Settlement transformations in the surrounding peri-urban area of Adama town in the case of melkadama.

Abenezer Admasu

A Thesis Submitted to

The Department of Architecture

School of Civil Engineering and Architecture

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Abenezer Admasu Danecho

Advisor: Daniel Lirebo Sokido (Ph.D.)

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Declaration

I hereby declare that this MSc Thesis entitled "*Settlement transformations in the surrounding peri-urban area of Adama town in the case of melkadama*" 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 research have been duly acknowledged through citation.

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Recommendation of Advisors/ Supervisors

I, the major advisor/supervisor of this research, hereby certify that I have closely advised/supervised the student while developing this research and read the draft thesis/dissertation research entitled "*Settlement transformations in the surrounding peri-urban area of Adama town in the case of melkadama*," prepared under my guidance by Abenezer Admasu .Therefore; I recommend the submission of the research to the department for further review and evaluation.

_____	_____	_____
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_____	_____	_____
Co-advisor/Co-supervisor	Signature	Date

Approval Board of Examiners

We, the undersigned, members of the Board of Examiners of the research open defines by Abenezer Admasu have read and evaluated the thesis entitled "*Settlement transformations in the surrounding peri-urban area of Adama town in the case of melkadama*" and assessed the understanding of the candidate about the research. This is, therefore, to certify that the thesis has been accepted in partial fulfilment of the requirement of the Degree of MSc in Urban planning and Design. ----------

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_____	_____	_____
Chairperson	Signature	Date
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External Examiner	Signature	Date
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ABBREVIATIONS

AIPP	Adama Integrated Planning Program
ATM	Adama Town Municipality
ASTU	Adama Science and Technology University
CIS	Corrugated Iron Sheet
EMR	Extended Metropolitan Region
ETB	Ethiopian Birr
FGD	Focus Group Discussion
GDP	Gross Domestic Product
GRP	Gross Regional Product
IHDP	Integrated Housing Development Program
KG	Kindergarten
MOUDHC	Ministry of Urban Development, Housing and Construction
PLUREL	Peri-urban Land Use Relationships - Strategies and Sustainability Assessment tools for Urban-Rural Linkages.
WHO	World health organization

ABSTRACT

Emerging nations like Ethiopia are experiencing fast urbanisation due to rural-to-urban migration, an increase in the demand for housing and jobs, and population expansion in urban areas. However, neighbouring rural "peri-urban" areas are susceptible to unanticipated changes since there was no systematic plan to address the needs of urbanization. Despite the limited research on socio-economic and policy matters in peri-urban areas, there has also been a lack of attention given to spatial changes in Adama, either as a result; the goal of this study was to investigate the nature, origins, and dynamics of spatial modifications occurring in peri-urban transitional zones. The case study approach was employed in this study to help it attain its known goal and also based on the length of the in-depth interview and the research budget this study takes 51 households from the case region, or 5% of all households, are chosen for data collection from the case area with stratified random sampling strategy. The study found out those spatial transformations in the settlements happens due to multiple factors such as 'selling' land informally for economic improvement and fearing expropriation by government program, and land fragmentation due to densification. These factors transform farm land and rural settlement in to informal residential areas. As a result almost all rural land holdings experience fragmentation and land use change. The analysis makes some potential suggestions as well for future planning. Therefore, this study may advise local governments, community leaders, and urban planners to pursue the following actions in order to enhance infrastructure and service supply and to legalize informal economic activity. Use a participative approach to planning intervention. Planning should also take into account the community's vernacular building tradition, context of the site, and foundation of subsistence.

Keywords: Settlement, Transformation, Peri-Urban Area, Adama.

CHAPTER ONE

1. INTRODUCTION

1.1 Background

Peri-urban areas, which are at the receiving end of urbanization and have a growing demand for land for non-agricultural or urban land uses, create tenure hotspots. Due to growing urbanization and population increase, it was becoming more and more obvious that peri-urban areas were now sites where a lot of changes and activities were occurring(Adam 2016). Comparing Africa to other industrialized continents like Europe (72.7%) and North America (79.1%), urbanization in Africa was low (37.1%).(Leulsegged, Gete et al. 2011). However, urbanization in emerging nations was generally advancing considerably more quickly than in developed nations, where it may even reach 3% or 4% a year(Soubbotina 2004). According to population projections, urban areas was home to nearly 50% of Africa's population by 2030(Un-Habitat 2010). Rural-urban migration, economic development, technological change, and rapid population growth were all factors contributing to the developing world's fast rate of urbanization (Marshall 2009). Unprecedented urban population expansion in Africa was driving up demand for urban land at an incredibly fast rate. In order to meet the growing demand for urban land, conversion of peri-urban agricultural land on the outskirts of the already developed area is typically the primary method (Danso-Wiredu and Midheme 2017).

There are more than 110 million people living in Ethiopia, but one of the least urbanized nations in the world (García 2017). Its urban population is barely 17% of the total. According to some projections, Ethiopia's urban population will triple over the course of the next 20+ years, growing at a pace of nearly 5% annually (Castelló, Etter et al. 2016). Additionally, it is anticipated that by 2050, 42.1% of the nation's population will reside in urban areas, with the average rate of growth in urban populations estimated to be 3.98%. (Un-Habitat 2012). Ethiopia has more than 900 metropolitan areas, yet only roughly 23% of the country's population lived in Addis Ababa, the capital city (Brown and Miller 2008).

Currently most of urban centers in Ethiopia are concentrated in the four regional states: Oromia, Tigray, Amhara and SNNPRS. Urbanization in Oromia (9.2) is highest as compared with Tigray (8.0) and Amhara (7.5) (Schmidt and Kedir 2009). Adama is one of the urban centers in Oromia and city name Adama have been derived from the Oromo word adaamii, which means a cactus or a cactus-like tree. More specifically, adaamii means Euphorbia

candelabrum, a tree of the spurge family, while hadaamii would mean Indian fig. Following World War II, Emperor Haile Selassie renamed the town after Biblical Nazareth, and this name was used for the remainder of the twentieth century.(Schmidt, Dorosh et al. 2020) In 2000, the city officially reverted to its original Oromo language name, Adama, though "Nazareth" is still widely used.(Regassa, Kassaw et al. 2020)

However, the long railway that connects Djibouti and Addis Abeba was one of the key factors in the development and change of the towns peri-urban districts. One of the major towns created as a result of the Addis Abeba-Djibouti railway route is Adama. In the Great Rift Valley of East Africa, 99 kilometers southeast of Finfinne (Addis Abeba), Adama was founded in 1916. 2020 (Terfa, Chen et al. 2019). Since its founding, Adama has functioned as the region's administrative, commercial, manufacturing, and educational hub as well as a distribution hub for the nearby districts as a bustling city(Regassa, Kassaw et al. 2020). Numerous open and tireless efforts have also been made to make the city more appealing for investment, habitation, trade, and industry, as well as to create a prosperous and renowned metropolis(Manikandan and Sensing 2018).

Due to a rise in population and a high demand for urban space, Adama town's peri-urban surroundings have undergone unforeseen changes. The area has already become an informal community where the original landowners unofficially transfer some of their farmland due to a number of circumstances (described in detail in the following chapter). As a result, farmland is becoming urban, and old rural homes are being replaced with korkoro bet. There are social, economic, and spatial aspects to the total changes. Although planning interventions and studies on the transformation of the peri-urban areas around Adama are necessary, no study has been done so far specifically on spatial alterations. Prior research has focused on a number of historical and cultural themes, while other studies have raised concerns about water resources.

In general, this study was done with the expectation that its findings would close the information gap about the peri-urbanization process and support future development initiatives of Adama town and the area around it.

1.2 Problem statement

The majority of urban growth was unplanned, with informal settlements serving as the urbanization's focal point. Ethiopia, although the rate of urbanization was 4.4%, has a level of urbanization of 17%. (Tesfaye). According to national-level projections, Ethiopia's urban

population will increase thrice between 2020 and 2050. Some of Ethiopia's major cities' populations are expected to more than triple by 2050, according to preliminary city-level predictions (Programme 2010). By 2050, the population of Hawassa will have increased more than three times, that of Mek'ele almost five times, but that of Adama nearly four times. It is reasonable to anticipate that the built-up regions of these cities will grow even more quickly than their people (Tegenu 2010).

Following population increase and high demand for urban land, surrounding peri-urban areas of Adama town has undergone unplanned transformations. Due to multiple factors (discussed in chapter two in detail) the area already become informal settlement, where original land holders informally transfer part of their farm land. Therefore, farm land was being transformed in to urban areas and previous rural houses are being replaced by korkoro bet. The overall transformations also have social, economic and spatial dimensions.

Numerous social factors, in addition to financial and administrative limitations, become obstacles to planning and a driving force behind informal change. However, there hasn't been much interest to study these areas. For instance, Achameleh (2014) investigated the urbanization and land conflict in Ethiopia's peri-urban districts. But the majority of his research was devoted to policy matters. Urbanization and spatial connection in Ethiopia were explored by Paul Dorosh and Emily Schmidt in 2010 and by Emily Schmidt and Melkamu Kedir in 2009. However, the focus of their research was on economic changes. Regarding Adama town, there was no study done on urban transformation so far, especially concerning spatial transformations of the town’s surrounding peri-urban areas. However, there was a little attempt to study water and health issues of Adama town. In Addition, Addisyhun (2019) also published a thesis on ‘Housing transition in urban land; under Addis Ababa University in 2019. But the area of spatial transformation related with urbanization is not investigated yet. Therefore, this study focuses on spatial transformations in the peri-urban areas to fill the knowledge gap by considering it as one of the critical issues in informal urbanization in Ethiopia in general, and in Adama town in particular. Geographically the cases of peri-urban locations surrounding Adama town are chosen due to the researcher’s living experience in these areas and their proximity to his place of study.

Additionally, because of these changes take place on agricultural land adjacent to cities, settlement changes in Adama Town's surrounding peri-urban areas, which serve as incubators for new unofficial (informal) settlements. It destroys the current peri-urban landowners' settlement patterns, way of life, and socioeconomic foundation.

1.3 Objectives

1.3.1 General objective

The primary goal of these study is to examine the traits and mechanisms underlying settlement transformation in the peri-urban areas around Adama Town.

1.3.2 Specific objectives

Under the general objective there are four specific objectives. These are;

- To analyse the process of settlement transformation in the peri-urban areas around Adama Town.
- To investigate the characteristics of settlement transformations in surrounding peri-urban areas of Adama Town.
- To find out the reasons and influences of the transformation of settlement in the peri-urban areas of Adama Town.
- To identify the potentials and significant issues with regard to settlement transitions in the research area, and then suggesting potential solutions.

1.4 Research questions

1, what are the main features of the settlement changes in the peri-urban areas around Adama Town?

2, What are the main causes and influences of the transformation of the settlement in Adama Town's peri-urban surroundings?

3, How does spatial transformation happen in the surrounding peri-urban areas of

Adama Town?

4, What are the main issues and potential fixes related to the changing settlement patterns in the research area?

1.5 Significance of the study

Ethiopia, a developing nation, has a high rate of urbanization (4.4%). (Bogale and Korf 2009). To comprehend the current state and development of urbanization, it was essential to study the traits and procedures of housing and settlement transformation. The results of this study can be used as input for various urban development and planning projects, including the Adama Integrated Planning Program (AIPP), as it focuses on settlement difficulties in the areas around Adama Town. Studying spatial transformation aids in the creation of land

regularization strategies and the definition of criteria for redrawing municipal boundaries. The results of the research can potentially be used to improve or revitalize the local places in the future.

Additionally, the documentation of the study area's current human settlement pattern and characteristics of urbanization is crucial for the Adama people. This information can also be consulted by academics and researchers for more research because the topic of spatial planning associated with urbanization, particularly in the peri-urban areas surrounding Adama Town, has not yet been researched. The administrations of Adama Town may generally use the research's findings for a variety of development initiatives since the work contains an analysis of the study regions' urban growth patterns and suggests ways to address them.

1.6 Scope

1.6.1 Thematic scope

Thematic scope of this research was investigating the spatial development and change of the peri-urban areas around Adama Town. The investigation takes into account activity, area, and place meaning at the settlement, compound, and home levels. These activities therefore require the documenting of spatial components from both the past and the present. Other topics like culture, history, ecology, economy, demography, and so on are not the main focus of this research. However, in some instances, they are exploring in connection to space in order to understand their impact on the alteration of the study locations.

1.6.2 Geographic scope

The geographic scope of this study includes residential areas in the peri-urban surroundings of Adama Town in the case of malkadama, which is close to Adama Town's southern boundary. The selection of the cases area was based on criteria that were discussed in the following chapter of this study. In order to study settlement transformations in this cases area, representative sample households was chosen from the cases area.

1.7 Limitations.

The lack of properly structured secondary data and the issue of reluctance exhibited by some participants which means challenge was finding residents, community leaders, and kebele leaders for interviews. The majority of the interviews were scheduled, and it occasionally interfered with their work or other interests. All of these difficulties were overcome thanks to

the persistence of the researcher and data gatherers as well as their participation in the interviewees' activities, which helped to analyse their actual circumstances.

1.8 Operational Definitions

Several researches so far conducted in different parts of the world on specific issues related to urbanization, urban growth and sprawl tried to put their own operational and contextual definitions for the peri- urban areas. In spatial terms,(Rakodi 2012) defines the peri-urban area as "…*the transition zone between fully urbanized land in cities and areas in predominantly agricultural use. It is characterized by mixed land uses and intermediate inner and outer boundaries, and typically is split between administrative areas"*. According to PLUREL (Peri-urban Land Use Relationships - Strategies and Sustainability Assessment Tools for Urban-Rural Linkages) used nearly similar definitions peri-urban area includes both urban fringe and urban periphery. (Zasada, Loibl et al. 2013)cited on (Ravetz, Fertner et al. 2013)defined peri-urban area as *discontinuous built development containing settlements of each less than 20,000 population, with an average density at least 40 persons per hectare* (Ravetz, Fertner et al. 2013).

1.9 Outline of the paper or the Research.

This study is broken up into five segments to make it easier to grasp and navigate the topics of each chapter.

Chapter 1, is introduction part that discusses background of the study, research problems, research objectives and questions, scope, significance and organizations of the study.

Chapter 2, deals with reviewing definitions of peri-urban area in the context different continents and reviewing related literatures on cause, character, process and actors of peri-urban transformations.

Chapter 3, discusses selection of research methodology, data collection and analysis tools, research procedure, case selection criteria, sampling, and research design.

Chapter 4, there is a case analysis section that includes a socioeconomic, life story, and spatial examination of the case's locality. This chapter also discusses the summary of findings for the cases.

Chapter 5, according to the research findings, this chapter includes conclusions and recommendation. How space, activity, and meaning will change in the instances area is covered in the conclusion section. Additionally, the recommendation section offers potential

recommendations for decision-makers in local government, community leaders, and planners of physical space.

CHAPTER TWO

2 LITERATURE REVIEW

2.1 Concepts and Definition of Terms

Researchers around the world use several terminologies for the same region or location. However, it is still unclear which of the following terms should be used to refer to the same geographic area when any of the others—rural-urban fringe, peripheries, urban fringe, dynamic edge outskirt, peri urban, city edge, rural-urban interface, extended metropolitan region, Desakota, metropolitan fringe—are used interchangeably. Although the word "peri-urban" is frequently used in literature and policy discussions, there is little basis for a shared understanding of what a peri-urban area is because the definitions utilized are situational and instance specific. (Iaquinta and Drescher 2000).

*The urban fringe – that subzone of the peri-urban area (rural-urban fringe) in contact and contiguous relations with the central city, exhibiting a dense of occupied dwelling higher than the median density of the total rural-urban fringe a high proportion of residential, commercial, industrial and vacant as distinct from farmland, and a higher rate of increase in population density, land use conversion and commuting. The rural fringe – represents the sub-zone of peri-urban area (rural-urban fringe) contiguous with the urban fringe, exhibiting a density of occupied dwellings lower than the median density of the rural-urban fringe, a high proportion of farm as distinct from non-farm and vacant land, and a lower rate of increase in population density, land use conversion and commuting. (*Pryor 2010)

Pryor's concept and scheme were refined by (Bryant, Russwurm et al 2014) who also created the distinction between the "inner fringe" and the "outer fringe." The inner fringe is where the transition to urban use is most progressed, while the outer fringe is where the rural landscape predominates (Bryant, Russwurm et al 2012). The peri-urban area is described in spatial terms as *".....the transition zone between completely urbanized land in cities and areas under largely agricultural usage*" by (Rakodi 2009). It is often divided into administrative areas, has varied land uses, and intermediate inner and outer limits.

The PLUREL project different zones of urban spaces from urban core to rural-hinterland are clearly identified and defined as follows. (The zoning and relationship among each zone is presented in figure 2.1):

- *Urban fringe- a zone along the edges of the built-up area, which consists of scattered pattern of lower density settlement areas, urban concentrations at transport hubs and large green open spaces.*
- *Urban periphery- a zone surrounding the main built-up areas with lower population density, but belonging to the Functional Urban Area as described in fig below. This can include smaller settlements, industrial areas and other urban land uses.*
- *Rural Hinter land – rural areas surrounding the peri-urban area, but within rural-urban region.*
- *Urban Core- a region which includes the Central Business District and other civic functions;*
- *Inner Urban area- generally high density built development (built-up areas);*
- *Suburban area- generally low density contiguous built-up areas that are attached to inner urban areas and where houses are typically not more than 200 meters apart.* (Ravetz, Fertner et al. 2013)

Therefore, According to PLUREL peri-urban area includes both urban fringe and urban periphery (see fig 1). (Zasada, Loibl et al. 2013)cited on (Ravetz, Fertner et al. 2013)defined peri-urban area as discontinuous built development containing settlements of each less than 20,000 population, with an average density at least 40 persons per hectare (Ravetz, Fertner et al. 2013).

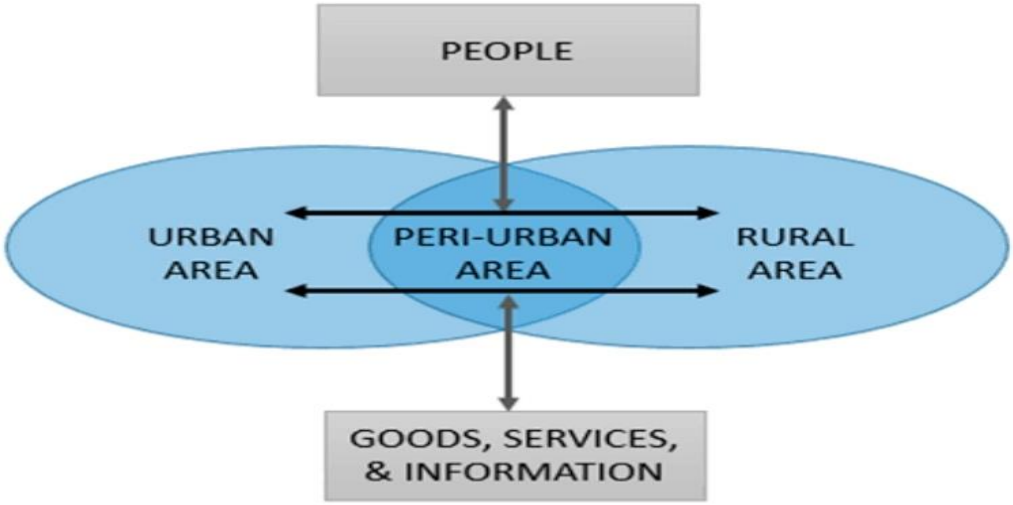

Figure 2. 1 Peri-urban areas and the 'rural-urban-region' Geographic concepts

and definitions as used in PLUREL project. Source (EUROPETowards)

2.2 Peri-Urbanization and Related Concepts

In the Africa and the other developing nations of Asia and the Pacific, the phrase "peri urbanization," which refers to the urbanization of the fringe zone, is used in a variety of ways. Similar to terminology, the nature of alterations in peri-urban areas varies from location to location in connection to the socioeconomic state of the area. The first of these is the idea of an **Extended Metropolitan Region** (EMR) (Anderson and Smith 2001). The complex system of cities, towns, and semi-urban or rural settlements in the Asia Pacific region has reportedly been referred to as EMR, according to Smith (2001). Because of the expansion of cities along communication corridors, there has been a fusion of urban and regional growth, blurring the lines between urban and rural areas.

The second idea is **suburbanization**, which is widespread in the western world and might be confused with peri-urbanization. Suburbanization, or the spatial deconcentration of people and economic activity in a metropolitan area, is a phrase used to describe the movement of people and businesses from the inner city to the suburban ring, primarily in the United States and Canada.

The other very similar development compared with peri-urbanization is **urban sprawl**. Urban sprawl usually has a negative connotation due to its consumption of huge land with a low density, and inefficient land use in the urban peripheries. Sprawl is a common phenomenon in both the developing and developed countries. Sprawl development causes the formation of peri-urban (urban fringe) areas.

2.2.1 Peri-urbanization in Western world context

Even within the western world of the United States of America and Europe, there are notable differences in the nature and characteristics of urban periphery zones. Like most other cities outside of the United States, Australia, and Canada, most European cities still have substantial centers, and the urban and rural zones are typically divided by an edge that is "hard" as opposed to "graduated."

England during the 17th and 18th centuries in Europe before being transferred to America (Hausmann, Günther et al. 2013). The economically prosperous middle class—traders, bankers, and subsequently industrial entrepreneurs—turned their weekend homes in the outlying rural towns into permanent dwellings and commuted into the cities every day.

The concepts of suburbs and the rural-urban periphery (peri-urban region) are frequently misunderstood. (Evenden and Walker 2015) explains that the two concepts are distinct while Johnson (2018) on his part argued they are related concepts.

Peri-urban areas are defined by PLUREL as '*discontinuous built development containing settlements of less than 20,000 with average density of 40 persons per square kilometers'* (Ravetz, Fertner et al. 2013).

2.2.2 Peri-urbanization in Asian and Pacific Region context

Many scholars conducted research in different countries with different names for the same part of the cities, the outskirts of the city dominantly in India and other south East Asian countries. Among these are (rural hinterland of the city by(Kundu, He et al. Kundu, He et al.2013); Rural-urban fringe by(Nangia 2012); urban fringe by(Kabra, 2010); (Hill, 1986); desakota regions by (McGee, 2010); metropolitan region by (Saini, 2011).

(Lal 1987) looked at how urban influences on rural villages varied depending on how far they were from the Bareilly city core. These urban factors include the population density, percentage of built-up land, type of settlement, and density of housing, which are all stated as dwelling gradients in relation to gradient from the city. In his work "the city and urban periphery with a case study of Bareilly," published in 1987, Lal made a significant contribution to the literature on India's urban fringe.

The rural-urban interface (peri-urban) is the most dynamic spatial element of any mega metropolis, according to(Sengupta 2007) study on the territorial integration of urbanizing villages around the Delhi Metropolitan Area. This region is a spatially in-transition territory that is part of the urban fringe.

> *Suburbanization, including the relocation of slum communities, and to a lesser extent, step-wise migration from smaller towns and cities has become the principal drivers of residential peri urbanization (Webster and Muller 2002)*

2.2.3 Peri-urbanization in African Context

The study of peri-urban areas in Africa attracted little attention prior to the 1990s. Before the 1980s, the terms "peri-urban" or "urban periphery" did not occur in any literature about African cities, according to Simon, McGregor, and Nsiah-Gyabaah (2004).

The flow of resources from urban to peri-urban areas has really been one of the good aspects of peri-urban interactions, where the resources have been a significant catalyst in the creation of livelihoods.(Nourine, Chembo et al. 2011). According to Kamete (2011), cited in Chembo, a flow of resources is believed to have a favourable effect on the development of non-farm activities (2011).

(Oduro 2010)produced one of the most significant contributions to interdisciplinary research in Africa when he examined how urban growth affected the way of life in peri-urban Accra, Ghana. He described the peri-urban area as a "zone" and a transitional belt between the city and the countryside, a zone going through numerous changes and having both urban and rural characteristics coexist.

(Sisay Habtamu 2012) also studied tenure in-security issue around Addis Ababa city and discussed the contribution of urban land policy gap to insure secure tenure over peri-urban land rights.

(Getahun and Humanities 2005) investigated how population increase and settlement growth affected locals' quality of life in one of Addis Abeba's outlying sub-cities. In his investigation, he found that the agricultural community is being impacted by the forced change of livelihood and continuous and rapid settlement expansion to the outskirts of Bole sub-city, with a specific site of kebele 15.

In their study titled "Impact of urbanization of Addis Abeba city on periurban environment and livelihood," Mekonen and Alemu (2011) evaluated the spatiotemporal extension of Addis Abeba to the peripheries (peri-urban).

2.3 Rural-urban changes in peri-urban dynamics

(Habitat 2016) estimates that 54% of people on the planet live in cities. Due to the significant concentration of people in cities and towns, urban regions' economic contributions to the gross regional product (GRP) are assumed to be growing. Thus, cities account for more than 80% of global GDP despite having just 54% of the world's population (Habitat 2016). The spread of the economy and the advantages of development are possible. However, the infrastructure, service delivery, and management capabilities of governments are coming under increasing pressure due to rising urbanization. One-sixth of mankind, or more than a billion people, currently reside in slums, and (Habitat 2013)predicts that number will nearly double in the next 30 years to reach one third HABITAT (2010).

Urban centres across Africa are becoming the future habitat for the majority of Africans. The population projection shows that by 2030, about 50% of the population of Africa will inhabit urban centres (Un-Habitat 2010). The unprecedented growth of urban population in Africa is causing an exceptionally rapid increase in the demand for urban land. The rising demand for urban land therefore tends to be met primarily by converting peri-urban agricultural land at the periphery of the existing built-up area (Un-Habitat 2010). Peri-urban areas, where there is a rising demand of land for non-agricultural or urban land uses and located at the receiving end of urbanization, form tenure hotspots. It is increasingly evident that peri-urban areas are now becoming places where a lot of changes and activities are taking place due to rapid urbanization and population growth (Wehrmann 2008).

In most emerging nations, rapid urbanization prevents the official housing and land markets from operating effectively. These can be seen in the fact that between 30 and 70 percent of people live in informal settlements in developing nations, according to Durand-Lasserve (2011). Furthermore, according to the(Miles and Paddison 2005), up to 85% of new housing construction and 64% of the existing housing stock in low-income countries are illegal. (Miles and Paddison 2005)asserts that urbanization is the primary driver of residential home development and transformation, particularly in recently conquered areas. Therefore, as the population of the newly invaded land grows, so do the potential for spectacular gains.

2.4 Peri-urban transitions' characteristics

2.4.1 Environmental and spatial changes in the peri-urban setting

2.4.1.1 Environmental degradation and pollution

Despite just making up 2% of the planet's land area, cities are home to more than half of the world's inhabitants (UN-Habitat, 2010). urban places with a dense population has led to a significant alteration of the environment in peri-urban areas. Concern arises from the large-scale land use/cover changes that result with rapid urbanization, especially in developing nations, because urbanization is a major driver of environmental change on a variety of scales (Bandyopadhyay, 2018). There are many effects of urbanization on ecosystem structure, function, and dynamics. It is a complicated process that converts peri-urban areas and rural land to urban land use (Luck and Wu 2002).

According to (Edessa 2010), Oromia is the region of Ethiopia that is home to fertile soils, abundant mineral resources, a source of biodiversity, a forest ecosystem, and numerous rivers

that are used for urban agriculture and other industrial purposes. Edessa explains that the fertile lands surrounding Addis Abeba, the nation's capital city, are currently exhibiting a paradigm shift away from agricultural food production and towards horizontally prolonged urbanisation and non-food production, which has anchored the dissolution of the local family, starvation, and other environmental hazards. The report also showed that the Ministry of Health had informed the public via the media that 30% of people were afflicted with illnesses brought on by flora farm chemicals, which had also contaminated the air, the land, and the water.

2.4.2 Changes in land use and fragmentation

Environmental degradation is occurring in the peri-urban areas as a result of certain structural changes. The rural-urban fringe is the limit of urban land growth. It is renowned as a "natural laboratory" for the study of environmental effects due to its busy socioeconomic activity, significant man-land relationships, acute contradictions, and delicate ecological environment (Msangi, Rosegrant et al. 2011).

The degradation of land and water resources is one of the most critical issues that the peri-urban development process is accompanied by. In their study on "land transformation in Bangalore's ecology," (Narayanan and Hanjagi 2009) defined land transformation as the act of changing the form, shape, structure, appearance, or nature of land that has been put to some use.

2.5 peri-urban transitions in progress

The procedure of purchasing a block of land in an informal manner is orderly and has its own steps. The key activities or behavioural patterns of key actors as well as rule structuring processes through which actors acquire and retain a plot of land from the informal market follow more or less predetermined procedures and activities (Achamyeleh 2014). As a result, it is possible to say that informal land transaction in the area is mainly built on trust, with no legal documents involved. In the case study area, social norms like trust play a prominent role in the regulation of the behaviour of transacting parties (Adam 2014).

Identifying a plot of land that is for sale, expressing interest in it, observing the seller's behaviour, negotiating a price, and concluding and documenting the transaction through a traditional agreement or contract are the key activities and stages in the informal acquisition and development of land. Even though the contracts that the parties to the transaction signed in front of the community elders were invalid and had no legal standing, these

papers/contracts were crucial in preventing future disputes between the parties to the transaction over property. Additionally, how the seller behaves is very important for the success of the land sale.

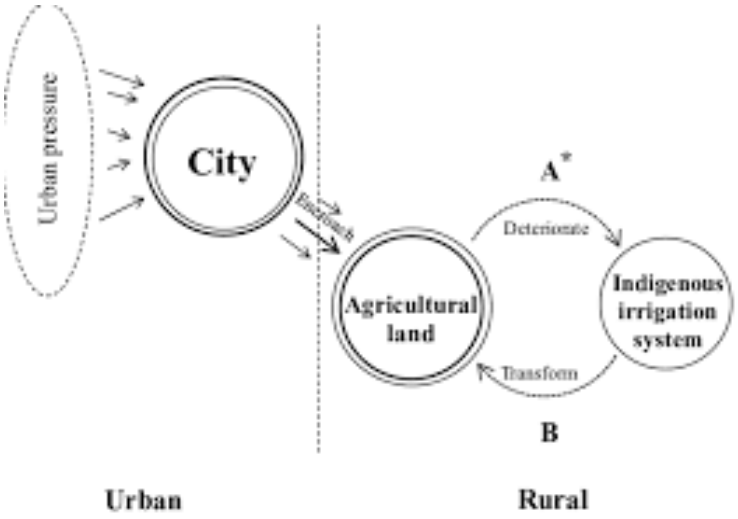

Figure 2. 2 Stages of Urbanization of villages in the urban fringe, Source: Adopted from J.V. Bentinck (2000) quoting R. Ramachandran (2001)

2.5.1 Formal (Institutional) channel

The process of land supply for urban development in Ethiopia is largely based on land reacquisition from local peri-urban farmers and reallocation of land to private developers and others by the government. Therefore, the urban growth and development process in Ethiopia is a four-step phenomena. The final step in the process of urbanization in Ethiopia covers mainly those activities related to reallocation of the redeveloped land to private developers, investors, and other urban groups through lease contracts on the basis of annual ground rent for a specified lease period (See Figure 3)

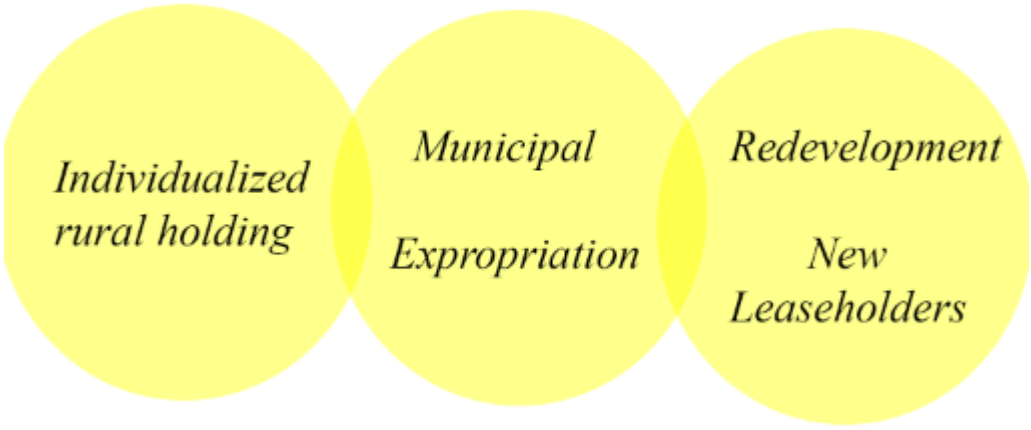

Figure 2. 3 Urban land development process in Ethiopia. Source: Achamyeleh (2014)

Therefore, a crucial flaw in Ethiopia's urban land development process that has led to tenure insecurity is the inability to convert the rights of local peri-urban people into urban land rights.

2.5.2 Informal channel

The peri-urban areas that are affected by urban growth are most frequently linked to uncontrolled urban growth and development (Chirisa 2014). Therefore, transitional peri-urban areas are ideal locations for the growth of new informal settlements, which will also result in the creation of new built-up property rights. According to this report, "informal settlements" are homes built on property over which the residents have no legal claim or homes built without adhering to local construction codes (Adam 2007). In other words, “informal settlements” refers to the contravention of official law with regards to occupation of land, its use, subdivision standards, and ways of transferring or bypassing official requirements for building permits.

The response from the government to this request can come in two different forms. In the first scenario, the informal settlers' request would be granted, and a leasehold agreement would be reached; in the second scenario, the settlers' request would be denied, and their homes would be demolished (see Figure 4).

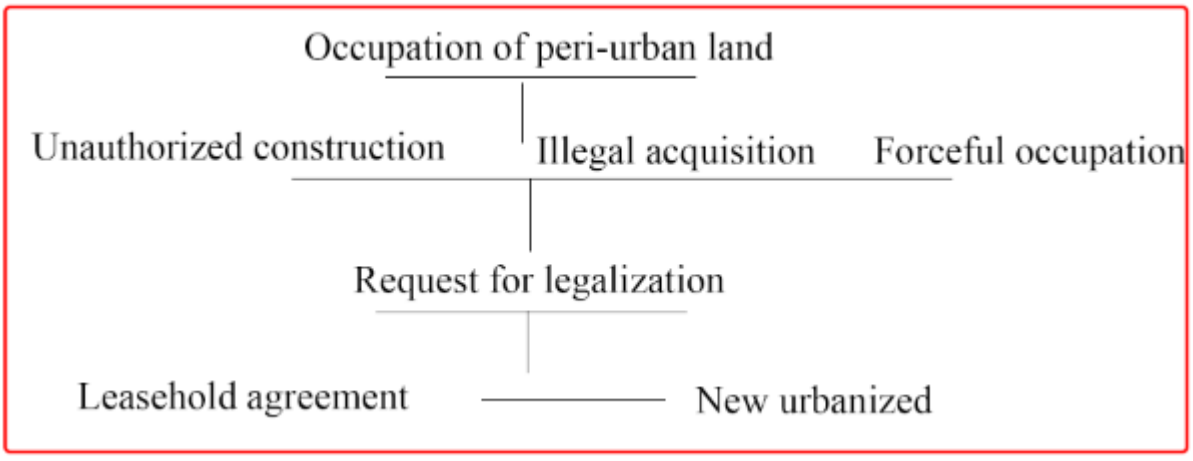

Figure 2. 4 Built-up property right formation process through the informal channel: Source: Achamyeleh (2014)

2.6 Factors of Peri-urban transformations

2.6.1 Population Growth (rural-urban migration)

Urban growth is mostly driven by population growth. According to urban studies, by 2030, urban areas will generally have grown by more than 463,000 square miles (1.2 million square

kilometers) as a result of population increase. Africa will experience the fastest urban land cover expansion, with a 590 percent increase over the 16,000 square mile level of 2000. The Nile Delta in Egypt, the coast of West Africa on the Gulf of Guinea, the northern beaches of Lake Victoria in Kenya and Uganda and extending into Rwanda and Burundi, the Kano region in northern Nigeria, and Greater Addis Abeba, Ethiopia, will see the most urban expansion (Herlitz, 2012).

Ethiopia is the second largely populated African country with an estimated population of 84.7 million inhabitants in 2011 (UN-HABITAT, 2012). However, the country currently sees high urban growth rate. Ethiopia, still being one of the least urbanized countries in the world (17 per cent), has one of the fastest rates of urbanization (4.34 per cent) higher than the average growth rates of the Sub-Saharan Africa (3.95 per cent) (Dereje, Kindie et al. 2012).

However, rather than being drawn to cities by possibilities, rural-urban migration in Ethiopia has largely been a response to push factors associated to ecological deterioration and poverty in rural areas. For instance, about 48% of Addis Abeba's residents were migrants, according to the 2007 Population and Housing Census. Additionally, during the time of the census, nearly 14% of the migrants had stayed. One study conducted in 2008 showed that unlike earlier reasons of rural-urban migration in Ethiopia i.e. negative rural-push factors, it is search for an educational opportunity which is urban pull factor that drive them to the city as reported by the majority of the migrants (Bank 2006).

2.6.2 Shortage of housing

Housing makes about 70% of the land used in most cities, defines urban design and densities, creates jobs, and promotes growth. Housing, however, has not been a priority for national and international development agendas over the past 20 years, as seen by the disorganized and dysfunctional spread of many cities and towns (Habitat 2016).

2.6.3 Economy (Market Failure and Informal Access to Land)

Many people choose to access land through an unofficial system due to government rules, delays, and inefficiencies with the conventional land distribution procedure. According to certain empirical sources, such as Tendayi (2009), the development of informal land markets is the result of flaws in the public land management system, particularly the land distribution procedure. He continued by saying that as the legal land supply collapsed, opportunistic and

informal land supply tendencies began to emerge. To make up for the gaps in the legitimate land supply market, many people have turned to the informal land markets.

The peri urban areas due to the inability in paying rent, paying for land leases or paying for condominium housing programs. In general, the idea that informal settlements in the peri-urban areas are both responses and witnesses to extensive urban poverty and signal for the failure of urban governance (Habitat 2016).

2.6.4 Expropriation as a method of urban growth

The delivery of urban land is a crucial issue for Ethiopian land policy at the moment since urban centers or cities in Ethiopia are battling with the rising demand for land for various urban development goals. The affected peri-urban landowners who lose ownership of their property as a result of urbanization are entitled to alternative property or monetary compensation. Expropriation is governed by federal law, which has rationalized the procedure based on a notion of public good (FDRE 2005).

More than one-third (nearly 37%) of households lost their holdings due to expropriation or private investments, according to a 2007 World Bank study of a few peri-urban/rural areas. Additionally, it was determined that more than 50% of the expropriated land in the last three years has been put to private use (Deininger, Selod et al. 2012).

2.6.5 Land governance and administration

The federal government in Ethiopia has the overarching authority to create laws governing the use and management of land and other natural resources (FDRE, 2017). In addition, regional states are given authority to manage land and other natural resources under their control. Despite overlap, there are separate institutions in charge of administering rural and urban land, which creates conflicts of interest and a lack of clarity in matters pertaining to peri-urban land. With significant variations in structure and capacity amongst the regional states, duties are also shared between the federal and regional levels (Achamyeleh, 2014).

2.7 Peri-urban transformation actors

In an effort to comprehend the most significant actors According to Bryant, Russwurm, and McLellan (1982), the state, the grassroots, or the poor farmers, businessmen, and others, are among the key stakeholders who each play a part in the growth and alteration of peri-urban territory. It is wise to consider the roles played by the government and its agencies, the farmers who donated their land, the businessmen who purchased land, the property dealers

with a focus on the land market, and the developers in order to better understand the factors underlying land use/cover dynamics from the actors side. (See Table 1.)

Actors	Interest and Motivations	Roles in land development and transitions	Roles in land development and transitions	Degree of Influence
Government political leaders from higher to local level	Guide development Make political interactions with business people and make financial benefits/revenues	Policy making and project approval Influence decision making process	Formal and in some cases informal	High
Land sellers (when farmers individually sell land)	To get high price of Land	Selling land willingly or Forced to sell by some political pressures	Informal	Depends on the political pressures
Private formal Developers	Generate financial benefits through speculation	Land developers	Formal	Very significant in their influence to promote or hinder dev't
Land brokers and middlemen	Profit maximization from the profit gained by the seller	Enhance transaction in the form of service delivery	Informal	Depends on their number of customers

Table 2. 1 Actors and their role in peri-urban transformation Source: Compiled from (Bryant and Bailey (1987), Bentinck (2000) and Masum 2009), Yirgalem (2009

2.7.1 The Government and its Agencies

Land use in the peri-urban area is constantly under pressure from a range of interest groups. One of the main interest groups—indeed, the main initiator—goes to the decision-makers

who have the power to influence the government, create public policy, and enact laws governing urban planning. It is the responsibility of the government to oversee project development, appraisal, and approval as well as to implement the policies, development initiatives, and general decisions that have been made. Government involvement in that process takes many different forms (Bentinck 2000). Authorities' goals and interests differ depending on their position within an organization, but they also frequently reflect personal agendas and individual or conflicting interests.

(Birhaneselassie 2016) has identified the key players in the informal land delivery system, including residents of informal settlements, land brokers, land speculators, local farmers, and state agents in his study of the situation of informal actors in urban land management in one of Addis Abeba's sub-cities, the Kolfe-Keranio sub-city.

2.7.2 The Independent Developers

The investor is one of the many local players with a stake in the demand side of the land market in peri-urban areas. Players in the private sector are actually not just investors; they also include certain farmers, various entrepreneurs and speculators, brokers and property dealers, as well as many other unnoticed groups

Additionally, they are the ones who carry out developments without authorization. They also steal land from rival developers who don't share their political views or otherwise interact with them. These investors/developers are also among the largest public land speculators, and they are anxious to stay in the real estate market because they stand to gain the most from it (Chodos, Jaffe et al. 2017)

2.7.3 Real estate brokers and others

The property dealers and brokers are the other group of private stakeholders that are active in both the supply and demand in the land market and who speed up the pace of land conversion. Property dealers constantly and everywhere get involved in the expropriation process of acquiring land. Some opportunistic groups have developed as a result and reaped the benefits, but the great majority of rural farmers have lost their land and means of subsistence to both the legal government land expropriation and the black market for land.

2.8 Form determinants

Rapoport (2010) commented on the existence of housing forms that are at odds with the environment, the existence of some types of housing in various temperature zones, and some

instances, such as the Tasmanian Aborigines' lack of housing in areas with cold climates. As a result, there are situations where a way of life may result in almost anti-climactic solutions, with the type of housing related to economic and social activity rather than climate, which may happen as a result of the needs and motivations of primitive and peasant builders that are "irrational" in terms of climate. These could include rituals, religious convictions, status, and other things. The prevalence of anti-climactic remedies makes one doubt the more fervent climatic determinist viewpoints and implies that other causes must be at play.

2.9 Summary

As was already mentioned in this chapter, different researchers have defined and utilized different terminologies for peri-urban locations. The definition provided by Rakodi (2011) was judged to be the most appropriate for this investigation. As a result, the term "transition zone" is used to describe the area between fully urbanized (formal) land in cities and areas with a predominance of agricultural usage. It is distinguished by mixed land uses, intermediate boundaries, and outer limits, and is frequently divided into administrative areas and also it is employed, and peri-urban areas for this study contain both urban and rural fringe, which Bryant (2015) and Pryor refer to as "rural-urban" fringe (2016).

In various global contexts, peri-urbanization takes on distinct characteristics. In Europe, it is associated with industry and sub-urbanization, while in Asia, it is associated with extended metropolitan regions (EMRs).While in Africa, the majority of peri-urbanization is ascribed to the unofficial growth of cities (Olujimi and Gbadamosi, 2007). In a similar vein, peri-urban areas in Ethiopia are the immediate environs of cities with overlapping land use and administrative areas (Achamyeleh 2014).

2.9.1 Research gap

Numerous social factors, in addition to financial and administrative limitations, become obstacles to planning and a driving force behind informal change. However, there hasn't been much interest to study these areas. For instance, Achameleh (2014) investigated the urbanization and land conflict in Ethiopia's peri-urban districts. But the majority of his research was devoted to policy matters. Urbanization and spatial connection in Ethiopia were explored by Paul Dorosh and Emily Schmidt in 2010 and by Emily Schmidt and Melkamu Kedir in 2009. However, the focus of their research is on economic changes, (see table 2 below). Regarding Adama town, there is no study done on urban transformation so far, especially concerning spatial transformations of the town’s surrounding peri-urban areas.

However, there was a little attempt to study water and health issues of Adama town. Therefore, this study focuses on spatial transformations in the peri-urban areas to fill the knowledge gap by considering it as one of the critical issues in informal urbanization in Ethiopia in general, and in Adama town in particular.

Author and year	Title(Name of the research)	Study description	Research gap
Paul Dorosh and Emily Schmidt (2010)	Urbanization and spatial connection in Ethiopia	Their research focuses on changes in the economy.	Their research focuses on changes in the economy.
Achameleh(2014)	urbanization and land conflict in Ethiopia's	His studies focused primarily on policy issues.	It's not about spatial transformation of the settlement, but its all about shortage of urban land.
Addisyhun (2019)	Correlating two deferent prei-urban areas	The focuses of his studies was based on the housing issues compering two different urban reigns.	It deals about the parameters which helps to compere transition of both area
The researcher of this study	Settlement transformation in the prie urban …	this study focuses on spatial transformations in the peri-urban areas to fill the knowledge gap by considering it as one of the critical issues in informal urbanization in Adama.	

Table 2. 2 The research gap in the related issues of studies

Different processes are used to alter the land in peri-urban settings. Both of them are unofficial channels. Government officials anticipate using the binary continuum method, another novel strategy, to ease tension and social issues between peri-urban landowners and the executive branch.

The majority of the variables influencing peri-urban transitions in Ethiopia are human ones, despite the fact that there are both physical and human determinants of form in general (Ravetz, Fertner et al. 2013). These include intergovernmental landownership rights, housing shortages, economic issues (including market failure and unregulated access to land), and

urbanization strategies (expropriation). In accordance with the variables, there are peri-urban transition players, each of whom play a specific part in the process. The performers in this group are divided into formal and informal actors based on the roles they play. Government officials and business owners are formal actors. While land sellers, middlemen, and brokers are informal actors. Governments in peri-urban areas occasionally engage in shady land deals through their political leaders.

In general, even though, peri-urbanization is recent phenomenon in Ethiopia, it is expanding around many cities. Due to its dynamic character, peri-urban areas are known by mixed and changing land uses, where different actors involve on transformation processes.

CHAPTER THREE

3 RESEARCH METHODOLOGY

In order to appropriately examine and study the research problem, this chapter covers how the researcher selects the research approach that best matches the research questions. It also outlines the different methodologies used in this research and how they are implemented. Additionally, this chapter covers case selection criteria, sampling, and research design in addition to data gathering and analysis methodologies. Thus, a mixed methodology that combines qualitative and quantitative techniques is used for this study in order to examine the breadth and depth of the issues. The case study technique is chosen under the mixed method because it is more pertinent than other methods for a research project addressing a descriptive, causal, or explanatory inquiry (Yin 2009).

3.1 Selection of a Research Methodology

Researcher's use mixed method which is selected to explore nature of the problem and to quantify extent of the problem using both qualitative and quantitative methodology respectively.

Qualitative methodology enables to explore the character of settlement transformations. It is used to understand the underlying reasons, opinions, and motivations; it provides insights into the problem or helps to develop ideas or hypothesis for potential quantitative research. As (Creswell 2014)described it:

Qualitative research is often used to uncover trends in thought and opinions, and dive deeper in to the problem. Generally, qualitative research seeks to explore a specific phenomenon, not prove a prediction. Often used in the social sciences and education, qualitative methods provide rich, contextual exploration of the topic that are often personally or culturally meaningful. (Creswell 2014)

Whereas quantitative methodology helps to understand the extent of transformation happening on the study area. It is used to quantify attitudes, behaviours, spatial features and other defined variables, and generalize results from a larger sample population. Regarding this methodology, Creswell (2014) wrote,

Quantitative research uses measurable data to formulate facts and uncover patterns in research. Quantitative research is more objective than qualitative methods. In this type of methodology, the researcher crafts a hypothesis and then tests it through structured means

instead of exploring or describing a phenomenon, quantitative methods deal with facts and statistics. This type of research is often used in natural science or medicine. (Creswell 2014)

In order to apply a variety of measurements that incorporate both contextual understanding, such as interviews or observations, along with facts or statistics, the mixed technique will be chosen. With the use of mixed techniques, a researcher can explore a subject from a variety of angles and get a wide-ranging understanding of it. A mixed methodology allows for the integration of many phenomena since it integrates multiple philosophical perspectives.

Since it is more applicable than other techniques for research addressing explanatory, causal, and descriptive concerns, the case study approach is specifically chosen for use in mixed methods research (Yin 2009). According to Robert K. Yin (2009), the case study technique is helpful to characterize an intervention and the real-world context in which it occurred as well as to explain putative accidental relationships in real-world interventions that are too complex for survey or experimental strategies. Additionally, he added that the case study method prefers data collection in natural situations over relying on derived data. As part of a case study, conducting some fieldwork utilizing a questionnaire or other tools aids in better understanding the phenomenon.

According to Robert K. Yin (2009), types of research questions are important to choose research methods. “What” questions - in case of studying prevalence, it favors survey or analysis of archival records, but in case of exploratory research- favour case studies. “How” and “Why” questions most likely favor case studies, experiments, or histories. Therefore, case study is found to be the best method for this research since all of the research questions are ‘what’ and ‘how’ questions which ask characteristics, causes and processes of transformations.

3.2 Method for data collection

This study was conducts a reliable and in-depth study using both quantitative and qualitative methods. Methods for gathering quantitative data are substantially more regimented than those for gathering qualitative data. Numerous survey types, including online, print, mobile, and kiosk surveys, as well as in-person and phone interviews, longitudinal studies, website interceptors, online polls, and systematic observation, are used to collect quantitative data (Creswell 2014). In this project, organized interviews, structured observation, and the analysis of secondary sources like published books and reports will all be used to gather quantitative data. Look at Table 3.1.

Qualitative data collection methods often use unstructured or semi-structured techniques. Some common methods include focus group discussions (FGDs), in-depth interviews, direct or participatory observations, photography, Video recording, sketching, mapping, and review of documents for these types of themes. The sample size is typically small, and respondents are selected to fulfil a given quota(Creswell 2014). Therefore, qualitative data will be collected using multiple tools such as in-depth interview, focus group discussion, sketching, photography, and direct and participatory observation. See Table 3.1.

Qualitative data collection methods	Quantitative data collection methods
In-depth Interview	Secondary source review
Focus group discussion (FGD)	Structured observation
Direct observation	Semi-structured interviews
Mapping	
Sketching	
Photography	

Table 3. 1 Summary of data collection tools will use for this study

3.2.1 Qualitative data collection methods

- In-depth interview

This way of asking questions allows the interviewee to have more control of the interview. In this research, the in-depth interview will be semi-structured, which use an interview schedule to keep some control of the interview, but also allows for some flexibility in terms of the interviewee's responses. It also includes a life history where the interviewer wants to find out about the whole, or portion of the interviewee's life history.

- Focus group discussion (FGD)

This type of interviewing involves choosing a number of participants from the local populace. It consists of representatives from the kebele government and local leaders. The researcher predetermines the discussion topic taking into account the study objectives, and leads the conversations in order to direct the debate to be with the agenda.

- Mapping

The collection and analysis of spatial transformation patterns at the house, homestead, and settlement levels can be done extremely well through mapping. Utilizing synchronic

analysis (the current state of the case areas) and diachronic analysis, it is carried out (documentation of events in chronological order). Google Earth and the Adama structural plan are the sources of all the information needed for synchronic and diachronic analysis.

- Photography

Another crucial approach in this study is photography, which is employed to describe the actual state of the site's physical features and look, as well as the activities that take place there. The method uses the photo registration technique, which involves recording the number of each photo taken during fieldwork in order to make it easier for the researcher to select the pertinent photos for data analysis and report writing.

- Sketching

Another approach that has similarities to photography is sketching. According to the researcher's perception, it made it easier to gather physical and spatial data. The technical information, such as dimensions, sections, details, layouts, and descriptions of the circumstance (condition) that needs to be sketched, included in this method makes it more significant.

- Direct observation

This is non-participatory observation in which the researcher collects data in a systematic manner by observing and recording things in their naturally occurring setting. In this method, the researcher used different techniques to document his perception such as mapping, field note, Photography, and sketch.

- Participatory observation

Participatory observation is a useful technique for gathering information on resident activity. Understanding the link between space and activity as well as the hierarchical usage of space by various groups is aided. Additionally, it gives the interviewer a thorough sense of how the action relates to space. This methodology is employed in this study's data collecting as a systematic way to get to know interviewees.

3.2.2 Quantitative data collection methods

- Secondary source review

The researcher employed secondary sources in addition to primary ones to gather pertinent information. These include studies undertaken by the Oromiya Urban Development Office, the Adama Town Administration, and other researchers that have been published or unpublished. Valid research output results from the triangulation of data gathered from several primary and secondary sources.

- Structured observation

This method is used by the researcher to identify and count the number of things that are present in settlements or domestic settings, such as the number of rooms in a house, the quantity of public water points (bono wuha), the number of health centers, and the number of schools.

- Semi-structured interviews

This includes a series of structured questions that are asked by an interviewer to the interviewee. In this research, the researcher used this method by being present at the respondents' location and reading all the questions to them. The questionnaire was a combination of a fixed choice of answers and open-ended questions that allow respondents to answer freely in addition to predetermined fixed choice answers by researcher.

3.3 Method for data analysis

Data collected using quantitative and qualitative methods are analyse using appropriate methods. Therefore, quantitative data are analyse using different type of charts, tables and figures. Whereas qualitative data are analyse using synchronic analysis, diachronic analysis and life story analysis. Table 3.2 below shows summary of data analysis tools.

Qualitative data analysis tools	Quantitative data analysis tools
Synchronic analysis	Charts
Diachronic analysis	Tables
	Figures

Table 3. 2 Summary of data analysis tools will use for this study

3.3.1 Qualitative data analysis methods

- Synchronic analysis

This method is relevant to analyse spatial configuration of existing situations of specific place. In this study, the researcher use this method to analyse existing situations in the settlement and homestead.

- Diachronic analysis

Diachronic analysis is relevant method to study transformations through documentation of events in chronological order. In this study, this method is used to explore spatial transformations of settlements, compounds.

3.3.2 Quantitative data analysis methods

Tables, charts, and figures are instruments for quantitative data analysis. These tools are important for carrying out variable comparison analysis and for using precise numbers to present facts. The data gathered from the field will also be analysed in this study using tables, charts, and figures.

3.4 Data type and source

In order to achieve the objectives of this study both primary and secondary data were used for data collection. All data from primary and secondary sources were triangulated to yield valid output.

Primary data were collected from different sources such as key informants (community leaders, elders, kebele leaders and government officials) and residents of selected sample households in the two cases. All of the primary data were collected by making interview with above mentioned sources and by direct observation of spatial and physical elements.

Other sources of data include books, journals, and research papers written by students and foreigners. Secondary data was gathered from reports that have been published and unpublished as well as socio-economic abstracts that have been created by the administrations of the Oromiya regional states, Adama Town, and Denbla Sub City Office. The researcher made every effort to collect secondary data, even if there may not be much of it available from the pertinent kebeles and Adama Town Urban Development Office.

3.5 Research procedure

The development of the research proposal, which included the formulation of the research question and the choice of the most suitable research methodology, served as the starting point for this study. Key informant discussions and a pilot research were then conducted in order to choose the case study location. Following the selection of the instances, a study questionnaire is created, and then data was gathered in the two examples that were choosing. Finally, data analysis and report writing are done depending on the information gather. Figure 3.1 is shown below.

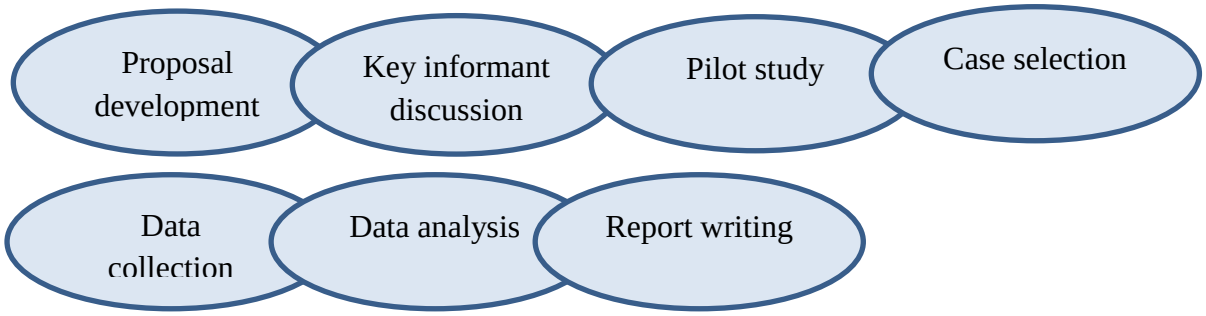

Figure 3. 1 Research procedure

3.6 Case selection and criteria

One of Adama Town's key characteristics is its informal settlement. The agricultural lands and hills that surround the town are being haphazardly and unplannedly turned into urban areas. Seqeqlo, Melkadama/Melkhida, Denbla, and Dabi-solqe are the four acknowledged informal locations of Adama's sub-city extensions on a geographic axis. The majority of these locations are made up mostly of residential buildings without the necessary infrastructure or services. (Observe Figure 3.1.)

A list of selection criteria were used to choose the most appropriate case sites for this study. The criteria focus on extent and rate of transformation, ease of access, convenience and richness of data on the thematic issue (see Table 3.3). Melkadam was chosen as the study's best case area based on these factors (see Figure 3.2). The case area has an own personality. Melkadama is a community that may be found south of Adama town, close to the entrance to Wonji town and from 1984 up to 2013 there were included in wonji zone, but after 2013 they are in Adama region. Transformations in this area began early because a main route passed through Melkadama. Later, the construction of a railroad station and beige fabric factory, as well as the expansion of amenities like electricity, encouraged peri-urbanization in the region.

No	Case areas	Settlement age	Dominant Existing Land use	Activity /liveliness	Variety of building typology	Accessibility And Security	Rate and extent of Transformations
1	Seqeqlo	Recent	residence	Low	Low	difficult	Low
2	Melkadama	Old	residence	high	high	easy	High
3	Denbla	Old	residence	high	high	Fair	High
4	Dabi-solqe	Recent	residence	moderate	moderate	Fair	moderate

Table 3. 3 Case selection criteria sores Google earth age map view

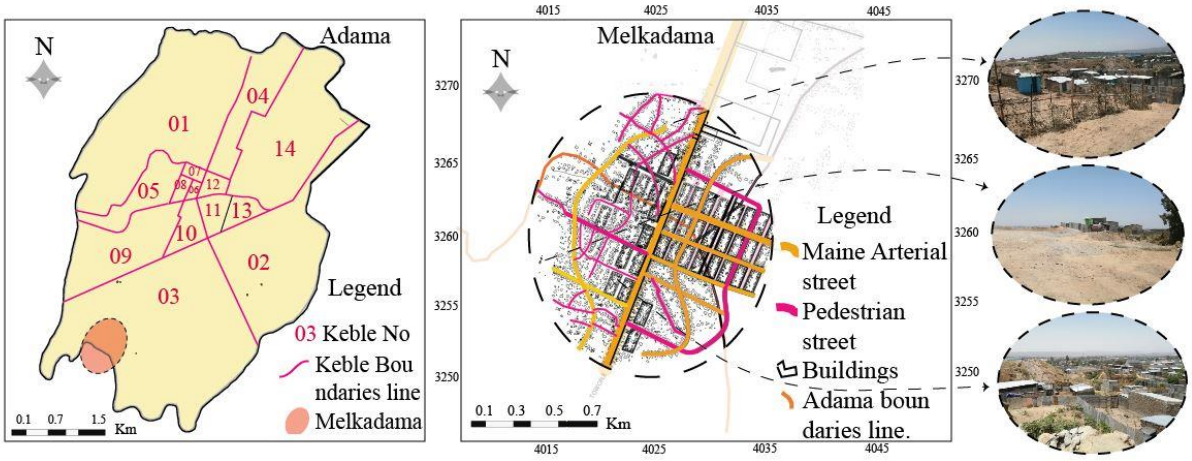

Figure 3. 2 Adama Map and case area(Melkadama map): Peri-urban informal sites source Google earth

3.7 Sampling technique and population

3.7.1 Sample Population

The Melkadama keble/Denbla sub city/ census data indicates that there are 6820 people living in Melkadama overall. There are 1028 households as a result. However, due to its larger and more dispersed spatial extent, the study in Melkadama is focused on the city's central region which includes the localities (neighborhoods) of 09, Denbla, and Metosemanya (180), whose population is estimated to make up more than 48% of Melkadama's total population and thus roughly comprises 610 households.

This study employs the case study approach, which combines qualitative and quantitative methodology. In each case, an appropriate sample population was used in order to undertake an in-depth analysis of the relevant situations. This study anticipates a high degree of confidence and a low percentage of error occurrences due to the in-depth interview. As a

result, 51 households from the case region, or 5% of all households, are chosen for data collection. The length of the in-depth interview and the research budget are two major factors that are taken into account when calculating the sample size.

3.7.2 Sampling technique and procedures

During the pilot study, a household in the case area was observed to have various features. The stratified random sampling strategy was chosen for this investigation as a result. When a population is heterogeneous and includes a variety of discrete categories, stratified random sampling was a useful sampling strategy since it allows for the division of the frame into distinct "strata." Then, each stratum is sample independently as a subpopulation from which certain components may be chosen at random (Mohsin, 2016). To stratify is to divide a population into groups based on attributes like position, rank, income, education, sex, or ethnic background (Kanupriya, 2017). Since the case sites are dispersed settlements with homes that have a variety of characteristics, this sampling strategy helped to ensure that samples from all categories were distributed fairly and equally. The following methods and processes are typically used to perform fieldwork.

- Case selection criteria were used to choose the case area (Melkadama). (See section 4.) eight data collectors are then train on research technique, a methodical approach, and a briefing on the study issue.
- Before employing a questionnaire to gather data, a physical survey of the case locations is conducted by traveling around nearby streets, speaking with locals, and taking images of communities and homes. Three groups (generations) of homes are found on the case sites throughout the physical scanning process. Old generations (the original landowners), recent generations (those who inherit land through family), and new
- A pilot test was carried out on one of the case area's homes during the physical scanning of the case site. Eight data collectors receive practical training in accordance with the testing of the research questionnaire. After the pilot test, the research questions and methodical approach to interviewees are adjusted.
- By using stratified random sampling, 51 sample households from the Melkadama case area were chosen. To ensure a fair distribution of households across all generations, the site is first separated into different neighbourhoods, and then samples of households with an equal representation of each generation are randomly chosen. To

aid with data collecting, a printout of a Google map has markers for the sample homes that are chosen, which must include at least ten homes from each generation. When a sample household is unavailable or unwilling to answer, another neighbouring household of the same group is substituted during the fieldwork.

- In-depth interview is done on twelve households from samples. These house are selected based on willingness/patience of households and richness of data they give.
- Ten important sources in all are questioned for background data. Community leaders, kebele leaders, and seniors with sufficient local knowledge were key informants.

3.8 Validity of data

Cross-checking and triangulation of data obtained from several sources help ensure the validity and dependability of the information. Data will be gathered from many sources, including community leaders, elders, kebele leaders, and people, was cross-check and supplement by methodical procedures and direct observation. Setting up organized methods of communication with locals aid the researcher will gather trustworthy information. For instance, running pilot tests aid the researcher will hone the research questions and establish a structured interview process.

The most crucial factor in obtaining accurate data from respondents was earning their trust. This was done by using knowledgeable data collectors who spoke the local language and were well-versed in the culture. Additionally, by adhering to legal procedure, including displaying legal paper which was produced by the ASTU department of architecture, and by explaining the purpose of the data collection to the interviewers prior to the interview, the confidence were developed.

CHAPTER FOURE

4 RESULT AND DISCUSSION

4.1 House hold profiles and Background

4.1.1Background

The city name Adama may have been derived from the Oromo word adaamii, which means a cactus or a cactus-like tree. More specifically, adaamii means Euphorbia candelabrum, a tree of the spurge family. Following World War II, Emperor Haile Selassie renamed the town after Biblical Nazareth, and this name was used for the remainder of the twentieth century. In 2000, the city officially reverted to its original Oromo name, Adama, though Nazareth is still widely used.

Adama is a busy transportation centre. The city is situated along the road that connects Addis Ababa with Dire Dawa. A large number of trucks use this same route to travel and that was one of the reason for their raped urbanisation.

Location

Adama is located in the north-central part of the Main Ethiopian Rift (MER), within the East Showa zone of Oromia National Regional State. It's located about 100 km southeast of the capital city Addis Ababa. Adama city is one of the largest cities in Oromiya and it's found between escarpment and the Great Rift Valley in West and East, respectively. Adama is found in the Rift valley area in the upper Awash River Basin. Geographically the study area is located at 8º32′0" N – 8º36′0" N latitude and 39º16′0" E – 39º20′0" E longitude. The city is pretty large, with the population close to one third of a million people. . The administrative area of adama is 12,612.6 hectares of land, out of which 5,671.23 ha. is planned (HTM, 2010). The rest of the land is reserved for urban expansion zone. However, currently the area is occupied by informal settlement.(Figure 4.1). The areal extent of Northeast Adama is 45 km2 . The location of the map of our study area drawn from a top sheet number of 0839A4 and 0839C2 published in 2001 by the survey and mapping department of Ethiopia at a scale of 1:50,000. It is situated in a flatland area surrounded by sloping hills on all sides except the one facing the south.

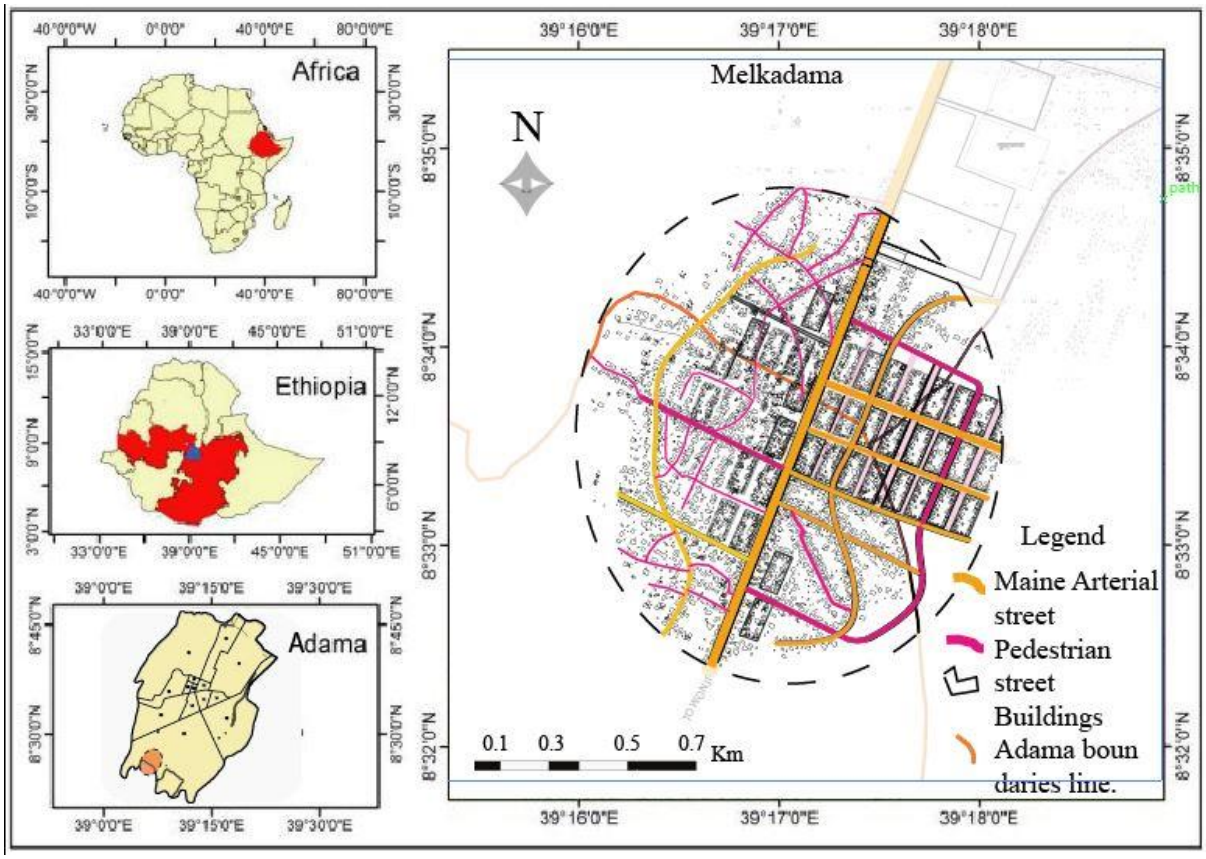

Figure 4. 1 Location map of melkadama source Google earth GIS project of AMB

The soil is light sand and fine clay, which is easily blown into storms during the dry season. Climatically, Adama falls within the kola zone /low land zone and the average annual temperature is about 20 degrees centigrade with maximum temperature slightly exceeding 30-32 degrees centigrade during the month of May. Summer temperatures are low giving mild and pleasant weather conditions. Annual rainfall, which comes during the month of June, July and August, ranges between700 mm and 900 mm.

Demography

Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), the city has a total population of 220,212, an increase of 72.25% over the population recorded in the 1994 census, of whom 108,872 are men and 111,340 women. With an area of 29.86 square kilometres, Adama has a population density of 7,374.82; all are urban inhabitants. A total of 60,174 households were counted in this city, which results in an average of 3.66 persons to a household, and 59,431 housing units. The four largest ethnic groups reported in Adama were the Oromo (39.02%), the Amhara (34.53%), the Gurage (11.98%) and the Silte (5.02%); all other ethnic groups made up 9.45% of the population. Amharic was spoken as a

first language by 59.25%, 26.25% spoke Oromo and 6.28% spoke Guragiegna; the remaining 8.22% spoke all other primary languages reported.

Population size			Area in km2	Density in inh/km2
Female	Male	Total	61.86	5,125.6
102,580	78,629	181,209		

Table 4. 1Adama town population size and density; source: CSA, 2007

4.1.2 Household size and place of origin

The data collected during field work from Twenty-nine houses shows that the size of 51.72% of households (HH) is small, whereas 41.37 % of households are medium size and 6.89 % are large size, see table 4.2 below. Seventy-five percent of small size households are new comers, whereas from the total newcomers 51.72% of new comers are from small size households. The size implies these households establish family recently and come to Melkadama deciding it would be the best option to acquire land and own home by purchasing informally from farmers. Seventy-eight percent of the newcomers arrived at the settlement with-in the last five years, which indicates how fast the land is being acquired and fragmented by the arrival of the newcomers. These activities also changed land use and propagated commercial activity in the area.

Category	Family size	Household frequency	percentage
Small size household (SSHH)	1-5	15	51.72%
Medium size household (MSHH)	6-10	12	41.37%
Large size household (LSHH)	11-15	2	6.89%
Extra-large size household (EX-LSHH)	>15	0	

Table 4. 2 Family size in Melkadama source: data from the site

Additionally, of all the households included in the survey, 71.4% are recent immigrants, while 28.6% are Melkadama natives who were born and raised there. According to data gathered on the ground, Melkadama, Other Oromiya region, Adama town, and other parts of Ethiopia account for 28.6%, 33.7%, 18.3%, and 20.4% of the newcomers, respectively. As these statistics demonstrate, the bulk of recent immigrants leave rural communities in the

Oromiya zone in pursuit of reasonably priced land close to an urban location.

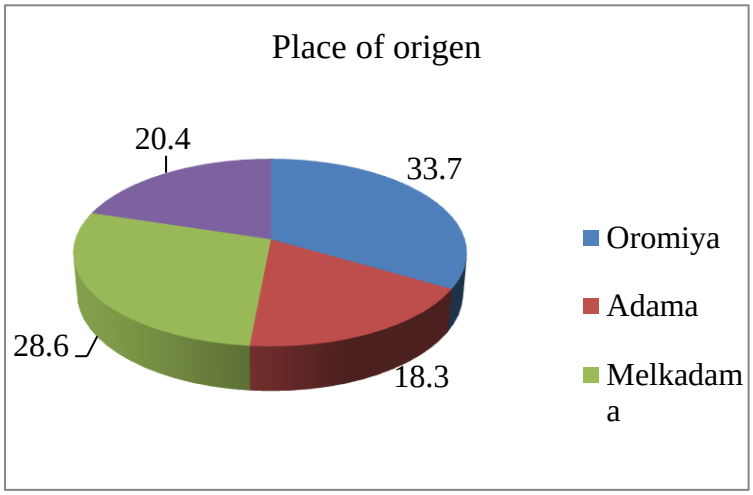

Figure 4. 2 Household place of origin in Melkadama

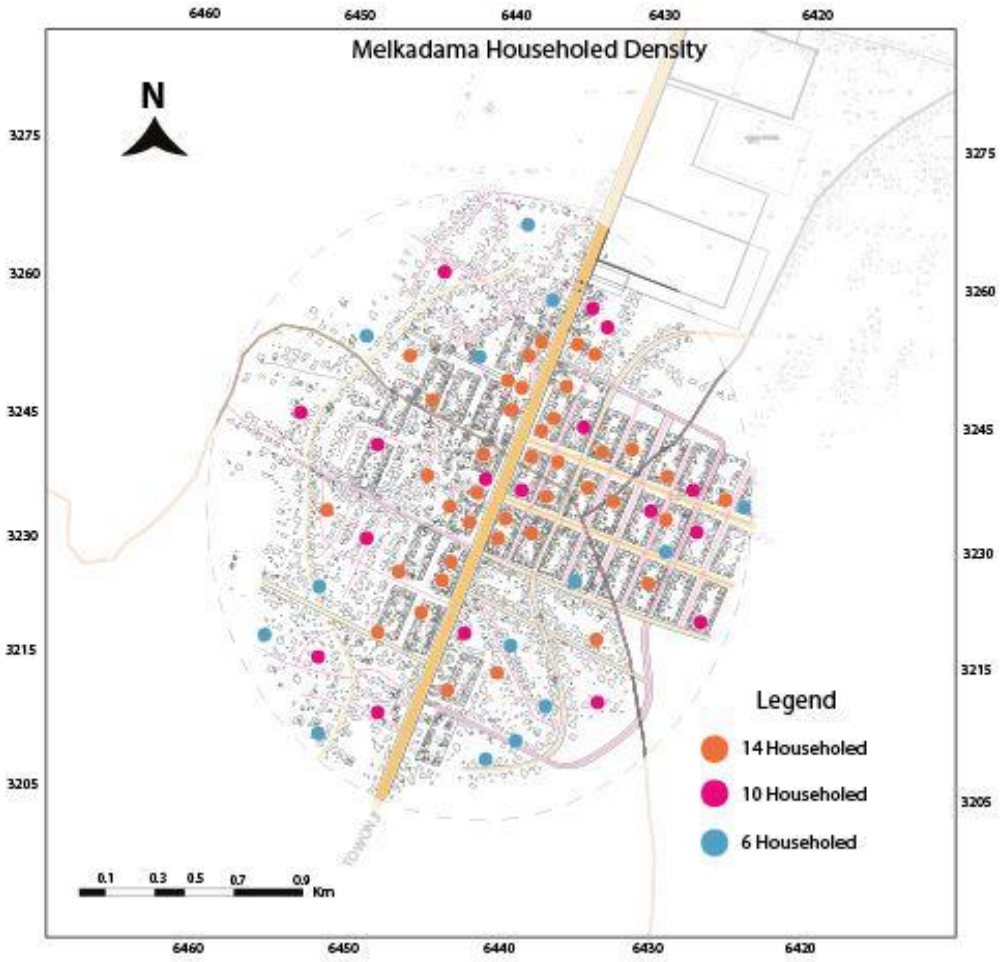

Figure 4. 3 Household Size indication map of Melkadama

4.1.3 Male to female ratio

According to the data collected from Twenty-nine households the numbers of females are greater by ten than males. Within interviewed households, the number of female comprises 52.5%, while the rest, 47.5%, are male.

Category	Male	Female	Total
Small size HH	26	31	57
Medium size HH	61	73	134
Large size HH	29	34	63
Total	116	138	254

Table 4. 3 Male to female ratio in Melkadama . 4

4.1.4 Duration of residence in the settlement

It has been more than fifteen years since people start to live in these areas (Husen and Twedag, 2015). However, the data collected from Twenty-nine households shows almost 60% of households stayed here one up to thirty eight years. From these groups, almost 70% of them are households who stayed for the last ten years, out of which more than 85% of them are from small size households. (See Table 4.3). Small size households which comprise 85% of newcomers in the last ten years are mostly households who establish family recently and their low stability push them to the peri-urban areas in search of affordable land. In general, forty percent of the households stayed in the settlement for only ten years acquiring land through informal purchase or inheritance. This figure shows majority of land transformations happens in the previous ten years.

Years of stay	1-5	6-10	11-15	16-20	21-30	31-40	41-50	51-60	>60
Small size HH	14	6	2	0	1	0	0	0	0
Medium size HH	3	1	0	2	3	5	1	0	3
Large size HH	1	0	0	1	0	2	2	2	1
Total	16	7	2	3	4	7	3	2	4

Table 4. 4 period of stay of households in Melkadama

Over the previous thirty to fifty years, 22% of the households have remained in place. According to Table 4.4 and Figure 4.5, 17% of the households remained in the settlement for more than 50 years.

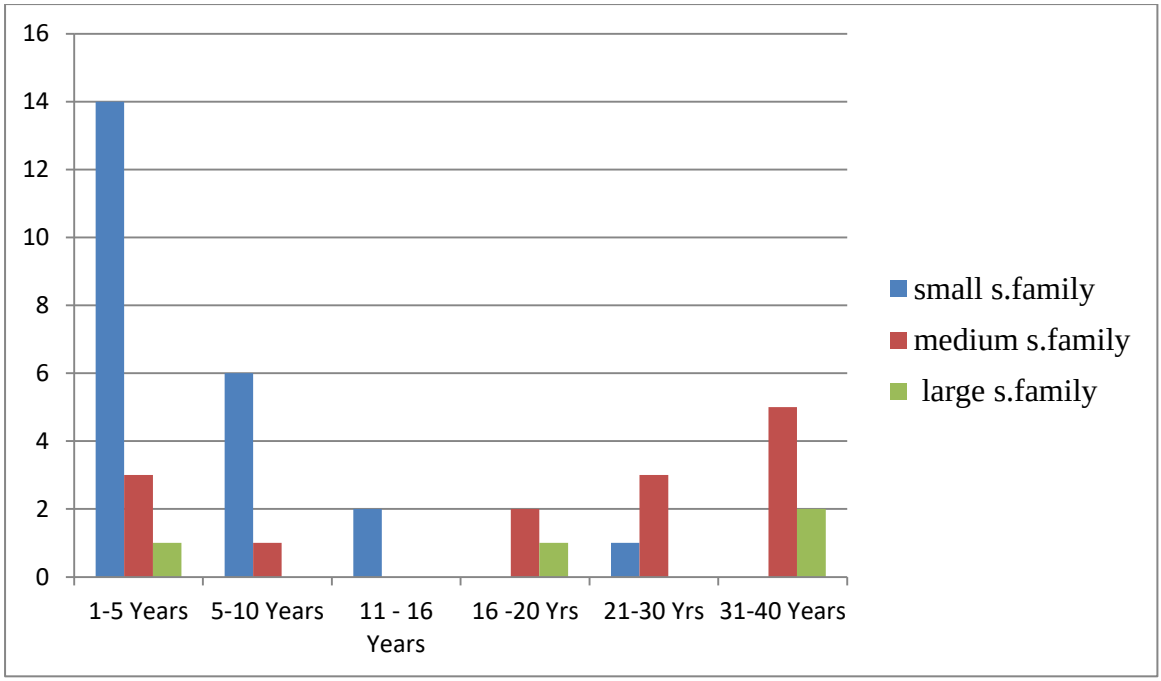

Figure 4. 5 period of stay of households in Melkadama

Years of stay	1-30	31-50	>50
All family	32	10	6
Percentage	59.4%	21.9%	18.7%

Table 4. 5 summary of period of stay of households in Melkadama

4.1.5 Ways to acquire land

Land has become an extremely expensive resource in modern times, with urban land prices rising daily due to the growing demand for either residential or commercial urban plots of property. The informal transformation of peri-urban areas near Adama town, like Melkadama, is brought on by urban expansion and a housing crisis. Despite the fact that Melkadama is an unofficial community, the cost for the previous ten years, the area of land has been doubling every year. The current average land price for a square meter of land is ETB 3500 (USD 64).

Family status	Means of land acquisition								
	Buying land			Inheritance			Renting house		
	SSH H	MSH H	LSH H	SSH H	MSH H	LSH H	SSH H	MSH H	LSH H
New comer	4	2	0	1	3	0	1	0	1
Native	0	1	0	4	9	3	0	0	0

TOTAL	7	20	2
PERCENTAGE	20.3%	58.1%	5.8%

Table 4. 6 Means of land acquisition in Melkadama

Twenty-nine households in Melkadama were the subject of a survey, but the remaining twenty-two were key informant and kable and community leaders as a households and the results show that 20.3% of those households acquired land by buying farmland from farmers, 5.8% of those households live there by temporarily renting a land for a short period of time, and the remaining 58.1% of households live in land that has been passed down through inheritance (see Table 4.6).

In Ethiopia, buying and selling land is prohibited. For these reasons, land exchanges often take place under the guise of selling a home or receiving an inheritance from a family member. The majority of land "purchase" agreements are prepared in this manner, aided by brokers, and witnessed by parties on both sides. Through these channels, a piece of property might be "sold" illegally without adhering to the country's laws on land ownership and transfer..

Nearly one third of households acquire land by buying farmlands, according to the survey data on the twenty-nine homes. This suggests that a large number of households participated in the informal sale of land within the town, which contributed to the transformation of Melkadama.

4.1.6 Sources of a family's income

The bulk of Melkadama people's primary source of income used to be farming. Farmland availability decreased over time as a result of on-going land fragmentation, and people began looking for alternate income sources.50% of the 29 households in this survey currently make money from many sources, including farming, various private businesses, family support from abroad, and government jobs. They rely on two or more of the aforementioned income sources. The remaining 50% of the households earn their money from a single source, specifically 21.87% from private enterprises, 18.7% from farming, and the remaining 9.37% from government personnel (see Table 4.7).

Source of income	Private	Gov't	Farm	Farm + support	Farm +private	Private +support	Gov't + private	Gov't+ privet+ suppor

Frequency	7	3	6	3	2	2	4	2
Percentage	21.87%	9.37%	18.7%	9.37%	5.6%	6.25%	12.5%	5.6%

Table 4. 7 Means of household income in Melkadama

Only 46.9% of the aforementioned sources of income are formal; the remaining 53.1% come from a combination of formal and informal ways. No household, though, stated that this was the only source of information. Additionally, 21.9% of the total number of households receive remittance help.

4.1.7 Household income

Households in Melkadama have a variety of income sources, as mentioned in section 4.7. The households in Melkadama that were interviewed are categorized here according to various income levels. The absolute poverty level is ETB 7,184 per year per adult, which is equal to ETB 599 per month per adult, according to the National Planning Commission's 2017 report. The food poverty line for 2015–16 was calculated to be ETB 3,772 per year per adult, or ETB 314 per month per adult. For an average family to survive for a month, it is therefore thought that they need at least ETB 3,000. The absolute poverty level is ETB20 per day per adult, so if the price of an enjera is ETB 5 apiece, the individual must be able to afford at least ETB10 per day or ETB300 per month ignoring other ingredients needed to prepare food at home.

ETB1,500 (5*300) would be required for an average of 5 people if we consider ETB300 is the minimum amount required for one individual. According to NPC's 2017 data, households spend roughly 50% of their income on food; if they spent the other 50% on non-food items, their total outlay would be ETB 3,000. Therefore, ETB3,000 per month is regarded as the absolute poverty line in this community for a typical household. The amount is about equal to the ETB599 monthly adult poverty threshold for 2015–16 (NPC, 2017). As a result, individuals who live below the poverty line are considered the poorest of the poor, and 34.38% of the households that were interviewed fall into this category.

A household that can afford to consume three times daily must spend a minimum of ETB17 per day per adult or ETB85 per day per household on enjera and ingredients. Given that 50% of total expenses are for food, a month's worth of food and non-food expenses would be ETB 2,550. As a result, according to the statistics gathered, 53.13% of households are considered to have low incomes and can afford between ETB3,000 and ETB5,000 per month.

As a result, about 6% of households are considered to be middle-income, and it is anticipated that they can afford ETB4,800 per month for food and ETB5,000–ETB10,000 per month overall. These families are able to take care of their essential necessities. .

The remaining 6.25% of households are regarded as high income and are presumptively able to afford luxury items and have extra money saved up for other requirements (Table 4.8). These households can afford more than ETB 5,000 per month for food or a total of ETB 10,000 per month.

Income level per month	<3000 ETB (the poorest of the poor)	3000-5,000ETB Low income	5,000-10,000ETB Middle income	>10,000ETB High income
Frequency	11	17	2	2
Percentage	34.38%	53.13%	6.25%	6.25%

Table 4. 8 Household income category in Melkadama

4.1.8 The travel time to and from work

Out of the Melkadama households surveyed, 42.6% of workers have a job location within walking distance and commute there on foot. The other needs the taxi and bajaj for transportation because 28.84% of them work in Adama and other surrounding areas. 17.21% of them are traders who commute weekly to their places of employment in Addis Abeba and other large cities they use bus when they need transportation .The rest 7.36% work in abroad. Usually they use illegal routs to travel (see Table 4.9).

Distance	<2km (walking distance)	2-5km Convenient for taxi/bajaj	5-20km nearby towns	>20km Major cities	Dubai
Frequency	51	19	5	3	11
Percentage	42.6%	28.84%	5.6%	17.21%	7.36%
Transport	On foot	Taxi	Minibus	Bus and minibus	Airplane

Table 4. 9 Home range in Melkadama

4.1.9 Disability

Table 4.10 shows that just 1% of people in Melkadama are disabled and that 99% of residents are in good health. There are only one incidences of blindness and two cases of body part disability among 29 homes or 204 people. It is possible to conclude from these data that the community's health is in good shape and has a high potential for productivity.

Disability type	blind	hearing	body part	No disability
Frequency	1	0	2	202
%	0.5 %	0 %	1 %	99 %

Table 4. 10 Disability in Melkadama

4.2 Transformations at the settlement level

In Melkadama, farmland is currently being converted into squatter settlements. Additionally, residents have taken over grazing land, the sole open area for a variety of cultural and social activities. Spatial (figure ground) alterations in the chosen typical block of Melkadama are shown in Figure 4.8 below.

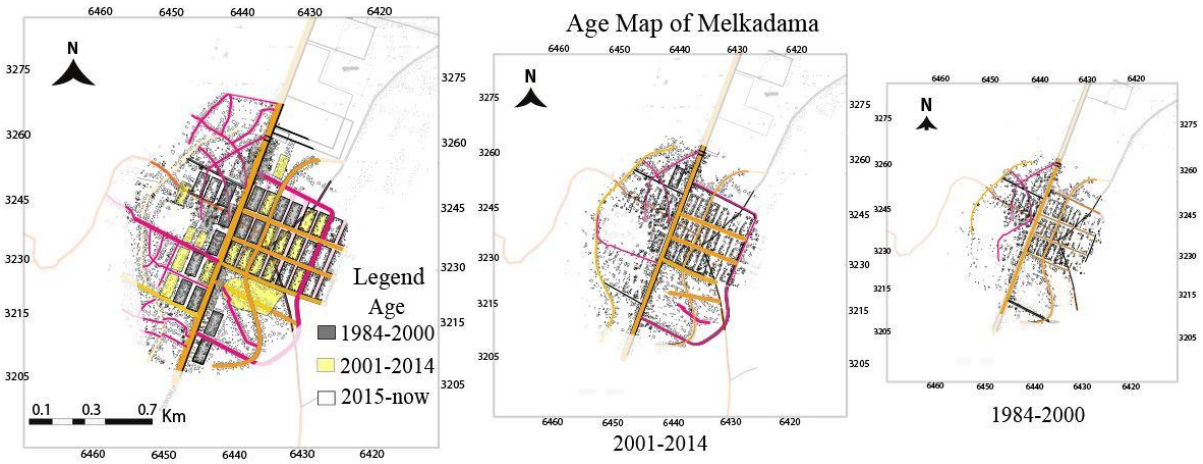

Figure 4. 8 The age map of melkadama source Google Earth

The bulk of contemporary CIS homes were constructed in the last eight years, as seen in the figure below. Construction of residential homes is the first step in the transformation process,

which then moves to the core area, which is typically the backyard farm of local farmers.

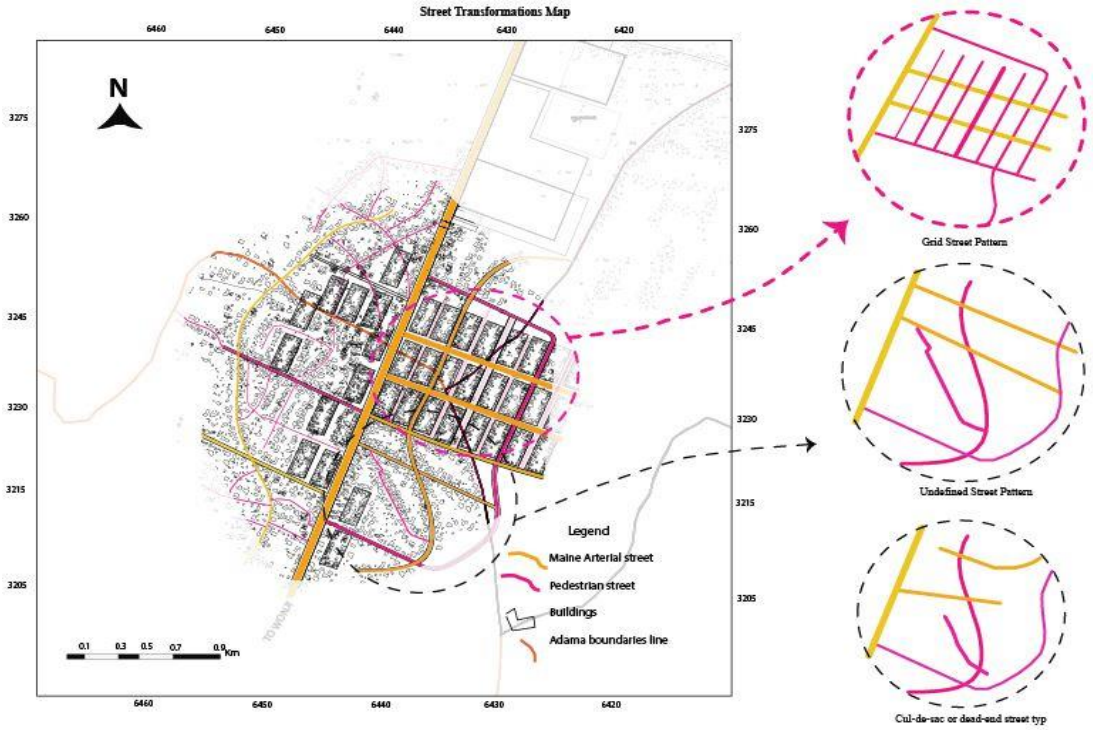

Figure 4. 9 Street block condition in the settlement of Melkadama

The transformation process also begins with the informal subdivision and transfer of land plots around the perimeter of farm land blocks. At this time, the entire perimeter and core area of the land have already been sold and are crowded.

A, Characteristics of transformation

Land fragmentation and land use change are the two main transformations in the compounds. The use of the land typically changes when it is divided, whether by inheritance or "selling." These kinds of transformation make up 51.47% of the overall transformation. In addition, only land use change accounts for 42.13% of land transformations, and only fragmentation accounts for 9.34% (Table 4.10).

The majority of land use changes in compounds occur when the owner decides to use all or a portion of the original plot for a different purpose. The majority of the conversions during the last ten years have been from agricultural land to purely residential living areas. The first of the two features of a transition in land use is the absence of fragmentation in the shift in land use. Land use changes in these situations occur when the original landowners or farmers build additional homes inside the complex, either for newlywed couples or for rental purposes.

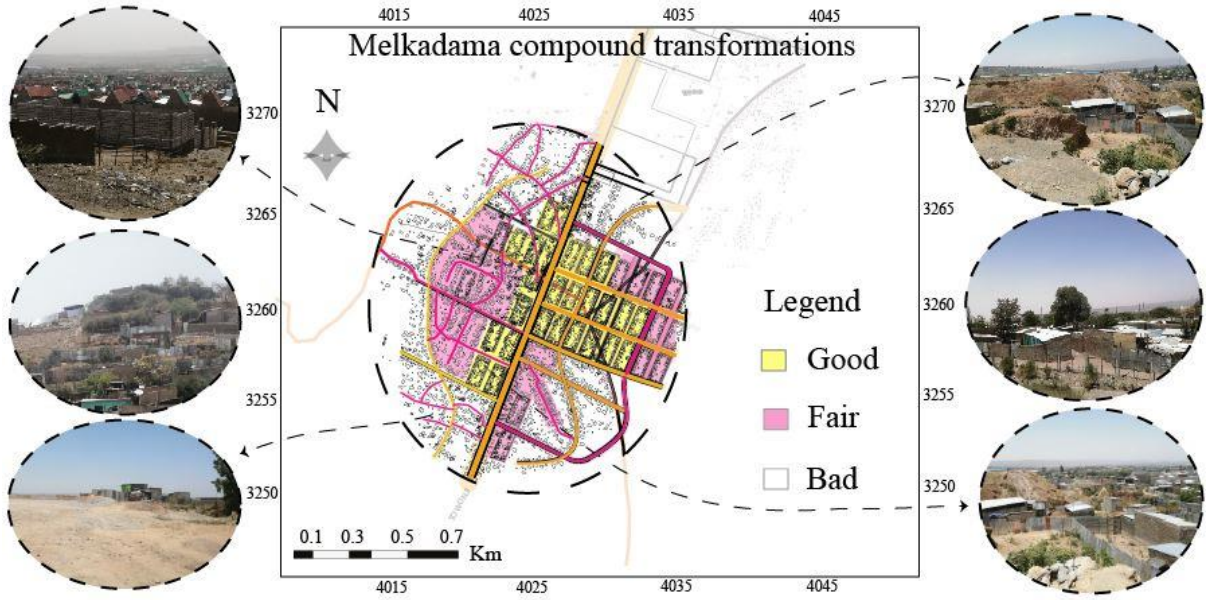

Figure 4. 10 Characteristics Map of compound transformations in Melkadama

Second, after fragmentation, the majority of land use changes take place when properties are inherited or bought by newcomers. In both situations, farmland is converted into a residential neighbourhood devoid of any farming activities. The cumulative impact of these modifications on numerous homes led to a high rate of peri-urban transformation in the Melkadama area.

Type of transformation	Land use change	Land fragmentation	Relocation for development	Other
Frequency	16	8	5	Not mentioned
Percentage	42.13%	9.34%	5.38%	

Table 4. 11 Characteristics of compound transformations in Melkadama

B, Causes of transformations

Compound transformations in Melkadama were impacted by a number of factors, including the ‘selling' of land for economic improvement, land fragmentation due to densification, developing new land due to development-induced relocation, and selling land out of fear that it would be taken for development with little compensation.

Twenty nine percent of households sold farm land to improve their life quality, after ‘selling’ part of land they construct “korkoro bet” considered modern house with corrugated iron sheet (CIS) roofing (see figure 4.11). These types of houses are observed in almost all households who ‘sold’ their land. They also furnish their houses with modern expensive furniture. Some

households send their family member to Addis Ababa and United Arab Emirates for work using the money they collect from ‘selling’ their land.

Figure 4. 11 Compound transformations in Melkadama

Compound transformations were also influenced by densification. Due to over-fragmentation of the land brought on by population growth, about 21 percent of compounds have changed. A large number of young people flee to Ethiopia's major cities and other countries as a result of the lack of farmland. As previously shown (Table 4.11), 5.38% of the alterations at the compound level followed relocations due to development.9.46% of the households that were interviewed "sold" their land out of fear that it would be taken for development with little to no recompense. The 2021 attempt to regularize Melkadama land and include it within Adama town administration has forced people to live with the fear that their farm land would be taken any time in the future. During the interview, I observed that respondents didn’t answer question related to government expropriation of land or low compensation payment sufficiently due to fear. According to key informants from Melkadama, low compensation payment is the number one factor for informal land transformation. But the data from standard questionnaires collected from households shows that the major factors are economic reasons and density.

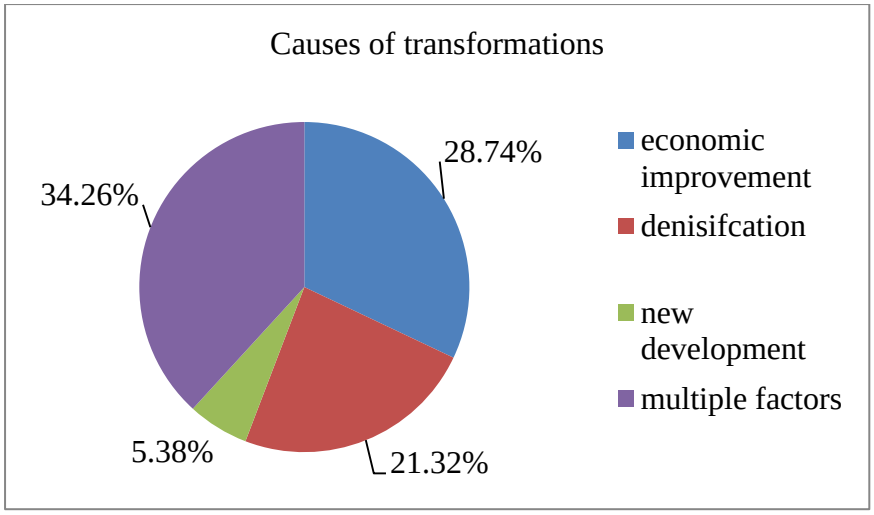

Figure 4. 12 Causes of compound transformations in Melkadama

The rest 34.26% of transformations happen due to multiple factors. That means transformation in more than half of interviewed households happen due to combined factors which include at least two of social, economic and physical factors stated on Table 4.12

Causes (factors)	Land sold for economic improvement	Land fragmentation due to densification	Land taken for new development	Land sold fearing new development and low compensation cos	Multiple factors Economy + density + low compensation cost +other
Frequency	12	9	2	3	16
Percentage	28.74%	21.32%	5.38%	9.46%	34.26%

Table 4. 12 Causes of compound transformations in Melkadama

4.3 Transformation at the building condition

A key informant from the Oromia Zone Culture and Tourism Bureau claimed that three different types of buildings had been built throughout various historical periods. For a variety of causes, these typologies changed, and presently the community is dominated by modern CIS roof building construction.

Figure 4. 13 Transformation of the house in Melkadama source oromia vernacular house site

The first type of house to be identified was known locally as "huguma23," and where all of the house's components, including the wall and roof, are built linked to one another as a one unit (see Figure 4.10). Simple tents of this kind were built from long grasses and used as temporary shelter while people moved around in search of grazing land for their cattle.

Figure 4. 14 Building transformations in Melkadama source oromia vernacular house site

In the Oromia, Sidama, and SNNPR regions, this form of dwelling predominated over the previous century of construction. With the exception of a few finishing touches, interior uses, and decorations, its basic structure and construction method are the same throughout all of these nearby places. These kind of homes were allegedly imported from the SNNPR's northern region, according to key informants. When people began to buy their own farms and settle permanently, this permanent building became familiar.

Modern buildings with CIS roofs are the second building style that has been prospering. This style is broken down into two typologies: the "adama corkoro" and the "service bet" simple shed houses. Typically, "adama corkoro" is used as the primary residence, with specialised areas separated by walls. These typologies typically include a living area, a master bedroom,

a child's bedroom, and a store. Additionally, "service bet" can be employed as a primary residence or a secondary residence that provides services (see Figure 4.15).

Figure 4. 15 Building transformations in Melkadama

Building type	Age of the building				
	Before 1984	1984-1994	1995-2004	2005-2014	2015-2023
rural home with a thatch roof	2	12	8	3	2
New CIS roof structure	0	2	5	15	35

Table 4. 13 Transformation of house type in Melkadama

4.3.1 Building conditions

The following criteria are used to classify building conditions as good, fair, and bad. These include building part (floor, wall, and roof) condition, finishing condition, interior comfort, and structural integrity.

Good condition:

Homes in good condition are those that have a secure structural integrity (no structural failures like leaning or bending or damage to structural parts), well-finished interiors (moderate heat, enough light and ventilation) and no deterioration (damage) on building components.

Fair condition:

Fair condition houses are those that have minor structural failure (which poses no risk to life and is easily repairable, but will deteriorate if not corrected), minor finishes damage (which is

easily repairable but will deteriorate if not corrected), a moderate amount of heat, light and ventilation, and repairable damage to building components.

Bad condition:

A house is considered to be in poor condition if it has structural failure (exaggerated leaning, bending, or distortions on the structural parts), poorly finished building components that are leak-prone, inadequate room comfort (inadequate heat, light, and ventilation mechanisms), and irreversible damage to building components (Sevier damage or leakage in a situation vulnerable to health insecurity). 6.45% of traditional homes meet the aforementioned standards for good condition. The remaining 67.75% and 25.8% are, respectively, in fair and terrible conditions. 38.7% of modern homes are in good condition. The remaining 58% and 3.3% are, respectively, in fair and poor conditions (see Table 4.13 and Figure 4.14).

Building condition	Rural thatch roof houses		Modern CIS roof houses	
	Frequency	Percentage	Frequency	Percentage
Good	3	11%	14	24.56%
Fair	18	66.66%	36	63.15%
Bad	6	22.22%	7	12.28%

Table 4. 14 Building conditions in Melkadama

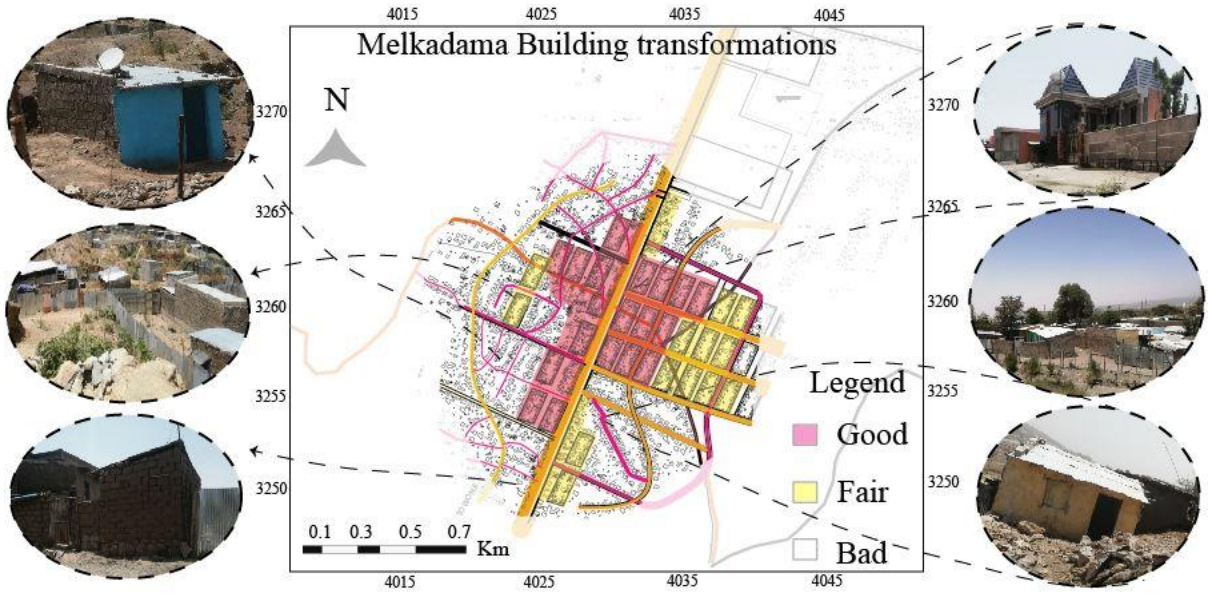

Figure 4. 17 Transformation of building condition in Melkadama

4.3.2 Financing source for building homes

The most prevalent sources of funding for households in Melkadama are savings, loans, financial support from extended family members abroad, and sales of real estate such as land and cattle. Savings make up 36.9% of the financing for house construction among the households surveyed. Loans, family support, and property sales each contribute for 3.57%, 26.19%, and 15.47% of the total. 17.85% of families use two or more of the aforementioned sources in combination (see Table 4.15).

	Source of finance				
	Saving	loan from relative (friends)	Family support from abroad	Selling property land, cattle	Saving +family support +selling property
Rural thatch roof	13	1	6	2	5
Modern CIS roof	18	2	16	11	10
Total	31	3	22	13	15
Percentage	36.9%	3.57%	26.19%	15.47%	17.85%

Table 4. 15 Source of housing construction finance in Mekadama

4.3.3 Transformation in the source of funding for traditional thatch roof homes

Traditional homes were financed before 1988 through savings and the sale of assets like livestock. However, since 2000, households have drawn money from a variety of sources to pay for housing. Family help from overseas and a combination of sources have replaced traditional sources of financing for homes today (see Table 4.16 and Figure 4.18).

Source of finance	Number of buildings built over years			
	1984-1994	1995-2004	2005-2014	2015-2023
Saving	2	2	7	8
Loan	0	0	0	0
Selling property	0	0	0	0
Family support	1	2	5	0
family +	0	0	0	0

Saving				
remark	Mostly saving	Remittance + saving		Mostly saving

Table 4. 16 Transformations of source of finance for traditional houses in Melkadama

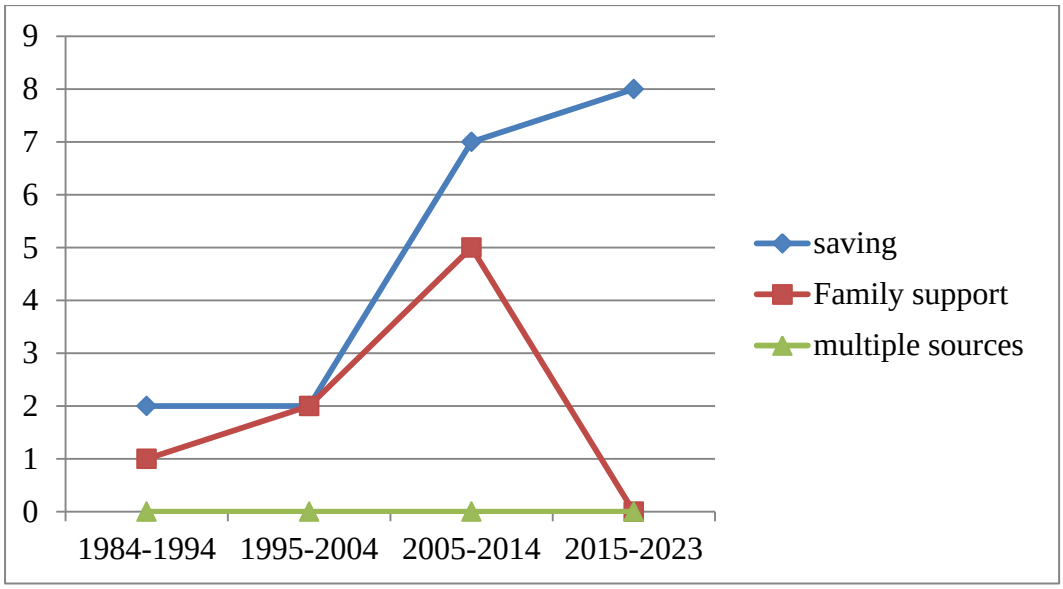

Figure 4. 18 Transformations of source of finance for traditional houses in Melkadama

4.3.4 Transformation in the financing sources for modern CIS roof dwellings

Based on information from the households surveyed, saving or borrowing served as the primary source of funding for all modern buildings prior to 2004. However, new funding methods have been used for house construction since 2004 as a result of a growth in the number of modern building construction. These include financial planning, overseas family support, land sales, and various (combined) sources. Savings accounts for the majority across all years from the aforementioned sources. (See Table 4.17).

Source of finance	Number of buildings built over years			
	1984-1994	1995-2004	2005-2014	2015-2023
Saving	0	0	7	18
Loan	0	0	0	0
Selling property	0	1	1	7
Family support	0	1	0	14
family +	0	0	2	6

Saving				
remark	Mostly saving	Saving + Remittance		Mostly saving

Table 4. 17 Transformations of source of finance for modern CIS houses in Melkadama

4.5 Summary of findings

One of the towns in the Oromia region was Adama, which was founded in 1924. Since then, the town has gone through several distinct political and economic systems, including feudal, social, and capitalist ones. The development of the community is impacted differently by each method.

The town's continued growth during the 2000s, when it functioned as the Oromia region's capital, has led to the creation of peri-urban regions around Adama town. These places have undergone social, environmental, and spatial changes. In the last ten years, Melkadama, originally Melkhida, has seen a number of changes. As a result of its proximity to the entrance of Wonji town, Melkadama's transformations began earlier than those of any other kebles.

Land fragmentation and changing land use are characteristics of the transformation character and process of Melkadama. The invasion of farmland by informal land transactions altered the source of livelihood for many communities.

The changes have had an impact on the types of homes built in peri-urban areas. Modern CIS roof houses have replaced older traditional thatch roof homes as a result of peri-urbanization. There are currently no traditional thatch roof homes being built in Melkadama. While the number of contemporary CIS roof houses being built rises annually.

In general, no transformation in Melkadama is guided by a strategy or plan; they all happen informally. The growth of informal settlement was influenced by a number of racial, economical, and political reasons. Additionally, performers play a significant part in the process of peri-urban change. If the informal transformation process is allowed to continue, it will become unavoidable unless it is stopped at an early stage by the concerned entity.

4.5.1 Parameters

No	Parameter	Categories	Result

	Socio-economic profile		
1	Family size	Small size	40.51%
		Medium size	46.99%
		Large size	12.50%
2	Period of stay	New comers	39.81%
		Natives	60.19%
3	Sex distribution	Females	51.12%
		Males	48.87%
4	Means of land acquisition (ownership)	Squatting (buying land)	20.31%
		Inheritance	58.11%
		Rent	5.84%
5	Household heads	Male	84.15%
		Female	14.85%
6	Home range (distance from work place)	< 2km	42.6%
		2-5km	28.84%
		5-20km	5.60%
		>20km	17.21%
		Abroad	7.36%
7	Household income level	The poorest of the poor	34.38%
		Low income	53.13%
		Middle income	6.25%

		High income	6.25%
8	Disability	Hearing disability	0%
		Body part	1%
		Blindness	0.5%
		Mental disorder	0%
		Deafness	0%
		No disability	98.50%
	Compound transformations		
1	Transformation type	Land use change	42.13%
		Land fragmentation	9.34%
		Dislocation	5.38%
		Both (land use change + fragmentation)	51.26%
2	Cause of transformations	Selling land For economic improvement	28.74%
		Land fragmentation due to densification	21.32%
		Land taken for new development	5.38%
		Selling land fearing low compensation	9.46%
		Multiple factors	34.26%

	Building transformations			
1	Building type	Before 1984		2.38%
		1985-1994		16.6%
		1995-2004		15.47%
2	Building conditions	Good	Thatch roof	11.00%
			Modern Building	24.56%
		Fair	Thatch roof	66.66%
			Modern Building	63.15%
		Bad	Thatch roof	22.22%
			Modern Building	12.28%
3	Transformations of source of finance	Thatch roof	Before 1994	Saving
			1995-2005	Saving + Remittance
			2006-2023	Mostly saving
		Modern bldg.	Before 1994	Saving + Remittance
			1995-2005	Remittance
			2006-2023	Mostly saving

Table 4. 18 Parameters of the study and results of Melkadama

CHAPTER FIVE

5 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

In general, the peri-urban areas surrounding Adama town are "transition sites" that are changing from being rural to urban. However, based on past patterns in Adama, this shift is a two-step process rather than a one-step transformation from rural to urban. These are the transitions from rural to peri-urban (peri-urban) and subsequently from peri-urban to formal urban settlement. The case study area, Melkadama, was an informal village where a huge number of impromptu structures were taking place during the research's time period. The development of the area by building infrastructure and offering services is not feasible economically, according to government officials who claim that compensation must be paid. Accordingly, it appears that this is a persistent phenomenon that demonstrates the inevitable growth of informal settlement, particularly in emerging nations (Payne, 2009).

The majority of geographical changes in a settlement are followed by transformations to activity and place meaning. For instance, when land fragmentation due to a shift in land use from farming to habitation happens, the meaning of the place is likewise altered. For instance, open areas like grazing land and forests where cattle flourished, elders interacted, and children played are now gone and have only been preserved in elders' memories.

The other sides many households have experienced conflict as a result of the meaning differences among family members regarding a particular piece of land. Some family members view the land as a treasure that cannot be "sold," while others see it as an asset that can be altered and transferred for economic gain. Similar to this, when the home leader "sells" land without the consent of household members, it causes tension among household members. Each heir may at times assert ownership over land that has been sold informally, and on rare occasions, this might result in violence.

The vast front yard, traditional homes, backyard vegetation, and farmland are all characteristics of a typical farmer compound in the case settings. Based on a person's age, sex, and level of privacy or publicity of their behaviour, these locations are zoned in a hierarchical manner. The most public area in the compound is the spacious front garden, which is close to the entrance and is used for ceremonial events, family gatherings, cattle

husbandry, children's play areas and family gatherings. The front garden is currently disappearing due to changes. However, several of the newly divided plots still include a little front garden to preserve its purpose.

In conclusion, these types of transformations demonstrate how adaptable humans are, willing to let go of past significance and embrace the unknown in order to survive. There is no permanent meaning because it sticks with the new option whenever there is one. Unless the meaning is necessary to survive, spatial configurations and activities will always alter.

Traditional thatch roof cottages have been replaced by modern CIS roof dwellings called "Korkoro bet" in almost all of the original settler households. Activity and the sense of space within a house are changing in tandem with the shift in typology. According to tradition, a thatch roof shelters all activities in a single room that is hierarchically separated according to the functions it serves. As a result, each area has a certain meaning, even if that meaning varies depending on the age or sex group.

The meaning of space in homes is generally impacted by typology and spatial transformations, and in certain cases, this meaning might change depending on the age group or the occupant's claim to the space. As a result, a space that was established for one activity and purpose has been replaced by another activity and purpose throughout the transition period. This illustrates how the concept of space changes even though the physical architecture does not.

The majority of the population of Melkadama accepts transformation favourably. They were able to momentarily make money thanks to informal land transfers and economic activity in the area. On the other hand, it will have detrimental effects over time. In this scenario, unstable housing, the potential for slums, informality, environmental degradation, and the loss of culturally significant areas are the main outcomes and related threats of transitions.

The people who live in settlements occupy the land informally and lack secure tenure. The original inhabitants have a legal right of usage over the farmland. The majority of the land, however, was given to strangers and turned into an unofficial town without a valid ownership deed. In addition, some of the contemporary structures that are being built haphazardly are not even inhabited; rather, they are being constructed to claim the land and provide some kind of legal foundation for its transfer. The majority of the time, a piece of land with a straightforward shed building is ‘sold' to a different new owner. A plot of land may have been

"sold" (transferred) 10 times in the previous ten years, according to information from key informants. Each new owner who 'buys' the land will make a double profit when they sell the land a short while later.

The ecology of Melkadama was also greatly impacted by the high rate of urbanisation and the quick transformation of existing communities. Deforestation, pollution, the loss of farmland, and an expansion in built-up area are some of the towns' key characteristics as a result of population growth. Precious natural resources are being degraded and, in some cases, are permanently lost as a result of poor planning and monitoring. If not well planned and handled today, they will cost a lot or become hard to recover from.

The current transient economic advantages may make transformations in the settlement appear good overall. However, maintaining the existing course will intensify the dangers and effects outlined above.

5.2 Recommendations

5.2.1 Local officials' and community leaders' responsibilities

One of the main causes of the growth of informal settlements is the local government's inadequate ability to supply homes and serviced urban land. Low-income individuals who are unable to get land through official routes make up the majority of the informal settlers. Local governments should therefore strive effectively to satisfy the housing needs of the poor in order to decrease informality and promote equitable development. Low incomes and the impoverished have not yet been taken into account in any housing initiatives. Although it was the intention of cooperative housing and the integrated housing development programme (IHDP) to incorporate low-income people, this goal has not been achieved. Therefore, adequate planning and implementation techniques for low-incomes and the lowest of the poor in various town sizes should be considered in future housing initiatives. One strategy to help the poor raise housing funding is to make it easier for them to connect with microfinance and saving institutions.'

Local governments should collaborate with community leaders to improve peri-urban regions since they are crucial to the stabilisation of informal settlements and the resolution of disputes. For community leaders to come to an agreement on the peri-urban development process, the government should set up awareness-raising campaigns, training sessions, and discussion forums. Therefore, developing a shared understanding and agreement on a

development strategy aids in community leaders' efforts to persuade people and mobilise local resources for the area's growth. Taking action against land speculators and kebele officials who assist shady land deals also helps to restrict the growth of informal settlements, according to information from the local communities.

5.2.2 Urban planners

Planning for secondary cities and towns has thus far been requested by regional administrations. Additionally, there were centralised systems for plan updates and regulatory mechanisms, but they did not take into account local interests or actual conditions. Prior planning tendencies have prioritised technical concerns over taking into account the complex system of socioeconomic, racial, ethnic, and political realities of the community. As a result, enforcing such technical plans that lack community support in Ethiopia become a source of ethnic and political conflict. As a result, gaining community acceptability should be the first factor taken into account when planning for inclusive and sustainable development. For plans to be implemented successfully, community involvement is essential. Once the community is convinced, planning may begin taking social (human) and physical elements into account. The community must be included in all planning stages if development is to be sustainable. Therefore, it is advised that urban planners take the following actions in order to lessen the negative effects of peri-urban areas' transformation and to guide their transition from rural to urban in the direction of building a prosperous and sustainable future:

Community involvement and participation: In transitional peri-urban settings, community leaders play a significant role in stabilisation and conflict resolution. Therefore, working with local inhabitants and community leaders is preferable to coercive eviction and land expropriation on the part of local governments.

Planning the area with the current settlement pattern and circumstances in order to minimise damage to individual properties: Contextual factors in planning reduce the amount of compensation costs. Property owners profit as well because it ensures minimal destructions. Two crucial issues that could direct spatial planning should also be included in planning. In addition to ensuring fair and appropriate compensation for expropriated property, it also protects vernacular architectural and settlement traditions as well as geographical heritages.

Implementation of the plan: Fundraising and financial planning are required for this step in order to carry out the plan. It is possible to include phasing in the implementation techniques

if the funding is insufficient. Priority should be determined by spatial and socioeconomic factors when phasing. Throughout implementation, the plan may need to be modified. Monitoring the appropriate execution of the strategy, however, is the most crucial factor to take into account in order to minimise unforeseen results, such as resource misuse and misappropriation. It would be easier to ensure successful implementation and decrease misappropriation with the aid of contemporary land management systems like cadaster and land registration.

5.2.3 Policy recommendations

To manage the land in peri-urban areas, there is currently no defined structure or policy direction. The peri-urban areas are allegedly under the control of both urban and rural administrations. Additionally, Wonji town asserts that it has jurisdiction over the peri-urban districts of Adama nearby due to ethnic and socioeconomic considerations. Because of the administrative bias in transitional peri-urban areas, informality was left outside of everyone's purview. In transitional peri-urban areas, the land policy should take into account overcoming these inconsistencies and administrative ambiguities between rural and urban land administrations. Setting up an integrated and coordinated approach between the two administrative zones will help with this.

Therefore, peri-urban policy formulation and execution process must be included as a priority agenda to ensure equitable development in general and city governments in particular.

Current urban development process	**Proposed urban development process**
Informal rural/ peri-urban land holding	informal rural/ peri-urban land holding
Municipal city administration	registering/ formalizing
Expropriation	regularization
Redevelopment	renewal
Leasing	formal land holding

5.2.4 Further study areas

The reasons of transformations are one of the research's results that needs further study. These include the following: a lack of policy, administrative and financial weakness,

migration and remittance, informal land transactions, and the role of actors, and also the primary focus of this study is on spatial alterations in Melkadama, as indicated in the research's scope. Therefore, topics like vernacular construction practises and spatial heritage, which are only briefly mentioned in this paper, should be further researched. Additionally, more research needs to be done on other transformational factors such the economy, culture, society, and environment. This aids in gaining a deeper understanding of transformation by looking at it from several angles.

Generally, other examples should be researched by using the same research approach or any other legitimate means in order to contemplate a wider implementation measures.

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ANNEXES

Annex 1: Standard Questionnaire

Names of Interviewer: _____

Names of interviewee: _____ Site Locati_____ date_____

- Profile

  House hold profile

  House number _____Tenure type/ownership _____Head of house hold _____Period of stay _____ Family size _____ Male _____ Female ____

1. Before settling in this neighbourhood, where were you originally from? Why did you choose to settle in this area?

   _____

   _____

   _____

   _____

   1.1 Personal profile

No	Name	Relationship with	Gender	Year of birth	Disability	Expenditure/	Job location	Transportation to work	Remark

2. At the compound level, significant changes/ transformations have occurred over the last fifteen years.

   2.1 Is there any transformations that occurred at the compound level? Yes ☐ No ☐

   2.2 What was the characteristic of transformation? Segregation/land fragmentation ☐ Land use change ☐ Other

   _____

   _____

   _____

   _____

   2.3 What are the factors that cause transformations? (Segregation, land use change and others...)

   Effect of urbanization: - section of land sold for new comer ☐ Densification: - Divided for sons/daughters ☐ taken for development ☐ selling land informally due to low compensation cost ☐

   others_____

   _____

3 Significant changes /transformations at the building level

No	List different type of buildings that has been constructed in the compound	Year of construction	Purpose of the building	Building material	Building technique	Building condition B-Bad F-Fair G-Good	Source of finance S-saving C-Credit/ loan FS- Family support SP-selling property	How much it coasted
1								
2								
3								
4								
5								
6								

4 Major changes/transformation at the settlement level

4.1 Describe how the land use of settlement transformed with in previous fifteen years' time frame.

_____

_____

_____

_____

4.2 What are the major factors that cause transformations in settlement level? Natural factors such as earth quake, flood, landslide... etc.☐ Density: population increase ☐ Effect of urbanization ☐ life style change ☐ others_____

_____

4.3 What are the major problems and threats in the settlement transformation? Farm land invasion ☐ un-serviced land ☐ lack of infrastructure ☐ unplanned settlement ☐ in formalism ☐ others;_____

_____

_____

_____

5 Basic information/physical infrastructure and social infrastructure

5.1 Transformation on physical infrastructure and social infrastructure

No	Infrastructure **Use codes below to fill the table	Transformation process						
		Source/ type	2022	Source / type	year	Source/ type	year	
1	Water >> PM –private meter, PB-public/bono, R-rent, ST-stream, >>Specify others							
2	Electricity >>PM-private meter, R-rent, Kkerosene,							

	No-no electricity							
3	Telephone >>P-private , M-mobile No-no telephone, >>specify others							
4	Access road >> AS-asphalt, CS-cobblestone, P-pista, UG-unpaved ground. >>specify others							
5	Sanitation >>PT- public toilet, CT- communal toilet, P-private toilet, F-forest >>>specify others							
6	Kitchen >> CK-communal Kitchen, PK-private kitchen, No-no kitchen >>specify other							

5.2 Transformation on communal spaces and social activity

No.	Social service	Distance from home In KM >> 2022	Impact of transformation on social life	Distance from home In km year…… …..	Impact of transformation on social life	Distance from home In km year…… …..	Impact of transformation on social life
1							
2							

3							
4							
5							
6							
7							

6 Sketch the layout of the compound site plan and how it changes, and add descriptions

year	2014	Year……	Year……..	Year……
Site plan				

Annex 2: Key Informant questionnaire

Key Informant Name _____

location_____

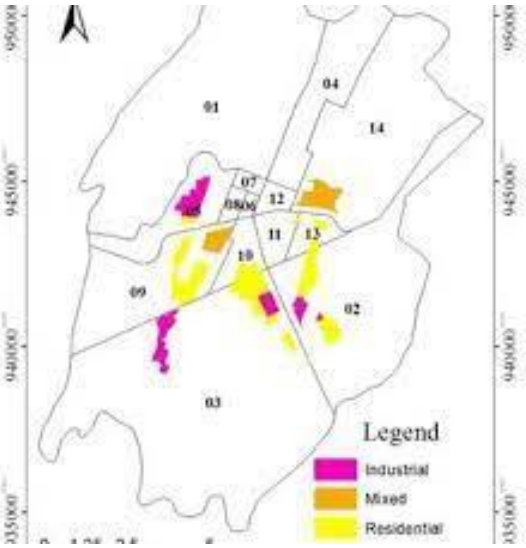
1. Personal Profile
   1.1. Name _____ Gender _____
   Position _____ Age _____ Living experience in the settlement_____Education:_____
   1.2. Role in the community? Community leader, kebele leader, professional, other_____
   _____
2. When did people first begin to settle in the area?
   _____
3. What was the character of original settlement?
   _____
4. What were major elements / land uses/ of original settlement?
   _____
   _____
   _____
5. Is there any transformation that happens on the settlement pattern and land use? Yes No
6. What are the major changes that occur with in previous twenty years?

Annex 3: Maps and background info.

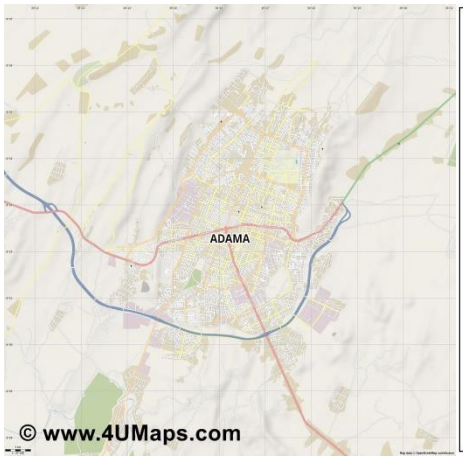
Keble annual budget data of Adama

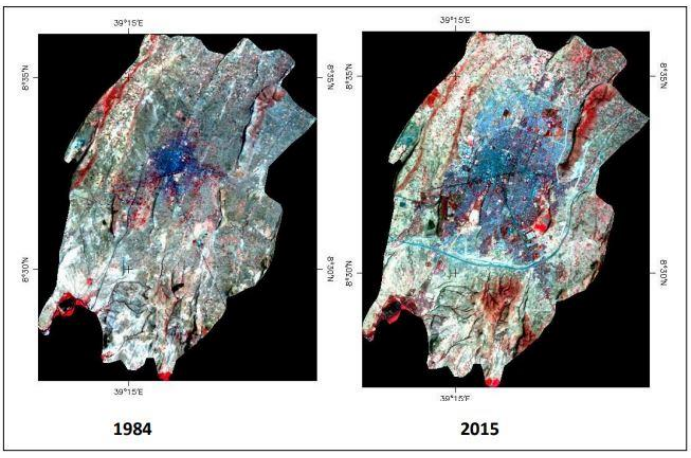
Adama structural CAD map

Google earth map of Melkadama



Keble boundary of Adama





Annex 4: Activities in public spaces and services

Public water source (bono) in Melkadama






Privet clinic in melkadama

Annex 5: Key Informants

List of Informants

Name	Age	position	Location	Education
Ato Bekle Dana	57	Traditional or cultural leader	Melkadama	with no formal education
Wizero Kedija Duto	46	Kebele Leader	Melkadama	with no formal education
Aba Megrsa Kmal	71	Traditional or cultural leader	Melkadama	with no formal education
Ato Hussen Kemal	35	Denbla sub city Officer	Denbla	College

Weizero kedija duto from Melkadama

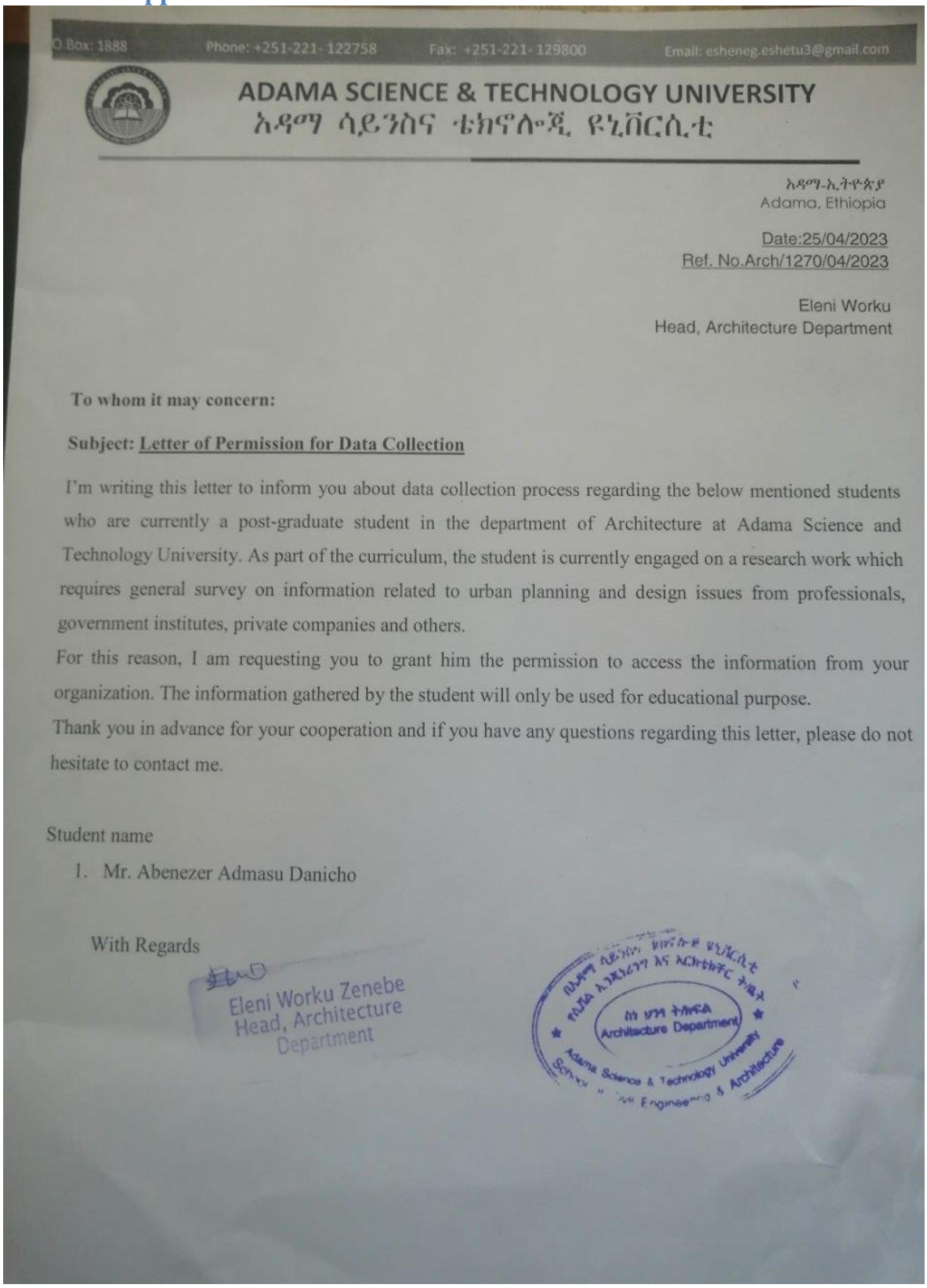
Annex 6: Partial view of Melkadma

Annex 7: Pilot test and onsite developing trust in the community.






Annex 8: Support letters



O.Box: 1888 Phone: +251-221- 122758 Fax: +251-221- 129800 Email: esheneg.eshetu3@gmail.com

ADAMA SCIENCE & TECHNOLOGY UNIVERSITY
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Adama, Ethiopia

Date:25/04/2023
Ref. No.Arch/1270/04/2023

Eleni Worku
Head, Architecture Department

To whom it may concern:

Subject: Letter of Permission for Data Collection

I'm writing this letter to inform you about data collection process regarding the below mentioned students who are currently a post-graduate student in the department of Architecture at Adama Science and Technology University. As part of the curriculum, the student is currently engaged on a research work which requires general survey on information related to urban planning and design issues from professionals, government institutes, private companies and others.

For this reason, I am requesting you to grant him the permission to access the information from your organization. The information gathered by the student will only be used for educational purpose.

Thank you in advance for your cooperation and if you have any questions regarding this letter, please do not hesitate to contact me.

Student name

1. Mr. Abenezer Admasu Danicho

With Regards

Eleni Worku Zenebe
Head, Architecture Department

Architecture Department