenarios must be considered to ease the pressure on this rugged land. This requires, among others, continuously updated land use planning data complete with the synthesis and analysis to feed an up-to-date land use-related policy and strategy. The current situation, therefore, calls for developing a land use, study program in each region

that will aim at achieving proper land resource utilization on a sustainable basis (Venema,2013).

2.4 Policy and Regulatory Framework Concerning Integrated Land Use and Environmental Planning

2.3.3. Environmental Policy of Ethiopia

The environmental policy of Ethiopia has been endorsed in 1997 with the aim of;

Improving the environment of human settlements to satisfy the physical, social, economic, cultural, and other needs of their inhabitants on a sustainable basis;

Preventing the pollution of land, air, and water most cost-effectively so that the cost of effective preventive intervention would not exceed the benefits;

Conserving, developing, sustainably managing, and supporting Ethiopia's rich and diverse cultural heritage;

Ensuring the empowerment and participation of the people and their organizations at all levels in environmental management activities; and

Raising public awareness and promoting understanding of the essential linkages between environment and development, etc. (FDRE, 1997).

These and other provisions of the policy are included because environmental problems in urban and rural parts of the country became serious issues of development of the country, Particularly, urban development guided by some development planning efforts were not in line with the issue of conservation of urban environment affecting sustainable development. The policy also provides some key principles that reinforce the consideration of environmental aspects during any developmental activities, some of these are;

Every person has the right to live in a healthy environment;

Sustainable environmental conditions and economic production systems are impossible in the absence of peace and personal security. This shall be assured through the acquisition of power by communities to make their own decisions on matters that affect their lives and environment; The development, use, and management of renewable resources, shall be based on sustainability; The use of non-renewable resources shall be minimized and where possible their availability extended (e.g. Through recycling); Appropriate and affordable technologies

that use renewable and non-renewable resources efficiently shall be adopted, adapted, developed, and disseminated;

When a compromise between short-term economic growth and long-term environmental protection is necessary, then development activities shall minimize degrading and polluting impacts on ecology and life support systems. When working out a compromise, it is better to err on the side of caution to the extent possible as rehabilitating a degraded environment is very expensive, and bringing back a species that has gone extinct is impossible;

Full environmental and social costs (or benefits foregone or lost) that may result through damage to resources or the environment as a result of degradation or pollution shall be incorporated into public and private sector planning and accounting and decisions shall be based on minimizing and covering these costs. etc.

All these and other provisions of the policy assure the need for incorporating environmental concerns within the planning and implementation process of every activity of government and the people to minimize the negative impact of development activities on the surrounding environment. Hence, according to the policy planning and implementation process, any urban center in the country has to respect environmental conservation and sustainability.

2.5. Lesson Drawn from the Review of Literature

All the scholarly Literature reviewed to yet assures that the present global environmental issues are getting worse from time to time threatening human life and the eco-system in general. Even though there are emerging efforts in some countries to tackle the adverse effects of these environmental issues, still much has not been done and the impact of climate change and other environmental hazards are continuing to affect the well-being of the people at large.

Urban centers in the developed world take the lion's share of impacting the environment due to high emission of greenhouse gases from their largest industries and third-world countries are suffering from this effect unfortunately. Besides, developing nations like Ethiopia have to manage their urban environmental problems like air and water pollution, land degradation, mineral resource depletion, deforestation, etc. formulating appropriate policy instruments for urban and rural environmental conservation aided with a practical solution.

The planning process of urban land use plans should consider and serve as a tool for sustainable urban development rather than being a cause for urban land degradation and

unsustainable use of urban land which is a scarce natural resource. Best practices of applying measures for sustainable urban development in different parts of the world ought to be transferred to other countries and integrated effort among countries has to be made to overcome the spreading effect of climate change and global warming.

2.6. Research gap

Some of the potential research gaps found from both thematically and empirical review concerning the effect of land use planning and implementation on the urban environment: The case of Dukem sub-city, Bishoftu town; Ethiopia.: There are Limited Studies. This highlights the need for a more in-depth analysis of the specific spatial patterns in Dukem.

1. Public participation and environmental management rules have not been effectively utilized for the effect of land use planning and implementation on the urban environment: The case of Dukem sub-city,
2. Existing research does not adequately address the effect of land use planning and implementation on the urban environment: The case of Dukem sub-city. The time-series data to assess how the spatial patterns have evolved is needed.
3. Socio-economic impacts of the effect of land use planning and implementation on the urban environment: The case of the Dukem sub-city, has not been sufficiently explored in previous research. So, potential correlations between spatial patterns and socioeconomic factors, such as population growth, urbanization, and industrialization development need potential investigation.
4. Urban Planning and Policy Recommendations: It is distinct that existing studies lack practical recommendations for urban planning and policy development based on the effect of land use planning and implementation on the urban environment: The case of Dukem sub-city, this thesis focuses on deriving actionable insights to inform future planning decisions too.

2.7 Conclusion

In general, this chapter presents Conceptual or theoretical and physical framework related to the Evaluation of Land Use Planning and Implementation concerning Environmental Aspects. In the theoretical review part, the Definition of terms and concepts like Urban Planning, Land Use, Plan Implementation, Pollution, Waste Disposal, Open space, land use planning, environmental planning, and Environmental aspects of land use planning and

current global environmental challenges was discussed in brief. The empirical review part consists of the best practices of other countries in tackling the adverse impact of environmental challenges, policy, and regulatory instruments endorsed by the Ethiopian government to protect the natural environment assessed, and finally What lesson can be drawn from other countries from the review of related literature explained

CHAPTER THREE

3. METHODS AND MATERIAL

3.1. Introduction

This section presents various aspects of the methodology that was used in the research.

Description of the Study Area, Historical Foundation of the town

Research design, Research Type, Research Strategy, Research Approach, Research Dimension, methods of data collection, sampling techniques, the sources of data, data analysis and interpretation, ethical considerations, and Limitations of the study.

3.2. Description of the Study Area

Dukem sub-city was located 37km South East of Addis Ababa along the Adama-Dire Dawa- Djibouti transport axis. Geographically the study area is located by latitude 8°45'25"N8°50'30"N and longitude 38°51'55"E - 38°56'5" E covering a total area of 115.576 km².

It is located at an average altitude of 2100m above sea level. Dukem sub-city shares a boundary with Debayu sub-city in the East, Ada'a Woreda in the North, Akaki Woreda in the South, and Sheger City, Gelan sub-city city in the West directions. The population is also rapidly growing because of its nearness to Addis Ababa and its economic importance. According to the National Population and Housing Census carried out in 2015, the population of the sub-city was 28,829. The peasant association in the south with the largest common boundary with the Dukem sub-city is Oda nabe wereda. This is followed by the Tedecha wereda peasant association that is found in the northern part of the sub-city. The third largest part of the Dukem sub-city is bounded by Tedecha wereda.

Geographically, Dukem is found in the main Ethiopian rift valley near the western escarpment. Volcanic rock materials of various compositions cover the area. Due to weathering of the rock, and subsequent erosion and deposition, thick residual clay and silty clay soil cover most of the plain topographic landforms.

Topography, the elevation of the Dukam sub-city ranges from 1890m to 2300m above Mean Sea Level with an altitudinal range of 410 meters. The northeastern, northern, and eastern parts of the town are generally characterized by rugged topography. On the other hand, the southern and western parts of the Dukam sub-city have monotonous flat topography. The elevated topography in the northeastern and northern parts of the town is responsible for

determining the southwest flow direction of major perennial and seasonal streams including the Dukam River and the Gerbicha stream. There is also flush water from the Eastern Industry Zone. The rugged topography in the northern and northeastern parts of the Dukam sub-city is inaccessible with a stony landscape and steeper gradient that has an impact on the infrastructure development of the town.

3.3. Physical Characteristics of the Town

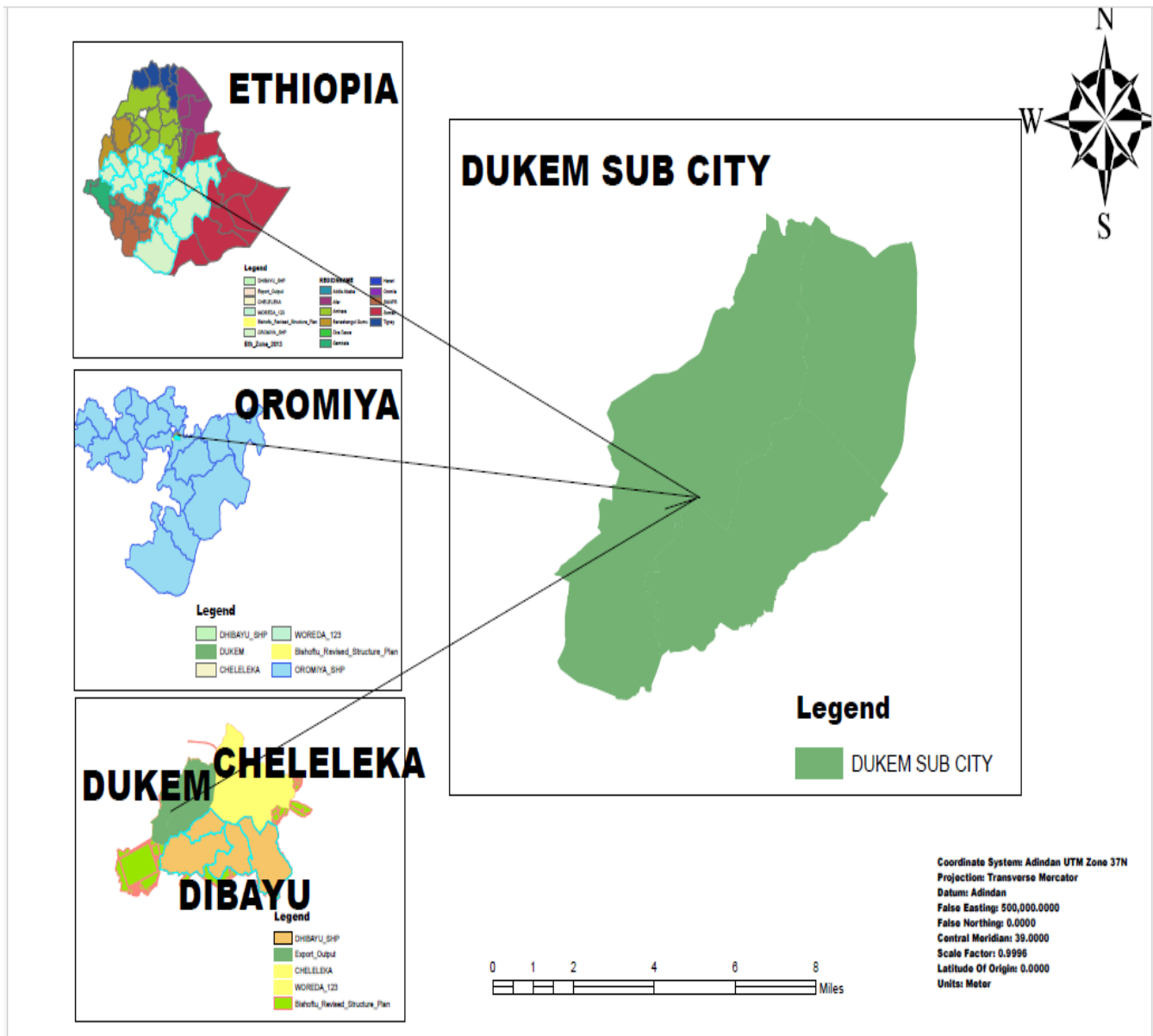


Figure 3.1: location map

Source; researcher 2024

Total area and Land use

The total area of the town is 9,630.21 hectares Its topography is mainly rugged terrain landform features with ridges and plains in all its land area dominate the town. The latitude 8°45'25" N-8°50'30" N and the longitude of 38°51'55" E-38°56'5" E.

Table 3.1: shows the numbers of the population newly merged into the city

Land use type		Area Covered In Hectare	Percentage /%/
1	Residence	3612.21	37.5
2	Commerce	204.8	2.1
3	Administration	20.8	0.2
4	Social service	246.3	2.6
5	Transport and street network	1926.9	20
6	Manufacturing and storage /Industry	1735.7	18
7	Environmental sensitive area	1883.5	19.6
Total		9,630.21	100

Source; socio-economy of Dukem sub-city

3.4. Design of Research

The conceptual framework that guides research is known as research design, and it serves as a guide for data collection, measurement, and analysis. The study's research kind, research strategy, research time dimension, and research approach were all included in the research design. Use descriptive method, which used quantitative methodologies, was conducted in the study. Instruments like questionnaires, interviews, and observation helped the study reach its goals. In addition to this, the researcher's active observation gave him the chance to see how the current land use was implemented for environmental issues. Methodological Random Sampling and in this particular study, primary and secondary data sources were combined with purposive sampling approaches. The data analysis included quantitative information, a type of sampling of purposive sampling also known as judgment sampling, which involves using expertise and judgment and is displayed with a narrative discussion using tables, photographs, maps, bar graphs, and pie charts, and analyzed using GIS 10.8 software

3.5. Type of Research

Based on this, the study's objective was utilized in a descriptive research design, which involved describing and analyzing what is happening in a setting or what is real, such as current practices, advancements, and situations about the Town's environmental concerns and land use planning and execution. Additionally, this research design was advantageously relevant in gathering specific data from a large number of respondents.

3.6. Research Approach

Both qualitative and quantitative approaches were employed. To undertake the study quantitative approach was used to obtain information through numerical data and explained and described based on the numeric data obtained through a questionnaire whereas the qualitative method was used to describe the opinions of the respondents through interviews, focus group discussion, and personal observations.

3.7. Methods of Data Collection

Primary Data: Field data on the ground were collected by direct observation at the study area. The researcher observed and collected the necessary camera information about the existence of urban sprawl. Primary data was also obtained by questionnaires from users, residents, occupants, and workers of the area concerning their opinions, difficulties, and problems with the Level of urban expansion as well as the migration it caused. Furthermore, primary data will be emanated from studying levels of urban sprawl in the study area.

Secondary Data: There are data collected from Land sat images, Land sat data types 1996, 2023 acquired in the same season December and October, level of resolution (30m), Map projection = "UTM", Projection units = "meters", Datum and Ellipsoid= "WGS84" and UTM zone = 37. The False Color Composite (FCC) images are useful to distinguish between different cover types or ground objects like buildings, roads, and vegetation. The FCC of RGB= bands 4, 3, and 2 have been chosen for this research. The urban areas appear blue, the vegetation red, water bodies from dark blue to black, and soils with no vegetation from white to sub-city.

Data Analysis and Interpretation

The collected data was analysed using various ArcGIS& remote sensing. The most important data in the spatial variation was statistical analysis using ArcGIS and remote sensing part of the sub-city area of the sample distribution in the study area will be applied. Data analysis included systematically reaching and arranging the interview transcripts, filled

questionnaires, field notes, and other material accumulated to increase understanding of the respondent's subjective experiences. Different software such as ARC GIS 10.8 and Excel were used to analyse the data in a descriptive and statistical method including maps and percentages. Finally, data will be processed and presented.

the effect of land use planning and implementation on the urban environment: The case of Dukem sub-city, requires a combination of spatial analysis techniques, statistical methods, and Geographic Information System (GIS) tools.

3.7.1 Data Collection Instruments and Justification

For conducting the study various data-gathering instruments have been utilized; both open and close-ended questionnaires, interviews, observations, and focus group discussion were employed.

Questionnaire: the researcher used both open-ended and close-ended questions for respondents of the selected sample households. The questionnaires were firstly prepared in English languages and then translated into Amharic and Afan Oromo, to ease the information collection. **Questions are**

- Are there open spaces and green areas in your Neighbourhood
- How do you dispose of solid wastes
- Are there any problems faced at the waste disposal site
- Do you think your neighbourhood is convenient for the living environment
- Is there an Abattoir in the town
- What problems are faced by the slaughterhouse

Interviews: - the structured and semi-structured interview was conducted to gain better insight and keep the quality of information from the opinion of the interviewees.

- What is your idea about the plan preparation process with environmental aspects?
- Do you think that the current land use plan has incorporated sufficient green areas and open spaces and uniformly distributed for the town?
- What is your view on the environmental abuse in the town?
- What are the causes of implementation problems regarding to environmental issues of the plan
- Knowledge gap in the expert about the plan
- Shortage of human capacity to implement the plan

Observation: Data on the field was collected through direct observation of the plan implementation situation and related processes in the study area. Observation was taken by physical assessment, survey, taken photograph. Observing and updating the existing land uses and their implementation condition was the central data for the analysis of this research, to capture a great variety of interactions.

Environmental issues data, such as Waste disposal sites, greeneries, open spaces, Abattoir, physical nature of the town, and related aspects were collected by observation.

Focus Group Discussion: Focus Group Discussion: Sometimes it is preferable to collect information from groups of people rather than from a series of individuals. So, the focus group discussion was conducted with those who have sufficient knowledge about the basic plan preparation and implementation situation in the town. There were two groups that the researcher discussed. These are one group of the municipal offices (experts) and the other groups from the two kebeles administrator those who are assigned different responsibilities of the town. Thus, eight participants in each group participated to discuss the issues of the environment aggravated as a result of plan preparation and Implementation in the study.

1. What are the major environmental problems intensified in the town?
2. What are the conflicts happening related to land use in the town?
3. How do you observe the waste management system in the town? What are the major problems associated with it?
4. How do you see the existence, provision, and development of urban greens in the town?
5. What do you think is the contribution of the land use plan of the town to current environmental problems?
6. How do you evaluate the land use plan of the town about the environment did it bring positive changes or negative impacts, what is your opinion?
7. What are the major considerations in urban planning in terms of environmental issues (i.e. waste management, protection of water bodies, Greenery, Abattoir)?

Document Review: Essential documents of the picked city were reviewed to catch the essential news about the effect of land use planning and exercise of the surroundings in the study district. Additionally, extra information was calm from appropriate books, and additional essay materials.

3.8 sampling Technique: This research has selected two sampling probability and non-probability sampling methods. From probability sampling techniques the analyst has second-hand a systematic random sampling method. The reason for the pick of this sampling method is that it presents an equal chance to the accused; whereas for purposive examining, a non-probability sampling method was working to select key informers. The analyst selected the

informers the ones endure provided information that was a main recommendation for the research.

Population

total population of **165,588** and **households are 24,095** by the year **2014**. From the total population **70,079(50.88%)** are males and **67,655(49.12%)**

Table 3.2: shows the population of the city in the year 2014 E.C

Age group	(CSA)			As Dukem mayor count		
	Male	Female	Total	Male	Female	Total
0 – 4	4,396	4,199	8,595	7,266	6,974	14,240
5 – 9	3342	3817	7159	5907	6341	12248
10-14	3947	3980	7927	5775	6612	12387
15-19	6309	7362	13671	11153	12231	23384
20-24	7056	7309	14365	11666	12140	23806
25-29	7356	6466	13822	20288	10741	31029
15-29	20721	21137	41858	43107	35112	78219
30-34	4874	3287	8161	8057	5461	13518
35-39	3363	2445	5808	5560	4061	9621
40-44	2093	1371	3464	3460	2279	5739
45-49	1181	1454	2635	1953	2413	4366
50-54	972	1115	2087	1606	1851	3457
55-59	808	571	1379	1335	949	2284
60-64	719	829	1548	1187	1378	2565
65-69	629	761	1390	1038	1264	2302
70-74	449	693	1142	742	1151	1893
75-79	388	358	746	643	631	1274
80-84	180	259	439	297	429	726
85-89	75	144	219	124	271	395
90-94	60	67	127	99	113	212
>95	48	42	90	75	67	142
Total	48,245	46,529	94,774	88,231	77,357	165,588

3.8.1 Frame of Sampling

A sampling frame can be a list with all the types of sampling units or units of analysis, or it might be a record from which samples are taken. In this particular study, the town's list of households and the staff members of the local government.

3.8.2 Unit of sampling

The unit to be sampled such as a person, home, organization, institution, period, etc., is known as the sampling unit or unit of analysis (IUDS Guide, 2012). Thus, the study's sample units included woreda administrators, professionals, municipal managers, households, and town administrative organs

3.8.3 Sample Quantity

Owing to the manageable data amount, time, cost, and consideration of the sample's relevance. The Town has households are 24,095 in this study, according to the Land Office of Dukem administration 162 households will make up the sample size that the researcher will use. Kothari's (2004) sample size calculation formula was utilized to establish the study's sample size. For a sample size of n and a target population of N , $fn = n/1+n/N$, if N is less than 10,000.

Consequently, the study's sample size is computed using the formula that follows.

$Z^2pq/d^2 = n$ where the intended sample size, n

Z = standard normal deviation with the necessary degree of confidence

P is the percentage of the target population thought to have a given set of traits. With a 93% level of confidence, the appropriate standard normal deviation is $Z=1.81$, the required level of significance is 7% (0.07), and $q=1-p$, d = statistical significance. We assume $p=0.5$ Thus, the following formula yields the sample size: $n= (1.81) (0.5) / (0.5) = 2 (0.5)^2/0.07*0.7 = 168$ Using the formula $fn= n/(1+n/N) = 168/[(1+ (168/24095))] = 170$ households, the sample is determined since the target population is households and there are fewer than 10,000 of them.

For a population of less than 10,000, where n is the sample size

N is the study's population, and fn is the number of homes in the sample. Based on the size of the Town's population, a total of 162 households from three woredas make up the study's sample

Table 3.3: Sample Size, Sampling Unit, and Sampling Methods

No	Sample Unit	Sample Size	Sample Technique
1	Community/Residents	162	Systematic Random Sampling
2	Administers and professionals	4	Purposive Sampling
3	FGD (kebele administration)	8	Purposive Sampling
4	FGD (Municipal professionals)	8	Purposive Sampling
Total		182	

Source: researcher, 2024

3.9. Source of Data

Both primary and secondary data were employed in the research to gather the necessary data in the study area.

Primary data is collected from homes via field surveys conducted at various research locations including the two Kebeles. Additionally, information is obtained from various target informants. such as kebele administration, professionals, and local sectoral authorities who were specifically chosen.

The secondary data will be gathered from the body of literature already in existence on urban land use planning and execution, specifically about environmental conditions. The social, economic, environmental, and physical context of the research region, as well as the state of the environment with urban land use planning and execution, will generally be the basis on which the secondary data is gathered. The information was gathered from official government publications and research studies, among other official documents, about the Dukem sub-city in Bishoftu town.

3.10. Data Analysis and Interpretation Tools

To analyze the data first step made is to arrange for coding and tabulation. Then the data is classified or classes based on their common characteristics. After gathering the data, quantitative different software such as ARC GIS 10.8 and Excel were used to analyze the data in a descriptive and statistical method including maps and percentages. Finally, data will be processed and presented.

The effect of land use planning and implementation on the urban environment in the case of Dukem sub-city requires a combination of spatial analysis techniques, statistical methods, and Geographic Information System (GIS) tools.

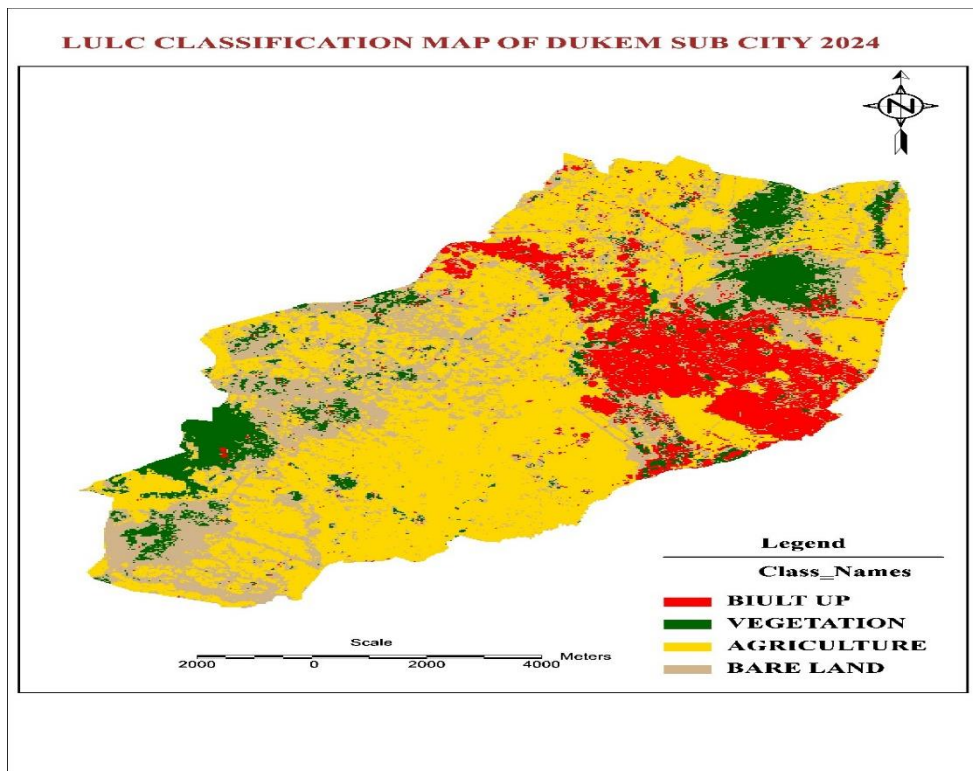


Figure 3.2. Land use land cover classification map of 2024

Source satellite image of the year 2023 and processed by ERDAS

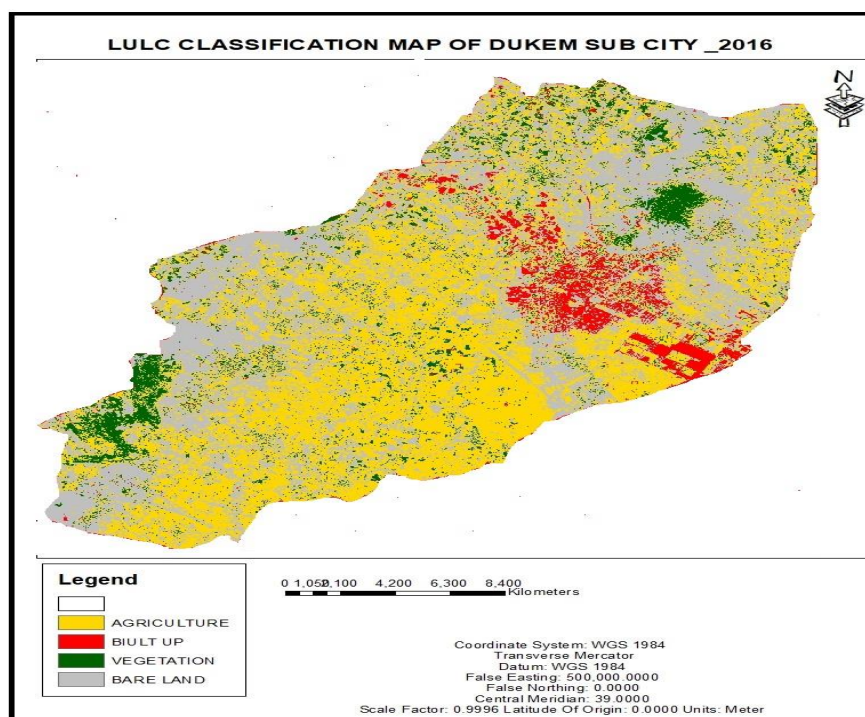


Figure 3.3. Land use land cover classification map of 2016

Source -satellite image of the year 2023 and processed by ERDAS

3.10.2 Operationalization Framework

To properly measure/ answer research objectives the researcher uses the following operationalization framework of the study

Table 3.4: Operationalization Framework

Research Objectives	Concepts	Variables	Methods of Data Collection	Data Analysis
To Assess the Environmental Considerations During the Preparation of the Land Use Plan in the Town.	Availability	Presence of urban greenery and open spaces, Waste Disposal, Abattoir Areas	Observation Interview Questionnaire	Descriptive Analysis
To Evaluate the Extent of Plan Implementation regarding Environmental Consideration.	Implemented components	Proportion Got Implemented green areas, open spaces, waste Disposal, Abattoir	Observation Interview Questionnaire	Descriptive Analysis
To examine the Institutional Capacity of Concerned bodies in the planning process.	Capacity	Number of skills manpower, Level of Education, The budget allocates, Work experience Availability of policy, Regulations, Rules	Document review Interview	Descriptive Analysis
	Effectiveness	Budget, level of coordination		

Source: Researcher, 2024

3.11 Limitations

Adequate time, finance, lack of organized data, and insufficient awareness among pedestrians and government sectors that constitute primary data sources were some limitations of this study. However, the researcher tried his best to overcome such challenges by creating consecutive awareness among Focus Group participants and interviewing people before the actual period of data collection time. The problem with the lack of organized data is handled by triangulating data gathered from various sources which were found appropriate by the researcher.

3.12 Conclusion

To carry out the study, a descriptive method which involves both qualitative and quantitative approaches was employed to achieve the objectives of the study; instruments such as questionnaires, interviews, and observation were employed. In addition to these, the researcher's active observation allowed him to observe the situation of existing land use and its implementation status concerning environmental issues were carried out. Systematic Random Sampling and purposive sampling techniques as well as primary and secondary data sources were used in this particular study. The analysis of the data covers both qualitative and quantitative evidence and is presented using maps, photos, tables, bar graphs, pie charts, and other statistical tools with narrative discussion

CHAPTER FOUR

4. FINDING OR RESULT AND CONCLUSION

4.1. Introduction

This unit focuses on the outcome of facts gathered from the field survey and shows the request of the research methodology as defined in member three. The study is the judgment of land use to find the effect of land use planning and implementation on the urban environment: The case of Dukem sub-city, Bishoftu city

Planning and exercise of material facets is broad and complex. It involves comprehensive relating to space and socioeconomic positions for all cities under study. It still includes approximately researching the plan preparation process to visualize the sites and the exercise questions that may directly or obliquely pertain to accompanying allure preparation. An attempt is working to support and survey the existent truth on the ground mainly through a careful amount of bearing documents all along the preparation ending (both spatial performances/maps and text documents), direct and improvised attention to recognizing issues through advocating interviews, focus group discussion and questionnaires from the concerned carcasses. Accordingly, in this part, the answer rate, and demographic and socioeconomic traits of respondents, resulting in verdict, understanding, conversation, and decision have been examined. Response Rate In the suggestion stage, it was projected to collect data from 162 sample households accused therefore, questionnaires were duplicated and distributed to 162 households by data to households by dossier connoisseurs accompanying close follow-up from the few the investigator. All the delivered questionnaires are restored to the researcher. Nevertheless, a few unlimited questions were not solved by 10 respondents. In real conditions, this means a 100-portion response rate. Also, the interview and FGD were adequately trained because the researcher herself was straightforwardly complicated, in the process repeated introducing a 100 percent reaction rate. Environmental factors in this study are urban agriculture green area open space and waste management

4.2. Demographic and Socioeconomic Characteristics of Respondents

Respondents' demographic signs like sexuality, instructional status, professional environment, business, and number of years stayed in the Dukem sub-city Bishoftu municipality were trusted as main and take care of imposing a significant impact on the study or theme and accordingly be assessed for this study.

4.2.1. Sex Composition

Regarding the respondents' sex, an unexpected trend was reflected in the female respondents. They were not willing to respond when they requested. This reflects their lack of detailed know-how regarding land use planning and implementation with environmental issues of the town they are living in. As a result of this, the majority of the respondents 125 persons which accounts for 77.16 percent are male and only 37 (22.83 percent) are female. Although the number of females is smaller, compared to males, their exclusion from participation might lead the plan to serious impacts if their interests are not considered. This is also presented hereunder in the following

Table 4.1: Sex Composition

Sex	Frequency	Percent
Male	125	77.16
Female	37	22.83

Source: Field Survey, 2024

4.2.2. Educational Level

Concerning the educational level of the respondents, the researcher exerted an effort as much as possible to engage literate people as the issue under study is technical. This is performed by classifying the respondent's educational status into five subcategories (no education, secondary and below, diploma, degree, and master's). The result is presented here under the figure (figure 4.1).

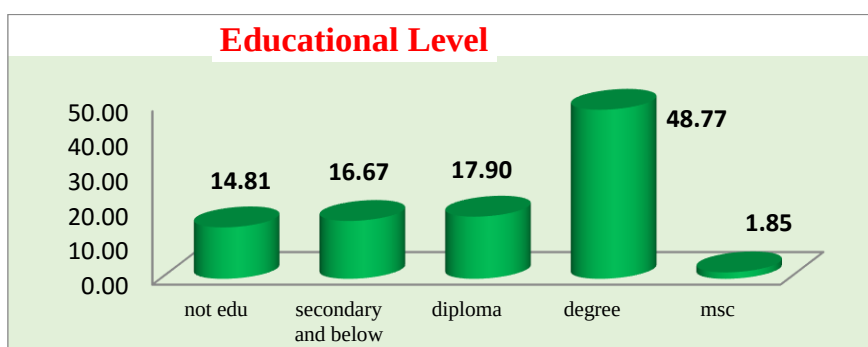


Figure 4.1: Educational Level

Source: Field Survey, 2024

From the data analysis presented in the chart, it is possible to conclude that the efforts pre-planned to attain and capture literate residents in the process of the survey were successful. Accordingly, only 1.85% of the respondents are found to have a master's, 48.77 % have a

degree the majority, 17.90 % have a diploma, 16.67 are secondary and below and finally, it was only 14.81% of the respondents had no education. This also implies possibly the majority of respondents can deliver, argue, suggest, and comment on the study subject matter and whatever issues of their home or/and working Dukem sub-city Bishoftu town.

4.2.3. Respondents by Occupation

The other demographic situation considers the respondents' occupational status. It has a due effect on household income, expenditure, and subsistence of the livelihood of the family as well as on to implementation of the town plan as per the standards of the land they occupied. In many generalized ways of categorizing into 7 broad divisions, the survey result is presented below as follows.

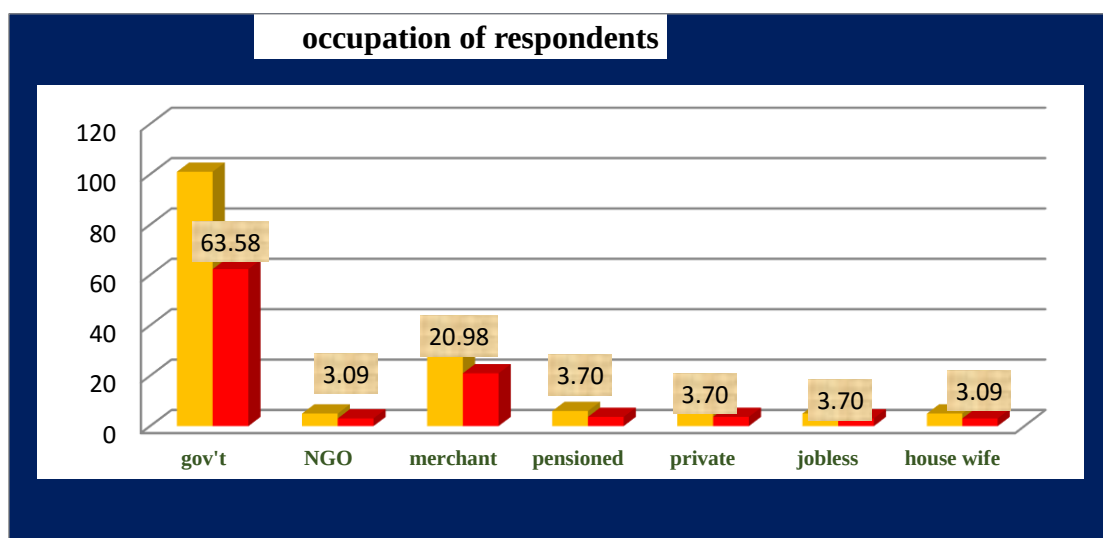


Figure 4.2: Work Occupations

Source: Field Survey, 2024

As shown in Figure 4.2 out of the total respondents, captured while the household survey was conducted, government employees accounted for 103(63.58percent), 5 (3.09 percent) were employees of NGOs, followed by merchant/self-employed who accounted for 35 (20.99 percent), 6(3.7) persons are pensioned. In addition, according to the above data, 3.7percent 6(persons) of respondents have no permanent job or are jobless and participating here and there in every temporary or daily activity as soon as provided for their existence, thus taken as unemployed, finally only 5 (3.09) of the respondents was found to be housewives.

4.2.4. Respondent Years of Stay at the Town

Regarding years of stay in the town, the respondents have been assessed in three categories, namely, 1-5 years, 6-10 years, and greater than 10 years (Table: 4.2).

Table 4.2: Years of Stay in the sub-city

Respondents	Numbers of Years Lived in Dukem sub-city			Total
	1-5	6-10	>10	
Number	40	56	66	162
Percentage	24.69	34.57	40.74	100

Source: Field Survey, 2024

The majority of the people captured in the survey (40 percent) are described as having been living in the Dukem sub-city of Bishoftu town for more than 10 years. Moreover, as a few respondents expressed, it is their born place/town though is not present in the analysis table for the sake of simplicity. Following this 34.57 percent also lived from 6-10 years old and 24.69 percent of them lived for 1-5 years. From this again one can simply recognize these informants are in a very good position regarding any realities in the Dukem sub-city Bishoftu town in general and the research's subject matter in particular.

4.3. Results or Findings

The results of this study are presented using bars, charts, pictures, and another suitable presentation mechanism that best explains and creates ease of understanding. The presentation of results is made to be in line with the research objectives set formerly for this study. Thus, treating the objectives in chronological order is made hereunder immediately following a synopsis of the planning experience of the Dukem sub-city Bishoftu city.

4.3.1. The Overview of Planning Practices of Dukem sub city Bishoftu Town

The municipality of Bishoftu town Dukem sub-city was stabilized in 1907 and the first partial plan for the town was prepared by Oromia Regional State Works and Development bureau in 1907. As studies show the plan has been implemented partially though there was a gap in its land use implementation.

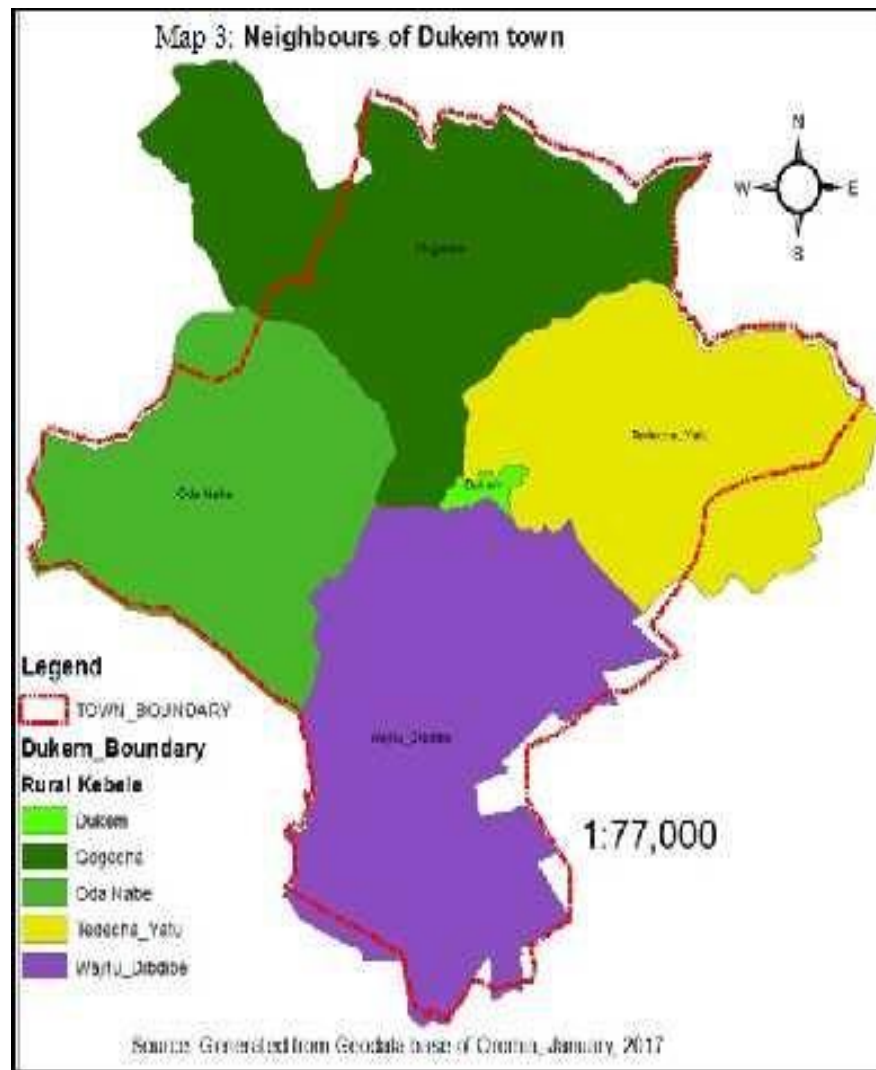


Figure 4.3: Existing (previous) Land Use Plan of the Tow

Source: Master plan RUPI 2010

Land use functions such as recreation and playgrounds, and public square neighborhood open spaces are currently left just as vacant open spaces not developed for the intended use as per the proposed land use of the plan. Moreover, land uses, such as proposed neighborhood playfields in the plan have been changed and are currently used by other land use function

As stated previously, the current basic plan of the Dukem sub-city was prepared by the Oromia Regional Planning Institute (RUPI) in 2010 to lead the development of the town guided by some form of urban plan for ten years.

The basic plan of the study area is composed of different proposed land uses like administration, commerce, residence, manufacturing and storage, Transport and Road network, reserved area, urban greenery, and social services. The plan covers an area of 9 hectares within its delineated boundary (See Figure: 4.4 and Table: 4.4).

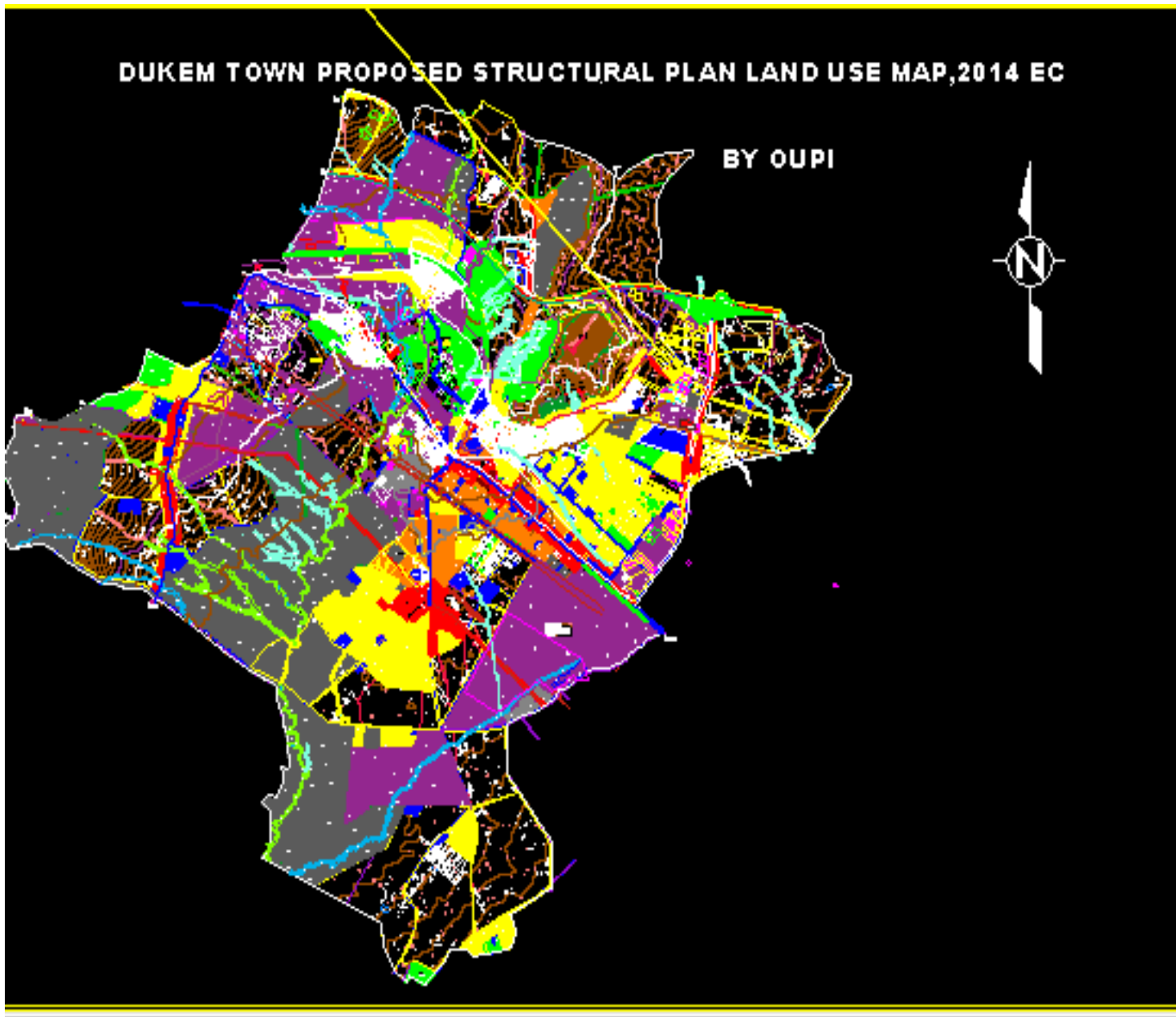


Figure 4.4: Basic plan

Source: Master plan RUPU 2010

Table 4.3: Dukam sub-city Existing land use plan

NO	Existing Land Use	Area Hect	in percentage	Remark	
1	Residence	1128.1	11.70		
2	Commerce	121.8	1.26		
3	service	61.3	0.64		
4	administration	4.57	0.05		
5	industry	510.5	5.30		
6	Road and Transport	777.1	8.06		
7	Environmental sensitive area	6778.066	70.40		
8	Quarry	129.5	1.35	constraints	248.9 hec=2.58%
9	Gorge	115.9	1.2	constraints	
10	Pond	3.5	0.04	constraints	
Total area		9630.3	100%		

Source: Land office of Dukem administration

4.3.2. Community Perception of the Convenience of the Living Environment and Incompatible Land Uses

According to the results of the survey, 33.33 percent of the households agreed that the living environment is convenient, 30.84 percent were neutral and the rest 35.83 percent reflected their disagreement.

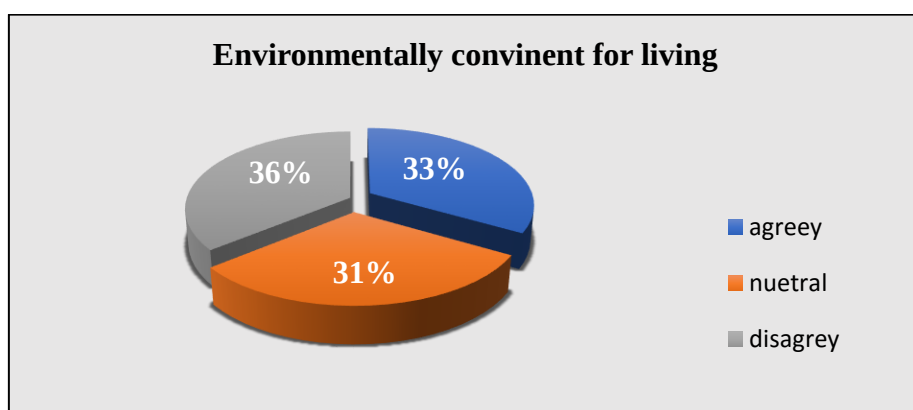


Figure 4.5: Environmental Convenient

Source: Filed Survey, 2024

As per the response of those who said environmentally the neighbourhood is not convenient, available environmental problems are the following Sound pollution (like “woodwork”, “metal work”, “Music shops”, “flour mills”, “car”, “cattle movement”, “garage”), and waste material is disposed of in everywhere.

Besides, the sample respondent households have confirmed the absence of public participation during the plan preparation resulting in the prevalence of incompatible uses like residence and garage, residence and woodwork and metal work, residence with flour mill, river and waste disposal, church and waste disposal, school and waste disposal, and market and waste disposal.

4.3.3. Environmental Considerations in Land Use Plan Preparation of Dukem sub-city Bishoftu Town.

The drawbacks of the plan begin with, its preparation without the due participation of the public and concerned professionals, especially concerning locating environmental land use functions for the planning period, for instance, the waste disposal site, urban greenery, and abattoir. As per the interview made with professionals of the town Municipality, the plan was simply the technical output of surveyors, socioeconomic, and a planner. Apart from these issues, the basic plan was not backed with an implementation strategy and source of finance required for its implementation as per the information from interviews and FGDs.

4.3.3.1. Land Use Proposal for Waste Disposal Site

Waste disposal sites are one of the environmental components that the planning process should pay due attention to. Similar to the other towns there is no proper waste disposal site in the town and how the waste disposal site is approached in the planning process is not reasonable. The manual of the basic plan specifies the standard required to propose a waste disposal site. Some of these include;

- It should be located at an economic travel distance for vehicles (30 minutes),
- It should be accessible by a paved road,
- It should be opposite to the main prevailing wind direction etc.

However, the plan preparation did not consider such standards while proposing a waste disposal site. According to the information from the focus group discussion (FGD) held with professionals of the town administration, though the aerial extent and wind direction issues are well considered to locate a waste disposal site on the plan, still there are some limitations concerning its location during plan preparation (proposal) process.

The town has one community association abattoir located along the Dukam River and within the proposed buffer on the former plan. As can be seen from the next map, the Abattoir (slaughterhouse) is near the Dukam River.

As regards waste management, solid wastes or offal (discarded as refuse) have been removed by disposing into the river, burning, and discarding to hyenas and other scavengers outside the fence open disposal and burning which contaminates the residence and the river. This occasionally emits an irretentive smell to the surrounding areas. The existing analysis shows that the sanitation problem of the site is directly related to poor management of the abattoir.

As can be seen from the next picture, an outsized concentration of blood, horns, bones, and other wastes are seen in the compound and disposed of in the river. With due attention, these can be easily managed on the spot and even can be changed to other resources. Another problem about this waste disposal site is the absence of an indication of whether the site is proposed for solid or liquid waste disposal site as it leads to miss use of the site for disposing one of the two or both kinds of wastes in the area and may cause serious management problems in the future



Figure 4.6: Waste Disposal Site

Source.-.: Researcher, 2024 Foto own gallery

4.3.3.2. Land Use Proposal for Urban Green Areas

An effort was made to see the proportion of urban green areas on the proposed land use plan, which are elements of environmental aspects accordingly, the proportion of land occupied by urban green areas in the proposed land use is indicated in the table below, the proposed land uses for urban greenery on the land use plan of the town include urban agriculture,

recreation, open spaces, forest and buffer zones. The total of these lands accounts for 13.4 percent of the total planning area which is less than the standard area provision basic plan manual, 2010 (15-20 percent).

Table 4.4: Urban Green Areas on the Plan

No	Green Land use areas	Area in ha.	Percent
1	Urban agriculture	60.68	10.15
2	Recreation and open spaces	16.23	2.72
3	Forest	3.2	0.53
4	Total	80.11	13.4

Source: Researcher, 2024

As can be observed from Table 4.4 the area allotted for environmental land use such as urban agriculture, Recreation open spaces and forests shows a deficit moreover some of the planned environmental land uses have been changed to other uses as confirmed by the researcher during the data collection time which indicates a low level of consideration of environmental issues while preparing the basic plan of the town.

The other point to be raised here is that the plan preparation process ignored, the provision of green areas in the central part (former built-up area) of the town. As one can see the land use plan of the town's proposed green areas is located only at the expansion side of the town where new settlements are proposed.

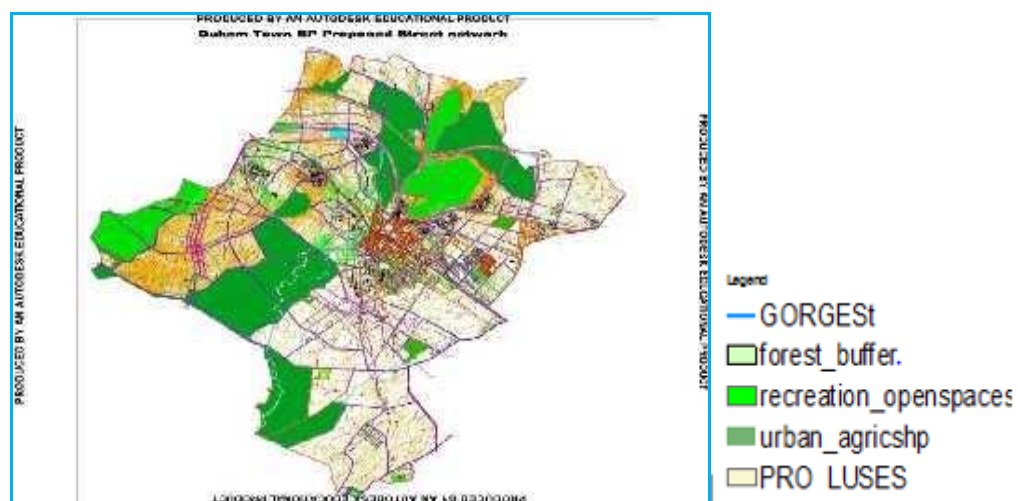


Figure 4.7: Land Use Proposal Urban Greenery Area Map 2016

Source: Source: Land office of Dukem administration

In proposed land use, urban greenery most of the areas allocated to urban agriculture, were rivers and gorges, which is 10.15 percent.

Respondents were also asked whether there was a greenery area in their living environment. Hence the majority of respondents said that there is no greenery area in their neighbourhood.

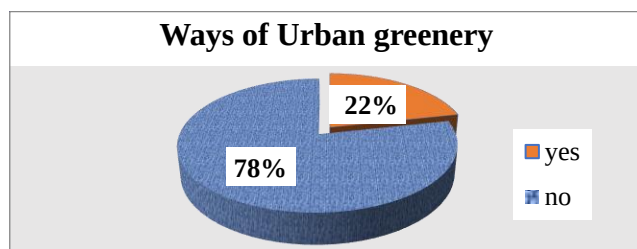


Figure 4.8: Ways of Urban Greenery and Open Spaces

Source: Researcher, 2024

As shown in the figure: 4.7 majorities of the respondents 127 (78 percent) agreed on the absence of greenery and open space and the rest 35 (22 percent) on the presence of greenery and open space. Out of 35 respondents, 32 (91 percent) replied that greenery and open space are not sufficient in their neighborhoods. According to the information from the interview, the plan preparation did not consider the sufficient and fair distribution of greenery and open spaces in all neighborhoods rather it considered residential areas. Moreover, the field observation represented in Table: 4.5 shows that neighborhood open space, greenery, and stadium account for only 2.7 percent, urban agriculture 10.15 percent, and forest 0.53 percent in the proposed land use of the town.

Generally, the proposal for urban greens on the plan has some limitations. As such the proposal of urban agriculture is found in the gorge area, forests are located on farmlands, and neighborhood open spaces and greenery in some neighborhoods are on farmlands.

4.3.3.3. Land Use Proposal for Abattoir

As per the observation made on the land use map of the town, the proposed abattoir in the town is incompatible with other proposed land uses that violate the planning criteria and principles. Thus, according to the Manual for the preparation of basic plans for small towns (MUD, 2010),

The abattoir should be located in the periphery of a town/ city;

- It should not be located close to residential houses, schools, churches, offices, etc.;
- It should be accessible at least with a compacted gravel collector road;
- It should not be located in the direction of the urban future expansion area;
- It is preferable if the slope is about 5%;
- It should have available infrastructures such as water supply, electricity, etc.;

- It should not be near latrines or any other waste disposal system;

Thus, the land use proposal of the abattoir didn't consider the criteria. Therefore, the abattoir is located along the Dukam River and within the proposed buffer on the former plan. As can be seen from the next map, the Abattoir was accessible by any form of road and didn't consider the dominant direction of cattle flow. (Fig.4.9) shows the location of the abattoir on the map and adjacent land uses.

Although the location of the abattoir has taken into account the prevailing wind direction there have been some weaknesses as seen from the point in terms of compatibility with the waste disposal site. In addition, the site of the abattoir is not situated in the dominant cattle flow direction for the town market.

As regards waste management, solid wastes or offal (discarded as refuse) have been removed by disposing into rivers, burning, and discarding hyenas and other scavengers outside the fence open disposal and burning which contaminates the residence and the river. This occasionally emits an irretentive smell to the surrounding areas. The existing analysis shows that the sanitation problem of the site is directly related to poor management of the abattoir.

As can be seen from the next picture, an outsized concentration of blood, horns, bones, and other wastes is seen in the compound and disposed into the river. With due attention, these can be easily managed on the spot and even can be changed to other resources.



Figure 4.9: Abattoir Waste Discharge to River

Source: Dukem socio-economy

Evaluation of Land Use Plan Implementation of the Sub-city About Environmental Considerations

The basic land use plan of the Dukem sub-city which was prepared by RUPI in 2017 is now left with only three years to end its planning period. However, failure due to the proper implementation of the plan, there are still many environmental problems that cannot be

addressed by the implementation of the plan to date. This section has tried to assess the drawbacks of the plan implementation process for each environmental land use function in detail.

Urban Green Areas

As in many small towns of the country, the consideration given to the provision and development of urban green areas is much less showing ineffective plan implementation capabilities to preserve green areas.

Urban green areas in the study town consist of all kinds of neighbourhood greens, playgrounds, and fields, green along the street, forests, and open space.

Total Land proposed

the land use land cover characterization classification for the year

2016 is produced and introduced as follows, vegetation inclusion is 8.292 % from the absolute region, built-up is 4.585, Agriculture 43.869 %, and barren land is 43.254 %.

Grid code	class_Name	AREA(HEKTAR)2016	Par %
10	AGRICULTURE	5070.21	43.869
11	BIULT UP	529.866	4.585
13	VEGETATION	958.304	8.292
16	BARE LAND	4999.15	43.254
		11557.53	100

Table 4.5: proposed land

Source: Researcher, 2024



Figure 4.10: Change Residence Area

Source; Researcher, 2024 own gallery

A. Neighbourhood Green Areas, playgrounds, and Open Spaces

The field observation shows that there are different neighbourhood green areas, open spaces, and playgrounds in the town, but they are not well-developed neighbourhood green areas within the residential settlements. However, green areas within the new residential are being reserved for future development except for some. The small portion of existing green areas with a total area of 0.32 ha has been changed to residential land uses previously

B. Urban Agriculture

Currently, there are huge efforts in most of the urban centers to enhance the role of urban agriculture in the context of food security and poverty alleviation for the urban populations. Urban agriculture (UA) encompasses both pre-urban and urban activities. In this manual definition by FAO (2007) is adopted, "It is defined as the growing of plants and the raising of animals for food and other uses within and around cities and towns, and related activities such as the production and delivery of inputs, processing, and marketing of products".

functionalities. Hence, due to this and other reasons the land allocated for urban agriculture is not yet developed as per the proposal of the plan.

The information obtained from the interview and FGD confirmed that the allocated land for this purpose is unsuitable and thus cannot be implemented within the planning period. Moreover, part of this land is now being used for waste disposal and the construction of community policing services. As such the areas that are designated for urban agriculture are not used for the intended purpose.



Figure 4.11: Land Use Changes Made (from Urban Agriculture to Other Uses)

Source: Researcher, 2024

C. Green Along the Street

However, the proposed land use plan recommended the planting of street trees on medians and along walkways of streets. Currently, there is no development of green areas along the street sides. The reason for the absence of these green areas is that most streets in the town are not developed as per the proposed plan due to lack of finance

Waste Management

The Interviewee and focus group discussion said that, even though the waste disposal site is located on the proposed land use plan of the town, it is not yet implemented and developed. This is because of:

The land is occupied by the farmers;

- Lack of finance required for implementation; and
- Lack of public participation during the plan preparation process.

As per the information obtained from interviews with officials and FGD professionals, currently, there is no formal waste management practice in the town and people dispose of their waste everywhere and on the roadsides polluting largely the urban environment.

The municipality tried to allocate four sites (on the open market, between the church and road, behind the secondary school, and on urban agriculture) used for the temporary disposal of wastes, being collected by 10 persons in groups (micro and small-scale enterprises) from each household. However, no control over such enterprises, whether they are working properly or not, they may collect one day and they may not collect another day, and this gap in waste collection tasks creates favorable conditions for people to dispose of their waste everywhere they find. Even if in this site selection there are environmental problems because the site is near to many people work together.



Figure 4.12: Temporary Waste Disposal Sites (Near to Market and Church)

Source: Researcher, 2024

The participants of FGD confirmed that implementation of the planned waste disposal site could not be feasible even in the future because of its fairness; lack of finance and the land being occupied by farmers. This implies that the planned waste disposal site will not be feasible and implemented within the planning period of the land use plan.

The information from sample household respondents supports the present fact of waste disposal in the town.

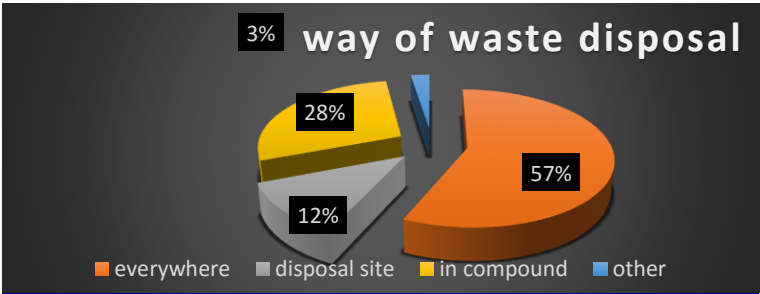


Figure 4.13: Way of waste Disposal site

Source: field survey, 2024

According to the results of sample surveys, 57 percent of the people dispose of their waste everywhere, 28 percent of them dispose within their compound, only 12 percent of them dispose of their waste on sites temporarily allocated by the municipality and 3 percent of them are others like the waste is burned in every neighborhood site like the road. These figures simply show the proportion of respondents who are using the proper disposal site was minimal. On the opposite, the majority of respondents dispose of other areas.

On top of this, concerning the presence of any problem with waste disposal sites, 99 percent of the respondents said yes, there is a problem, and among those who said yes, 48 percent believe that the problem is the absence of disposal site, 30 percent of them said allocated area is too far, and 21 percent of them said, the location is not appropriate place.

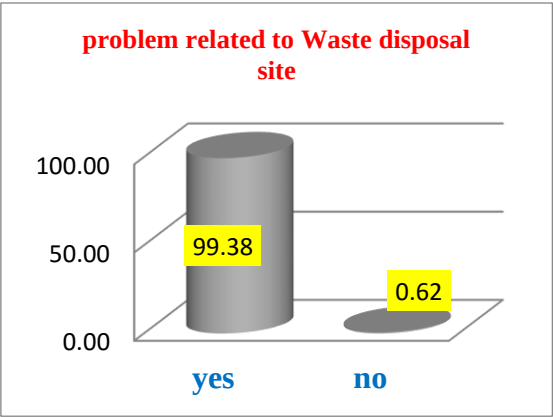
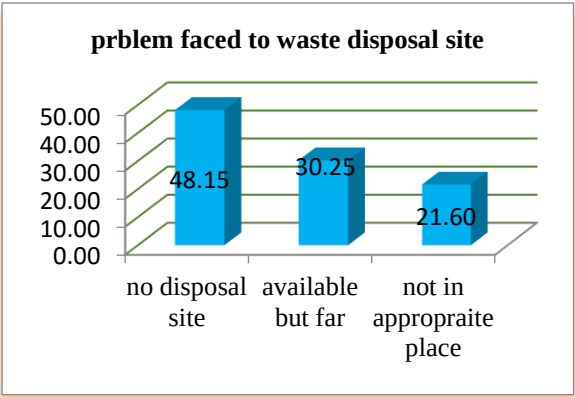


Figure 4.14: Problem Related
Source: Field Survey 2024



Source: Field Survey 2024
Figure 4.15: Problems Faced

Abattoir Site

The abattoir of Dukam town does not regard the prevailing wind direction that is usually blowing from Bishoftu city. Besides, it is located at the edge of the Dukam Rive (Fig4.16).



Figure 4.16: The existing location of Dukam Abattoir

Source: Clipped from the base map of Dukam town2024

The wind direction, centrality of the abattoir, and its location at the edge of the Dukam River imply that its location is incompatible. Because of this, it should be relocated to the west direction of the existing asphalted highway at the back of the factory under construction roughly around the coordinate of (X=487088, Y=973800).

This site has a better slope class ranging from 1% to 2%. It is also central and accessible by gravel road. Furthermore, it does not affect the future expansion direction as the site has a stony landscape from where red ash is extracted by the town administration.

As per the information from the interview held with municipal officials, even though the abattoir is proposed in the basic plan of the town it has not yet been implemented. The town does place of abattoir but residents slaughter animals in their compound and everywhere they get appropriate to undertake such activity.

According to the results of a sample survey of household respondents, 95 percent of the households replied that there is no abattoir in the town the rest 5 percent said yes there is.

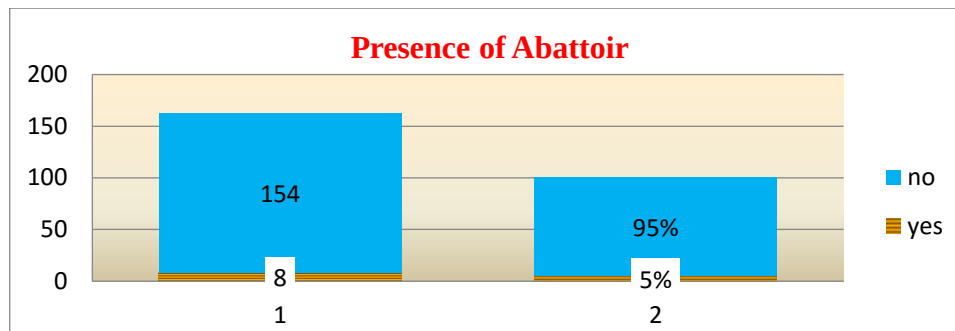


Figure 4.17: Presence of Abattoir

Source: field survey

Among those, who replied “No, there is no abattoir within the town”, 51.25 percent of them ensured that they slaughtered animals within their compound, 47.5 percent slaughtered everywhere and 1.25 percent of them slaughtered in other places mentioned out of such categories.

Another problem about the proposed abattoir is if there is a chance for its implementation in the future, yet there become issues of incompatibility since the proposed abattoir is located just adjacent to waste disposal, and a municipal cemetery.

From the discussion made above, it can thus be inferred the implementation of a land use plan with the consideration of environmental aspects was seriously challenged

4.4 Institutional Capacity of Concerned Bodies in Land Use Planning and Implementation Process

4.4.1 Lack of Awareness and Participation of the Community in the Plan Preparation

As per the information of FGD held with professionals of the town administration, there was no community participation during the plan preparation process. The plan was simply the output of surveyors and planners, technical ability without any form of public participation in the initiation and preparation period.

As the saying of professionals in FGD, a group of surveyors first came and collected data on existing natural and man-made features of the town and then prepared the base map required for the next phase of the draft proposed plan to be prepared by the planner.

The planner then visited the entire part of the town using the prepared base map compared with the ground reality for ten days and then started to prepare the plan. In the meantime, a person assigned to undertake a study of the socioeconomic part tried to collect only a few socioeconomic and after adjusting and modifying some other previous socioeconomic studies would finalize his duties. The planner, after he finalized the land use proposal plan,

submitted the plan together with the socioeconomic study to the RUPI within the pre-specified period (25 days).

The RUPI after approval, sent the plan to the municipality and then the implementation phase began after all this process had been taking place, this was all about the procedure to follow during the plan preparation process in the town, and in this process, community participation was ignored totally as per professionals in the FGD.

In General, the Dukem Socioeconomic Document 2015 was written as, four surveyors collecting data and preparing a basic map, and the planning team, one planner, and one socio-economist prepared the plan.

4.4.2. The Plan Implementation Process

The plan implementation process was not assisted by the required manpower and logistics facilities as per the demand of the town administration. The municipality is not well equipped with surveying equipment, professional software like GIS and Auto Cad, and trained /qualified staff in the field of planning.

A. Lack of Sufficient Logistic Provision

As one can observe the available devices and equipment within the municipality, there is only one theodolite, one roller meter, one Desktop, and two laptop computers. They are shared even by departments. The plan for the town is available only in the form of a hard copy because the regional Bureau did not give a soft copy to municipalities due to the fear that the plan might get abused by someone interested in making some private benefit during such faults.

B. Lack of Qualified Technical Staff Members

As per field survey results, the municipality is not provided with the qualified manpower needed for effective plan implementation of the town there is no staff member with qualifications in urban planning or Architecture. Those who are currently working in the position of planners are surveyors. Table 4.5 shows the municipality's organizational structure as compared with the existing type and number of professionals

Table 4.6: Available manpower of plan implementing bodies.

	Work position and process	Actual need	Existing	Gap
Plan implementation and beautification process	Process head	1	-	1
	Planner	1	-	1
	Surveyor	1	1	-
	Designer	1	-	1
	Town cleaner professional	2	1	1
	Urban greenery professional	2	1	1
	Driver	1	-	1
	Secretary	1	1	-
Land Administration process	Process head	1	1	-
	Land administer/ manager/ planner	2	2	-
	land administer/ land market	1	-	1
	Surveyor	2	-	2
	Surveyor	2	2	-
	Database professional	1	1	-
	Secretary	1	1	-
Design and construction process	Process head	1	-	1
	Planner/ plan agreement professional	1	1	-
	Architect	1	-	1
	Building/ Civil/ Engineer	1	-	1
	Secretary	1	-	1
Total		25	12	13

Source: Dukem municipality, 2024

Table 4.5 above shows there are no staff members available and missed or vacant positions in the town administration office (municipality). As indicated in the table, out of the total number of working positions 13 (52%) were vacant indicating how much the shortage of human resources is serious within the municipality.

Moreover, existing professionals of the town administration did not yet get training with the ability to use professional software like AutoCAD, GIS, etc. Surveyors currently working in the municipality use the plan in the form of hard copy theodolite and roller meter to accomplish their day-to-day activities.

C. Inadequate Financial Capacity

As a town municipality, one of the most important resources to answer the questions and needs of the community of any urban centre about infrastructure, sustainability, quality of life as well as the overall development of the town, financial plays an essential role. As a municipality without financial generation, it has no life. The financial generation (Revenue) of the municipality is indicated in the table below.

Table 4.7: Financial Generations

Years E.C	Planned Revenue (ETB)	Actual Revenue (ETB)	Actual performance (%)	GAP
2012	27,312,408	19,252,486	70.5	8,059,922
2013	2,072,897	2,045,198	98.66	27,699
2014	4,339,717	4,012,826	92.46	326,891
2015	5,291,137	4,318,794	81.61	972,343
Total	14,823,953	12,655,837	83.82	9,386,855

Source: Dukem Finance

The secondary data shows the ineffectiveness of the Dukem sub-city town municipality in collecting the revenue above, whereby the planned revenue is greater than the actual performance

for the last five consecutive years (2009-2015 E.C). The table above shows how much the planned and actual performance of the municipality mismatches every year and it is possible to understand how it could have a great impact on the municipal effectiveness in plan implementation. Here it shows the municipality's capacity for revenue generation lacks consistency and has fluctuated. Within the last five years, the municipality failed to collect 2,168,116 ETB and it was less effective & less efficient in performance.

Interpretation and Discussion

Based on the findings related to the objectives of the study, these sections' interpretations and discussions of the study are presented as follows:

The Overview of Planning Practices of Dukem Sub-city

The planning process of urban land use plans should consider and serve as a tool for sustainable urban development rather than being a cause for urban land degradation and

unsustainable use of urban land which is a scarce natural resource. The result of the finding shows that the town has a history of plan preparation two times; hence from its establishment that is the partial plan of 1989 and the basic plan of 2010. (See Figure 4.3 and Map 4.4 respectively). The first partial plan of the town that was prepared in 1989 as its name indicates did not entertain all land uses in the town plan, especially the formal and informal greenery and recreational areas land use except the stadium was ignored. Also, during implementation, land use changes were made at a previous point in the finding part. This implies that there was a gap in its planning as well as land use implementation which consequently led to uneconomical and no sustainable use of urban land use. It has a negative influence on current and coming generations economically, socially, and environmentally. The second basic plan tried to incorporate necessary land use functions which could enhance the proper development of the town within its plan preparation, but even in this plan source land uses did not satisfy the earned marked standard requirement coverage concerning the standards some land use was below standard. For example, the residential, administrative manufacturing, and storage land use, and urban greenery.

Community Participation in Convenience of the Living Environment and Incompatible Land Uses

As the review in the literature part, the environmental policy of Ethiopia ensures that (FDRE, 1997) every person has the right to live in a healthy environment, and Sustainable environmental conditions and economic production systems are impossible in the absence of peace and personal security. This shall be assured through the acquisition of power by communities to make their own decisions on matters that affect their lives and environment.

But the result of the findings shows that there are environmental problems like Sound pollution (woodwork, metalwork, Music shop, floor miles, car, cattle movement, garage...), waste material is disposed of everywhere, which affects the health of its residents.

The other one was incompatible land uses in the town, like houses with a garage, houses with woodwork and metalwork, a house with a mill, a river with waste disposal, a church with waste disposal, and a market with waste disposal. Generally, the result of the finding shows there is a high environmental issue that needs great planning and implementation consideration. This implies that the concerned bodies that means the municipality and the environmental authority do not work in an integrated manner with responsible stakeholders

to keep the environmental safety of the town. Moreover, there is no awareness creation in the community on how to keep the environment clean and safe.

Therefore, it needs due attention considering the Environmental Policy of Ethiopia which was endorsed in 1997 to improve the environment of human settlements to satisfy the physical, social, economic, cultural, and other needs of their inhabitants on a sustainable basis, Preventing the pollution of land, air, and water in the most cost-effective way so that the cost of effective preventive intervention would not exceed the benefits, Conserving, develop, sustainably manage and support Ethiopia's rich and diverse cultural heritage, Ensuring the empowerment and participation of the people and their organizations at all levels in environmental management activities and Raising public awareness and promote understanding of the essential linkages between environment and development, etc. (FDRE, 1997

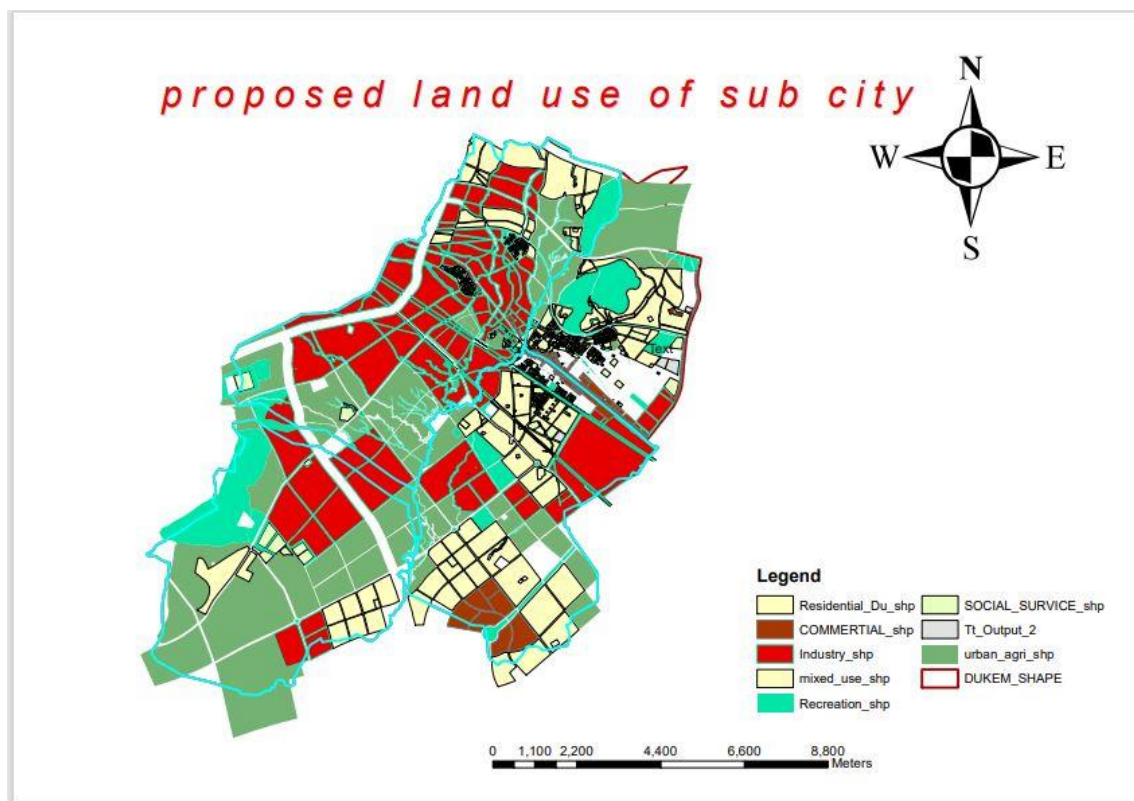


Figure 4.18: proposed land use

Source: researcher 2024

Environmental Considerations in Land Use Plan Preparation of the sub city

According to the results of the findings, the drawbacks of the plan begin with its preparation without the due participation of the public and concerned professionals, especially concerning locating environmental land use functions for the planning period. This implies

that the plan does not consider the participatory approach of planning which is key for the success of implementation as well as management of a given development. Without community participation, you cannot deeply investigate the problem and also you cannot provide an appropriate solution for them. This means there is a failure to plan that could in turn result in planning to fail. The following result of the finding illustrates this fact.

Land Use Proposal for Waste Disposal Site

Waste disposal sites are one of the environmentally sensitive areas that need careful consideration of their spatial part concerning human health and environmental impact mitigation. However, the result of the finding shows that the waste disposal site was located within existing forest land owned by farmers at a far distance from the town just adjacent to a municipal cemetery and abattoir and at a near distance to residential settlements this creates incompatibility problems with these mentioned land uses so that its implementation chance remains questionable within the planning period. Another problem about this waste disposal site is that no area is marked whether for solid or liquid waste disposal site as it leads to misuse of the site for disposing of one of the two or both kinds of wastes in the area and may cause serious management problems in the future. Therefore, this implies that deforestation is a must to implement the plan in the future and also there is conflict of land use between the cemetery and residence which could highly affect the implementation of the plan. So, the plan does not consider the deforestation of existing forests which leads to high environmental degradation. Second the waste disposal site is located near incompatible of the land use proposal of the basic plan. (See Figure 4.5)

Land Use Proposal for Urban Green Areas

The Basic Plan Manual 2010 ensures that urban greenery must account for 15-20 % total share of the land use plan for recognizing the environmental policy issues of the country as well as urban centers of Ethiopia. However, the result of the finding shows that the land use proposed for the green area was less than the standard area provision which is 13.4%. The gap is not only less than the standard but also poor in its spatial distribution as there is no equitable distribution. For instance, the central areas were ignored in green areas. This implies that the plan preparation does not consider the needs and interests of the community, peoples who live in the central area needs playgrounds and urban greenery for fresh air respiration and beautification of the neighborhood. (See Figure 4.6).



Figure 4.19: Land Use Proposal for Urban Green Areas

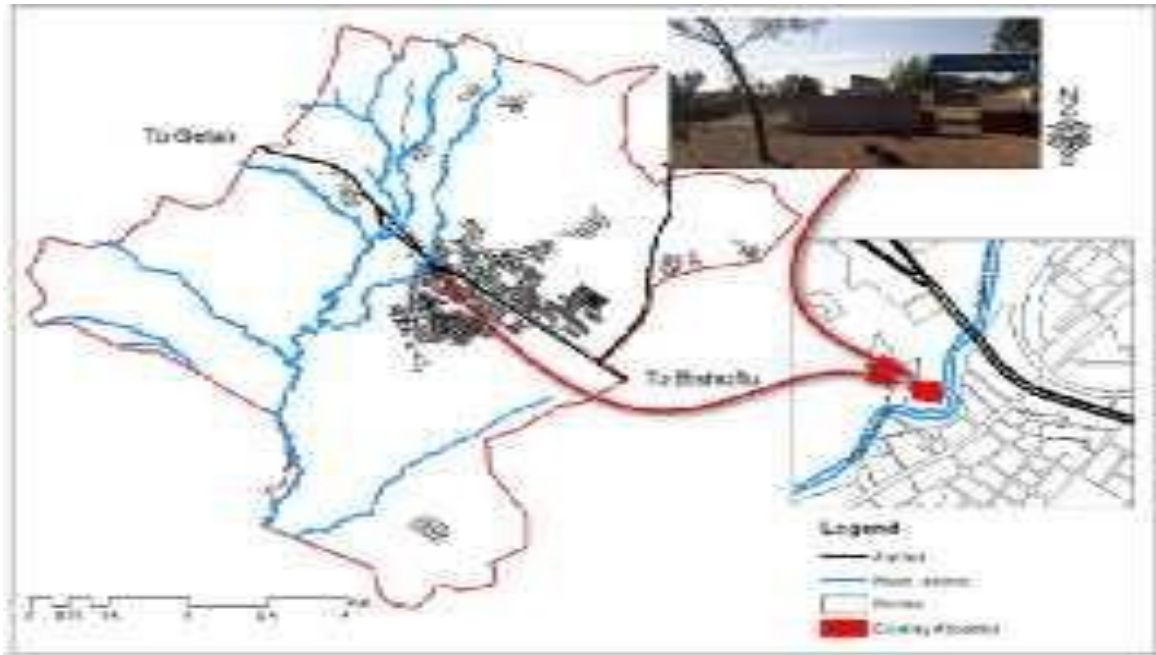
Source: researcher 2024

Abattoir

Abattoirs are one of the important urban functions that need to be placed site in appropriate and suitable sites to be compatible with the surrounding geographic features. In the observation made on the land use map of the town, the proposed abattoir site in the town is found to be incompatible in operation with the other proposed land uses that violate the planning criteria and principles. The abattoir should be located on the periphery of a town. It should not be located close to residential houses, schools, churches, or offices. It should not also be near latrines or any other waste disposal system etc.

As a result, the spatial proposal of the abattoir didn't consider the criteria. Therefore, the abattoir is yet located close to the Protestant church and waste disposal site which is not accessible by any form of road and didn't consider the dominant cattle flow direction.

(Fig.4.8) shows the location of the abattoir on the map and adjacent land uses



Source socio economy of sub city

Evaluation of Land Use Plan Implementation of the sub city about Environmental Considerations

The success of a given plan is its proper implementation and its ability to be problem-solving. But when we see the result of the finding the basic plan of the 2010 Dukem sub city left with three years from its ten-year life span had several implementation problems concerning environmental issues. The gaps in implementation concerning environmental considerations are discussed as follows.

Urban Green Areas

As the result findings indicate the consideration given to the provision and development of urban green areas is much less showing ineffective plan implementation capable of preserving green areas.

As per the proposal on the land use urban green areas in the study town consist of all kinds of neighbourhood

greens, green along the street, forests, open spaces, urban agriculture, etc. But when we see the implementations, there are no well-developed neighborhood green areas within the residential settlements until now, existing green areas of a total area of 0.32 ha have been changed to residential land uses. This implies that weak implementation status as the area which was previously green is converted into residential use. Concerning urban agriculture, its location is found in the buffer zone along the riverside. However, such areas are gully,

gorges, and steep slopes. Hilly areas are unsuitable for urban agriculture or require huge capital to manage the use of such functionalities. Hence, due to this and other reasons the land allocated for urban agriculture is not yet developed as per the proposal of the plan and is now being used for waste disposal and construction of community policing services. The other one is no implementation of the green areas along the street side due to a lack of finances and improper implementations of the proposed street network.

This indicates that there is a gap during the proposal of the land use and no consideration of community interest and carelessness of the professionals in considering the environmental issue of such sensitive areas which could be buffered and planted with trees as forest.

(See Figure 4.10).



Source from google earth

Waste Management

The waste disposal site is located on the proposed land use plan of the town; it has not yet been implemented and developed until now due to the Lack of finance required for implementation. Because of this currently, the land is used by the farmers.

The municipality tried to allocate four sites used for the temporary disposal of wastes, being collected by micro and small-scale enterprises from each household. However, with no control over such enterprises, whether they are working properly or not, they may collect one day and they may not collect another day, and this gap in waste collection tasks creates a favourable condition for people to dispose of their waste everywhere they find it.

This implies that the planned waste disposal site is not feasible and implemented within the planning period of the land use plan.

Abattoir

The abattoir area, which is proposed in the basic plan of the town, is not yet implemented. The town does not have even a temporary place of abattoir so residents slaughter cattle in their compound and everywhere they get appropriate to undertake such activity.

Another problem about the proposed abattoir is if there is a chance for its implementation in the future, yet there become issues of incompatibility with waste disposal, protestant church, and municipal cemetery since proposed.

Hence its implementation is restricted for reasons risk of its location at an inappropriate site, posing environmental hazards to its surroundings, and also being affected by some nearby activities.

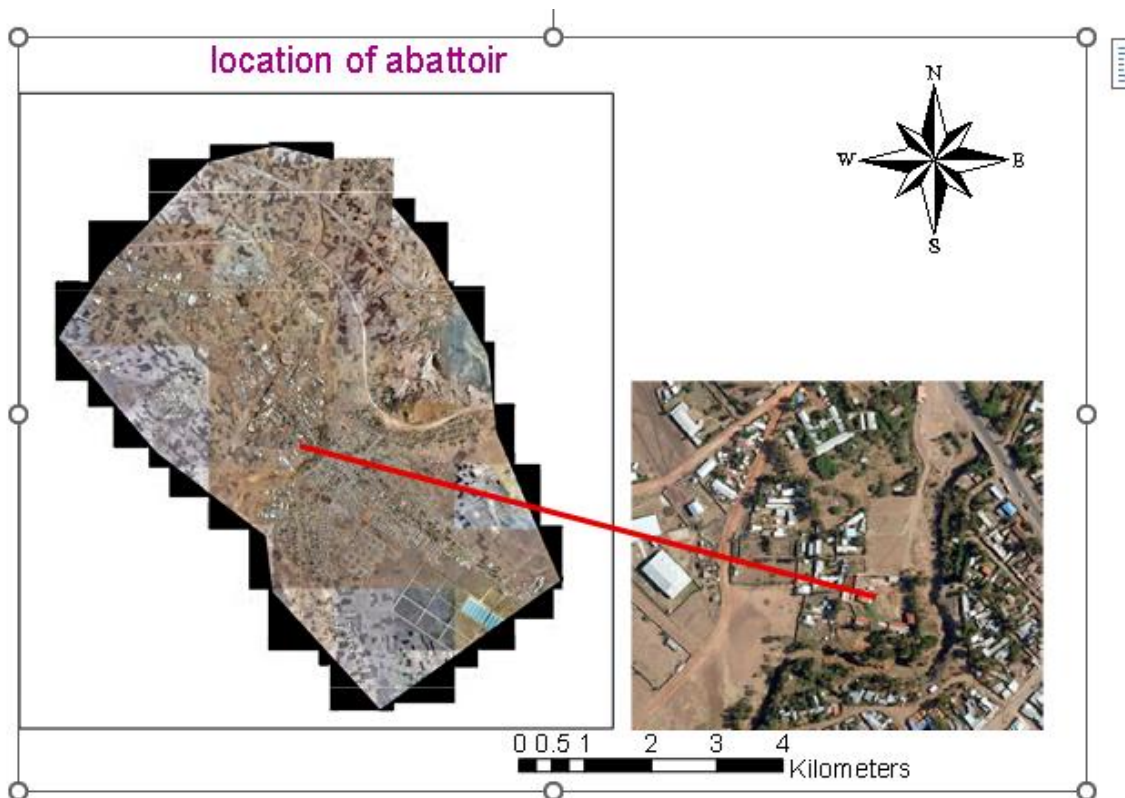


Figure 4.20 Location of Abattoir

Source; researcher 2024

Total Land implemented in hectare

Table;4.8 land implementation

Grid code	Class Name	Area(Hectare)2024	Par %
1	BIULT UP	1576.17	13.638
6	VEGETATION	1158.12	10.02
9	AGRICULTURE	5758.92	49.828
10	BARE LAND	3064.32	26.514
		11557.53	100

Source; researcher 2024

Institutional Capacity of Concerned Bodies in Land Use Planning and Implementation Process

The result of the finding shows that at the initial stage of the plan preparation, the community was not involved or participated and many issues of the community were not incorporated in the plan. The community lacked awareness about the plan. This implies that the community lacks a sense of belonging which hurts plan implementation.

The other point is about the plan implementation as the result of the finding indicated that the plan was not implemented because of the following factors, Lack of Sufficient Logistic provision, Lack of qualified technical staff members (see table 4.6) and Inadequate Financial capacity (see table 4.7). This implies that the municipality does not consider its capacity concerning the plan implementation. It also lacks the coordination and integration work with the responsible stakeholders like the community, and zonal and regional offices in supporting them.

Generally, the institutional capacity of the municipality in the land use plan and implementation was poor and failed to plan and implement

Conclusions

In this chapter, the results and findings of the whole study are analyzed and presented using various analytic data presentation tools. Besides, the data described in the results and the findings section were interpreted and discussed by the theoretical and empirical review literature on the issue. Eventually, gaps related to urban land use planning, and its implementation status concerning environmental issues were identified so that solutions to overcome the identified gap were recommended in the next chapter.

CHAPTER FIVE

5. CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the conclusion and recommendations are made based on the research finding, which comes from the analysis, discussion, and interpretation section of primary and secondary data.

Conclusion

In this study, an attempt was made to evaluate the land use planning and implementation of environmental aspects supported by the case of the basic plan of the Dukem sub-city. Thus, the finding indicated that land use planning and its implementation as regards environmental issues are ineffective in general.

The researcher assessed the land use plan preparation with environmental considerations in the study area. In this regard in the town urban greenery areas are insufficient. The total of these land uses accounts for 13.4 percent of the total planning area which is less than the standard area provision 15-20 percent. In addition, less attention is given to environmental consideration of land use for Waste disposal sites and abattoirs. Although there is a site for waste disposal in a proposed plan, the site is located just adjacent to the municipal cemetery and abattoir and at near distance to residential settlements and this creates incompatibility problems. The site does not indicate whether it is a solid or liquid site, simply proposed as a waste disposal site. It shows that it is not properly designed and is difficult to implement. The abattoir site is also proposed in the plan, but the proposal did not consider the criteria simply located close to residential and river and waste disposal sites so it is not in a proper location.

The other point that the researcher tried to assess is the plan implementation with environmental aspects in the study area. In this case, although there are different urban green areas and open spaces these areas are not well developed until now. In addition, green areas within the residential are being reserved for future development except for some. And some urban green areas are not implemented but also changed into other land uses. The other land use considerations environmental aspects are waste disposal and abattoir sites, which are not also implemented as proposed.

In assessing the institutional capacity of concerned bodies in the land use planning and implementation process the researcher found that lack of public participation in plan preparation, the knowledge and corrective arrangement disagreement of the plan preparation team, lack of mechanics supplies, and deficiency of the plan in soft copy have existed as the main barriers. Usually, the poisonous land use plan and implementation results show an unhealthy nature in the township. Moreover, lacking urban plant life, weak appliances for grinding garbage management, commotion and air character, and weak environmental management have experienced harsh friendly and energy problems, that certainly build a poor city concept.

5.2 Recommendations

The following recommendations are delivered depending on the judgments of the study. The recommendations, if implemented, are trusted to cause success with definite changes in the land use planning and implementation accompanying referring to practices or policies that do not negatively affect the environmental aspects of the plan.

Recommendation for action

The implementing body should have all types of documents of the basic plan (soft and hard copy of the plan, socioeconomic document) for effective implementation.

The time requirement for basic plan preparation should be in line with the days indicated in the manual. It takes 4 months for small town plan preparation (Structural Plan Manual, 2012). But in practice, the Oromia RUPI is preparing the plan within 25 days. This will affect the plan quality.

Plan preparation and implementation should be open to the public and should have Public Participation. It ensures community ownership and belongings during the implementation period of the plan.

On-task preparation should be to authorize the experts and commissioners having to do with land use planning and implementation in addition to implementation devices like GPS, Total Station, and software in the way that GIS and AutoCAD. In addition, the institution should be strengthened by skilled manpower by hiring those who have planning qualifications. Creating awareness to protect environmentally sensitive areas like forests, water bodies, urban greenery, open spaces, and buffer zones. Generally, awareness creation of the plan itself and the process should get due attention.

The proposal of the basic plan in terms of the area coverage for urban greenery areas is less than the planning manual standards. So, in the future time while revising the plan due consideration must be considered. Besides relocating incompatible and unsuitably implemented land uses, would become important.

Institutional financial capacity plays a fundamental role in the land use implementation of the plan. The professional FGD recommended that the proposed waste disposal and abattoir site was not implemented and the plan was abused because of a shortage of finance. Therefore, the institution should be financially capacitated

There should be strong cooperation between the planning institute that prepares the plan and plan implementing bodies/local authorities.

Municipality revenue collection practices have to be improved, increased and to cover all possible expenditures for plan implementation and facilitation.

Recommendation for further research

Further research shall be conducted on the planning process concerning the standard and the impacts of urban expansion on the surrounding farmers.

Further research should also be undertaken on the scope of stakeholder involvement from the initiation up to the implementation process of any type of plan, the municipal capacity in plan preparation and implementation process, and the evaluation of consultants, who are involved in urban plan preparation and implementation.

5.3 Conclusion

This chapter gave due attention to the conclusions of the research findings about the objectives of the study. In addition, the recommendations proposed by the researcher to solve the problems of urban land use planning and its implementation were discussed in the chapter. Therefore, the Dukem sub-city of Bishoftu town Municipality in collaboration with the Woredas administration, offices, investors, NGOs, the community, and private sectors can use and implement the recommended solutions of this research to improve the gaps in urban land use planning and its implementation of sustainable development of the town.

Sample Interview with Manager and Municipal Professional Respectively



Source. researcher gallery

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Appendices

A. Questionnaires for Households

1. Demographic and Socioeconomic part

Dear respondents: This questionnaire is prepared for the Evaluation of land use planning and Implementation concerning environmental aspects in Dukem sub-city Bishoftu Town. The study is carried out for an academic purpose for the partial fulfilment of a Master's Degree in Urban Planning and Design at Adama Science and Technology University. So, you are requested to answer each question genuinely.

NOTICE

- You are not expected to write your name
- Please provide only one answer for each question
- **Contact** Fenet Kisi
 - Email fenetkisi486@gmail .com

Thank you so much for your cooperation

Address: kebele_____

1. Sex of household head 1. Male 2. Female
2. Marital status 1. Single 2. Married 3. Divorced 4. Widowed
3. Family size 1 No of Male..... 2. No of Female.....
4. Education of household head 1. No formal education 2. High school graduate
3. Diploma 4. Degree 5. Specify any other
5. Employment 1. Government 2. NGO 3. Self-employed business person 4.
Pensioned 5. An employee of another private organization 6. Unemployed
6. Specify any others-----
7. Monthly family expenditure 1. Up to 500 2.501-1000 3.1001-1500 4.1501-
2000 5. 2000-3000 6.>3000
8. For how long have you lived in the Town? 1. -5 years 2. 6-10 years
9. 11-15 years 4. 16-20 years 5. >20 years
10. Housing ownership 1. Kebele 2. Private 3. Private rental 5. Specify any other
11. Have the living rooms including 1. Toilets 2. Kitchens 3.
Bathrooms 4. Have all 5. If others specify

2. Questionnaires related to the community

1. Are there open spaces and green areas in your Neighbourhood?

- A. Yes, it is sufficiently available B. It is available but not sufficient
C. There is no open space and greenery D. If others specify-----

2. How do you dispose of solid wastes?

- A. Dispose of everywhere B. Dispose of the disposal site
C. Dispose in my compound D. If others specify-----

3. Are there any problems faced at the waste disposal site?

- A. Yes B. No

4. If your answer to Question Number 3 is yes, what problems faced

- A. There is no disposal site in the town
B. Even if it is available, it is far away from my neighborhood
C. Even if it is available but not placed in its appropriate position
D. Others specify-----

5. Do you think your neighborhood is convenient for the living environment?

- A. Yes B. No

6. If your answer to Question Number 5 is No List out Environmental problems available in the town-----

7. List out any incompatible land uses that disturb the environment in your town.

8. Is there an Abattoir in the town? A. Yes B. No

9. If your answer to Question Number 8 is yes, do you use it properly?

- A. If yes, I use it always B. No C. Sometimes I use it

10. If your answer to Question Number 8 is No, where do you perform it?

- A. In my compound B. In any open space C. If other specif.

11. What problems are faced by the slaughterhouse?

- A. There is no problem with the slaughterhouse
B. It is not compatible with other land use C. It is far away from the neighborhood
D. If others specify-----

I would like to thank you for your cooperation!!

B. Interview Questions (Guideline) for Government Offices /Municipality/

1. What is your idea about the plan preparation process with environmental aspects? -

2. Do you think that the current land use plan has incorporated sufficient green areas and open spaces and uniformly distributed for the town?
3. What is your view on the environmental abuse in the town? -----

4. What are the causes of implementation problems regarding to environmental issues of the plan?

A. Knowledge gap in the expert about the plan

B. Shortage of human capacity to implement the plan

C. Carelessness

D. If other reason specifies.....

5. Concerning identifying conservation areas for future recreational, development, urban Agriculture, etc., please point out the activities performed and the result achieved by your town administration
6. Do you know specific sites that were previously green and open spaces now changed to other uses? If “yes”, how many of them are changing and what measures have been taken to replace them by the town administration?

Table: 1 Greenery Changed to Other Land Uses

In Plan	Land Use Change	Area in Hectare	Remark

7. What problems are faced due to the shortage or lack of green areas and open spaces in the town? -----

8. What efforts have been made to raise the awareness level of the public on personal hygiene and household cleanliness in line with solid waste management? -----

9. What are the trends of solid waste collection and disposal techniques and available resources in the town? -----
10. Are there waste management regulations at the town level to encourage the involvement of stakeholders in the area? -----
11. What are the trends of Liquid waste collection and disposal techniques & resources available in the town? -----

12. Is there any decentralization system of waste collection to lower administrative levels? -----

13. Is there an existing enforcement policy in the town on the self-treatment of waste? -----

A. Complex buildings B. Industrial plants, C. Other similar units

14. What mitigation and conservation measures do you take as a town administration concerning Environmental Aspects (Urban Greenery, Waste Disposal, Abattoir....) in your town? -----

15. Does it incorporate sufficient human resources and technical equipment?

Table: 2 Human Resources

Department	Work position	Actual need	Existing	gap

Table: 3 Technical equipment

No	Requirement	Fulfilled	gap

16. Financial and other resources-----

Years in E.C	Planned Revenue (ETB)	Actual Revenue (ETB)	Gap

17. What is the proportion of the Budget allocated for the planning department out of the total budget? -----

18. Wow, looks like your coordination among different organizations and stakeholders to improve environmental management. -----

I would like to thank you for your cooperation!!

C. Interview Guide for Beautification Office

1. What are the causes of implementation problems regarding to environmental issues of the plan? -----

2. Do you have continuous awareness-raising movement activities and coordinated actions with different environmental activities?

3. If yes, please list the activities performed -----

4. What are your control methods for environmental abuse in the town? -----

5. What are the trends of solid waste collection and disposal techniques and available resources in the town? -----

6. Is there any hazardous liquid waste generated from hospitals in the town?
A. Yes B. No
7. If yes, specify it and the management practices-----

8. What are the trends of solid waste collection and disposal techniques & available resources in the town? -----

9. What are the trends of Liquid waste collection and disposal techniques & resources available in the town? -----

10. In general mention the overall problems related to Environmental Aspects (urban greenery, waste disposal, abattoir...) developed at the town level in the past year.
11. In your view, what should be done in the future to improve the situation?

D. Discussion on Guides instead of Questionnaire for FGD

8. What are the major environmental problems intensified in the town?
9. What are the conflicts happening related to land use in the town?
10. How do you observe the waste management system in the town? What are the major problems associated with it?
11. How do you see the existence, provision, and development of urban greens in the town?
12. What do you think is the contribution of the land use plan of the town to current environmental problems?
13. How do you evaluate the land use plan of the town about the environment did it bring positive changes or negative impacts, what is your opinion?
14. What are the major considerations in urban planning in terms of environmental issues (i.e. waste management, protection of water bodies, Greenery, Abattoir)?

I would like to thank you for your cooperation