

Impacts of Urban Expansion on the Livelihood of Farming Households at the Urban Periphery of Burayu Town, Ethiopia

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This is to certify that the thesis prepared by Abebe Hambe entitled: *“Impacts of Urban Expansion on the Livelihood of Farming Households at the Urban Periphery of Burayu Town, Ethiopia”* submitted in fulfillment of the requirements for the degree of Doctor of Philosophy in Urban and Regional Planning complies with the regulations of the Addis Ababa University and meets the accepted standards concerning originality and quality.

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ABSTRACT

Urban expansion is a phenomenon that most countries with a lower urbanization level are faced with. Ethiopia is among the least urbanized but rapidly urbanizing countries in Africa. Urban centers are encroaching onto peri-urban areas and the pressure is greatest in towns surrounding Addis Ababa. This study focused on urban expansion and its impacts on the livelihood of peri-urban farmers in Burayu Town, Ethiopia. The town has been subjected to rapid urban expansion due to its location close to Addis Ababa and its designation as one of the towns for industrial development. The research sought to understand three distinct but very much related issues: historical trends of spatio-temporal LULC changes, expropriation and compensation laws and their implementation modalities; and the impact of land and property expropriation in the setting of public ownership of land on the livelihoods of households at the urban fringe of Burayu. The research employed a mixed research approach where qualitative and quantitative methods were intertwined with focus on descriptive methods to understand real phenomena of the research. Software including GIS, Erdas Imagine, CA-Markov, AutoCAD, Ms-Word, and SPSS-26, were used to analyze spatial transformation and household surveys. In the first case Landsat satellite imagery was used to analyze land-use change from 1980 to 2020 and the lesson was used to predict changes in type and magnitude for the years 2030 and 2050 using Markov Chain and Cellular Automata models. The analysis revealed that over the study period the proportion of built up area to total urban area changed from a mere 1.7% in 1990 to close to 48% in 2020 and to 68% by 2050. The areas of other major land uses decreased appreciably. Secondly, expropriation and compensation laws and practices in a public ownership context were analyzed in depth. Descriptive and analytic approaches were used in the research. The techniques employed for selecting case study kebeles was the purposive sampling techniques and a systematic sampling method was used for selecting households. Instruments used for data gathering include questionnaire survey, focus group discussion and observation. The findings indicated presence of discrepancies between the expropriation laws and how property valuation and compensation is practiced in Ethiopia. Thirdly, the research investigated the relationship

between land expropriations for urban functions on the livelihoods of project affected persons in Burayu town. A mixed research approach, sample t-Test model, regression analysis and a framework for sustainable livelihood development were used as analytical tools. The analysis showed that the socio-economic status of expropriated households has deteriorated due to the expropriation of their landholding. In conclusion, the findings of this research indicated the need to use modern technology for tracking LULC changes and the necessity to make urban expansion orderly and sustainable, development policies to be comprehensive; the expropriation process to be transparent and participatory and livelihood restoration plans to be part of the urban expansion scheme.

Key words: Urban expansion, Land use land cover, expropriation, compensation, livelihood impact, farming communities, Burayu town, Ethiopia.

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Acronyms

ADB	Asian Development Bank
AU	African Union
BTM	Burayu Town Municipality
CBD	Commercial Business District
CA-MCM	Cellular Automata Markov Chain Model
CSA	Central Statistical Agency
DEM	Digital Elevation Model
DFID	Department for International Development
EMA	Ethiopian Mapping Agency
ERDAS	Earth Resource Data Analysis System
ETB	Ethiopian Birr
ETM	Enhanced Thematic Mapper
ETM+	Enhanced Thematic Mapper Plus
FAO	Food and Agricultural Organization
FDRE	Federal Democratic Republic of Ethiopia
FGD	Focus Group Discussion
GCP	Ground Control Point
GIS	Geographical Information System
GPS	Geographic Positioning System
IPS	Industrial Project Service
KIA	Kappa Index Agreement
KII	Key Informant Interview
LCM	Land Change Modeler
LDP	Local Development Plan
LULC	Land use/Land Cover
MCE	Multi Criteria Evaluation
MLP	Multi-Layer Perceptron
MSS	Multi-Spectral Scanner
MUDC	Ministry of Urban Development and Construction
NGO	Non- Governmental Organization
OECD	Organization for Economic Co-operation and Development
OLI	Operational Land Imager
ORAAMP	Office for the Revision of the Addis Ababa Master Plan
ORSLDMB	Oromia Regional State Land Development and Management Bureau
OUPi	Oromia Urban Planning Institute
OWWDSE	Oromia Water Works Design and Supervision Enterprise
SPOT	System Pour l'Observation de la Terre (French)
SPSS	Statistical data Package for Social Science Students
TM	Thematic Mapper
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDESA	United Nations Department of Economic and Social Affairs
UNECA	United Nations Economic Commission for Africa
UNICEF	United Nations International Children's Emergency Fund

UNEP	United Nations Environmental Program
USGS	Geological Survey of the United States and the Global Land Cover Facility
UTM	Universal Trans Mercator
WEF	World Economic Forum
WGS	World Geodetic System

CHAPTER I: INTRODUCTION

This study sought to assess the trends of horizontal development of Burayu town into neighboring rural areas at the periphery of the town which are within the urban boundary proper but dominantly practice agriculture as a way of living; expropriation practices and its governing laws; and the impacts of land and property expropriation on the livelihood of these agricultural communities. As an urban planner and a resident of the study town, the author was aware of the multitude facets of this overall scenario which initiated him to conduct in-depth study so as to comprehend fully the current situation and propose ways to overcome the threats. This chapter covers the background to the study, problem statement, objectives, research questions, scope of the investigation, significance of the study, limitations of the study, and format of the dissertation.

1.1. Background of the study

Urbanization is a phenomenon that is characterized by population and economic agglomeration in limited areas in comparison to scattered settlements in rural areas (Jat et al., 2009 & United Nation, 2014). It presents both opportunities and challenges, with advantages outweighing disadvantages (United Nation, 2008& UNECA, 2018). Apart from horizontal expansion, which affects the natural setting of the ecosystem, urbanization is observed to bring about economic development in most cases (Samat et al., 2014a). As the majority of the world population resides in urban centers and the level of global urbanization is likely to increase (Pacione, 2009) the impact of urban areas will become increasingly a global phenomenon.

Rapid urbanization and population increase around the world are accompanied with deterioration of natural environment such as forests, arable land, biodiversity, and diversity in ecosystem services (Ray & Ray, 2011; Watson et al., 2019). Urbanization sets in motion substantial processes involving land use, socioeconomic, and ecological changes in both developed and underdeveloped countries; the magnitude of change and hazards attached to it being significantly more problematic in developing countries. The most visible manifestations of rapid urbanization in less developed countries are unprecedented horizontal expansion characterized by scattered built-up areas (Mansour et al., 2023) and alteration of the natural land use land cover (LULC) (Dhiman et al., 2019) which adversely affect the livelihoods of local farming communities through eviction (Sikarwar & Chattopadhyay, 2020), and biodiversity degradation (Parida et al.,

2023). The changing nature of the interaction between rural and urban land uses has serious ramifications for quality of life, the environment, and ecosystem services, all of which are changing due to urbanization (Niemelä et al., 2010; Wan et al., 2015). The transformations are particularly fast and strong in areas near urban boundaries.

As the second most populous country in Africa, Ethiopia has been subjected to a rapid urbanization process since the implementation of economic development and privatization policy since the 1990s (Terfa et al., 2019). The increase in urban population in most developing countries, including Ethiopia, is due to natural growth, migration, re-classification of rural areas into urban, and the creation of new urban centers (CSA, 2013). The extraordinary expansion of Addis Ababa (the capital city of Ethiopia) towards adjacent peri-urban areas has increased the pressure on natural environment and the local community. Subsequently, the population increase and the dynamics of land use changes have led to the conversion of rural land into built-up, which is observed to affect the livelihood of the local farming households (Emana, 2014). As a result peri-urban areas are observed to be places of conflicting interest between agricultural land and urban land use (Adam, 2016). In the current study, peri-urban areas are defined as areas that are located on the outskirts of large urban areas but retain rural characteristics such as substantial reliance on agricultural production. Hence, in the case of Burayu, the peri-urban area may be within its urban jurisdiction but the population is rural by any definition: having no urban infrastructure and facilities, residents rely predominantly on agriculture for their livelihood. This research has used the term urban periphery in place of peri-urban interchangeably.

The Government of Ethiopia has made economic sector and urban development policy reforms to transform urban centers into engines for attracting domestic and foreign investment (IPS, 2004). However, local governments and society at large did not pay due attention to the adverse effects of this complex transformation process on changes to the livelihoods of the farming community in peri-urban areas like Burayu Town.

Nearly all of the land currently owned by different business organizations in Burayu town was once either agricultural land, grasslands, vegetation cover, or forests held by farmers living in different kebeles of Burayu town. Thus, the establishment of such large-scale business organizations has led to the expropriation of households that affects their livelihoods. Expropriation is a mechanism used in most countries to acquire land for public use, though it can sometimes be accomplished via other measures. Expropriation can occur through mutual

arrangements (Geiger, 2002). Furthermore, every sovereign government retains "power of eminent domain" in order to promote the common good (Epstein, 1985). However, various governments have used the concept of public interest for various development agendas albeit as a tool to seize privately held land for inconspicuous purposes. The case is worse when land is under public ownership as in Ethiopia.

The issues of rapid urbanization, the demand for more urban land and the land use/land cover changes that follow it and, the impacts of the changes on the livelihood of expropriated households require in-depth investigations so as to mitigate the negative consequences of urbanization. This research plans to address these concerns taking Burayu town as a case study area.

1.2. Statement of the problem

Globally many urban centers especially in developing countries have experienced an extraordinary population growth and spatial expansion over the last few decades. More than half of the global population today lives in cities, and this figure is anticipated to rise by more than 70% by 2050 (UNDESA, 2019). This stimulates urbanization, an inevitable global process that has a number of implications for social, economic and environmental aspects (Dociu & Dunarintu, 2012; Ivan, 2014). The most important factors for accelerated urbanization in Ethiopian include rural-urban migration, natural population growth, and favorable urban development policies (Tegenu, 2010; Turok & McGranahan, 2013). For instance, the horizontal expansion of Addis Ababa city to the neighboring towns has transformed over 120 km² of farmland, forests and grasslands into urban settlements over a period of 24 years (Leulseged et al., 2012). The development activities of the city have consequently brought impact on the land resources in peri-urban areas.

The Ethiopian industrial development strategy which was adopted in 2004 created 32 urban centers at country level to host industrial development and eight of them are located around Addis Ababa (IPS, 2004). Rural areas surrounding Addis Ababa were overrun by built-up areas at unprecedented rates, and they were also reclassified under the administrative borders of the urban centers which they border.

The most serious problem about newly built industrial corridors is the large expanse of land required, which could only be secured through municipal expropriation. Thus far, research

findings in Addis Ababa have revealed that, as a result of huge urban development initiative over the last three decades, vast numbers of farming households have been evicted from their main source of income, land, with inadequate compensation (Koroso et al., 2020; Leulseged et al., 2012; Woldesemayat & Genovese, 2021). In the Ethiopian case, most of the studies focused mainly on larger cities and only very few of them addressed the overall impact of urbanization and urban expansion in small and medium-sized urban centers like Burayu Town.

This study is motivated by the fact that towns surrounding Addis Ababa, such as Burayu town, are attracting a large number of people, and industries. Such changes in land use have an impact on peri-urban households and the social settings of the local farmers. The ranges of impacts are observed to include loss of income source (land expropriation), improper compensation payments, eviction, environmental degradation, and overall major disruption of livelihoods. This indicates that there is a knowledge gap about how to harmonize urban development and the livelihoods of local farming households. The dichotomy of treating separately urban and rural areas through different policies hinders the mutual development of the two entities which in turn results in parasitic relationships.

Thus, the purpose of this research is to better understand changes in LULC changes, the practical consequences of expropriation and compensation legislations, and the livelihood strategies of expropriated households with a view to draw lessons for policy making that consider integrated development of the urban peripheries with that of the urban center proper.

1.3. Research Gap

Burayu town is one of the satellite towns surrounding Addis Ababa that has accommodated the spill-over effects of the capital city. Since its establishment in 1946, the town has served as an industrial and an administrative center. The spatial extent and economic activities of the town have changed dramatically after the designation of the town as a corridor for industrial development (IPS, 2004). The land needed for industrial development was secured through the acquisition of privately owned land. In light of this, unprecedented horizontal expansion of built-up areas became the dominant feature due to the continual reclassification of the surrounding rural kebeles into the administrative boundaries of Burayu town. Poor expropriation practices and improper compensation payments are observed to have negative impacts on the social, economic, and cultural settings of landholders, resulting in insecure livelihoods. Furthermore, farmers were observed to engage in informal land transactions, despite the fact that this is

prohibited by law. Based on the aforementioned points, the following were the significant research gaps which triggered the current study.

1. There is no in-depth study which clearly shows how the land use and land cover of Burayu town and its surrounding areas changed. This situation creates ambiguities on the magnitude and pace of urban expansion and the manner of expansion. Burayu has become part of Shaggar City which encompasses all urban and rural areas around Addis Ababa in 2023. The megacity will inherit the town with all its problems; one of the key problems being not well researched land use land cover changes. The use of satellite images and prediction models in the making of urban planning contextual has not been explored properly.
2. The difference between urban and rural policies impedes the integrated growth of adjacent entities which results in one influencing the other and initiating parasitic partnership. However, there is no sufficient study which unpacks the shortcomings of policies related to urban expansion especially expropriation and compensation laws.
3. Urbanization is a worldwide trend that presents both opportunities and risks depending on how we handle it. There is observable knowledge gap in Ethiopia, notably including in Burayu town, on how to integrate urban expansion with the improvement of the livelihoods of farming communities in the periphery of urban areas.

1.4. Research objectives and questions

The general objective of the research is to examine the manner of land use land cover (LULC) changes, expropriation policies and practices in the process of urban expansion, and their implications on the livelihood of farming households in the periphery of Burayu town.

The specific objectives of the research are the following:

1. To investigate the historical trends of spatio-temporal LULC changes between 1980 and 2020 and analyze forecasts for 2030 and 2050;
2. To examine the manner of implementation of expropriation cum compensation laws in the process of urban expansion in Burayu Town, and
3. To analyze the impact of land expropriation for urban expansion on the livelihoods of farming households in the urban periphery of Burayu.

The objectives listed above would be understood better through searching for answers to the following questions. The research questions are grouped into three based on the focus of the objectives.

Specific Objective 1: Trends of LULC change and forecasts:

- What is the trend of land use/land cover change between 1980 and 2020 in Burayu town?
- What are the main driving factors for the rapid expansion of the town?
- What is the capacity of prediction models to predict future LULC changes?
- In a development as usual scenario, what will be the impact of current urban expansion rate on the functional relationships of urban quarters of Burayu as predicted for 2030 and 2050?

Specific Objective 2: Expropriation laws and implementation practices:

- Are the expropriation and compensation laws and practices consistent with international and national laws?
- How are expropriation and compensation laws implemented and how are they perceived by the farming community?

Specific Objective 3: Impact of expropriation on livelihood:

- What are the major effects of urban expansion on the livelihoods of farming households in the study area?
- Who are the most affected households by expropriation practices?
- What are the primary means of subsistence employed by farming households following expropriation?

1.5. Scope of the Study

In spatial terms, this study is focussed on one of the emerging towns surrounding Addis Ababa. The key reason for selecting Burayu town as a research study area is due to its fast growth in terms of population, infrastructure, physical size and the unprecedented proliferation of squatter settlements in and around the town (ORLDMB, 2020). Though the other towns surrounding Addis Ababa are also expanding, but the degree of change is not comparable to that of Burayu. Hence this aroused the interest of the researcher to focus on Burayu Town only.

The general thematic scope of the study is land use and land cover changes. More specifically, this is related to 1) the manner and conditions of land use-land cover changes; 2) expropriation laws and practices since the early 2000 period while converting non-urban function land uses to urban functions, and 3) changes in the livelihood of farming households as a result of the forced land expropriation and displacement, and their adaptation strategies. The LULC thematic area was analysed using data from satellite images. Thematic areas 2 and 3 had government land ownership as a basis for their operations. The study also focused on identifying other driving factors for the rapid urban expansion; the use of prediction models for the understanding of LULC changes and implications of the land use-land cover changes for policy on sustainable urban development.

In terms of temporal scope for thematic area 1, the study analysed urban expansion and the associated changes from the early 1980s to 2020 while for the future expected land use-land cover change the temporal scope is between 2020 and 2050. The temporal scope for thematic study areas 2 and 3 is between 2005 and 2019.

1.6. Significance of the Study

A research on the issues of urbanization has multiple significance for understanding and making proactive mitigation strategies for sustainable development. Given the aforementioned issues, the relevance and worth of this research are apparent via the following angles. First and foremost, there has been little research into the remarkable horizontal expansion of small and medium-sized urban centers in Ethiopia, such as Burayu town, despite the fact that the town and the peri-urban areas are affected by the expansion. Burayu is also being targeted by both the national and regional governments as a viable site for land expropriation and transfer via lease mode to local and international investors. As a result, this study is expected to be useful to understand the intricate relationships between land expropriation and rights on property; impacts of expropriation on the livelihood of farming households, and the impacts of rapid land use change on the environment.

The study will provide significant contribution for policymakers, funders, and international organizations looking for alternative policy solutions to valuation, expropriation and compensation issues. The outcome of this study would add to the current body of information in Ethiopia on expropriation, appraisal, and restitution. The findings of the study, together with

those of other studies, can serve as the foundation for more general assertions about expropriation, appraisal, and compensation techniques. Furthermore, the outcomes of this study are expected to help the city administrations to identify their failures and find out mechanisms to alleviate the problems.

This study will also contribute to the advancement of more convincing theoretical and technical approaches that will enable better understanding of the effects of urbanization through the use of remote sensing and GIS techniques. One of the original contributions of this study is the use of the sustainable livelihood framework as an analytical tool in urban contexts, implying that a livelihood restoration plan should be part of urban development schemes that have substantial expropriation and displacement as an outcome. The results of the simulations in this study could be used not only as spatial recommendations for monitoring future developments in LULC dynamics, but also to address risks and deterioration in bordering rural areas and urban sustainability in small and medium urban centers. Identifying agricultural land, grassland, and vegetation covers that are prone to being transformed to built-up areas, is also useful to inform Ethiopia's national policy for future urban planning. It can also inform land cover management strategies and assist local governments in planning for the present and the future. They can strike a balance between growing the city and protecting its natural resources. In turn, the findings of the research will also contribute as a source of information and an initial basis for academics as a starting point for further study of the subject matter. Generally, the findings of this study would strengthen the knowhow on urbanization-related impacts on expropriated farming households.

1.7. Limitations of the study

This research has certain drawbacks. The notion of a 'peri-urban area' in an urban setting is extremely complex and arbitrary, particularly given the differences in terminology between nations and geographical areas. Another difficult issue for scholars and regional planners is to identify and delineate peri-urban areas. The statistical parameter used by scholars in India and the rest of Asia to delineate the peri-urban is not used in this study because it is not applicable to the context of African. The bulk of research in India also found that the delineation approach employed for their cities' peri-urban zones is primarily arbitrary and not static. Instead, the researchers applied qualitative criteria and the strength of the city effect due to closeness or placement right next to the city's jurisdictional border. The peri-urban areas of Burayu town comprise settlements beyond its administrative limit as some of the settlements are situated, as

well as settlements within the town boundary, exposing an enormous area in between the inner city and the outskirt. However, this study excluded the peri-urban zone beyond the administrative boundary in order to focus solely on the nature of modifications identified within the municipality jurisdiction, the urban periphery.

Medium-resolution Landsat satellite images were utilized to monitor and model the LULC change in Burayu. The researcher was unable to obtain and afford high spatial resolution satellite images such as Quick Bird, IKONOS, Geo Eye, Worldview, and SPOT, which will have provided finer and more accurate data of excellent reliability for mapping LULC categories. For this study, Landsat images in December and January of the same season were chosen for availability reason; although it was preferable if all land satellite images were in the same month and at the exactly the same time.

Several constraints and challenges confront the researcher during data collection, including the difficulty of obtaining officials and other key informants within the time frame specified, the unwillingness of some farmers to participate in interviews due to security concerns, and the failure to obtain all compensation payment payrolls and other documents. However, these obstacles are resolved through other ways, such as the employment of several approaches to obtain the necessary data for the research, and thus the constraints have no substantial impact on the study's reliability.

This study seeks to analyze the effects of LULC change, expropriation, and urban expansion on the livelihoods of households living at the urban periphery of Burayu town. The study focused primarily on the impact of municipal expropriation practices, which left many agricultural households without much or no farmland to rely on in the foreseeable. In looking at the effects, a detailed investigation of the influence on agricultural production at the home level may not have been performed. As a result, the present study left this topic exposed for additional investigation.

1.8. Structure of the dissertation

The thesis is organized into six chapters. *Chapter One* contains introductory and explanatory information on the focus of the research, gaps in prior studies, research objectives, questions, and scope, significance and limitations, and structure of the research report. *Chapter Two* deals with literature review on pertinent aspects of the research. These include urbanization and urban expansion, land tenure modalities, expropriation as well as sustainable livelihoods framework.

Chapter Three presents the local context about urban development, land ownership, expropriation and compensation laws and practices. In *Chapter Four*, description of the research methodology including description of the study area; materials used and their sources; sampling techniques, methods of data collection and analysis are described in detail. In *Chapter Five* the historical LULC changes and forecasts for the future; findings on expropriation laws and practices; and the impacts of expropriation on the livelihoods of households at the urban periphery are presented. *Chapter Six* describes the implication of the study for policy making while the final chapter, *Chapter Seven* deals with conclusions and recommendations. List of published articles are presented in the appendix.

CHAPTER II: REVIEW OF RELATED LITERATURE

Urbanization as a process and its impacts on the form and function of human habitats has been the focus of study by geographers, architects, /planners, sociologists, economists, politicians and environmentalists for long. A body of knowledge exists globally but the differences in natural settings of settlements and the social structure of society inhabiting the settlements creates variations which deserve close scrutiny.

The main emphasis of this chapter is to present a review of the basic theories and themes related to urbanization, urban expansion, land use and land cover changes, expropriation and compensation laws and practices and changes to ways of life (livelihood) as a result of urban expansion as well as contextual aspects pertaining to Ethiopia on the issues of the research.

2.1. Conceptual Discourse

2.1.1. Urban growth trends

Urbanization is a process that is characterized by population and economic agglomeration in compact areas (Manzoor, & Iram, 2018). In developed countries urbanization served as an engine of development attracting investment to regions and adding value to rural products (Azadi et al., 2011). Conversely, as noted by World Bank (2015) urban growth in developing countries took place without significant economic improvement. According to UNDESA, (2019) African urban population will be four fold in 2050 compared to that of 1950. At 14% urbanization level in 1950, Africa's urbanization level was the lowest in the world but during the 1950-1970 period it had the fastest growth rate (growing by 2.3% per year). **Figure 2.1** depicts a comparison of the world's urban and rural populations from 1950 to projected figures through 2050 (UNDESA, 2014)

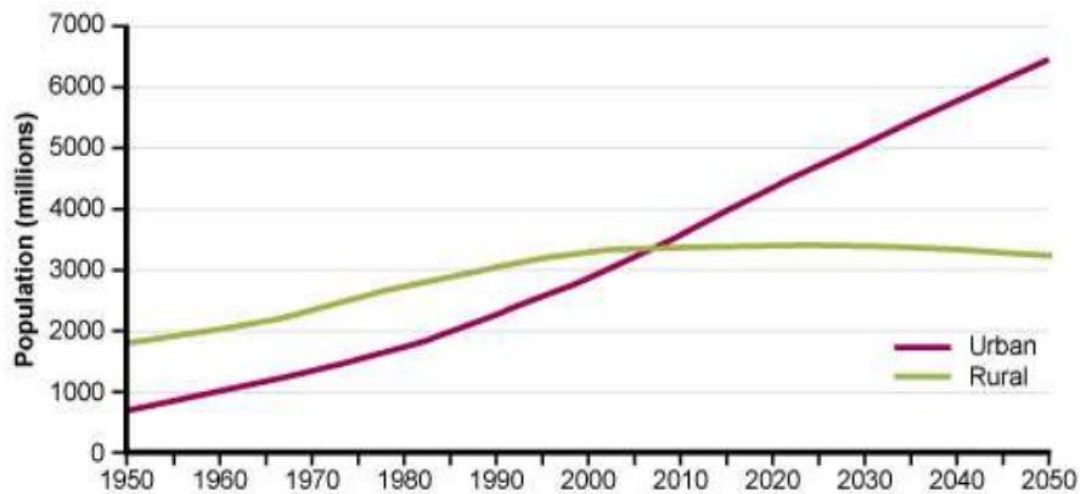


Figure 2.1: Urban and rural population of the world, 1950–2050

As illustrated in figure.2.1 above, the proportion of people living in rural areas is declining while the proportion of people living in cities is increasing. This spread of urban areas and the urban influence in the social and economic realms has a global nature. This transformation will have impact on households surrounding urban areas. For that reason, urbanization in general and urban expansion in particular offers both opportunities and challenges (UNECA, 2018) leaving the choice to those who have leverage on planning and governance.

2.1.2. Urban transition

Urban transition is defined as the structural change of society from a dispersed, predominantly agricultural subsistence economy to a predominantly concentrated, dense urban activity (Farrell & Nijkamp, 2019). It is best shown by the urbanization curve, which displays a country's journey through the three stages of urbanization: beginning, rapid, and terminal (Mulligan, 2013). Such urban transition trends are visible throughout the world in all countries. Following this pattern, the urban transition takes the form of an attenuated *S-shaped curve*, as shown below in **Figure 2.2** (Mulligan, 2013). The early stages are characterized by traditionally more agrarian societies where only a small part of the population is concentrated in densely populated settlements. This stage depicts the process of urbanization that occurred prior to industrial revolution and the initial stages of urbanization in less developed countries too. At this stage not more than 20% of the population lived in urban areas (Rogers, 1978).

In the history of urbanization, the accelerated period is characterized by a transitional period that represents a structural change from an agrarian to an industrial society due to a tendency towards economic concentration rather than scattered agricultural activities (Mulligan, 2013). This stage was most commonly experienced when the urban population of a country is between 25% and 70% of the nation's population.

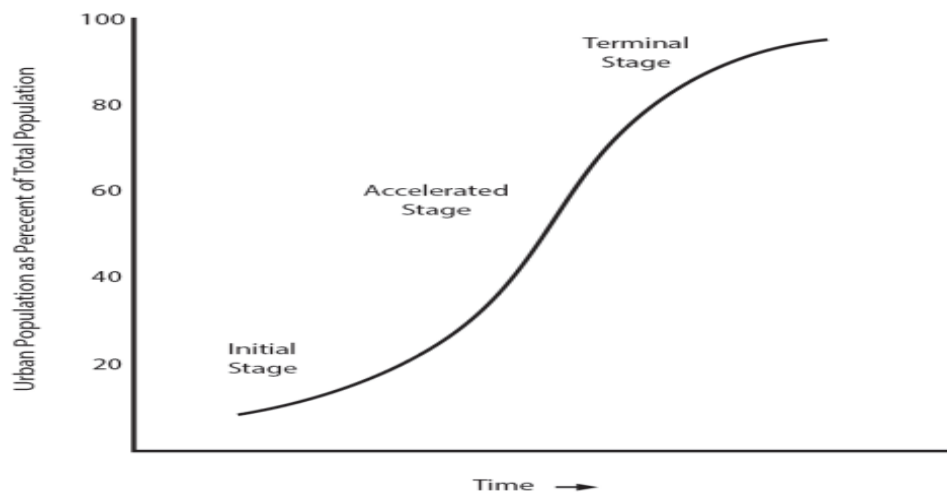


Figure 2.2: Urbanization Curve

Thirdly, the terminal stage of the curve represents a destination point where urbanization is nearly complete (Mulligan, 2013). This stage can be achieved when more than 70% of the population of a country is engaged in non-agricultural activities and is living in urban areas. No country will ever have a population that is 100 percent concentrated in urban areas, with the exception of small island states and territories such as Singapore and Bermuda. Some countries, such as Kazakhstan, Poland, and Slovakia in rare cases have experienced de-urbanization, which is characterized by a decline in urban areas accompanied by rural growth (UNDESA, 2014).

2.1.3. Factors of Urbanization/urban transition

There are various perspectives regarding the causes of rapid urban growth. Most urban analysts agree that the factors which had significant role for urban transition are population dynamics, economic technological transformations, and political factors.

The Demographic Dimension

The demographic transition theory, proposed in 1945 by W. S. Thompson and F. W. Notestein, is based on trends in fertility and mortality that have been observed in demographic studies

throughout history (Kirk, 1996). In this theory the demographic transition is represented by three levels: first, a point of population stagnation where birth and death rates achieve similarity, second, initial population growth increase due to decline of death rate and increase in birth rates, and finally, birth and death rates stabilize (De Janvry & Sadoulet, 2016). However, the demographic transition is not the same for all countries; late marriage in developed countries resulted in low birth rates, as a result population growth stagnated, whereas in most developing countries, population birth rates remain high, indicating that they are in the second stage of demographic transition, particularly in Africa (Todaro & Smith, 2012). Furthermore, Dyson (2011) elaborates on a population growth scenario of urban areas without rural-urban migration due to a fall in urban death rate.

The Economic Dimension

Migration could be a rural push and an urban pull factor in the economic dimension of urbanization. Push factors which may include poverty and lack of basic facilities, drive rural population to urban areas (Srinath, 2013). There are a variety of perspectives why individuals migrate to urban areas. Most economic analysts assert the primary motive of migrants is perceived economic benefits from agglomeration economies (Fu & Gabriel, 2012). Furthermore, the informal economy provides job opportunities for the non-skilled migrant workers (Todaro & Smith, 2012). In developing countries such as Ethiopia, the construction sector is the backbone of all activities that require covered space. It attracts many non-skilled workers; the increase in population triggers the second wave of demand for built up spaces, and so on. Hence, the significance of the economic dimension in urban transition is evident.

The Political Dimension

The reclassification of adjacent rural areas under urban administrative settings as a site of urban expansion to meet the demands for urban land for various activities is primarily a political or administrative process (Montgomery et al., 2004). In some local governments, the reclassification process has been conceptualized as a form of political capital (Lubell et al., 2005). The geographical setting of an area, such as proximity to a major city, presence of market, airport, and transport terminals, play a critical role in accelerating the horizontal expansion of urban areas towards adjacent rural settings. The accelerated growth consequentially initiates political decision to incorporate the peri-urban areas under urban jurisdiction.

2.1 4. Peri-Urban Areas

Many researchers have used their own operational and contextual definitions to clarify the concept of peri-urban area due to the lack of a universally accepted definition. Therefore, before using it in this study, it is necessary to understand the perceptions of the various authors. In line with this, according to Friedberger(2000)peri-urban area is a region that extends 10 to 15 miles from the center to the outskirts of an urban center. However, in reality peri-urban areas are created at every level of urban hierarchies and also definitions of the concept differ. As a concept, it is an interface where urban and rural activities interact on the outskirts of cities. This refers to the parallel flow of products and services between rural and urban areas. Peri-urban is a place where shifting interfaces occur within the boundaries of urban regions, as represented in **Figure 2.3** below (Piorr et al., 2011; Simon, 2008).

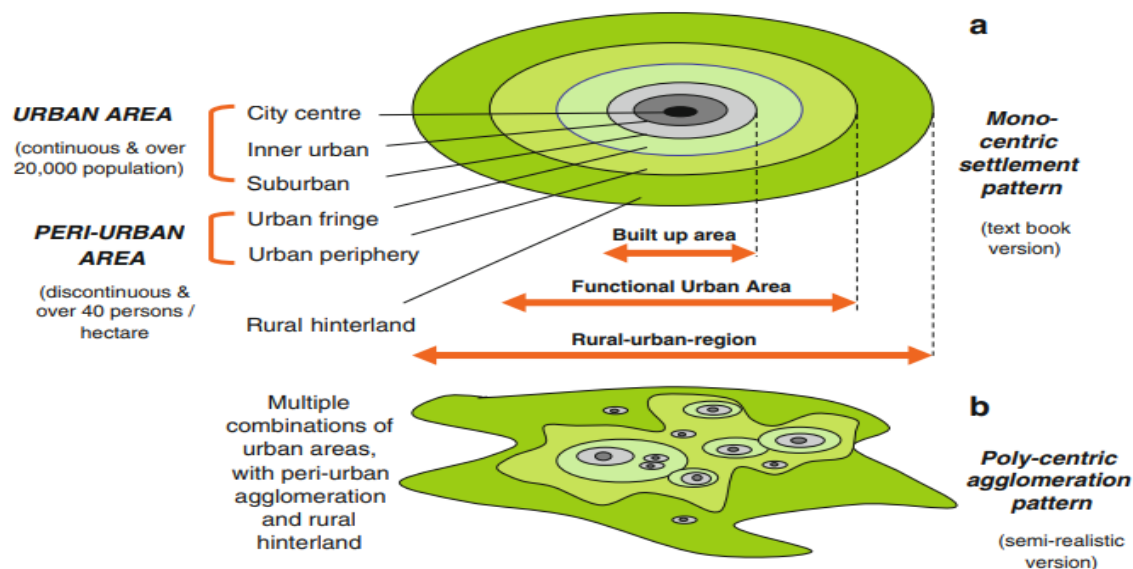


Figure 2.3: Spatial extent of peri-urban areas and rural-urban region

Source: adapted from Piorr et al., (2011)

In the context of African countries, peri-urban area is considered as the main receiving hotspot of squatter settlements (Kombe, 2005a) and also informal land transaction and the existence of conflict of interest among different stakeholders. Moreover, peri-urban area is the place where the existence of sudden changes in land ownership modality occurs from rural-based customary to urban statutory type (Wehrmann, 2008b). Peri-urban places are complex because of their proximity to urban areas and their interdependence with cities and rural hinterland areas. One of

the negative manifestations of peri-urban areas is urban sprawl, which changes rural land uses to urban built up areas (Kim, 2015).

As stated above, each author defines peri-urban area using his or her operational and contextual framework in different perspectives. The definition of peri-urban areas by different authors is summarized and presented in Table 2.1 below.

Table2.1: Definitions of peri-urban areas by different authors

Author	Definition	Main issue in the definition
Friedberger (2000)	A region that extends 10 to 15 miles from the center to the outskirts of an urban center	The area is ready for the development of various urban activities at the expense of agricultural lands as a transition zone.
Kombe, (2005a)	Peri-urban areas are on the front lines of the spread of squatter settlements, particularly in developing countries	Peri-urban area is considered as the main receiving hotspot of informal settlements
Wehrmann, (2008a)	The peri-urban areas in the context of Africa is equated with a locus of abrupt transformation of tenure where land is being transformed institutionally from rural-based customary to urban-based statutory tenure to third party	Sudden change in land ownership modality from rural-based customary to urban statutory
Simon, (2008)	peri-urban areas typically in the context of some African countries, present a changing interface between the dominant inner cities and their surrounding areas, but within the city's boundary limit	The peri-urban is a place where changing interface takes place within the boundary of urban areas
Author's use of the term in this research	In line with Simon (2008) peri-urban area as used in this research refers to the peripheral area of the urban region designated by law as urban but farming practice dominates. In the Ethiopian case, towns have urban kebeles and rural kebeles; the term peri-urban or urban periphery relates to the rural kebeles which are under the jurisdiction of urban centers for administrative purposes.	

Source: Compiled by the author

The concept of peri-urban areas used for this study are kebeles (counties) that lie at the periphery of Burayu town and inhabited by farmers whose livelihood is through crop farming and animal husbandry. These counties are in terms of jurisdiction, parts of the town proper but they wait to be formally developed into urban functions through the conversion of land uses by the municipal administration. Hence, the expansion of the town is understood to mean expansion of the built up area into what is now agriculture related land use. The kebeles referred to as peri-urban in this

study are Gefersa-Burayu, Gefersa-Guje, and Gefersa-Nono.

2.1.5. Urbanism

In the literature, the phrases urbanization and urbanism are used interchangeably, however they are not synonymous. The demographic definition of urbanization is a place to start because it implies that urbanization and urbanism are not interchangeable terms (Rogers, 2020). Urbanization refers to the processes of population concentration in a small region rather than the widely distributed settlement of rural farming communities (Liu et al., 2010). According to Rogers (2020) urbanism is described as the study of what happens within cities, the forms and functional links that cities have with their surroundings, both within and without. Urbanism is generally defined as the examination of how urban dwellers interact with their socioeconomic and structural environments. Moreover, urbanism refers to the ways or styles in which people live in cities (Kushwash, 2014; Wirth, 1938) while urbanization refers to the process by which cities develop or grow. Different kinds of urbanism have infiltrated the urban language, each with its own distinct view of the built environment (Talen, 2008). Some of them are inclusive urbanism, green urbanism, urbanism as an option, sustainable urbanism, new urbanism, integral urbanism, and so on; however, only inclusive urbanism will be used in this study.

Our world is currently facing challenges as a result of unprecedented population growth and concentration in urban areas. Associated with these large scale urban growths, rural lands are transformed into urban built-up areas by displacing farming communities. Thus, in order to mitigate such negative impacts in various fields of development agendas, some countries have undertaken a program that encompasses all, such as inclusive urban development initiatives that give due attention to all. In line with this an inclusive urbanism is a process in which various stakeholders participate in any mutual development agendas that affect them all equally and without marginalization (Espino, 2015). Inclusive urbanism implies taking into consideration the collaboration of various interest groups, as well as working together and making decisions for the welfare of the whole. It is obvious that inclusiveness is associated with participatory approaches in which relevant stakeholders, particularly the marginalized, express their own opinions (Wende et al., 2020). Implementing good urban governance and strategic planning is an important intervention mechanism for mitigating the effects of urbanization. Thus, improving governance in urban planning and management is a pivotal component of urban economic,

social, and physical regeneration.

2.1.6. Land Use Land Cover Change

For a better understanding of the study issues, the concepts of 'land use and land cover change-LULC' need more elaborations. Even though the terms 'land use' and 'land cover' are frequently used interchangeably, each one has its own connotation. Land cover refers to the bio-physical layer that encompasses the earth's surface, such as grass, trees, water, and so on while land use pertains to how the land cover is used by humans. Furthermore, land use land cover (LULC) change is defined as the modification of surface features on the Earth's landscape that is manifested by a difference in their surface appearance measured at two different times(Nosetto et al., 2012; Ravanelli et al., 2018). This implies that land use land cover (LULC) change entails switching from one LULC to another categories over time (Kibret et al., 2016).

The transformation of LULC can be viewed as a function of socioeconomic and environmental factors, which are referred to as the driving forces behind such changes. The principal driving forces for changes in land use and land cover can be classified as proximate factors, such as direct modifications by individuals at a local scale, such as individual farms, and underlying factors, which occur at a regional scale(Tizora et al., 2016). Changes caused by human activities including infrastructure provision, human settlements expansion towards the periphery of urban areas, and agricultural expansion via deforestation can be considered as proximate driving factors for LULC changes (Mesmin et al., 2020).

Changes in LULC are becoming a major part of modern resource management and environmental change monitoring systems. Other than man-made activities, natural occurrences like weather changes and ecosystem dynamics can also cause changes in land cover. However, in far too many cases, urban expansion and agricultural practices are the primary causes of modern land cover changes.

It is advantageous to be aware of the history of the LULC changes in order to comprehend changes in land usage and land cover to improve efficiency of land resource. As long as certain natural and artificial elements are present at all times, LULC is never steady and it always changes. Therefore, rigorous research and observation are required in order to improve planning for the long-term sustainable use of land. Contrary to land cover, which apparently is gross in the

information it delivers, land use can be directly employed for policy and planning objectives when derived from land covers.

2.1.7. Expropriation

The term "expropriation" refers to the government's ability to take over all ownership inside the country, notably the right to acquire private assets for public purposes (Scheiber, 1973). Expropriation pertains to the constitutional decision to acquire private property without the owner's permission in exchange for a legal compensation (Ambaye, 2015). As a result, the government is in a position to acquire land by compulsory takeover with payment for the greater public good (Reynolds, 2010). To promote sustainable growth, the government should offer social services such as public facilities, infrastructure, and so on that assure the well-being of communities. One type of infrastructure is roads, which play an important role in society's accessibility for various functional exchanges both within and outside administrative boundaries. The provision of such public infrastructures, services, and amenities necessitates enormous tracts of land that governments may not hold in the appropriate numbers, localities, or geographical arrangements (Collier & Venables, 2012). For example, the construction of a road by government entities everywhere in the world is a development measure that is often executed via expropriation of private landholders in exchange for compensation.

2.1.8. Compensation

Compensation is defined as restitution for the loss suffered by a property owner (Newton, 1993). Compensation has mainly been believed to encompass particular actions designed to restore those who have been dispossessed or adversely affected by the takeover. It is typically in the form of a one-time payment, either in monetary or in type, and is primarily intended to compensate those who have been adversely impacted. The payment of compensation is justified by socio-political and economic theories, and is also a means of maintaining the balance of social justice (Berkovich, 2014). In the most affluent countries, there is a "just compensation" principle that aims to adequately compensate expropriated households (Wyman, 2007). In the United States of America, the market value of the subject property is commonly recognized as just compensation for the evicted landlords (Michelman, 1981). In comparison, in the UK, compensation is based on the principle of worth to the owner (Allen, 2006). The value to the owner compensation principle includes market value of expropriated property as well as other

losses suffered by the expropriated person (Denyer-Green, 2018). Furthermore, in Sweden, expropriation is primarily used (as in most countries in Northern Europe) to provide infrastructure and other services of great public interest and the compensation payment is based on market value plus 25% to strengthen the position of property owners (Persson, 2015).

Globally, most laws that allow for the expropriation of private property usually include a provision for the payment of compensation. According to each country's constitution, compensation can be described as reasonable compensation, fair compensation, adequate compensation, just compensation, or commensurate compensation, as in Ethiopia. The payment of market value is the fundamental principle that guides valuations under expropriation laws in the majority of Western and developing countries. In other words, market value is commonly used as a basis for deciding on the existence of just compensation (Ambaye, 2012). The reason why market value is preferred is that the amount of compensation will allow owners to go to the market and obtain comparable property for the same price. The previous owner should not suffer a loss or profit. In the United States, the fair market value of the land for its highest and best available use is said to be the standard measure of compensation (Chang, 2012). Depending on their legal provisions, many governments have ratified "fair market value" as the means of determining compensation (Nikièma, 2013). Fair market value refers to the sum that a property could be anticipated to bring if sold in the open market by a willing seller to a prospective buyer. In most countries, fair market value is the most common method for determining amount of compensation (Stojić et al., 2018). In compulsory land taking the government is a willing buyer but the landholders are frequently unwilling sellers (Ty et al., 2013). For the reason of unwilling nature of taking, a number of countries offer a higher price above fair market value (McCarthy et al., 2012). In light of the above practices unwilling property losers recognize fair market value as an undervalued compensation for expropriated property (Kabanga & Mooya, 2018).

2.2. Theories of Urban Expansion

Knowing the theoretical perspective of any research theme is important for having a comprehensive view. Accordingly, many theories have been developed to understand the main features, trends, and patterns of urban expansion at various levels. The theories listed below have been developed to explain why and how urbanization occurs and existing urban areas expand.

Built-up regions could increase in three different ways: leapfrog, infilling, and edge extension (Liu et al., 2010). Leapfrog shows recently developed urban regions that are not physically connected to the existing urban areas (Capitals et al., 2016). Leapfrog development is the practice of developers bypassing existing land in favor of less expensive land farther from cities, leaving vast stretches of undeveloped space between the new development and the metropolis. The term "infilling" refers to the process of new urban area expansion filling in the void (or hole) left by the collapse of older urban areas or within older urban areas (Forman, 2014). This means that urban infill is the process of developing underutilized or unoccupied land inside already-built areas. The term "edge-expansion" describes how newly developed urban areas are extending unidirectional from the boundaries of already-existing urban areas in roughly parallel strips. The growth pattern known as "outlying" occurs when a new patch does not have a neighboring relationship with an existing patch. In urban planning, infilling primarily serve to accelerate and condense urban land use, particularly with regard to the use of underutilized in-city land (Ghani & Abidin, 2018; Qian et al., 2015).

2.2.1. Theory of Self-Generated Urbanization

In this theory for the occurrence of urbanization two conditions were placed as a prerequisite. According to Hawley (as cited by Bodo, 2019b), the production of surplus products to sustain people in non-agricultural activities, as well as the achievement of social development for the coexistence of a large community capable of working to support them, are critical to launching self-generated urbanization. This hypothesis also believes that rural to urban movement was a driving force behind the emergence of urbanization, as individuals began to travel to cities in quest of industrial work (Childe, 1950). This implies that according to this theory industrialization was identified as the driving force behind the creation of urban centers through migration of people from rural areas.

However, this theory has been criticized for focusing on migration of rural population to urban areas in search of factory jobs, i.e. economic factors, as the primary cause of urbanization while ignoring other cities that are urbanized for other reasons. One such line of thought advances the involvement of administrative bodies or the ruling class which is capable of wielding power over producers for surplus to be made available to off-farming communities as the cause for urban growth. Moreover, it is argued that there must be a class of traders and merchants in order for

off-farm activities to be facilitated and their raw material needs to be met. Different lines of arguments have been raised to understand the emergence and development of urban centers. Is /Are surplus production and social development, (i.e. economic factor) the only prerequisite for the development of urban areas? Is there a precondition for the rise of urban centers, and if so, what are the major driving forces behind the creation of urban areas? Is industrialization as a pulling factor, the only driving force for the creation of urban areas? In accordance with this theory, it is questionable if the economic dimension is the sole reason for the establishment and growth of any urban center, as the case study area, Burayu town does not support this phenomenon.

2.2.2. Expansionist theory

According to Barnett & Hyde (2001) expansionist theory, combining multiple roles produces resources that enable people to better meet their personal needs. Theory of expansionist founded on the idea that having several responsibilities is often advantageous. Neoliberal economics and the expansionist myth are strongly related. History tells us that Lisbon under French Urbanism had long neglected its metropolitan aspirations in favor of urban planning that is restricted to the city's boundaries (Teles & Camarinhas, 2011). The city has become more fragmented regionally, resulting in an ill-defined city-region and igniting a fresh discussion about urban and regional planning. While unplanned peri-urbanization and the actual removal of city limits have been attributed to a lack of regional planning, planning has also been positively and significantly influential in defining infrastructure important for future metropolitan expansion, defining the primary growth areas, and reshaping metropolitan centers. Baron Haussmann's urban reforms in Paris from the 1860s gained significant traction, ushering in a new era of planned city transformation. In light of this, a French school of urbanism evolved, aiming to create a new and integrated scientific field, going beyond hygienic, aesthetic, and engineering concerns that started at the end of the nineteenth century (Berdoulay & Claval, 2001; Fernández Christlieb, 2002).

The liberal expansionist strategy has become the dominant means of addressing the issues facing cities, especially in the USA in more recent times. According to liberal expansionists, this strategy blends a liberal political philosophy with the notion that the social and economic issues facing major cities can only be resolved by "playing the outside game" (Rusk, 1999) or "crossing the city line," (Dreier et al., 2001). It is argued that central cities are failing because of their

excessive isolation, particularly from the surrounding suburbs. Expansion is the remedy for this complex isolation; it entails establishing ties between the core city and its populace and resources and institutions located outside its borders on the governmental, political, social, fiscal, and economic fronts (Imbroscio, 2006). These days, the division between planning for urban and rural development places limitations on the efficient use of land; therefore, it is crucial to create and carry out regional integrated development at the regional level, including regional spatial planning.

2.2.3. Containment Theories

Reckless (1961) applied his theory of containment—a theory of internal and external controls—to unethical business decision-making in an effort to determine how various inner and exterior containment aspects affect a person's decision to commit an unethical business conduct. According to containment theory, deviation happens when incentives for immoral behavior are present and restrictions are so inadequate that they cannot prevent deviance. The theory takes into consideration the existence of both external and internal controls, as well as the forces that encourage or discourage deviant behavior.

Containment theory as applied to urban areas is concerned with strategies that limit the growth of urban development outside of a given area (Nelson et al., 2007). The fundamental premise of this strategy is that the market would turn inward and grab possibilities that were passed up if new territory is no longer open to development. Instead of having to extend their borders, central cities may wait for and assist the development wave that comes in behind the containment line. Urban planners have promoted containment of urban sprawl using a range of strategies during the 20th century. Urban confinement is a major land policy initiative that is becoming more popular across the world and comes in the form of compact city, reduction of urban footprint. Looking it from outside the city, the containment theory applies strategies which limit exodus to urban centers from rural areas by making services such as housing inaccessible.

2.2.4. Modernization Theory

Modernization theory contends that economic growth and development would be achieved through the transmission of growth impulses from developed countries through institutions, trade, and multinational corporations (Lotfi, 1998). According to Smith (as cited by Effiong et al., 2021) modernization theory asserted that urbanization is the outcome of the introduction of new

things and innovations within society through industrialization, technological application, information and cultural diffusion. According to Bodo (2019), when perceiving urbanization through the eyepiece of modernization theory, it is common to recognize new things in any community that has transitioned from a primitive to a modern way of doing things. In this concept, a close association was made between urban and rural communities to explain how 'advanced' man left the traditional way of life in rural areas and moved to modern life-styles in cities. Thus, migration is viewed as a way of progress and modernization (Lotfi, 1998). It was assumed that modern attitudes and trends would emerge in the city and diffuse outwards. Secondly, the role of technology in social organization and in shaping society is given credit for the rise of urbanization afterwards. In this context, it is assumed that technology is more important than social organization. As a result, the application of technology is viewed as the primary driving force of urbanization in society (Bodo, 2019c). Hence, urbanization, as per modernization school of thought, cannot occur without industrialization (Berliner, 1977).

Modernization theory has been criticized for its Euro centrism and simplistic assumption that modernization, westernization, and progress are all one and the same. Contrary to modernization theory, I argue that urbanization may have occurred throughout the world, particularly in developing countries like Ethiopia, without industrialization and technological application. Urbanization in Ethiopia occurred mainly due to state formation processes where garrisons turned into urban areas when they outlived their military camp purpose (Akalou, 1967). Furthermore, according to modernization theory migration is a means of progress and modernization. However, in the context of many countries, it may be the means by which marginalized or affected groups find a way to survive impacts of externalities, either internal or external. As a result, determining what motivates people in different communities to migrate or relocate within the same urban area necessitates considerable studies.

Above all, as per modernization theory, industrialization is perceived as the fundamental driving force behind urbanization. In spite of the theories contribution to explain a scenario of urbanization in its early stages in Europe, the global history of urbanization has revealed that various factors contribute to the formation of urban settlements. The theory fails to explain urbanization in developing countries where the growth of urban centers and urban population is not only influenced by local contexts but also global trends in economic, social and environmental changes.

2.2.5. Dependency Theory

The dependency approach to explaining urbanization perspective arose in response to critics of modernization theory, which failed to address the causes and consequences of urbanization in less developed countries (Bodo, 2015). This school addresses issues that are not dealt by modernization theory. Accordingly, at a new fundamental level, a more critical examination of dependency theory was based on three assumptions (Crenshaw & Kasarda, 1991). Firstly, these theorists believed that a distinct form of capitalist development pattern existed in societies, which they attributed to a type of social organization. For instance, this school of thought holds that development in developing countries is influenced by Europe's growth and expansion (Tetty, 2005). Second, capitalism necessitates a specific social structure, which include unequal exchange of commodities, uneven development, individual social inequality, core-periphery hierarchies, and dominance structures (Crenshaw & Kasarda, 1991). For instance, in case the feature of marginalization did not exist in society, the dependency school of thought asserted that a capitalistic development would introduce them into the system in order for it to exist. Finally, the dependency theory considers population dynamics, social structure, and technology as essential in urbanization and development. Hence, the dependency theory shed some light on the interdependence of urbanization processes in developing countries and the global expansion of the capitalist system. As a result, the dependency school of thought believes that social changes in developing countries were primarily caused by the structures and processes of the capitalist world system (Crenshaw & Kasarda, 1991). Thus, the global expansion of the capitalist system was only possible through the division of labor and unequal exchanges in a core-periphery system that benefits the core area at the expense of the periphery (Lotfi, 1998). In accordance with this, Wallerstein (1979), argued that core area benefited more because it is a location where resources such as raw materials were accumulated, processed, transformed, and surpluses were generated. Hence, according to the school of dependency, developing countries are the primary destination points for developed countries to obtain primary input raw materials for their industries and destinations for their commodities.

According to Drakakis, as cited by Lotfi (1998), the dependency theory has been criticized for under-valuing internal processes in developing countries. The theory oversimplifies and takes a stand that one explains all approach. However, contrary to the dependency approach, urban areas could and have been created by internal conditions or activities of a country that do not rely on

the capitalist system. Abu-lughod (1996) noted that this theory lacks framework for viewing cities as the product of larger social, economic, and political processes within communities, as well as a lack of awareness that global forces negatively affect third-world communities. It could be observed that the dependency theory has credence to understand the relationship of peri-urban areas to the center; but it could be noted that not just one theory has the capacity to explain all urban expansion processes.

2.2.6. Urban Bias Theory

Proponents of the urban bias theory shift the focus of urban development from an economic to a political perspective. The urban bias theory was developed by Michael Lipton, by comparing data from more than sixty developing and nine advanced countries (Effiong et al., 2021). In view of that, in poor countries, urban-rural disparities are widening as governments intervene in markets by levying agricultural taxes whereas governments in developed countries are doing the opposite by intervening in ways that provide farmers with subsidies (Dixon & McMichael, 2016). The most powerful groups of third world nations rely primarily on urban resources base, hence pass policies in favor of urban areas at the expense of rural areas resulting in the concentration of facilities and the creation of favorable conditions in urban areas. Thus, an inequitable distribution of existing resources, higher standards of living in urban areas result in a disparity between urban and rural areas.

Other opposing arguments have been made that urban bias does not typically entail rural poverty because some governments in developing countries have made efforts to develop rural areas by enacting laws and policies that favor rural settlements (Bodo, 2019a). For example, the governments of Taiwan and South Korea formulated land reform policies in order to increase agricultural production for the benefit of rural people, while the governments of Malaysia, the Philippines, and Thailand decided on development projects in health and education in order to improve the living conditions of the rural population (McGuise, 2001). These government measures discouraged rural-to-urban migration because job opportunities were available in rural areas (Muscat, 1990). In general, urbanization or urban transition could be either generative which stimulates economic growth associated with developed countries or parasitic where surplus products are extracted from surrounding hinterlands for the benefits of urban areas (Annez & Buckley, 2008).

One of the primary dichotomies that contribute to disparities between urban and rural areas is government intervention through various measures such as policies that may favor either entity rather than mutual development of both. According to urban bias theory, some developing countries prefer urban areas while others prefer rural areas. Contrary to urban bias theory, I argue that because urbanization is an unavoidable process, implementing mutual development policies which may benefit both parties result in sustainable urban-rural development. As a result, the development and implementation of various synchronized policies, which is a political factor, may cause the development of both rural and urban areas.

2.2.7. Summary of urban expansion theories and their implication to urban development

The expansion of urban areas has various consequences, both positive and negative. It has significant impact on natural resources and human life in the dimensions of social, economic and environmental settings (Dociu & Dunarintu, 2012). Urban areas act as centers of market, innovation and access to employment opportunities as well as basic facilities (WEF, 2017). Additionally, urban centers are generating globally more than 80% of the GDP (World Bank, 2019). On the other hand urbanization brings a great deal of stress on natural resources and existing social services and infrastructure (Thuong, 2013). Furthermore, unprecedented urban transformation presents enormous challenges in governance, service delivery, infrastructure provision, housing, and environment which may hamper progress towards development. Unprecedented rapid rate of urban expansion stimulates the degradation of environmental resources such as depletion of surface and ground water, pollutes air quality, alters landscape aesthetics and destroys wild life habitats (Wodike & West, 2019).

One of the manifestations of urban expansion is loss of agricultural land and open spaces which serve as breathing organ for urban settlements (Bhatta, 2010). Urban expansion is the primary cause for shrinking the income of farming communities by converting agricultural land into built up areas. This results in dispossession of main income source which stimulates vulnerability of livelihoods of the farming community (Mwavu et al., 2018). However, in well planned expansion, agricultural productivity could be improved; farming households could be trained to provide them means of integration with urban economic activities. But this is not observed in most cases and the livelihood of peri-urban households is by in large affected negatively. The main characteristics of urban expansion theories are presented in **Table 2.2**.

The review of urban expansion theories shows the various approaches employed by urban centers and city governments in the process of urbanization. Governments in different countries are observed to apply varied approach at different times. The main purpose of the review of theories being to draw lessons and craft analytical framework for analyzing the manner of urban expansion, for the current study area the following key lessons were learnt:

Table 2.2:Summary of Literatures reviewed and their characteristics

S.No	Theory	Main characteristic
2.2.1	Theory of Self-Generated urbanization	Placed two conditions as a prerequisite for urbanization: ✓ production of surplus products, ✓ achievement of social development
2.2.2	Expansionist theory	✓ Liberal expansionist ideology in play ✓ Socioeconomic issues facing major cities can only be resolved by "playing the outside game" ✓ Cities should be planned as integral part of their urban region
2.2.3	Containment theory	✓ Strategies that limit the growth of urban development outside of a given area ✓ Market would turn inward and grab possibilities that were passed up if new territory is no longer open to development ✓ Urban confinement is a major land policy initiative
2.2.4	Modernization Theory	✓ Introduction of new technologies and innovations ✓ Industrialization considered a pre-condition
2.2.5	Dependency Theory	✓ the global expansion of the capitalist system ✓ under-valuing internal processes in developing countries, Globalization glorified
2.2.6	Urban Bias Theory	✓ Promotion of urbanity ✓ Could be either generative or parasitic

Source: Compiled by the author

1. The *self-generated urbanization concept* could be applied to understand the expansion of

Burayu. The designation of the town as one of the industrial corridors has had impact on the town's expansion as will be shown later.

2. Burayu has pursued *expansionist approach* in its development. The rural kebeles were converted to urban land uses extensively without major change to the density of use.
3. Burayu has also pursued an *urban biased approach* in the expansion of its built up areas. The livelihood of the farming community at the urban periphery is observed to have deteriorated as will be shown later.

2.3. Understanding Urban Growth Systems

2.3.1. Urban growth and analytical models

To estimate and forecast future patterns of urban LULC change and its ecological implications, one must have a thorough understanding of the urban growth system. Urban growth involves a multitude of players with a wide range of behavioral patterns, hence an interdisciplinary framework and complexity theory are necessary bases for a scientific explanation of this phenomenon (Cheng, 2008). Theoretical analysis can serve as guidance when choosing among the modelling techniques currently used in remote sensing, GIS, and complexity modelling contexts.

Many environmental and socioeconomic processes are significantly impacted by urban growth and the spatial patterns of metropolitan land (Poelmans & Rompaey, 2010). The conversion of farmlands to urban land use is just one example of how urbanization has significantly altered the LULC of the Earth's surface. This implies that the conversion of the rural environment into urban forms causes physical and functional changes associated with urban expansion (Thapa & Murayama, 2011).

Nonetheless, there hasn't been a thorough investigation of the complexity of urban expansion and how it affects planning for urban development and sustainable growth management. Advances in our understanding of the origins, timeline, and consequences of the urbanization process to be necessary to support novel strategies for the planning and management of urban areas, such as sustainable development (Longley & Mesev, 2000). Understanding the dynamic process of urban growth requires an awareness of the link between time and space. Numerous factors, including topography, land use, population, economy, and growth policies, interact in a complex and

nonlinear way to form urban dynamic process (Puertas et al., 2014). In order to enhance the welfare of human society, effective and sustainable urban planning is essential. This requires concurrent modelling and monitoring of urban land use, which entails examining the effects of urbanization in various scenarios (Li et al., 2011). Urban growth models have been developed and widely used in research on the effects of urbanization on the surrounding environment. Appropriate methods are required in order to conduct effective assessment, monitor, and track land use change so as to inform responsive policy making. Remote sensing methods give time series LULC data that could be utilized to retrieve, evaluate, and model land use change (Viana et al., 2019). Used in conjunction with geographic information system (GIS), remote sensing techniques are useful data sources and tools for natural resource management (Wang & Xie, 2018). The advent of remote sensing data has offered a broad range of spectral, chronological, and spatial resolution images used in detecting landform differences on the earth's surface at a faster and lower cost than conventional ground survey methods (Fu et al., 2020; Gupta, 2017). In light of this, numerous studies have efficiently mapped and assessed LULC changes utilizing data derived from satellite images such as Landsat TM (4 and 5), Landsat ETM+ (7), Landsat OLI/TIRS (8), and many more (Alam et al., 2020; Jamal & Ahmad, 2020). These models can be used to assess development possibilities and to formulate urban policies. In light of this, the researcher reviewed the characteristics of different models to facilitate the choice of a better approach for this research.

2.3.2. Cellular automata (CA)

A cellular automaton (CA) is a mathematical model that illustrates how various elements can change substantially over time and how nearest-neighbor values can have an effect (Ghalehtemouri et al., 2022). CA is a discrete, spatially extended dynamic system composed of nearby cells or sites placed in a regular lattice and evolving in discrete time steps (Das, 2012; Itami, 1994). Using a probability matrix, the CA model forecasts changes in space over a specified period (Keshtkar & Voigt, 2016). Since the results of the modeling are explicit and based on defined transition criteria, CA is one of the most advocated methods for modeling LULC transformation (Yuan, 2010).

Additionally, because of the connectivity between raster grids, cellular automata model types are suited to depict, analyze, and anticipate spatial processes (K. C. Clarke & Gaydos, 1998). With

the combination of spatial and chronological simulation, the reliability of CA model promotes it as a widely used and effective technique to treat LULC alterations (Zhou et al., 2020). The condition of the nearby cells serves as the basis for the CA model's transition rules, which considers Markov's prior or present state of LULC (Gidey et al., 2017). Because of its analytical engine, CA offers an appropriate setting for dynamic modeling in GIS and remote sensing (Park & Wagner, 1997).

The ability to portray both population change and land use change simultaneously makes the cellular automata an effective tool for urban system simulations. In light of this, CA model has been utilized more frequently these days for land use change and urban growth modeling (Herold et al., 2003). It is important to note that time and space in the CA model are viewed as distinct units, with space being viewed as a regular grid in two dimensions. CA models can simulate probabilistic, nonlinear, and spatiotemporal processes (Wikle et al., 2019). Numerous researches have demonstrated the capability of cellular automata models to represent the intricate spatiotemporal processes of land use change, urban systems, and their patterns in a clear and intelligible way (Mohammed & Ukai, 2022; Smid & Costa, 2018). However, the CA model is constrained regarding transition rules and modeling frameworks.

2.3.3. Markov chain model

A Markov chain is a stochastic process where a limited condition moves from one point to another in a system with transition probabilities (Brooks, 1998). The probability of a variable's subsequent state or value relies on the current state in a Markov chain (Murray, 2007). LULC alterations, dimensionality, and patterns are frequently modeled and simulated using the Markov chain model (Ghosh et al., 2017). Markov chain model analyzes and summarizes the change in land use by a set of probabilities that transition areas from one status to a different status during a predetermined period (Paul et al., 2018). Each class that has been discovered in land use surveys may stay the same for a long period, and some may switch to another class. Accordingly, using historical data for each class, a matrix of actual transition probabilities can be utilized to forecast future land use change (Takada et al., 2010). Markov chains, however, are unable to anticipate and model changes in geographical distribution (Renard et al., 2006). There is no spatial explicitness in the Markov chain model, i.e. missing the spatial distribution of LULC, which is important for replicating land cover patterns (Halmy et al., 2015). Nevertheless, it is a strong and efficient model that can measure and forecast the amount of land use change (Crisci et al., 2012).

2.3.4. Agent-based modeling

Multi-agent (MA) systems consist of a group of autonomous agents that communicate with each other. (Van der Hoek & Wooldridge, 2008) each agent has unique capabilities and objectives, but they are all connected to the same environment. MAS is a computerised system that consists of several intelligent agents interacting with one another (Van der Hoek & Wooldridge, 2008). Additionally, users can adjust the complexity of the agents, add more agents with ease, and alter the levels of aggregation and description with ease (Wilensky & Rand, 2015). These features are just a few of the many ways that MAS models provide users with considerable flexibility (Bonabeau, 2002). Decision assistance requires the spatially explicit display of simulated LUCC outcomes, which is supported by recently developed MAS computer platforms (Benenson & Torrens, 2004). MAS is a very suited modelling technique, however there are still several obstacles in applying it to coupled human-environment systems (Bao et al., 2008). In light of this, the first challenge relates to the representation of the environmental system that is co-evolving and interacting with the human system. How to accurately capture the genuine variability of authentic human societies and settings is the second problem in using MAS-LUCC models. Developing a thorough, pertinent, and empirically supported decision-making process for MAS-LUCC models is the third problem.

2.3.5. ANN-based modeling

An artificial neural network (ANN) is a system made up of numerous simple processing units that operate in parallel (Tino et al., 2015). The network topology, connection strength, and processing carried out at computing elements, or nodes, determine the function of an ANN (Dongare et al., 2012). A learning paradigm, a learning algorithm, and a "network topology" must all be specified before a neural network model can be developed (Zou et al., 2009). ANN in conjunction with cellular automata models can efficiently realise land use systems, even though neural network models are widely used in LULC change analysis and prediction (Sajan et al., 2022).

2.3.6. Fractal-Based and Chaotic and catastrophic modeling

There are other models that are used to understand urban complexities in the process of urban expansion. The *Fractal-based modeling* is an approach where a system exhibits self-similarity at various spatial scales and can be arranged in a pattern known as fractal structure (Zhang & Li, 2012). Fractal dimension (FD) uses the self-similarity property at various spatial scales to

illustrate the intricate geometry seen in nature (Mandelbrot, 1983). In remote sensing, fractal geometry has been used for a variety of tasks, such as image classification (Z. Chen et al., 2019). Nevertheless, it is less able to create persistent textural features since it frequently fails to capture the unique patterns of the majority of land use and land cover types (Liang & Weng, 2018). One other modeling approach is the *Chaotic and catastrophic modeling*. In Chaotic and catastrophic modeling theory the variety of variables is drastically restricted while the system of interest can be expressed as a potential function (Clarke & Wilson, 1983). In light of this, the potent conclusions from catastrophe theory can be applied if these requirements are met and the potential function can be changed into a suitable canonical form.

2.3.7. Evaluation of Urban Growth Pattern Modeling

Appropriate methods are required in order to conduct effective assessment, monitor, and track land use change so as to inform responsive policy making. Remote sensing methods give time series LULC data that could be utilized to retrieve, evaluate, and model land use change (Viana et al., 2019). Used in conjunction with geographic information system (GIS), remote sensing techniques are useful data sources and tools for natural resource management (Wang & Xie, 2018). The advent of remote sensing data has offered a broad range of spectral, chronological, and spatial resolution images used in detecting landform differences on the earth's surface at a faster and lower cost than conventional ground survey methods (Fu et al., 2020; Gupta, 2017). In light of this, numerous studies have efficiently mapped and assessed LULC changes utilizing data derived from satellite images such as Landsat TM (4 and 5), Landsat ETM+ (7), Landsat OLI/TIRS (8), and many more (Alam et al., 2020; Jamal & Ahmad, 2020).

Analyses of LULC change via spatial modeling are useful for tracking change dynamics, determining optimal patterns of land use change, assessing growth effects, and making probabilistic predictions. Several modeling approaches allow for LULC simulation and projection, including statistical models (Somvanshi et al., 2020), equation-based analytical models (Xiao et al., 2018), multi-agent system models (Ralha et al., 2013), cellular automata models (Losiri et al., 2016), Markov chain models (Singh et al., 2015b), and hybrid models (Mwabumba et al., 2022). These models have proven to be excellent quantitative tools for monitoring and modeling LULC (Sohl & Claggett, 2013). Individual models have various limitations; as a result, hybrid modes are frequently used to address the inadequacies of individual models for land cover forecasting (Ruidas et al., 2022; Tajbakhsh et al., 2020). The

Cellular automata-Markov (CA-Markov) model, which blends cellular automata with Markov chain model, is the most extensively used hybrid model for LULC analysis (Ghosh et al., 2017; Xu et al., 2019; Koko et al., 2020a; Singh et al., 2015a; Wei et al., 2015). The model benefits from integrating the capabilities of cellular automata to represent spatial heterogeneity in a complex set with Markov lengthy forecast. Integrating dynamic modeling techniques can alleviate the drawbacks of a single model because the unified models will supplement each other (Huang & Kadali, 2008). Accordingly, the researcher used this approach to acquire reliable results for Burayu Town, Ethiopia. Critical issues in the modeling of urban growth patterns are reviewed below.

a) Hierarchy theory and the scale issue

When a system is hierarchical, it means that its subsystems are interrelated and have a hierarchical structure up until they reach the lowest level of the elementary subsystem (H. A. Simon, 1962). This implies that a hierarchy is any system that is organized into asymmetrically arranged tiers or layers (Wu, 2013). When there are many components and nonlinear interactions between them, both natural and artificial systems can become complicated (Levin, 1998). In both the natural and artificial realms, hierarchically structured complex systems are frequently found. Stated differently, they are typically organized into tiers or strata. At all hierarchical levels, the rates of interaction within components happen far more quickly than the rates of interaction between them (Salthe, 1985). In terms of geography, a spatially nested hierarchy is always produced when a geographic region is divided into smaller sections and then into sub-regions based on human or natural factors. Using near-decomposability, hierarchy theory is a broad theory that seeks to increase the understanding of complexities by simplifying the way it is described (Wu, 2017). When utilizing hierarchy theory, it is preferable to use quantitative techniques to extract hierarchical levels from data (Jørgensen, 2009). In the past few decades, advances in computing power, remote sensing, and geospatial analysis tools have made it possible for ecologists and geographers to quantify spatial structures ranging from the local ecosystem to the global scale (Pricope et al., 2019). Using the basic characteristic of many complex systems—near decomposability—hierarchy theory offers a generic framework for reducing complexity. It combines reductionism and Integrity from a philosophical standpoint, as Simon (H. A. Simon, 1962) noted: "a pragmatic holist can simultaneously be an in-principle reductionist when faced with complexity."

b) Multi-scale in urban growth

To attenuate its negative effects and devise solid policies for intervention, multi-scale examination of urban expansion is essential. Spatial scale is a necessary element in the remote sensing-based investigation of the dynamics of land use change and urban growth (Herold and Clarke, 2003). A broad framework that organizes the use of remote sensing to detect and analyze particular urban change dynamics from local to global scales was provided and addressed in light of recent advancements in the field. The factors that propel urban growth vary depending on the spatial scale, whereas the majority of earlier research has focused on individual cities of varying sizes. In order to prevent uncontrollably rapid urban expansion, multi scale relationships between urban growth and prospective drivers are helpful in strategic planning (de Mello et al., 2020). Urban systems are extremely complex social-ecological systems that exhibit non-linear pattern-process interactions both within and across several scales, frequently presenting as a hierarchical structure (Batty, 2008). The issue of scale is one crucial component of putting geographical evaluation for LULC change into practice (Diaz-Varela et al., 2009; Turner, 2005; Wu et al., 2011). In this sense, multiple urban growth patterns can be distinguished by using maps with varying resolutions or even scales. Although numerous studies have tackled the scale effect by altering the dataset's scale (Wu et al., 2011), it's crucial to examine the patterns of urban growth that emerge in the various maps that are accessible. The absence of certain growth patterns at particular scales may suggest that a particular map is inappropriate for use in a particular situation, which could have significant implications for monitoring particular processes or for land use planning.

c) Land use/land cover changes

Land use/cover change is a well-known hybrid concept. Land use and land cover (LULC) are two distinct concepts frequently used concurrently (Pandey et al., 2021). Land cover pertains to the natural ecology of the surface of the planet, such as the spread of vegetation cover, water, soil, and other natural elements of the land, whereas land use refers to how the land is being used by society with a focus on the useful role of land for economic activities (Kindu et al., 2013). Earlier studies have shown that worldwide ecological alterations such as carbon dioxide emissions, anthropogenic climate warming, loss of habitat, and groundwater resource loss were strongly related to LULC changes (Roy et al., 2022). Human-caused modification to the Earth's cover is believed to one of the major drivers of environmental degradation in any terrain (Viedma

et al., 2015). More importantly, urbanization and population growth have greatly influenced land use and land cover worldwide (Avtar et al., 2019).

In developing countries, unregulated conversion of rural land to urban use, such as agricultural fields into built-up areas, has resulted in unprecedented horizontal development of urban centers (Yar & Huafu, 2019). Such changes have impact on the quality of the urban environment as green fields which ones characterize fringe areas are pushed farther away and built up areas bring about environmental burden on localities. The environmental burdens include the destruction and loss of fertile farmland and natural landscapes (Singh et al., 2020), environmental degradation, soil depletion, storm water runoff, and land biodiversity loss (Ganaie et al., 2021), as well as creation of urban heat islands at local level and global warming, and ozone layer depletion at global level (Njungwi, 2021). Understanding the continual alteration of the natural landscape or the ecosystem requires a spatial-temporal examination of LULC changes (Wang et al., 2021). An effective evaluation of LULC change requires tools to measure the past and present and build a future scenario based on them. In light of this, through the application of land cover modeling, LULC analysis tracks the dynamics of change and offers a probabilistic forecast. The CA-Markov model, which combines Markov chain and cellular automata models, is chosen for the current study.

2.3.8. Understanding Spatial and Temporal Processes of Urban Growth

The following key aspects of spatio-temporal processes of urban growth are reviewed to create clarity on the modeling of urban growth.

Complex processes and dynamics

The comprehension of urban expansion in dynamic situations is crucial for resource managers and city planners. Particularly interesting are the projections of present spatial plans' future results and the analysis of alternative planning and policy options for impact reduction. Growing populations in loosely managed metropolitan systems can have significant negative effects on the environment and society, particularly when urban regions see rapid growth in a short period of time. In light of this, when numerous elements combine to make the urban system more unpredictable, its complexity typically acts as a barrier (Mundia & Murayama, 2013). It is challenging to predict the effects of urbanization in Africa and other emerging nations. A strong foundation of high-quality analysis and a clear grasp of the expected patterns and trends of urban

development are prerequisites for developing accurate estimates of future urban growth, (Bracken, 2014) which in turn are necessary to start addressing these urban concerns. Getting hold of trustworthy data on urban growth is a major challenge, and estimates of urban growth in poor nations have historically been somewhat inaccurate (Basudeb Bhatta, 2010). Owing to these intricate variables, forecasts regarding the future growth of cities are fraught with uncertainty, necessitating the application of creative instruments.

A conceptual model for global dynamics

Cities are more than just a single collection of residents in space; they are made up of many different-sized clusters of families, businesses, and facilities with spatial variability in their economic and social arrangements (Badcock, 2014) that is visible at various scales. Once a crucial density level is attained, urban agglomeration can develop rather quickly following a protracted period of apparently uncontrolled expansion (Roweis & Scott, 2018). Because of the inherent ambiguity in how they operate and change, such systems are not totally foreseeable (Chadwick, 2013). Addressing such problems necessitates a thorough model-building methodology capable of both characterizing and explaining the spatial dynamics of key parameters such as population size, socioeconomic status, and land use in urban areas as a consequence of the interpersonal and biophysical phenomena that form urban environments.

To better comprehend the relationships between patterns and processes, scholars have widely related metropolitan areas to complex adaptive systems (Dong, 2023; Roundy et al., 2018). Complex systems, which originate from individual-level, interacting processes, demonstrate great order and pattern across various scales (Ottino, 2003). They are ever-changing, evolving over time in light of nonlinear feedback that might trigger regime shifts in the system. Despite the widespread belief that urban systems are complicated, we know very little about how they emerge from micro-scale activities. Due to a paucity of geographically and temporally comprehensive data at the micro scale, analysis of complexity in land use, population, employment, and other major urban variables is frequently centered on cross-sectional comparisons of cities at aggregate scales (Lesschen et al., 2005). Comprehensive modelling attempts to characterize and explain urban land use patterns by modelling the most important parts of the underlying processes and deducing the complex dynamics that result. The following

complete modelling technique, which consists of three interwoven tasks, is crucial for gaining a better knowledge of the dynamics of urban systems (Munroe, 2014).

Task 1: Identify empirical regularities in the spatial dynamics of key variables such as population, employment, urban and rural LULC, ecosystem services at multiple spatial and temporal scales.

Task 2: Develop process-based empirical models that link individual behavior to the emergence of key variables.

Task 3: Determine the system's dynamical relationships between variables and the emergence of patterns and dynamics.

Land transition models

Land cover transitions are the product of three underlying properties (Yong et al., 2021). First, the transition denotes a distinct change in state. It implies that if an area, such as a single point in a polygon, or pixel, is in state A one moment and in state B the next, we may say that a state transition has occurred. Second, land transitions are geographically located. There is a physical location that can be assigned to each transition between states. Third, land changes are related to their surroundings. For example, a simple model of land transitions can generate a transition matrix, choose a state arbitrarily, draw an assortment of numbers that fits a transition, choose a pixel in the old region at random, and impose change on that pixel. Recently, most studies have expanded the scope of the modelling component of the effort to include land transitions (Provencher et al., 2016). Land use transition models offer both conceptual and actual guidance for efficiently managing the human-land interaction issue that arises during the urban-rural transitions process. Land transitions are modeled using a straightforward framework. Assuming n land cover/use classes at time zero and the same number of classes at time one, we can compute the transition matrix L , which is a $n \times n$ matrix, using direct measurement.

A conceptual model for local temporal dynamics of urban expansion

The CA-Markov model is a popular model across several LULC modeling methods and tools used for simulating both changes in time and space (Mansour et al., 2020). As indicated in the flowchart in Fig.2, the CA-Markov model was used to simulate and predict future land use changes in Burayu, Ethiopia. The CA-Markov model incorporates cellular automata and the Markov chain to forecast how the dynamics and patterns of LULC develop over time, allowing

concerned parties to make better decisions in the formulation of policy interventions (Gidey et al., 2017). In light of this, the Markov chain model predicts potential change by articulating the spatial and temporal variability from one moment to the next (Kumar et al., 2014). Accordingly, Eq. (1) illustrates how the forecast of LULC changes (Markov chain model) is calculated:

$$S(t, t + 1) = P_{ij} + S(t) \dots\dots\dots \text{Eq (1)}$$

where $S(t)$ is the system status at t , $S(t + 1)$ is the system status at $t + 1$, and P_{ij} is the transition probability matrix in a state derived as follows (Kumar et al., 2014):

$$\|P_{ij}\| = \begin{bmatrix} P_{1,1} & P_{1,2} & \dots & P_{1,N} \\ P_{2,1} & P_{2,2} & \ddots & P_{2,N} \\ \vdots & \vdots & \ddots & \vdots \\ P_{N,1} & P_{N,2} & \dots & P_{N,N} \end{bmatrix} \quad (0 \leq P_{ij} \leq 1) \dots\dots\dots \text{Eq (2)},$$

where P is the transition probability, P_{ij} is the possibility of shifting from current state i to another state j in the future, and P_N is the state probability at any point in time. The likelihood of a low transition is close to zero, whereas the likelihood of a high transition is close to one (1).

The Markov Chain calculates how much land is likely to change between the most current and forecasted dates. The switchover probabilities file, which is a matrix that encodes the likelihood that each land cover category would change to the other kind, is the result of this procedure (Mishra et al., 2014).

Analysis of historical LULC maps (1990, 2000, 2010, and 2020), development of transition probability matrices, simulation of 2020 LULC, and model validation were performed during the prediction process for 2030 and 2050. Accordingly, we used a Markov chain analysis to obtain the transition area matrix and the transition probability matrix from 1990 to 2000, 2000 to 2010, 2010 to 2020, and 1990 to 2020. The Markov chain model, on the other hand, lacks spatial explicitness. It ignores the spatial distribution of LULC, which is important in replicating land cover patterns and lacks a scientific explanation of the mechanisms of change (Weslati et al., 2022). Another model that is widely used for LULC prediction is the cellular automata (CA) model, which has the spatial flexibility to modify and govern the operations of complex distributed systems.

The CA model uses the condition of the nearby cells as its transition rules, taking into account Markov's prior or present state of LULC (Mansour et al., 2020). The CA model, however, has

restrictions when it comes to transition rules and modeling frameworks. According to Al-sharif & Pradhan (2013), the fundamental CA model is expressed as:

$$S(t + 1) = f(S(t), N) \dots \dots \dots \text{Eq(3)},$$

where S denotes discrete cellular states, t represents the current time instant and t+1 defines the future time instant, N represents the cellular field, and f denotes the local space transition rule of cellular states.

For LULC simulation, the integrated CA-Markov model was used to address the drawbacks of both models. The projected LULC change was simulated using the Land Change Modeler (LCM) in the IDRISI-TerrSet geospatial monitoring and modeling software. The CA-Markov in the LCM was run using the steps outlined below. In the first step, the LULC maps from 1990-2000, 2000-2010, 2010-2020, and 1990-2020 were used to carry out subsequent tasks.

2.4. Theoretical underpinning of expropriation, valuation and compensation

It is essential to review the theories, concepts, procedures, and methods used in the process of expropriation in order to comprehend the context of compensation. Expropriation entails the power of governments to acquire property (in most usual cases immovable property) for public purpose. Expropriation is an accepted practice under international law as long as certain requirements are met by governments. There are two basic tenets of expropriation: that the development project should benefit the wider population, hence serves the public interest and the expropriated person has to be fairly compensated (Almeida, 2018; Famuyiwa & Omirin, 2011; Kwarteng & Botchway, 2019). The main difficulty is the variations in the understanding and application of public interest, the way property is valued and compensation is paid.

2.4.1. Theoretical basis of Expropriation

Expropriation is a tool used by governments to handle the disparity between demand for land in the appropriate location and in the appropriate size for a development that is considered to be of public interest. The prior presence of ownership rights over material and immaterial properties other than the government is assumed to exist (Eggertsson, 1990). Three main ownership categories could be discerned: customary/traditional, private and government. The earlier two categories are subjected to expropriation by the government whenever the property is needed for

public use. This is usually known as government's 'power of eminent domain', a police power of the government for purchase priority or compulsory purchase without the consent of the owner (Bala, 2008). In this discourse, our main concern being land expropriation, the focus will be just on land related property.

Government taking over of private property is considered legal under international law if it fulfills at least four conditions. These four cardinal principles of expropriation are: a) Property has to be taken for a public purpose; b) on a non-discriminatory basis; c) in accordance with due process of law; and d) accompanied by compensation that is prompt, adequate and effective (UNCTAD, 2012). However, these principles are compromised partially or in full in most cases (Alemu, 2013; Cotula, 2009; Cotula, 2009; Famuyiwa & Omirin, 2011; Kabanga & Mooya, 2018; Kombe, 2010; Larbiet al., 2004).

Expropriation practices are normally carried out through either forceful land acquisition, consultations, or a combination of both compulsory acquisitions and discourse (FAO, 2009). Consultations have been acknowledged to be superior approaches to compulsory acquisition due to the engagement of project-affected parties (Lekgori et al., 2020; World Bank, 2016). In most cases Ethiopia has used compulsory acquisition in the guise of public interest. Hence, the concept of public interest and who defines it becomes a key issue in expropriation (Rekosh, 2004). There are various views regarding public interest, but two of the main lines of argument hold that: a) expropriation of private property for public purpose is justified only when equal and direct access to the new development for the public at large is ensured. This is the case when private property is expropriated for the development of public works such as public hospitals, roads, schools, public parks, etc. The 'equal and direct access; view of expropriation does not regard indirect benefit to the public as a public purpose; b) Public purpose understood to be equivalent to public benefit. This considers the direct and indirect benefits to the public as a public purpose and fails to rule out any new development from becoming a public purpose (Bala, 2008; Kothari, 1996). Nonetheless, the expropriation laws of the majority of countries adhere to this second scenario of public purpose. As a result the ad hoc interpretation of public purpose and the concomitant application of expropriation laws have compromised primarily the interests of expropriated households and that of the community at large worldwide.

2.4.2. Theoretical basis of valuation and compensation

2.4.2.1. Theories of Compensation

Valuation and compensation go hand in hand. The main concept in both cases is the types of recognized rights over property. Current compensation theories are firmly founded on private property rights which include firms that have legal personality. However, traditional societies have communal rights which are a variant of private property right over resources such as grazing lands; cultural sites; and water bodies used for rituals. Communal property rights are different from public ownership of a resource and the rights associated to it as the right owners are fairly recognized members of society in the first case while for public ownership all citizens have some form of entitlement to the resource. In a detailed assessment of theories of property rights, Kabanga & Mooya (2018) asserted that in the case of Kenya current compensation theories hold true for communal property rights too. Do these theories hold in the Ethiopian case is a matter for investigation.

Theories of compensation are firmly based on social justice theory (Rawls, 1971); a theory which advocates for a just and fair compensation for the involuntarily expropriated persons who should not be worse off from the pre-expropriation period. In fact it suggests the displaced should benefit the most from a project which has displaced them in the first place. However, this does not seem to be the case in most expropriation induced compensation practices.

The two primary classes of compensation theories are the *Equity and Equivalence theory* (or the indemnity and / or owner's loss theory) and *Taker's Gain theory*, which are based on payment scopes covered to achieve various compensation purposes (Kabanga & Mooya, 2018). According to Denyer-Green (cited in Kabanga & Mooya, 2018), the *Equity and Equivalence theory* seeks recompense that takes into account the entire range of damages in order to return expropriated persons to their pre-expropriation condition, but not worse off. This typically necessitates compensation for the fair market worth of the property removed, as well as extra pay for separation and hurtful affection, confiscation interruptions, and loss of comfort payments. According to this theory, compensation is computed by considering the expropriator's damages rather than the recipient's advantages. The indemnity theory is supported by several compensation concepts such as adequate compensation, proper compensation, fair compensation, and comprehensive compensation, among many others. In most cases, the market price of the property acquired is the primary criterion for compensation.

The Taker's gain argument, on the other hand, concentrates on the expropriated property and the expropriator. It contends that compensating for such extra elements included by the indemnification principle, such as disruption, loss of comfort, hurtful affection, depletes public resources while benefitting afflicted individuals. Since it is private property that is confiscated, the state should reimburse it at market price without anything more or less. In Taker's gain approach compensation is concluded by the expropriated persons' acquiring proceeds rather than the losses incurred due to expropriation (Kratovil & Harrison, 1954). As a result, compensation under the taker's gain approach often comprises the market worth of the property acquired only. Thus any compensation principles which focus solely on confiscated properties fall under the purview of the takers' gain hypothesis.

2.4.2.2. On valuation methods

Valuation methods for compensation have their basis in the approaches to compensation. The principle of total economic value is often utilized to determine the intrinsic worth of natural resources such as land (Kabanga, & Mooya, 2018). It is founded on the assumption that people can adopt numerous valuation methods for land and natural resources which may compromise recognition of the diverse benefits. So, proper approach is required to ensure that particular value aspects are not overlooked in empirical investigations and that duplicate reporting of values does not occur when several appraisal methodologies are used. In each empirical approach, it is vital to explore the various categories of advantages and how they affect individuals before selecting a valuation approach. The valuation of property encompasses socio-economic factors such as the land's market value and enhancements, as well as both intangible and tangible properties linked with the place. The holdings should be evaluated including both financial and non-monetary aspects. In this sense, land is regarded as referring to the natural landscape as well as everything persistently affixed to it. FAO advocates for fairness and equivalency; confiscated landholders should not be profited or impoverished as a result of land expropriation (FAO, 2009). Additional concepts advocated by the FAO include versatility, balancing of concerns between predicted impacted persons and the general public, justice, and openness.

The main underlying principle of valuation is the readiness to pay and a willingness to accept. Hence, valuation and compensation approaches can be classed as market or non-market approaches; it is enough to say that both aim to identify the maximum willingness to pay and the minimal willingness to accept, through examining disclosed or asserted values. The overall

economic worth of any improvement in well-being caused by a government or by a land acquisition program is thus determined by the net sum of all applicable willingness to pay and willingness to accept (Emerton, 2016).

Several researches have attempted to identify and describe the potential losses and hazards in land acquisition programs, particularly in developed countries. They include alienation, chronic unemployment, eviction, and discrimination. Examples include food shortages, elevated sickness and fatality, lack of access to public facilities, and livelihood rehabilitation (Akrofi & Whittal, 2013; Lekgori et al., 2020; World Bank, 2016). Land with diverse kinds of possession, structures, facilities, and communally owned rights are all likely to be lost as most methods incline to formal legal regimes and unitary rights of landholders. Agriculture, forests, cultural heritage sites, social amenities or public infrastructure, and social connections are examples of assets that expropriation of land would not account for properly. Natural assets are likely to lose their economic value, so are plants and machinery which lose their value once removed from their original location.

Thus, the losses anticipated in eminent domain initiatives are vast and diversified. To eliminate omissions or duplicate counting, the framework of total economic value becomes important in recognizing all potential losses and vulnerabilities. Insufficient and unjustified compensations may occur from failing to recognize and record all damages, adding to the deprivation of project-affected individuals. In valuing for compensation purposes, valuers might use the concept of total economic value property to pinpoint and record all possible losses as a result of property acquisition. The relevant question therefore is: do Ethiopian valuers utilize this approach to determine and evaluate all possible losses in a specific land acquisition appraisal for compensation? What approach was used in the valuation of properties in the case of expropriated persons in the expansion of Burayu town? This subject is significant because ignoring some losses during the valuation process could result in inequitable, unreasonable, and discriminatory compensations, resulting in the deprivation of project-affected individuals.

2.4.3. Methods and practices of Valuation for compensation

Valuation of property for compensation is typically based on the theory of social justice, which demands fairness, equity, and just terms of pay to be enforced (Bala, 2008). As a result, numerous funders, notably the World Bank Group, the Asian Development Bank, and the

African Development Bank have devised procedures as involuntary expropriation and resettlement policy structures that foster social justice and development in their sponsored operations. These frameworks are primarily intended to reduce impoverishment of project affected persons, thereby preserving the livelihoods of those affected after the expropriation of their land (Reddy, 2018). Various other organizations on human development initiatives (such as the UN Commission on Human Rights), promote the pursuit of equitable, fair, and reasonable terms of compensation (FAO, 2009; Keith, et.al., 2008). Experiences of many countries reveal that valuation systems vary and can be used in a variety of scenarios. However, a brief overview of the most common valuation approaches is presented below.

2.4.3.1. The sales comparison/market approach

The sale comparison method is an evaluation method that determines the value of a property in question by comparing it to a recently sold property in the "market" by a willing seller to a willing buyer. This means that it is typically based on the monetary concept of substituting property by money and necessitates the appraiser obtaining the most recent sales of assets identical to the property under valuation. Hence, the main intention of such valuation approach relies on market force to value the property and is also the most common method of land valuation. This implies that a willing seller to a willing buyer of a property can best reflect the value of a similar property (Gabrielli & French, 2021; Lorenz, 2006).

The market-based method is believed to be the best possible and open appraisal technique because it is economical and the assessor can justify his or her evidence (Pupose, 2018). However, the technique is incapable of capturing passive or non-use values as well as alternative values such as cultural advantages. Furthermore, since each parcel of land is distinctive and the assets are diverse, it could not accurately reflect the actual value of that particular asset, especially if the property market is passive or ineffective. The sales comparison can be used to determine the worth of the two confiscated and non-expropriated equal size lands/plots in nearby areas for landlords with legal entitlements in land acquisition initiatives, especially when the land market is active. Following an assessment of the property's value, the valuers should select the greater of the two values as the market value of that affected land (ADB, 2006; FAO, 2009; Keith, et.al., 2008). The sales comparison method could also be utilized for assessing the determination of values of agricultural products, plants, vegetation, and equipment in a similar

manner. The serious issue regarding the approach is the presence or absence of active market for the valuation items.

2.4.3.2. The income capitalization method

The technique is founded on the economic principle of expectation. The approach is used to appraise commercial, investments, and income-producing properties. It is used when market force becomes relatively sluggish and is based on an analysis of the capacity of property to generate future profits and capitalize income as an indicator of present value of the property (d'Amato, 2015; Ndjovu, 2003; UNECE, 1996). In the case of land expropriation, where the land market is dormant, assessors use the income capitalization approach to determine the value of the confiscated land based on the most advantageous authorized use of the property. The income technique is commonly utilized in the appraisal of farmland and assets for investment in land acquisition initiatives (World Bank, 2016). The income capitalization approach is also used to evaluate the loss of structures that are primarily employed for investment or income generation. Furthermore, the income approach, among other valuation methods, should be used to evaluate the loss of annual crops and trees that produce fruit.

2.4.3.3. The cost approach

The approach is founded on concepts about manufacturing and substitutes. It is assumed that a person is not going to pay extra for an asset than it costs someone to obtain a comparable item. The cost method, also known as the replacement method, is a valuation method where the value of a property is derived by adding the valuated value of the property to the current cost of building or replacement for improvement, and then deducting the depreciation amount. An asset has a justified value equivalent to the cost of generating an equivalent property of comparable usefulness (Blackledge, 2009; Ndjovu, 2003; Wyatt, 2009). However, pricing is not usually equal to value; therefore the assigned value might be inaccurate. In accordance with the principle of just and reasonable compensation in land acquisitions, the "replacement cost" is frequently used, where the transaction expenses are incorporated into the market value established utilizing different appraisal techniques, notably the cost methodology (African Development Bank, 2003). In the valuation of building structures, the quantity of materials and labor requirement is surveyed and the cost of replacement is calculated by applying unit rates for the work items. This approach is fairly simple and justifiable. The issue is when this method is used for the land component of the property under consideration. The usual practice is that experts create a unit

price guideline using sample assessments or similar data to establish a unit cost per constructed area (Asian Development Bank, 2007). Valuers require information on the current land cost, improvements made on buildings and depreciation rates.

2.4.4. International Practices of Expropriation and Compensation Payment

Property ownership right is not a complete entitlement; international law limits discretionary rights countries (Bankes, 2009). The term "public purpose" has a specific meaning. In paragraph 4 of the United Nations General Assembly Resolution on Permanent Sovereignty over Natural Resources, it is noted that expropriation "shall be justified on reasons of public utility or national interest that have been acknowledged as outweighing solely someone or personal motives, both within the nation and foreign." This indicates that dispossession is evidently permissible, provided that individual operations of confiscation fulfill the standards outlined by international legislation (Bowett, 2009). Expropriation is primarily meant to promote the realization of public interests. Expropriation of property that is privately held is often used to satisfy "urgent economic concerns." Best practice is to make available vacant land reserves; extra land held by overseas residents and land held by landowners mistreating occupants (USAID, 2005).

Expropriation in the name of public interest may imply acquiring by state for public organizations and legal firms, but also for privatized businesses and individuals for reasons that, while contributing to the welfare of the public, provide an obvious use, including earnings, to the beneficiary (Scheiber, 1973). This sector includes hotels, residential and commercial development, banking institutions, and petrol stations, among others. According to Article 14(3) of the German constitution, "expropriation must only be lawful in the interests of the public purpose". The US Constitution demands "just compensation" for each and every appropriation of privately owned property. Similarly, the Philippine constitution states that "just compensation must be paid". The confiscation of property cannot be performed exclusively for the advantage of the government's business interests or the needs of a private party. However, private individuals are able to profit from confiscation if the taking of property is carried out in the performance of a public need. Case laws in Austria, the Council of Europe and the United States have included expropriations in the interest of land reforms in the countries (Alemu, 2015).

In general, many nations have devised guidelines for evaluating "just compensation" in accordance with the provisions of their constitutions. The "fair market value" of the confiscated asset has been established as the basis for evaluating compensation for governmental

expropriations in the majority of countries with well-functioning judiciary systems. Public engagement is also required to guarantee that compensation is reasonable and that the aims of land confiscation are for the public benefit. However, it may not be the case as FAO observed. FAO (2007) reported that rural people in emerging nations are frequently excluded from many crucial decision-making procedures. Expropriated individuals are not notified and involved throughout the decision-making operations that affect them. The fair market value and principles which demand compensation for lost earnings and making payments within an acceptable period of time and interest for delays in compensation payments has been criticized by developing countries since it demands them to pay large capital amounts for confiscation and this diminishes their budget and delays proposed development undertakings (USAID, 2005).

2.4.5. Participatory Development Approach

Most of the failures of urban expansion related interventions and their negative consequences on the livelihood of project affected households emanated from the non-participatory approaches in planning. Many authors and development-related literatures have noted that the term "participatory development" is frequently used interchangeably with terms such as "bottom-up approach" and "community-centered approach". According to Nitzky (2013), the participatory development approach arose in response to dissatisfaction with the top-down approach of expert-led activities, to bring development intervention to the grass roots level of the community.

Participatory approaches are ways for the community to achieve the desired equitable social and human development. As previously mentioned, through participation, stakeholders identify, interpret, analyze, and present their own local knowledge in their development agendas (Reed et al., 2006). This can be accomplished by enlisting the active participation of relevant stakeholders, in order to influence and control development initiatives, decisions, and resources (Chifamba, 2013).

A set of interconnected shifts in development planning approaches have emerged as a result of past failures and new policy objectives (Weber & Rohracher, 2012). These include first, sector-wide reform and cross-sectional issues such as poverty eradication; and, second, interagency links and partnerships, which are becoming increasingly important in achieving development goals and strengthening institutional reforms. Third, there is a shift away from a blueprint approach of development planning towards more flexible approaches based on practice rather

than design alone. Finally, there has been a shift from centralized to decentralized approaches, implying bottom-up participatory approach.

Many theorists, including Chambers (2010), distinguish between the blueprint and process approaches to development planning. According to the blueprint approach, there are predetermined fixed objectives, inputs, outputs, and operational plans. The process approach, on the other hand, allows for flexibility in all aspects of the project, such as design, inputs, outputs, and management systems, implying that immediate objectives can be developed as the project progresses. According to Mok et al.(2015) the process approach to development planning is appropriate for projects that necessitate the participation of stakeholders. In response to failed centrally planned projects of the blueprint approach, there is currently a paradigm shift towards a learning processes approach. This indicates that the process approach emphasizes the participation of various stakeholders including the local community, private developers, nongovernmental organizations, and development agencies (Kassen, 2020). This means that the process approach is critical for filling gaps in the public sector or government, such as financial constraints, increasing effectiveness, and ensuring sustainable development. The process approach necessitates ongoing intervention and is applicable to projects that demand institutional development and the involvement of various stakeholders in order to ensure sustainability (Prno & Scott Slocombe, 2012). This is more concerned with the concepts of efficiency and empowerment in relation to development agendas, which correspond to neoliberal policies that emphasize cost savings and self-reliance (Regmi et al., 2020).

Currently, neoliberalism, which emerged in the 1980s, has become the dominant theory for designing development policies because it emphasized reducing government intervention in order to achieve greater economic growth (Hursh & Henderson, 2011). In line with this, in the era of neoliberalism, special attention has been paid to the private sector in order to fill gaps where the government lacks the capacity or the willingness to do so (Kumi et al., 2014). Thus, community participation began to receive institutional support in the neoliberal perspective due to cost-saving, project efficiency, and self-help benefits (Chaudhry, 2019).

The emergence of participatory approaches was accompanied by the development of various participatory methods as a means of ensuring the inclusion of all relevant stakeholders (Voyer et al., 2012). This can be achieved by empowering relevant stakeholders in their development issues. According to Medema et al. (2014) participatory approaches are most effective when

implemented in environments with flexible and adaptive structures, as well as sideways interaction and a more democratic and inclusive culture. Participatory approaches are frequently used in development projects to provide developing countries with financial and technical assistance (Leigland & Russell, 2009). Participatory approaches in development projects enable relevant stakeholders to incorporate indigenous knowledge and influence the quality of interventions (Arce-gomez et al., 2015).

The foregoing literature on participatory development is applicable to the planning of urban expansion where the actors are varied. There are different stakeholder where some have to give up their assets (such as property holders who will be expropriated), developers who would get land for developing new facilities, government agencies who will mediate and coordinate the process of expropriation, relocation planning, compensation payments and development control.

2.5. Impacts of urban expansion and expropriation on displaced households

This section presents review of the social and economic impacts of urban expansion and expropriation which follow urban expansion. Changes in land use call forth transformation of production and consumption relationships. Changes may have positive and/or negative impacts but changes normally affect the unprepared and this is usually the case for displaced households who are not given sufficient lead time through notices, the improper participation modalities applied regarding urban expansion.

2.5.1. Urban expansion and its impacts

The expansion of urban areas has various consequences, both positive and negative. It has significant impact on natural resources and human life in the dimensions of social, economic and environmental settings (Dociu & Dunarintu, 2012). Urban areas act as centers of market, innovation and access to employment opportunities as well as basic facilities (WEF, 2017). Additionally, urban centers are generating globally more than 80% of the GDP (World Bank, 2019). On the other hand urbanization brings a great deal of stress on natural resources and existing social services and infrastructure (Thuvo, 2013). Furthermore, unprecedented urban transformation presents enormous challenges in governance, service delivery, infrastructure provision, housing, and environment which may hamper progress towards development. Unprecedented rapid rate of urban expansion stimulates the degradation of environmental

resources such as depletion of surface and ground water, pollutes air quality, alters landscape aesthetics and destroys wild life habitats (Wodike & West, 2019). One of the manifestations of urban expansion is loss of agricultural land and open spaces which serve as breathing organ for urban settlements (Bhatta, 2010). Urban expansion is the primary cause for shrinking the income of farming communities by converting agricultural land into built up areas. This results in dispossession of main income source which stimulates vulnerability of livelihoods of the farming community (Mwavu et al., 2018). However, in well planned expansion, agricultural productivity could be improved; farming households could be trained to provide them means of integration with urban economic activities. But this is not observed in most cases and the livelihood of peri-urban households is by in large affected negatively.

2.5.2. Expropriation and its impacts

Change is usually resisted due to the uncertain outcomes. The situation is more pronounce in the case of involuntary relocation and expropriation which invariably imposes various impacts on displaced households regardless of the measures that are taken to make compensation fair and justified. It is may be necessary to change land use and property ownership to bring about improvements; however, according to the theory of social justice (Rawls, 2005) the benefits that accrue from the improvement should benefit those that are directly affected by the takeover of property.

Expropriation practices and impacts in other countries

In his review of the applicability of the theory of social justice for development projects in India, Bala (2008) questioned the equitability of development projects that are planned to benefit a large group of communities. Such projects at the same time lead to the loss of livelihood opportunities and impoverish many others, especially the involuntarily relocated persons. The social justice theory advocates the under-privileged (in this case the involuntarily displaced) should benefit but this is not the case in practice. His review revealed that most development projects lack participation of the affected community in their design; procedures are compromised due to lack of expertise; procedures are expedited to cover up in-built inefficiencies, and in situation where fiscal plans have not allocated sufficient budget for project implementation usually compromise the liberty of the affected persons by denying them fair and timely payment of compensation thereby limiting the application of distributive justice.

Different types of impacts imposed on displaced persons due to expropriation emanate from ill-crafted laws that do not fully recognize the rights of the affected persons or communities or from improper procedures of implementation of what might be proper laws. The World Bank (2012; 2016) noted that there are cases where the laws are not in line with what is internationally accepted rights of involuntary resettlement; however, the majority of problems arise due to the ill application of the laws approved by countries as shown by various researches on cases from Tanzania (Kombe, 2010); Kenya (Kieti, 2021; Syagga & Olima, 1996); and Ethiopia (Alemu, 2013; Ambaye, 2013; Siltan, 2019). Review of international practices on expropriation and involuntary resettlement display one or a composite aspect of the following main category of conditions:

- arbitrary designation of properties for expropriation,
- denial of rights of quasi-legal landholders;
- unfair compensation payments due to various reasons that include lack of experience in property valuation or lack of proper market data;
- diversion of compensation money due to corrupt practices;
- expropriation without compensation due to lack of fund and
- expedited property takeover and relocation due to improper project planning.

The prevalence of the above conditions results in changes in social and economic conditions of the affected persons as depicted by case studies in Kenya (Kieti, 2021; Syagga & Olima, 1996); Tanzania (Kombe, 2010) and Botswana (Lekgori et al., 2020). The impacts include, but are not limited to the following:

- changes in income level, more often reduction and unreliability of income;
- breakdown of social relations such as cultural and social values, norms and bonds
- Loss of assets valued by the owners but not recognized by expropriation laws;
- Forced changes in farming practices
- Stressful relationships arise between the community and the government due to denial of community rights on communal lands and grievances that arise due to inconsistency of compensation payments to expropriated persons,

Expropriation practices and impacts in Ethiopia

Government ownership of land in Ethiopia does not allow land to be a commodity for compensation except in the case of land held through leasehold system. However, in practice most landholders assume they own the land as they see property value is influenced by its

location and size not just on the type and size of the structure on it alone. But during expropriation valuers consider the value of a property in a simple cost replacement approach for the developed structures only as will be shown later (see Chap 3). This is one of the main reasons that investors prefer to secure land from the government through expropriation instead of a direct purchase of property from the landholders (Alemu, 2013). The few studies that are conducted on expropriation indicate the infliction of various negative impacts on project affected persons such as:

- Improper timing of serving expropriation notices
- Violation of the right to receive compensation payment prior to displacement,
- Non-participatory approaches in the planning of development projects
- Grievances on improper valuation practices

The impact of expropriation and displacement of landholders shown in other countries seem to be present in Ethiopia; however, variations exist in laws, in the practices and socio-economic and cultural aspects not only at country level but also locally. Laws related property ownership, expropriation regulations and practices are reviewed in detail in Chap.3 below and the case study of Burayu Town will unveil the reality later.

2.6. Livelihood Framework

As this study focuses on the effects of urban expansion on the livelihood of agricultural households in peri-urban areas, we present here a framework which ties the theoretical aspects of urban expansion, LULC changes, policies and practices related to urban expansion and the livelihood coping strategies of farmers. Unprecedented horizontal growth of urban centers into neighboring rural areas poses a host of economic, environmental, and societal concerns. These had a wide-ranging influence on the livelihoods of local farming people, displacing and depriving them of their farmland. Livelihood encompasses the means, assets, entitlements, capacities and opportunities which people employ to make a living. As a result, in order to alleviate the negative consequences of urbanization, each agricultural household design and apply their unique coping methods and livelihood frameworks. Thus, everybody strives for his/her livelihoods by adopting different coping mechanisms in order to generate income. A livelihood framework is a method of understanding how a family derives their means of income by drawing on capabilities and assets to develop livelihood strategies comprised of a variety of activities.

According to DFID, (1999) livelihood strategy focuses on understanding the manner in which individuals live, the resources available to them, the approaches they employ to earn a living in the face of policies and processes, and the desired outcomes. The livelihood approach is a well-established strategy in urban-rural sustainability analysis to understand how adversely affected people operate in the context of security flaws and also draws different livelihood capitals in different combinations that are affected by vulnerability context, range of institutions, and processes.

Contrary to others, DFID is largely focused on basic framework analysis rather than procedural operations in the context of rural-to-urban exposure. Furthermore, it pays close attention to ongoing processes in order to make them more sensitive and responsive to the conditions and needs of the poor. It is a tool for improving the poverty orientation of various types of activities supported by the agency. Thus, while DFID often evaluates people's livelihoods at the household level, the purpose is not just to find restrictions or opportunities that may be handled at that level. It is also vital to understand how policies and other institutional elements affect people's lives at the local level.

A livelihood is understood to be sustainable when it has the capacity to recover from various stresses and maintain capability to create opportunities that result in improved human well-being (Krantz, 2001). Examples of improved well-being include improved food security, decreased vulnerability, and improved ability to meet overall basic needs. The resources that households employ to build their livelihoods are usually referred to as livelihood assets (DFID, 2002). It consists of natural, physical, social, financial, and human capitals on which people rely to sustain their livelihood. These include the natural endowments accessible to people; houses and infrastructure they own; the culture and social networks they live in; the goods and services used to earn income; and the quantity and quality of labour households possess to carry out productive and reproductive duties.

Strategies adopted by households to overcome shocks, decrease vulnerability and assist to build asset bases are referred to as sustainable livelihood outcomes (Solesbury, 2003). Unprecedented urbanization processes without economic development pose multifaceted challenges, particularly to the livelihoods of the peri-urban households. Households in peri-urban areas are faced with both urban and rural behavioral patterns, which make situations difficult for poor households (Foeken & Mwangi, 1998). The examination of household's ability to make effective use of

various types of assets and process, i.e. sustainable livelihood system based analysis, provides a way to understand how livelihoods are influenced by organizations, policies, structures, and cultural norms (DFID, 2001; Hammill et al., 2005).

In less developed countries economic growth is slower than population growth, exacerbating the urban poor's predicament due to lack of regular employment opportunities, forcing them to rely on a variety of survival strategies. The takeover of agricultural land for urban functions creates may create new employment opportunities for some households while also altering their subsistence strategies through new investment activities(Cu et al., 2020). Peri-urban area livelihood strategies include any approach that enables in the generation of income from peri-farming and non-farming activities such as employments in household cooking, washing, informal open-air vehicle repair, metal works, carpentry, petty trade, local brew production, shoe shine, security guards, and so on (Foeken & Mwangi, 1998). Thus peri-urban households are involved in both the generation of cash through various activities such as wage labor, or the development of their own businesses (Shackleton et al., 2020) based on their assets.

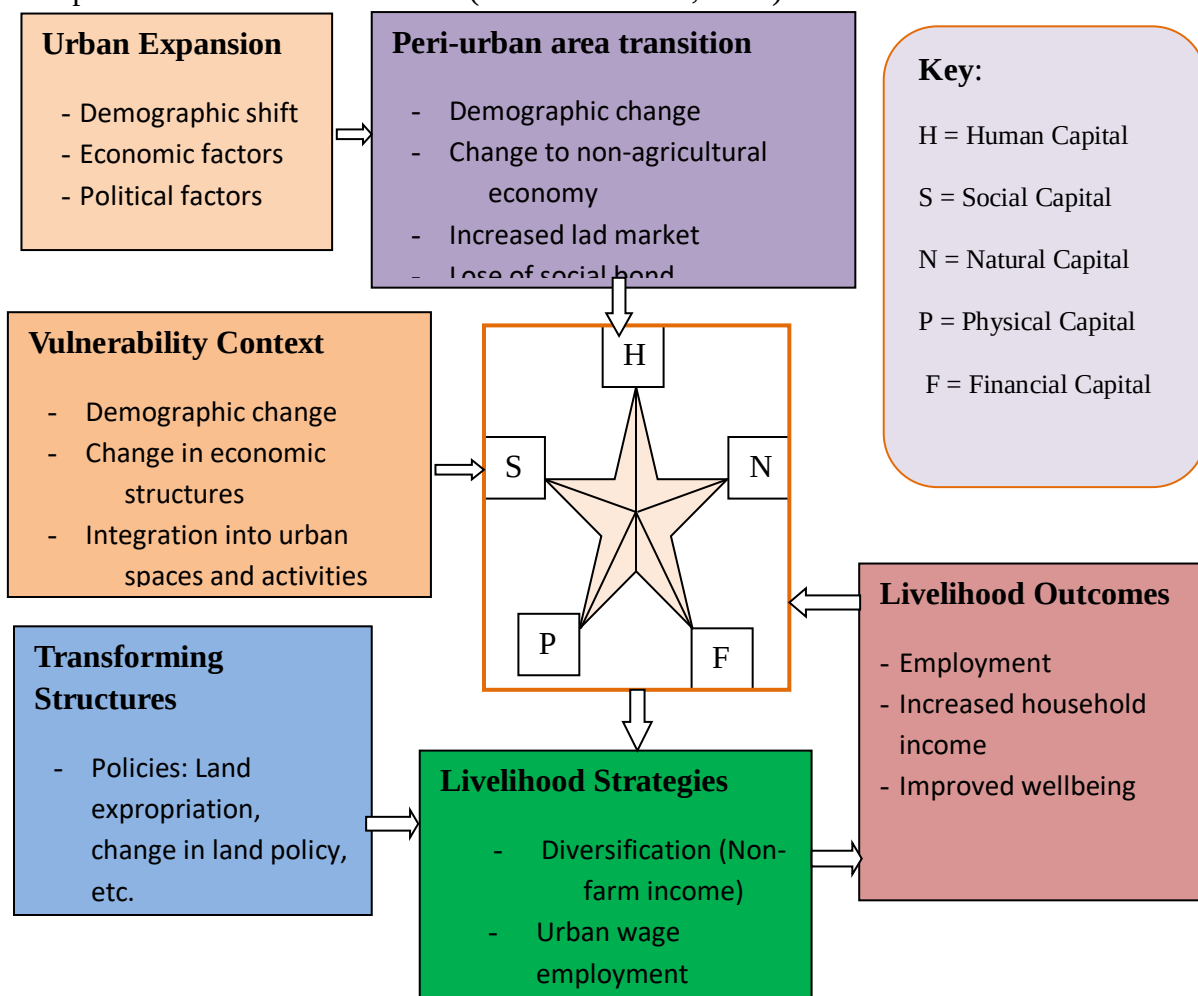


Figure 2. 4: Conceptual Framework for analyzing Impacts of urban expansion on livelihood of farmers

Source: Author's reconstruction based on DFID, 1999 Sustainable Livelihood Framework.

Figure 2.4 depicts an adaptation of the sustainable livelihood framework developed by (DFID, 1999) to the case of urban expansion. DFID's framework suggests vulnerability analysis to understand conditions of individuals; transforming structures which guide and influence actions and livelihood outcomes which inform the choices and aspirations of households. The sustainable livelihood strategy is a means to guide the interactions of all these aspects to produce a better outcome for the poor. Livelihood strategies include coping mechanisms for responding to shocks as well as adaptive strategies designed to improve living circumstances. The DFID Livelihood Framework has remained robust as it could encompass other features such as technology as an interface between human capital and financial capital. Here a reconstructed sustainable livelihood framework is proposed for the analysis of coping strategies of farming households.

Expropriation or dispossession of land results in disruption of established livelihoods; however, it may not always result in negative consequences as seen in some countries where non-farm employment opportunities became available to a large portion of the population, promoting the involvement of rural households in non-farm activities and improving their welfare. Tuyen (2014) discovered in a study conducted in Vietnam that rural households who lost their farm land acquired significant livelihood improvements from non-farm work. Also, the findings of a study conducted in suburban areas of Vietnam show that loss of farm land may increase the ingenuity in adapting coping strategies specializing in a single or diverse non-farm jobs or own household business activities by combining compensation money paid due to land dispossession with other natural capital such as residential land assets (Hardin, 2011). The findings of a study conducted in the lower Kiandani area of Kenya's Macahakos municipality revealed that the importance of agriculture as a livelihood strategy had diminished in the area (Mutua, 2013) due to the engagement of many households in different off-farm activities. However, in several instances expropriation of agricultural land for various industrial establishments and urban land uses has negative socioeconomic impacts on farming households as observed by Suu(2009).Hence, depending on their coping strategies of households makes all the difference as both opportunities and threats are present in urban expansion (Oduro et al., 2015). The issue in the case of Burayu Town in Ethiopia is then, how has urban expansion impacted the livelihood of farming

communities at the urban fringe and how have they adopted to the changes in their livelihood activities.

2.7. Contextual aspects of urban expansion, expropriation and compensation and their impacts on livelihoods in Ethiopia

This chapter presents a detailed review of the local context about urban expansion, land ownership and land management in Ethiopia and lays the foundation for the analysis of land based property expropriation for urban expansion. The chapters will present a concise review of urbanization and urban expansion, evolution of land ownership and expropriation related laws, and culminates by presenting a framework for the analysis of urban transition and its effects on persons affected by the process.

2.7.1. Urbanization and urban expansion in Ethiopia

In Ethiopia urban settlements have existed for millennia; the ancient towns of Adulis and Aksum date back to the 5th century B.C. (Hagos, 2010) while the towns of Lalibela (Roha); Debre Berhan and Gondar have centuries of history. The history of urban settlements in Ethiopia, as in any other country, is intertwined with politics, religion, and commerce, among other factors.

Nowadays, unprecedented population growth has become a major issue in Sub-Saharan African countries in general, and particularly in Ethiopia. Since the liberalization of the economy in Ethiopia to stimulate the national economy in the late 1990s, the country has experienced rapid urban growth (Berhanu, 2016). The rate of urbanization in Ethiopia has been very gradual; the rate picked from 6% in 1960 to 11% in 1984 and 14% in 1994 (World Bank, 2015). The population of Ethiopia is projected to grow from 108 million in 2018 to 191 million in 2050. The urbanization level of the country is expected to rise from 21% to 39% during the same period with a projected urbanization rate of between 3.5% and 5.4% per year (UNDESA, 2019).

A combination of factors such as rural-urban migration, natural population growth, economic growth, and favorable government policies are fostering rapid growth of urban settlements in Ethiopia (MoUDH, 2015). Among the policy reforms that have impact on urban growth include structural and institutional arrangements, investment incentives, financial reforms and spatial developments that facilitate economic activities thereby attracting domestic and foreign investments (IPS, 2004). However, uncontrolled urbanization and urban sprawl is observed to

have negative impact on the natural environment and the livelihoods of agricultural communities (Gebre & Gebremedhin, 2019). Horizontal expansion of urban areas normally results in the reduction of farm sizes or the full displacement of farming households from there the agricultural land (Lasisi et al., 2017). Horizontal expansion of urban areas increases the per capita land consumption and the demand for more land is exasperate the negative effects of urban growth (Adam, 2014). In some cases, like Burayu Town, urban growth is exponential and the land management structure is not equipped to deal with the expansion in an orderly manner. Moreover, studies of land use land cover are very limited, where they exist, the focus is on the modeling of change and not on the comprehensive analysis of the change and its impacts (Amenu, 2019). This implies that in Ethiopia there is disparity between urban expansion and orderly development and the anticipated socioeconomic improvements; a situation which requires more in-depth studies to discern the drivers, the modalities and impacts of the changes.

As the capital city of the country, Addis Ababa has attracted many people from the hinterlands and from throughout the world for different purposes. The development of Addis Ababa poses opportunities as well as challenges to the surrounding urban and rural areas (Tadesse & Imana, 2017). Burayu town is one of such towns in the proximity of the capital city which is chosen as a case study area to investigate such effects.

2.7.2. Evolution of Land ownership and Governance in Ethiopia

Land is the most important economic resource, especially for agricultural communities that depend on it for their livelihoods. Consistent with this, most of the time land is a major cause of dispute. Land tenure plays an important role in social, economic, legal and political aspects as a result land tenure security issues have received considerable public attention due to its economic importance.

In Ethiopia, the issue of land tenure modality is experienced through political infringement. For instance, as Ethiopia became a modern nation in the early 20th century; there were three modalities of land tenure under three political regimes. In accordance with this in Ethiopia before 1975 land-owning modality was a feudal system; during the 1975 to 1991 Derg period, it was state-ownership of land tenure; and eventually the current leasehold system of land-ownership modality since 1991 (Leta et al., 2021).

The land tenure modality of Ethiopia in pre-1975 period varied from place to place because of

the diverse socio-political events that existed in different parties of the country (Ambaye, 2015). Prior to the land reform of 1975 the land tenure modality in Ethiopia was either under public or church ownership, private individual or communal ownership. Hence, Ethiopia had the *rist land tenure* system in the north and *gult* in southern parts of the country (Crewett et al., 2008). The *rist* system was usufruct tenure system in which the governorate institution has ultimate power to reverse rights over the land (Leta et al., 2021) whereas *gult* is land obtained in payment for military service and held as private property. In Ethiopia, the feudal land tenure system allowed some landowners to sell, barter, or mortgage private land. The 1974 popular revolution changed the feudal system of landlordism to that of a socialistic administration. In line with socialistic socioeconomic and political system the Derg administration introduced a nationwide public land ownership system by abolishing all other forms of land ownership (Proc. No. 31/1975 and Proc. No. 47/1975). This public landownership modality provided rural communities opportunities to hold land for own farming purposes as the tenure system provides only use rights.

Following the overthrow of the Derg Regime in 1991, the Ethiopian People Revolutionary Democratic Front (EPRDF) retained the previous public ownership of land policy, with little changes to farmers' land rights (Gebreselassie, 2006). Despite adopting a free market economic policy, the new government decided to keep all rural and urban land under public ownership. The FDRE constitution article 40(3) establishes a broad framework for land policy in the country, declaring that land is a common property of Ethiopia's nations, nationalities, and peoples and shall not be subject to sale or other means of transfer (FDRE, 1995). At a later stage leasehold of land policy was enacted to manage access to land and to retain economic benefits from land to the public at large (Proc. No. 80/1995; Proc. No. 272/2002). In line with this, land is accessed by allocation or lease system from the government, inheritance or gift from individuals but prohibited to sell exchange and mortgage (except in the case of leasehold land).

The land tenure modality in Ethiopia is in a continuous debate. This debate has been carried out along extreme opposing themes concerning rights on the land. For instance, the government of Ethiopia advocates for state ownership of land with uses rights given to landholders without the right to sell or mortgage the land. According to Crewett et al. (2008) the government advocates such a policy based on the principle that government ownership guarantees every farmer equal access to agricultural land and prevents from land being concentrated in the hands of a small number of landowners. Furthermore, public ownership of land is favored by some compared to

private ownership from the perspective of two points (Kebede, 2002). First, land can easily be set aside for a variety of public uses as opposed to the difficulty to attain this through private markets. Secondly, there is significant portion of land in public ownership with little or no commercial value which could be accessed for the interest of public. Additionally, the public ownership of land gives room to monitor and constructively criticize public management policies and practices (Dunn & Miller, 2007). Moreover, in order to provide public goods for the community, land tenure modality under state ownership is considered to be a better modality whereas most municipalities are financially and technically incompetent to secure land from the private market to provide key services (Abate & Teshome, 2020). This requires well-informed, purposeful courses of action by public land management institutions to sustainably and equitably use land to serve the public interest. However, public ownership of land is observed to present various anomalies regarding land expropriation and allocation for a different function.

On the other hand the advocates of a private ownership of land tenure argue that state-owned land hinders the development of land markets, discourages farmers from investing in land, thereby reducing land productivity and fostering unsustainable land-use practices. In some African countries, land ownership modality is formally legalized as a private property right, but in others it remains public with multifaceted land rights for applicants i.e. individualized (Ali et al., 2014). In the context of Ethiopia public ownership of land is associated by many with insecure property rights (Lawry et al., 2014).

According to Proclamation No. 89/1997, Ethiopian national land policy describes the scope of personal land use rights and provides land can be leased and given as gift (FDRE, 1997) although land rights cannot be sold or exchanged, private property improvements on land can be leased or given as gift. The federal proclamation No. 89/1997 of the Rural Land Administration delegated the responsibility of land administration to regional governments by providing general guidelines that they must follow in developing their own regional laws. While the Ethiopian government has decentralized land administration to autonomous regions, the federal government is still in charge of developing land policy.

2.7.3. Expropriation and compensation laws and practices in Ethiopia

2.7.3.1. General on property laws in Ethiopia

As custodians of the public interest, it is the prerogative of all governments to administer land so as to maximum benefits and minimize negative impacts from the use of land. Regardless of the modality of tenure, governments have the police power to expropriate land against payment of compensation. In the Ethiopian case, expropriation and the attendant right for compensation were first explicitly recorded as a law in the Civil Code Proc. No. 165/1960 (GoE, 1960). Expropriation was justified if the takeover of the land is for public purposes. In spite of the changes in land ownership types since the 1960s, the policy of expropriation for public purposes only has remained the same albeit with variations in the meaning of public purpose. The 1975 nationalization of land vested ownership of land in the government, with use rights only for individuals. Except the addition of the leasehold modality of access to land since the 1990s, the public ownership of land and use rights only to individuals is still holding since 1975. With urban expansion the increase for land has also increased. Expropriation of private properties and landholdings has become a common practice. The laws that govern expropriation and the practices that are employed in property valuation and compensation payments have become sources of contention between authorities and landholders. The issues for investigation are whether or not the laws are in line with international understanding of purposes of expropriation and basis for compensation. This research revealed that the Ethiopian laws and practices related to expropriation and compensation are not in line with international laws-UN promoted principles of expropriation (UNCTAD, 2012) either in the basic provisions or the practices during expropriation.

2.7.3.2. The 1995 Constitution of the FDRE

Proc. No.1/1995 endorsed the government ownership of land of 1975 and codified the right to ownership of urban and rural lands as well as all natural resources to the State and the peoples of Ethiopia(FDRE, 1995). Private persons can own the immovable property they build and the permanent improvements they make on land (Art.40/7). The Constitution provides rights to the government to expropriate private property for public purposes but this is upon payment of compensation commensurate to the value of the property in advance of expropriation (Art.40/8). Displaced persons whose livelihoods have been adversely affected due to takeover of land for various programs have the right to commensurate monetary or alternative means of

compensation, including relocation with adequate assistance (Art.44/2). The Constitution further provides that there should be consultation with project affected persons on the planning and implementation of projects that have an impact on the environment (Art.92/3).

2.7.3.3. The 1960 Civil Code of Ethiopia

This code has been in operation since 1960 with only one major change and minor amendments. The major change is the provisions pertaining to the family law which were repealed and replaced by family codes of regional states. The Civil Code provisions regarding expropriation show that private property may not be taken for the purpose of generating income or financial gains for the state; such acts are considered unlawful under Art.1461/1(GoE, 1960). However, the Code further declares that if it could be determined that the undertaking would benefit the local community by indirect means such as increasing the value of properties in the area, such expropriation may be deemed to serve a public purpose(Art.1464/2). Hence, benefit to the public at large is embraced as public purpose in the Ethiopian law of expropriation. Therefore, the crucial issue is about who defines the public purpose and the level of trickling of benefits to the local community.

2.7.3.4. Expropriation and compensation laws

Ethiopia has enacted expropriation and compensation laws based on the 1995 Constitution and other laws (mainly the Civil Code) that have direct bearing with property. The law that was in operation during the period under the current study (since the early 2000s) is Proclamation No. 455/2005. This law was repealed and replaced by Proc. No. 1161/2019¹. However, as the majority of the expropriation cases in Burayu Town studied in this research fall under Proc. No.455/2005, we will review both laws. Both expropriation laws have strengthened the power of what is designated the appropriate/competent body of the government to define public purpose by allowing them to define public purpose on a case by case basis. The provision in Proclamation No. 455/2005 under Art.2/5 (FDRE, 2005a) states that designation of land use in master plans is considered a legitimate basis for demanding the surrender of privately held property to be redeveloped as per the new land use plan. The critical power for the determination of what is public interest in Proc. No.455/2005 Art.2/5 was upheld in the 2019 expropriation law.

¹The temporal limit of the research for the expropriation being from 2005 to 2020, the expropriation and relocation of households has already occurred by the time Proc.No.1161/2019 and Regulation No.472/2020were enacted. Hence the main expropriation law in effect during the study period is Pro.No.455/2005.

The overriding condition for expropriation to be determined by the competent authority is provided under Art.5/1 of Proclamation No. 1161/2019 (FDRE, 2019). The article states that the competent authority is empowered to declare expropriation is for a public purpose based on “the basis of an approved land use plan, or master plan, or structural plan whether the expropriated land directly or indirectly brings better development and is beneficial to the public”.

The rural land Proclamation No. 456/2005 (FDRE, 2005b) Art.7/3 provides for private property to be taken over for the ‘purpose of public use’ Moreover, the government reasserted its right over communal land by ruling that ‘Government being the owner of rural land, communal rural land holdings can be changed to private holdings as may be necessary’ (Proc.456/2005; Art.5/3). The rights of communities on communal land such as grazing land, forest land, cultural land, etc. where no one particular person has formal proof of holding is made precarious.

2.7.3.5. The Land Leasehold legislation

During the 1975-1991 Derg period land was freely allocated for those who could construct houses or other structures deemed necessary by the government. However, after the change of government in 1991, the modality of access to land was revised without changing the public ownership system.. To realize the use value of land, a leasehold policy was first enacted in 1993 (Proc. No.80/1993). The urban land leasehold legislation was modified through a series of proclamations in 2002 and 2011 (Proc. No.271/2002; Proc. No.721/2011. The urban lands Lease holding proclamations No.721/2011 (FDRE, 2011) defined public interest in the same way as the other laws. In Art. 2/5 of this legislation public interest is defined as *‘the use of land defined as such by the decision of the appropriate body in conformity with urban plan in order to ensure the interest of the people to acquire direct or indirect benefits from the use of the land and to consolidate sustainable socio-economic development’*. It explicitly empowered urban administrations to determine what particularly public interest is in the specific urban center under consideration. It could be concluded that variations to the interpretation of what constitutes public interest is highly possible as a result landholders will likely be treated differently in the different scenarios of expropriation as will be shown in this study.

2.7.3.6. World Bank Environmental and Social Frameworks

Similarities exist between the provisions for expropriation in both Proc. No.455/2005 and Proc. No 1161/2019 and the World Bank’s guidelines for Environment and Social Standards(World

Bank, 2016a)during involuntary resettlement The main difference relates to the eligibility criteria for compensation of displaced persons. According to the Ethiopian legislations persons who do not have formal land use rights over the land they occupy are not eligible for compensation. On the other hand World Bank recognizes all project affected persons (PAPs) and requires all project fund borrowers that the non-land assets of all PAPs be retained, replaced, or compensated for; restorative relocation takes place with security of tenure; and lost livelihoods be restored. Normally WB does not finance components of projects related to payments for compensation but requires borrowers to observe its guidelines.

The reviews of legal provisions on expropriation of land regarding the determination of what public purpose is as well as the rights of property holders in a public ownership of land system present various issues. The extent that land contributes on the value of properties; the tradability of property without considering land; the acquisition of private holdings and transferring them to other private persons in a pretext to advance the welfare of the community. The views of the affected persons in our research do not support the public ownership of land scenario advanced by Ethiopian expropriation laws.

2.7.4. Urban Planning and Expropriation Practices in Ethiopia

2.7.4.1. The 2008 Urban planning law

In Ethiopia, institutions for urban administration existed for long but formal urban planning started with the advent of the Italian occupation of 1936. Prior to those urban areas were laid out in traditional manners with the chieftains at the center and the retinues surrounding their chiefs. However, the fast growth of Addis Ababa and Ethiopia's exposure to the outside world since World War II brought about the emergence of urban plan preparation not only for Addis Ababa but also to secondary towns. The first urban planning institution in Ethiopia, the National Urban Planning Institution (NUPI), which was vested with the power to prepare urban plans at national level, was established in 1987. NUPI was an outcome of the office for the preparation of the master plan for Addis Ababa during its centenary celebration. This institution was re-established in 2005 and finally dissolved in 2008 giving way for the establishment of regional urban planning institutions.

The de-centralized mode of administration, including that of land administration, necessitated urban plans to be prepared by the regional administrations who administer towns under their

jurisdictions. Proclamation No 574/2008 was enacted to provide for the preparation of urban plans by regional urban planning institutions (FDRE, 2008). Proclamation No 574/2008 laid the basic principles which should be included in the process of initiating, preparing, and implementing any plan, whether urban or regional plan. Some of the key considerations in the preparation of that have to be considered include: sharing the national vision and standards, as well as being implementable; conformity with the plan hierarchy consideration of inter-urban and urban-rural linkages; ensuring the satisfaction of public needs through public participation, transparency, and accountability; balancing public and private interests; and giving due consideration for sustainable development.. The master plan which defines the land use for urban centers and peri-urban areas is declared the basis for expropriation of private holdings in order to develop areas/localities. In the takeover of land for uses other than the present function, the Urban Plan Proclamation No.574/2008 under Art. 2/5 provided for public purpose to be determined by *‘a chartered city or an urban administration in order to continuously ensure the direct or indirect utilization of land by people and thereby enhance urban development during the implementation of an approved plan’* (FDRE, 2008). The main question is then whether or not the concerned stakeholders participate in the process of urban plan preparation which defines land uses. Stakeholders’ participation claims centrality if expropriation is based on the urban plan but the planning process is usually fraught with inconsistencies due to lack of capacity and improper urban management practices. Urban plan preparation in a decentralized way adds relevance and legitimacy to the plans but at the same time it increases the variations in the interpretation of what is public interest; consequently expropriated person may be subjected to endure various violation of rights from the actions.

2.7.4.2. Purpose and rationale of expropriation

The growth of urban population around the world, especially in emerging nations like Ethiopia, has frequently sparked demand for land for constructions, including residential, commercial and the supply of basic utilities in urban communities. Additionally, there has been a continuous need for land in rural areas for the development of infrastructure, such as roads, electricity utility lines, the building of large dams for irrigation and electric power, horticulture, and the flower business.

One of the key intentions of government land ownership is to make land easily accessible for the provision of public goods for the benefit of the general populace. Being owner of land, the government promises to give land to domestic and international investors so that they develop

jobs for the local population. Thus, a large amount of vacant land that is free from any claims or disputes is necessary for all these development operations. According to the 1995 Constitution, both rural and urban land belongs to the government. In order to provide land for all of these activities, the government expropriates private landholders.

The Oromia Special Zone Surrounding Finfine in general and the Administration of Burayu town are not exceptions to this practice of expropriation at country level to meet the increasing demand for land that comes from different development actors. This is in accordance with federal proclamation No. 455/2005, which provides that the Woreda or City Administration may expropriate private landholdings and usage rights and transfer them to private investors if they consider the change in possession will benefit the public.

2.7.4.3. Expropriation and compensation procedures

The review of the different legislations regarding expropriation indicate that the two key issues are the definition of public purpose and who defines it and the requirement to conduct consultation with the project affected persons. This is so in the Constitution, the Civil Code, the expropriation and compensation laws of urban and rural lands, the urban planning law and the leasehold of land proclamations (Proc. No. 455/2005, Regulation 135/2007; Proc.No.574/2008; Proc. No.721/2011; Proc. No. 1161/2019 and Reg.No.472/2020). Specifically the expropriation and compensation law provides detailed procedures on how to determine properties for expropriation, valuation methods and compensation payment modalities. The appropriate bodies for the determination of properties for expropriation by declaring it is for public purpose are federal and regional authorities vested to administer land and the cabinet in the case of chartered towns.

The expropriation procedure is divided into three phases: *preparation, valuation, and handover*. Accordingly, the *preparatory stage* in which the initiative for expropriation should come from what the law defines as an "implementing agency" that means a government agency or a public enterprise with a desire to undertake development work, as stated in article 2(7) of proclamation No. 455/2005. In line with this provision at least one year ahead, the agency which requires the land provides detailed information on the need for land (Article 5(1)) to the concerned administrative body responsible for expropriation and valuation process (Article 3 (1)). In this preliminary phase the processes of planning in advance regarding the need for land for the

execution of public goods; the identification of the spatial location of the required land which is based on the structural plan of the town as well as determination of the ownership of the land should be undertaken. Then notice of planning is sent to landholders in a written letter and a call for meeting is follows to discuss about land acquisitions aimed at creating awareness and to reach consensus about the why and when of the development and the land need.

The second stage is the *valuation phase*. In this phase each property must be evaluated in advance before the property is handed over to the requesting agency. In accordance with this, the administrative body appoints valuation committees consisting of up to five members from various sectors with the necessary qualifications for property valuation, as stated in article 10(1) of Regulation No. 135/2007. Accordingly, the valuation committee is responsible for executing valuation based on proclamation No 455/2005 and the procedures in Regulation No 135/2007. Furthermore, as stated in article 21 of Regulation No. 135/2007, the valuation committee is responsible to maintain records of the evaluation process, the methods used and all particulars about the properties. The procedure for valuating properties to be expropriated is based on Article 7 of Proclamation 455/2005, which specifies what compensation landholders are entitled to. After valuation is completed, it is necessary to obtain administrative approval; notification regarding the types and amounts of compensation, as well as relocation of landholders must be provided in written letters. As stated in Article 4 (1 and 2) of Proclamation No 455/2005 the property holder has to be notified in writing about the amount of compensation to be paid and the time the land has to be vacated must. In line with this compensation payment is made and relocation is undertaken. In addition, the proclamation provided room for appeal on issues related to the compensation assessment and the expropriation process.

In the *handover stage* the management authority must notify the expropriated landowner at least 90 days in advance before the expropriation begins and at this time the compensation must have been paid. In addition to the above procedure, a landholder who has been served with an expropriation order is not willing to handover the land within 90 days as notified in article 4(5) the administrative body has the power to use police force to take over the property. A summary of the procedure of expropriation for urban and rural lands is presented below.

For urban areas, the procedure requires:

- Presence of approved master plan and detailed action plan

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- Presence of sufficient budget for compensation payment for properties to be expropriated
 - Property owners to be informed about the intention to redevelop areas at least a year in advance of expropriation
 - Priority right of individuals to redevelop their landholding
 - Requirement to serve notice of expropriation and demand handover of property at least one ahead of expropriation
 - Requirement to pay compensation and provision of substitute land or accommodation ahead of eviction
 - Right of landholders to redevelop their holding if a planned redevelopment is delayed by over six months after serving notice
 - Materials for expropriation: only property on the land and the permanent improvement made on the land are materials for compensation;
 - Compensation amount has to cover cost of replacing the lost property and, in the case of residential property, this payment should not be less than the amount required to construct the least approved standard house or compensation in kind for the rehabilitation of involuntarily resettled persons.

In the case of expropriation of rural land the requirements include the following:

- Materials for compensation remain the same as in urban areas: property on land and material improvements to the land
- Provision of equivalent substitute land whenever possible together with a compensation amount not exceeding maximum of one year's yield from the expropriated land
- If land taken without substitute land, compensation shall be 15 times the highest annual income generated in the previous 3 years preceding the expropriation.
- Household with proper land titles at the periphery of urban areas are entitled to compensation for lost properties and highest allowable land size for constructing replacement residence in urban areas (500m²) and children of a legal title holder who are 18 years and above to a minimum plot of land allowed in the adjoining urban area for house construction

The expropriation laws require, for both urban and rural areas, valuation to be conducted by certified private experts or institutions. In the absence of such expertise, the government is required to establish a permanent unit or still in its absence establish a committee to conduct property valuation. Valuation amount is required to be made public in advance of approval by a public authority. The law also provides means for addressing grievances through an appeal system.

Table 2. 3: Summary of National level contextual review of literature

Themes reviewed	Main characteristics
Urbanization and urban expansion in Ethiopia	❖ Old but discontinuous urban history ❖ Garrison and market locations as urban center locators ❖ Slow national urban population growth: 6% in 1960; 11% in 1984; 14% in 1994, 22% in 2022 ❖ High primacy of Addis Ababa, ❖ Decentralization of administration into Regional States promoting urban growth
Evolution of land ownership and governance	❖ Pre-1975 Private land, feudal system ❖ 1975 to 1991 State-ownership of land tenure; Usefruct landholding ❖ Post 1991: State-ownership of land continued; Leasehold system for individuals ❖ Land leasehold system Proclamations ❖ Proc. No.271/2002; ❖ Proc. No.721/2011)
Property laws, Expropriation and compensation laws as well as their practices,	❖ Private property right enshrined by law ❖ The 1960 Civil Code Proc. No. 165/1960 ❖ Constitution of the FDRE Proc. No.1/1995 ❖ State ownership of land compromised property rights of individuals ❖ Expropriation laws limit benefit to built structures only, no location factor considered in compensation calculation ❖ Misguided Public purpose/interest definition ❖ Pro.No.455/2005 and Proc. No. 1161/2019
Urban planning related laws and practices	❖ Establishment of planning institutions ❖ Development of National and regional planning institutions ❖ Urban planning law Proc. No 574/2008
Summary	Laws exist to guide urban planning/urban expansion but State ownership of land and the misguided definition of public interest found to be the main issue.

The foregoing review of procedures for expropriation regarding determination of properties for takeover for public purpose, who decides what, is public purpose in a redevelopment project, valuation and compensation processes seem to be up to accepted international standards. However, in expropriation practice, grievance seems to be the norm rather than the exception as

was found out in this study. The anomalies arise due to public ownership of land and lack of accountability of those who are entrusted to implement expropriation. The observed anomalies as would be shown later in the case of Burayu Town include the following:

- Public ownership of land and its negation of land value (location value) from the valuation equation;
- The relegation of the determination of what is public purpose to lower tiers of government as part of power devolution;
- Lack of expertise to properly conduct valuation;
- Screening out some requirements in contravention to the law, such as, the requirement that no compensation value should be lower than the amount required to construct the minimum approved stand house;
- Not serving notices timely
- Eviction without payment of compensation
- Eligibility for compensation firmly pegged to having legal title to land

This research will show how expropriation practices were carried out and their impacts on the socio-economic situation of farming households in the periphery of Burayu Town. The main characteristics of the review of contextual aspects of urban development, land ownership and expropriation laws and practices are presented in **Table 2.3** above.

2.8. Conceptual Framework

Urbanization and urban growth is a global process that poses opportunities and challenges based on our handling mechanisms. Accordingly, for mitigating the drawbacks and maximizing the its benefit understanding the main driving forces behind it is very important. Although globally, the main driving factors for urbanization in general and specifically urban expansion are known to be related to demographic changes, geographic location, economic structures and government policies that have impact on spatial organization of people and activities, these factors work very differently in different contexts.

Table 2. 4: Summary of lessons from the Literature Review

Issue	Lessons
Urban expansion	❖ Phenomena to continue operating in developing countries ❖ Socio-economic and environmental impacts of urban expansion requires proper understanding of the causal factor ❖ Modern technology is key to documenting land use changes and to guide urban planning practice ❖ Urban-rural development planning dichotomy requires proper guidance based on context ❖
Land ownership and property rights	❖ Land ownership a key factor in urban development planning ❖ Rights on land influence property rights ❖ Pace of development planning with or without state ownership of land is a debatable issue, not a settled one ❖
Property rights, expropriation and compensation	❖ Varied practices but always a serious issue in all countries ❖ Property rights central issue in democratic rights and social justice ❖ Public purpose a debatable issue and key concept in expropriation ❖ Awareness and knowledge of laws a key issue for good governance but most are unaware of their rights ❖ Market value a fair compensation norm but requires proactive documentation and practice ❖ Participation a critical process to ensure equitable development but its practice requires local adjustment

Horizontal expansion of urban areas usually results in higher per capita consumption of urban land compared to compact developments. Moreover, other urban expansion driving factors originate from governments' favorable policies to attract local and foreign investors in order to create employment opportunities. Such development processes bring about impacts on LULC, socioeconomic, and cultural settings in peri-urban areas. None of these factors are standalone conditions; they influence one another and the compound effects are complex. Hence, it is necessary to understand the interactions between urban expansion, public ownership of land, expropriation, LULC changes and impacts on livelihoods. A conceptual framework is developed to analyze and understand the intricate interaction of these factors and their impacts on the livelihood of the local community. The summary of lessons learnt from the literature review section of the research as presented in **Table 2.4** and the conceptual framework in **Figure 2.5**

will be used to uncover the manner of LULC changes, expropriation practices and impacts on the livelihood of farming households in the periphery of Burayu Town.

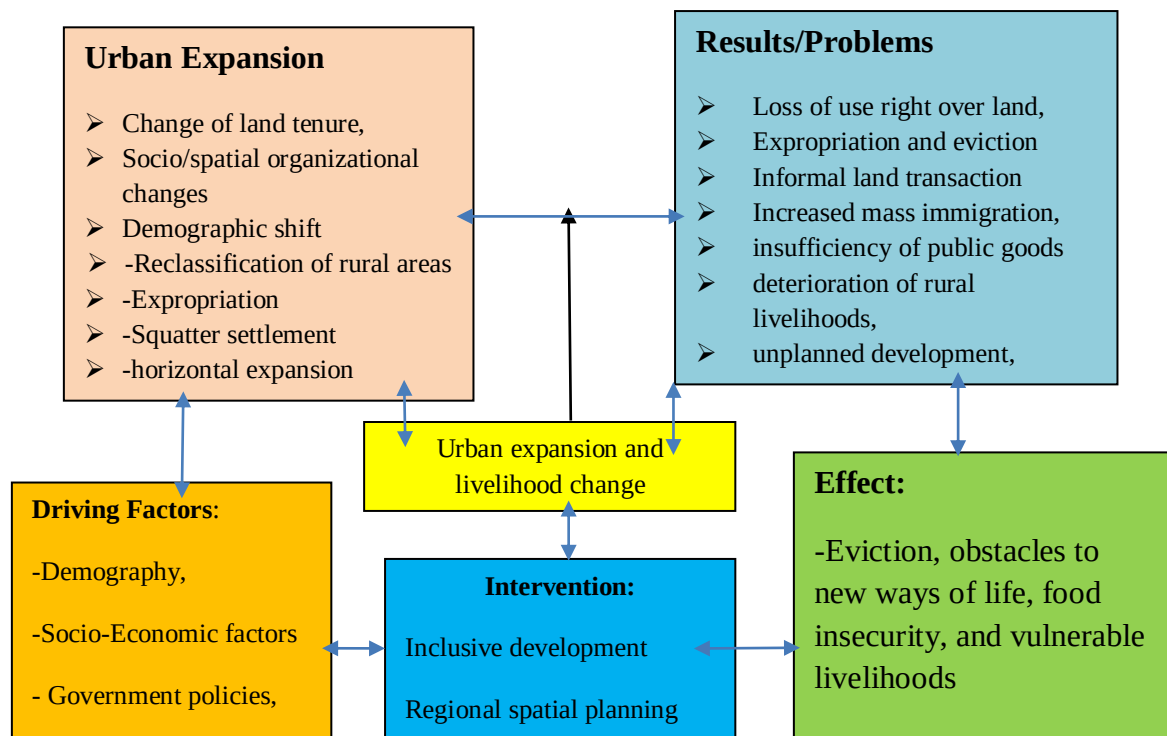


Fig. 2. 5: Conceptual Framework of the Problem
Source: own compilation

CHAPTER III: RESEARCH METHODOLOGY

This chapter discusses the broad background of the research area in relation to the spatial, biophysical conditions, demographic attributes, and patterns of the settlements. The presentation of the context will provide proper understanding of the situation under which the research is conducted. In the remainder of the subsections, the research methodology and procedures used to gather and evaluate data so as to answer the research questions developed in Chapter One are presented in detail. Furthermore, the considerations taken for the selection of the case study areas and sample respondents is presented subsequently. In addition to this, methods employed for

data collection and analysis tools are also discussed. Data sources and the challenges faced to get data are presented.

3. 1. Contextual Analysis of the Study Area

3.1.1. Geographic location and biophysical situation of Burayu town

Burayu town was founded as a settlement in 1946 by Grazmatch Robi Kelecha, a landlord of the area (BTM, 2020). One of the important factors for the establishment of the town was the presence of the historical tree ‘Burayu’ which served as a stopover location for merchants travelling to Addis Ababa from the western part of the country, as well as for people from Addis Ababa who wanted day-out leisure at the Suba forest

Burayu is bounded to the east and South-East by Addis Ababa City, to the north by Sululta district, to the west and South-West by Walmara and Sabata districts (BTM, 2020). Burayu town is located 15 kilometers along Nekemte road on the western outskirts of Addis Ababa. Astronomically, the town stretches from 9⁰ 01'00 " to 9⁰ 06'00 " N latitude and 38⁰ 36'00" to 38⁰ 42'00" E longitude (**Figure 3.1**).

Burayu town is one of the first grade regional urban centers² under the Oromia National Regional State, having a Zonal administrative status which is regarded as the third level of governance structure. All public sector offices in the town are organized in harmony with regional bureaus, which are in turn organized in accordance with the federal ministries. The town is divided into six administrative kebeles.

²The six towns in the former Oromia Special Zone Surrounding Finfine were re-organised as Shaggar City in 2023. Under this arrangement, Burayu is organised into two sub cities. However, the kebeles used as the case study areas remained the same administratively. The administrative structures used in this dissertation are as per the situation before the incorporation of Burayu Town under Shaggar City.

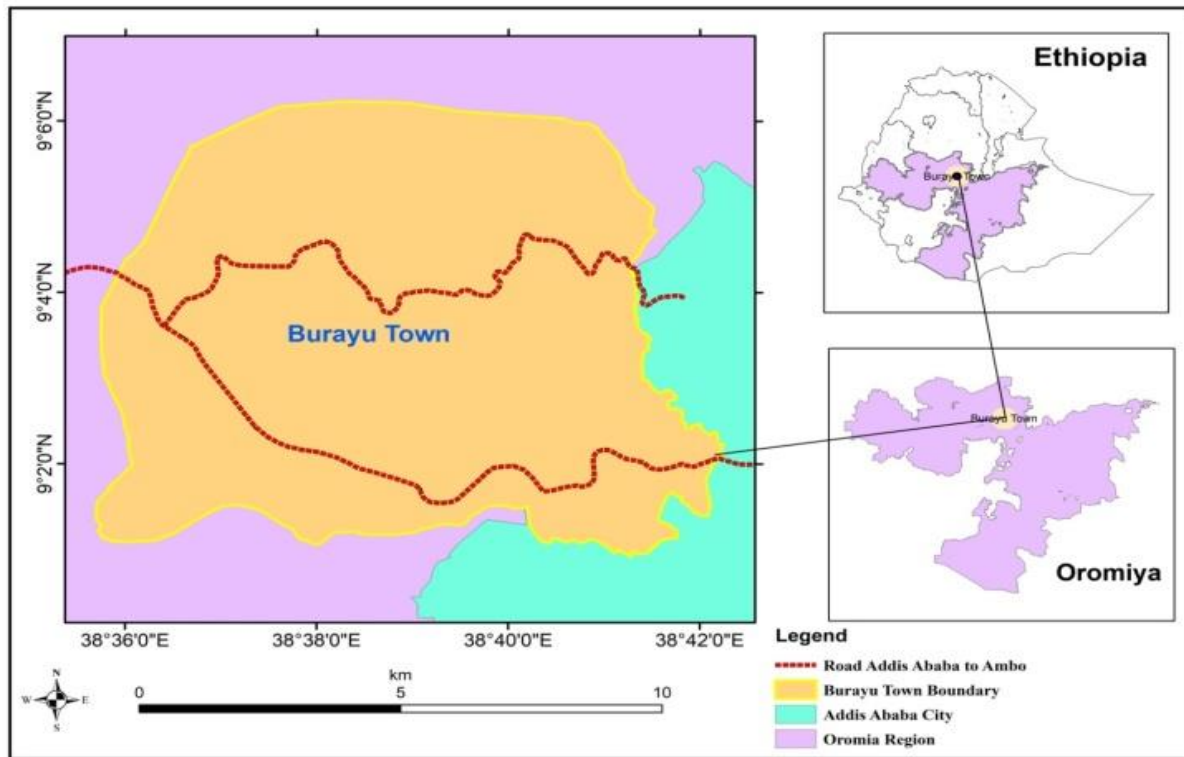


Figure 3.1: Location map of the study

The urban morphology of the town is characterized by a dispersed type of settlements. The area of the town is about 9,057 hectares (OIUP, 2014). According to the profile of the town, Burayu has a mean annual rainfall of 1067mm, (i.e. a range of 1300mm to 834mm annual rainfall) and an average annual temperature of 16°C, with *Dega* climatic condition. The topography of the area ranges from mountain chains around the Intoto ridge in the north-east to flat lands in the south, south-west, and west. The town's average elevation is 2619masl (i.e. within the range of between 2909m and 2349m above sea level). The study area is dominated by flat and rolling terrain types.

3.1.2. Population

Burayu town has experienced rapid population growth as a result of natural population growth and migration from other parts of the country in search of employment opportunities (Bekele, 2014). The town had 4,134 residents in 1984, 20,329 in 1994, and 63,889 in 2007. The 2007 statistics shows men and women make up nearly the same proportion of the population while the number of households in 2007 was more than triple compared to that of 1994, with an average family size of 5.1 and 4.18 respectively (CSA, 2007b). According to the 2014 urban population

prediction³, there were 115,000 individuals, 49.3 percent of whom were male and 50.7 percent of them were female (OIUP, 2014). According to the Oromia Institute of Urban Planning the primary causes of rapid population growth have been natural population growth, strong rural-urban migration, and urban-urban migration. The town currently has a population of more than 495,461 residents (BTM, 2020). Ethiopia is a country of diverse cultures and towns are mostly inhabited by multi-ethnic groups. In Burayu Town, the Oromos are the most populous ethnic group, accounting for 58.1% of the total population and speak Afan-Oromo as their first language (CSA, 2007). Following the Oromo, the Amara, Guragie, Gamo, Mossiye, and Argoba ethnic groups accounted for approximately 21%, 9.1 %, 6.2 %, 0.8%, and 0.2%, respectively. Finally, other very small ethnic groups with a population of less than 80 people account for about 4.6% of the total.

According to the 2007 Central Statistics Report, of the total productive age group of women, a high birth rate occurs for the age group of 20 to 29. The average fertility rate of the town women was 2.485 during the time period covered by the census, which was somewhat low in the area compared to the total fertility rate of urban areas in the Oromia region, which was 2.635 per 1000 people (CSA, 2007b).

Table 3. 1: Distribution of Migrants by Year of Residing in Burayu Town-2007

	Migrants by length of residence in the town (by year)							Percent
	< 1	1 – 2	3- 4	5 - 6	7- 9	10+	Total	
male	3,035	3923	3751	2362	2025	3876	19,024	48.7
Percent	45.8	47.6	51.9	50.1	48.2	48.5	48.7	
Female	3,596	4327	3483	2352	2178	4114	20,050	51.3
Percent	54.2	52.4	48.1	49.9	51.8	51.5	51.3	
Total	6,631	8250	7234	4714	4203	7990	39,074	61.2
Percent	17	21.1	18.6	12.1	10.8	20.4	100	

Source: (CSA, 2007)

According to the CSA (2007) report the number of migrants who have lived in Burayu town for less than one year was greater than the number of migrants who have lived there for one year or

³In Ethiopia population and housing census is supposed to be conducted every ten years. However, due to political unrest in the country no national level census has been conducted since 2007. Sometimes towns conduct partial census for planning purposes while most urban centres use projected population figures for their planning.

more. Accordingly, the migrants population of all ethnic groups accounted for approximately 61.2 % of the total population of the town, indicating the existence of a high migration to the town. The majority of migrants came from urban areas (77.68 %) rather than rural areas (22.32 %), as it is the preferred destination due to its proximity to Addis Ababa. Furthermore, according to the report approximately 67 % of the migrants came from another region, with only 33 % coming from different zones of the Oromia region, and approximately 69 % of the migrants were over the age of 18. The distribution of migrants by year of length of residence in Burayu town is shown in **Table 3.1** above.

3.1.3. Housing

Social development issues are primarily focused on social services and related social problems, both of which are major elements for the development of urban centers as well as for societal well-being (Schafft, 2016). Nowadays, the population of the world particularly in developing countries are under pressure due to lack of adequate public services related to social development (Lawson, 2005); Burayu town is not different, it is suffering from various problems caused by the lack of sufficient social services.

Among many other aspects of facilities needed for social development, housing is absolutely essential for the well-being of society. According to CSA (2007), Burayu town has 14,679 dwelling units and 15,270 households during the census period. The ratio of the total number of households to the housing unit is calculated to be 1.04. This implies that for every 100 households there are only 96 housing units which indicate the presence of co-dwelling. Furthermore, according to the Burayu town municipality, there were approximately 22,675 pure residence housing units and a total population of 27,512 households in the town in 2013. Similarly, the ratio of total households to housing units was calculated to be nearly 1.21, indicating that the average number of households per 100 housing units has risen to 121 household in the period between 2007 and 2013. This again indicates that there was a large gap between demand and supply of housing. Although this figure did not include housing units which were of mixed-use, the figure still indicates a cramped dwelling situation as households are compelled to live under conditions where living and working spaces are combined.

The Oromia Regional Land Development and Management Bureau announced during the regional evaluation of the annual reports for 2020/21 that Burayu town has taken the lead in the proliferation of squatter settlements. The town administration also reported that there are many

informal constructions, though the exact number was difficult to ascertain. The existing legal housing units in Burayu town are private houses, government houses, condominiums, and a very small number belonging to NGOs, FBOs and CBOs (OIUP, 2014). Thus, among these, 97.1 % of housing units are privately owned, with the remaining portion shared between the stated categories of owners. Based on the current unprecedented population growth and the imbalance of demand and supply of land for various development activities, lack of land for the construction of residential housing is a major barrier to access housing.

3.1.4. Economic situation

The livelihood strategies of the agricultural communities surrounding towns are determined by human, financial, physical, natural, and social capitals that make up the conventional asset pentagon of households (Chen et al., 2012). The existing transforming structures, such as government and private sector levels, as well as processes such as laws, policies, culture, and institutions, influence households' access to these livelihood assets and strategies in order to achieve sustainability. Farmlands are vital assets that sustain the livelihoods of the majority of Ethiopian farming communities in general; the situation of households living in the peri-urban areas of Burayu town is not different from other areas.

Various economic activities are observed in Burayu town, such as trade, investment activities, manufacturing industries, micro and small enterprises, urban agriculture. When compared to the unemployment rate in other towns of Oromia, Burayu town had a higher proportion of unemployment. This is partly due to the fact that rural-urban migration occurs at a higher rate compared to the other towns. During the 2007 census, the total unemployment rate in the town was 16.0% compared to the region's total urban unemployment rate of 13.9%(CSA, 2007b).The majority of peri-urban dwellers of Burayu town base their livelihoods on farm income, both livestock rearing and crop production with some farm income, which refers to wage earned on other farms within agriculture wage labor in agricultural activities; and off-farm income, which includes participation in road and building construction as a daily laborer, non-farm self-employment, rental income obtained from leasing property, and income from participating on various trade activities.

According to Burayu town's profile the economic base of the town between 1992 and 2013 was mainly industry, which took the lead in the number of firms, accounting for approximately 41.18% of the total, and created approximately 54.23 % of the total job opportunities. Aside

from these, many farming households engage in agricultural activities such as crop harvesting, animal rearing, and bee keeping on their plots of left after expropriation and on rental plot of land. The livelihoods of many dwellers are directly or indirectly dependent on the activities mentioned above. Almost all of the investments seen in town are from the private sector, which includes trade, hotel and tourism, industry, and social services. According to Burayu town administration between 2009 and 2014, there were 117 applications for investment project in the town, with a financial capacity of about 1.72 billion birr and a land need of about 429.2 hectares. The projected employment generation by the investment requests was approximately 6,948. However, contrary to the intention of the investment policy and despite the fact that 475.7ha of land was provided to the applicants, approximately 73% (85 applicants) of the investment projects were not put into operation, totaling approximately to 1.51 billion birr planned investment. This shows, despite expropriation of peri-urban land, investment was not carried out; consequently farmers lost their plots but the expected off-farm employments were not realized.

3.1.5. Overview of spatial plans of Burayu town

A summary of the planning history and the characteristics of the plans for Burayu Town are presented in this section

The Development Plan of 2001 G.C (1993 E.C)

A partial plan was prepared for Burayu town in 1993 by the Urban Development Bureau of Oromia Region. The plan focused on spatial aspects without giving adequate attention to the socio-economic and environmental situations of the area. Moreover, the plan was not properly implemented as the town lacked appropriate administrative structure and manpower. As a result considerable mismatch existed between the proposed land use plan and the reality on the ground (Source: IDP of Burayu town, 1998)⁴.

The revised Development Plan of 2006 G.C (1998 E.C)

The revision of the 1993 development plan was done by the *National Urban Planning Institute (NUPI)* in 1998 E.C. The previous development plan was replaced by an *integrated development plan* (IDP). The IDP covered the existing built up area (the developed part of the town) and the

⁴The researcher could not get the 2001 Development Plan itself, this review is based on a cross-reference of the plan by a 1998 document secured from the Burayu Town.

area under the town administration including the adjacent peasant associations which are now incorporated into the town. The integrated development plan was a more comprehensive plan which addressed socio-economic and environmental problems in addition to the physical and spatial aspects⁵.

The Existing Structural Plan of 2014 G.C (2006 E.C)

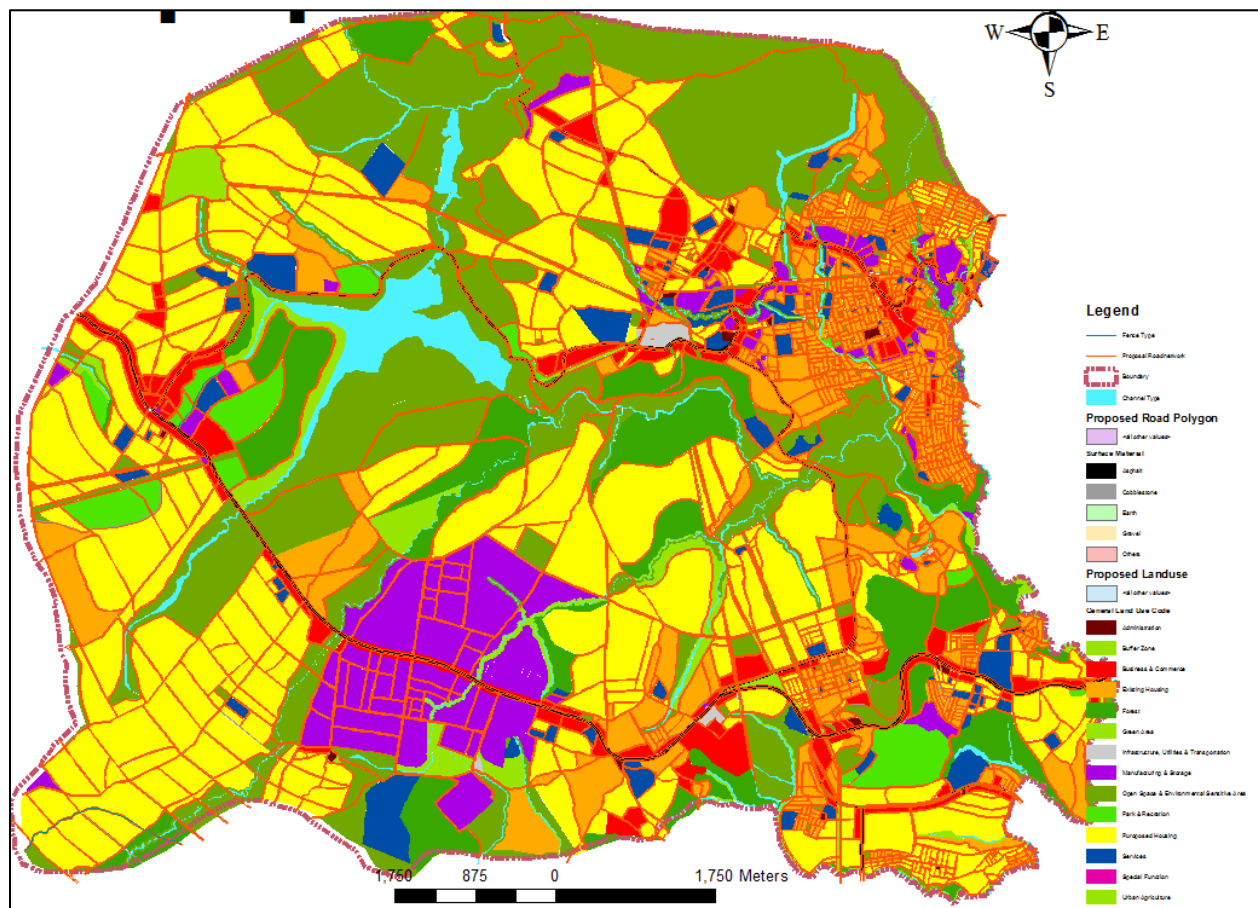
The previous *integrated development plan* was replaced by a *Structural Plan* which was prepared by the Oromia Urban Planning Institute (OUPI) in 2006E.C (2014 G.C). It covers a total area of 9,057hactors. The rural kebeles covered by the former Integrated Development Plan were formally incorporated as urban kebeles by this Structural Plan (**Figure 3.2** and **Table 3.2**).

Table 3. 2: Proposed Land use area coverage of Burayu Town, 2014

No	Land use type	Area (ha)	Percentage
1	Housing	3812	42.4
2	Business and Commercial activities	293	3.3
3	Social and municipal service	243	2.73
4	Manufacture and warehouse	498	5.5
5	Open space and environmental sensitive area(special function, urban agriculture, forest, and recreation and park	3240.8	36
6	Infrastructure, utility& Transportation	903.6	10.04
7	Administration	10.6	0.12
	Total	9,057	100

Source: OUPI, 2014

⁵The researcher could not get the 2006 IDP of Burayu at the Burayu Town Administration nor it was possible to get it from NUPI which was by then dismantled.



of predefined standardized measures that can be assigned to individuals in specific response categories (Dawson, 2007).

On the other hand, the qualitative approach stands on the premise that reality can be comprehended by investigating people's beliefs, perceptions, and reactions to various situations (Arghode, 2012). Thus, qualitative research approach prioritizes words over quantifiable data collection and interpretation (Bryman, 2012). Qualitative research approach discusses the research question using terms such as why, how, in what form, and to what extent, and lends itself to the understanding of the situation comprehensively. This means that data obtained through questionnaires, observations, or interviews using a variety of techniques could show what people have said in their own words about their livelihood, such as the economic, social, and environmental impacts of any development activity. In general, quantitative research focuses on counts and measurements, whereas qualitative research focuses on meanings, concepts, characteristics, and descriptions of events and results (Castellan, 2010).

When used independently, both qualitative and quantitative methods may have shortcomings (Campbell et al., 2013). Despite the fact that each method has its own limitations, researchers believe that biases inherent in any single method could be neutralized by biases inherent in other methods (Creswell, 2014). Researchers can reduce the limitations of specific methods to particular bodies of knowledge by combining two or more methods of data collection and analysis, which is the essence of triangulation (Denzin, 2017).

According to Creswell (2014), the use of mixed methods helps to resolve the shortcomings of single methods and improves the trustworthiness and reliability of the results of analyses. Mixed method approach has been used in a number of problem-based studies in which the properties of both quantitative and qualitative research processes, approaches, principles, and language are combined into a single analysis. Both approaches have distinct powers to generate information and are considered complementary to one another. When compared to mono-approach designs, a mixed approach allows for access to a broader range of viewpoints or pluralism. As a result, the use of both quantitative and qualitative methods was selected as approach as it can contribute to a better interpretation of the study as a whole than either approach alone. Thus, in this study, a mixed research approach was utilized to understand the research issues.

Apart from the use of mix research design approach, the descriptive research design was selected as it helps to manifests the fundamental characteristics of both qualitative and quantitative analyses side by side in order to maintain triangulation in its findings (Kothari, 2004). In light of this, a descriptive research design was used in this study to thoroughly analyze the influence of urban expansion on the livelihood of the local farming community and to identify possible management strategies to offset negative impacts.

3.3. Research Strategy

A research strategy is a method of organizing observations, defining methods as well as instruments for data collection (Curry et al., 2009). There are numerous research strategies, such as ethnography, grounded theory, action research, case study, phenomenology, and archival analysis (Denscombe, 2007). According to Yin (2003), case studies, experiments, surveys, histories, and archival information analysis are the different types of social science research inquiry strategies. In a mixed research design approach, surveying and experimental research are the most commonly used research strategies for the quantitative research components, whereas case studies, histories, and archival information analysis are amongst the most prevalently used qualitative research strategies (Creswell, 2009).

More than one research strategy may be used depending on the objective of a study, and it also provides an alternative method of collecting and analyzing empirical evidence (Kohlbacher, 2006). The choice of more relevant research strategy depends on the degree of focus on contemporary situation, types of research questions as well as the extent of control the researcher has over the actual behavioral events(Yin, 2003).

A case study is a research strategy that entails an empirical investigation of a specific contemporary phenomenon within its real context utilizing multiple sources of data (Noor, 2008). It can be used in both quantitative and qualitative studies (Bryman, 2017).It also employs contextual variables. The current study focuses on the actual events that have occurred and does not necessitate the control of behavioral events. A case study also allows a researcher to better understand the topics being studied by using a variety of methods to validate data (Berg, 2004). Moreover, a case study is favored because it helps one to gather various kinds of data from different sources or locations at a time. Furthermore, a case study is a detailed examination of an event by a researcher in order to achieve an intended objectives (Creswell, 2009). A quantitative

case study, a survey, and a case study can all be combined into a single research project (Yin, 2003). Hence, the case study strategy is becoming more popular as a research tool in the field of urban expansion and impact management. This current research employed the case study method in this manner.

In order to get familiar with the issues of the study, literature review is the beginning of any research. Desk Reviews is a technique through which written material or information about the research under investigation can be gathered (R. Kumar, 2011). The desk review research method facilitates the understanding of basic concepts in order to establish a conceptual framework to analyze the prevalent impacts of urbanization as well as acts as a method of data inquiry. Accordingly, a case study, survey and desk review strategies were utilized in this study.

3.4. Datasets and Sources

3.4.1. Time series data and processing techniques for LULC study

This study is carried out within the administrative boundaries of Burayu town. There are various types of data required and collected from different sources in order to achieve the intended specific objective. First and foremost, key data sources are employed to investigate LULC changes that have occurred in the research area in the past few years and to predict the future. The United States Geological Survey (USGS) provided the cloud-free terrain-corrected (L1T) Landsat data for free downloading at <https://earthexplorer.usgs.gov/> which was then used to examine the LULC change in the study area. In light of this, Landsat series satellite images with intermediate resolutions (Landsat MSS 1980, Landsat TM1990, Landsat ETM+ 2000, Landsat TM 2010, and the Operational Land Imager 2020) were utilized to analyze the spatiotemporal LULC dynamics of the research area (**Table 3.3**).

The supplementary data such as Topo map, and aerial photographs (scale 1:50000) of the town were obtained from the Ethiopian Mapping Agency (EMA). In addition, field observation with the aid of a Global Positioning System (GPS), and a digital camera were used. The study area shape file was accessed from Burayu town land development and management office. All such geospatial data layers were projected to the Universal Transverse Mercator (UTM) map projection of Zone 37N, Adindan datum and Spheroid Clarke 1880. Additionally, information for image classification and verification was obtained through discussions with elderly people. Historical data from Google Earth images were used for verification purpose.

In this analysis the area under investigation for LULC change is delimited to the area of Burayu Town as provided in its 2014 master plan. This area (the 9,057 ha) was adopted as the area for comparison of LULC changes in the different periods for the following reasons. 1) The pre-2014 development plans/master plans did not provide detailed delineation of the urban areas they represent making them unsuitable to be used to compare changes. 2) the satellite images show the land use class of the time they were taken reasonably well. It was also possible to have ground control points to delineate areas for comparison with the 2014 master plan. 3) The land use-land cover change planned for analysis takes the 2014 map as the basis for comparison and hence the changes in area in hectares is real value while the percentage change between two periods only shows the relative percentage increase (or decrease) during the periods under consideration as there is no increase in area of the town in real terms.

Table 3. 3:Satellite images and their properties

Acquisition date (YY/MM/DD)	Path/Row	Sensor	Resolution
1980/12/25	168/054	Landsat3, MSS	80m
1990/12/18	168/054	Landsat5, TM	30m
2000/12/05	168/054	Landsat7 ETM+	30m
2010/12/09	168/054	Landsat5 TM	30m
2020/01/19	168/054	Landsat8 OLI	30m

Source: <https://earthexplorer.usgs.gov/>

To improve the interpretability of the image's features the impediments were removed through the use of enhancement techniques, radiometric corrections of haze reduction and so on. For that reason, in this study the downloaded images were assessed based on quality evaluation techniques of sensors such as MSS, TM, ETM+ and Landsat8 OLI with their resolution check, availability and the objective of the study. Hence, a preprocessing of remote sensing data was a vital step in every image classification, and alternatively clear images can be used with less effort. For that reason, in this study free of cloud, haze and strip images were used, however the layer stacking of all bands of interest into a raster-stack were used for further image analysis in R software. Layer stacking bands of Landsat images are shown visually in R Studio for the years 1980, 1990, 2000, 2010, and 2020.

The most known and used manual for classifying LULCs has been the Land Cover Classification System: Classification Concepts and User Manual, which was created in 2000 and revised in 2005 by the Food and Agriculture Organization (FAO) of the United Nations (Di Gregorio, 2005). For instance, Gondwe et al. (2021) evaluated LULC change in Blantyre City, Malawi, from 1999 to 2019 by making some adjustments to the study area using the FAO land cover classification system user manual. Furthermore, several studies in Ethiopia that analyzed LULC change and urban growth using remote sensing data and GIS in urban areas categorized the spatial extent of the study areas into five LULC classes. For instance, Moisa and Gemeda (2021), and Halefom et al. (2018) used five LULC classes to examine the dynamics of land use/cover and urban expansion in Addis Ababa city and in Debre Tabor town, respectively. Intensive field visits were conducted at various times to determine the most prevalent LULC classes in the research area. In light of this, and based on the researcher's past knowledge of the research area, the FAO land cover classification manual was employed with a few minor alterations. To this end, the researcher identified 5 main LULC classes for each imagery year: vegetation, agricultural land, grassland, built-up area, and water bodies (**Table 3.4**).

Table 3. 4:Proposed LULC classification scheme

LULC class	Description
Vegetation	Areas with open woodland (15–65%), closed broadleaved deciduous trees (>70–60%), land with herbaceous closed vegetation (15–100%), permanent marsh, sparse tree, and shrub savannah
Agricultural land	land that is cultivated and used for small-scale farming, as in corn, wheat, and fallow plots of organized land for animal fodder
Built-up land	Human made structures; major road and rail networks; large homogenous impervious surfaces including parking structures, office buildings and residential housing; examples: houses, dense villages / towns / cities, paved roads, asphalt.
Grassland	Open areas covered in homogenous grasses; natural meadows, open savanna with few to no trees, parks/golf courses/lawns, pastures, open grassland dominated by hedges; usually with isolated trees, shrub cover like urban greenery
Water body	Areas where water was predominantly present throughout the year; may not cover areas with sporadic or ephemeral water; contains little to no sparse vegetation, no rock outcrop nor built up features like docks; examples: rivers, ponds, lakes, oceans, flooded salt plains.

Source: Adapted from FAO, 2000 LULC classification Scheme by the author

Classification of images facilitates automatically categorizing all pixels from the satellite images into LULC classes to extract useful thematic information (Al-sharif &Pradhan,2014).Accordingly, in this study, the Comprehensive R Archive Network (CRAN)

Random Forest Package, an ensemble learning algorithm for regression and classification, was used to classify Burayu town images into different LULC classes.

Analyses of LULC change via spatial modeling are useful for tracking change dynamics, determining optimal patterns of land use change, assessing growth effects, and making probabilistic predictions. Several modeling approaches allow for LULC simulation and projection as well as individual models, though, they have various flaws. As a result, hybrid modeling approaches are commonly utilized to solve these shortcomings for land cover forecasting (Ruidas et al., 2022; Tajbakhsh et al., 2020). The agent-based models, such as the CA-Markov, which blends cellular automata with Markov chain models, are the most extensively used hybrid modeling methods (Ghosh et al., 2017; Xu et al., 2019). Accordingly, this approach was used to acquire reliable results for Burayu Town.

3.4.2. Socioeconomic data sources and collection methods

For the purpose of understanding the driving forces of horizontal expansion of Burayu and the impacts that the expansion brought about on the livelihoods of expropriated local households it was necessary to collect pertinent data not only from the affected persons but also from other relevant stakeholders too. Accordingly, survey questionnaires were distributed to randomly selected farmers from the three sample kebeles. Monitoring mechanisms were devised to get all questionnaires duly filled and returned backed by all selected respondents. The questionnaires had both open-ended and closed-ended questions (Annex 1). Respondents were occasionally asked to recall and rebuild crucial events on aspects of their assets, their economic status and coping strategies after expropriation while also providing current information as part of a retrospective data gathering strategy. The use of such data was believed to enable the researcher to comprehend the realities before and after the expropriation.

Focus group discussion was used to collect data on the expansion of the town and how it affected the way of life of the farmers. Three separate FGDs were organized one per kebele each with 6–8 participants. Participants of the FGDs included representatives of the expropriated households from the three case study kebeles, officers of social institutions, office holders at various administrative tiers; officers in charge of managing urban land, and experts with more experience in the field of urban development.

Key Informant Interview (KII) was the other data collection method used in this research. Care was taken in the selection of key informants. Pertinent factors that were considered to enhance understanding of the phenomena of urban expansion and its impacts were considered while choosing informants. These include, but were not limited to age (elderly community members preferred), willingness to share information, continuity of residence in the area and knowledge of administrative measures taken during expropriation. Key informants were selected from the Oromia Regional State Land Development and Administration Bureau, the Burayu Town Land Development and Administration Office, Burayu municipal administration. Chairpersons of the three case study kebeles together with their respective experts in land development and management were interviewed. The focus of the interviews was on expropriation laws and implementation strategies used in the town's expansion, expropriation processes, rehabilitation measures, if any, and coping strategies employed by those who were relocated. There were two phases of the empirical data collection process: the preliminary data collection and pre-survey preparation stage constituted of the initial stage which was conducted on January 6 and 7 of 2021. Fifty (50) respondents were used to test the tool in the Gefersa Burayu kebele; after the test survey data collection, various revisions were made to the questionnaire. The formal data gathering was then conducted in the second stage. 128 Questionnaires were distributed between January 21 and March 19, 2021 and 100% of them were successfully collected.

Secondary data sources were also employed extensively in the study to substantiate information that could not be obtained through the primary data sources described above. Data was gathered through the review of policy and law documents, urban planning plans, land administration reports; besides the above information, demographic data was obtained from the Ethiopian Central Statistics Agency (CSA). Compensation payment payrolls of expropriated landholders, as well as the socioeconomic profile of residents in the research area, were reviewed from town profile documents. The researcher diligently supervised the data collection process through personal presence at the case study kebeles throughout the data collection period. Checklists were used to monitor the data collection and observations notes were entered on the data collection notebook daily.

3.5. Sampling and sample size determination

The selection of case study areas and research respondents is a crucial stage to achieve the objectives of research projects. This study used both probability and non-probability sampling

designs to select the study area and respondents in order to thoroughly examine the objectives of the study. Thus, the case study town and three rural kebeles were chosen purposely, while respondents were chosen using a combination of both sampling techniques. The following two subsections provide a brief explanation of how the case study area and respondents were chosen.

3.5.1. Case Study Area Selection

The task of selecting the case study area passed through multiple stages. The stages of case study area selection are typically based on the prevalence of the phenomenon to be investigated. Accordingly, my primary research topic is urban expansion and its effects on the livelihoods of expropriated households. In line with this, the researcher has worked in Burayu town in various capacities and has opportunities to visit the satellite towns that surround Addis Ababa. In this circumstance, the researcher observed that many farming households have been deprived of their primary source of income, particularly agricultural land rendering their livelihoods insecure. The satellite urban centers and the rural areas around Addis Ababa are rapidly expanding, particularly since urban centers were designated as national industrial development corridors. In accordance with this, the severity of the problem in Burayu town is high in comparison to the other satellite towns surrounding Addis Ababa. This was confirmed from the reports reviewed from the Oromia regional land management bureau which placed Burayu town at the top of the list of towns in terms of the number of expropriated households, the informal sell of land and prevalence of informal settlements as well as land allocation for investment.

Similarly, at the town level, Gefersa-Burayu, Gefersa-Guje, and Gefersa-Nonwere chosen as case study sites using a non-random purposive sampling method. The main criteria for the selection of the three peripheral urban kebeles was the severity of land expropriation, hence the horizontal expansion, the prevalence of informal sell of land and proliferation of informal settlements, in comparison to the other kebeles in Burayu town.

3.5.2. Selection of study Participants

Expropriated farming households were engaged in the interviews, surveys, and focus group discussions (FGD) because they provide ground truth data. Furthermore, concerned government officials and experts at various levels were selected as sources of data in order to acquire their

opinions, as they had received extensive exposure and knowledge while dealing with the farming community in the process of expropriation and compensation appraisals.

Depending on the objective of the research, there are several ways for determining sample sizes, such as descriptive, observational, and randomized research studies with varied formulae for measuring sample size (Kasiulevičius et al., 2006). The underlying premise of sampling is that, given a sufficiently high degree of probability, a relatively small number of units, chosen in a way that properly reflects the research population, will produce a reasonably true picture of the sample population being investigated (Kumar, 2011).

Most of the land expropriation in Burayu Town was carried from kebeles in the expansion zone; hence households from the expansion zone were natural choices to be informants. The sequence of survey population selection followed first identification of the case study kebeles, then determination of sample size of the study population, decision on method of picking the respondents and then finally visiting the chosen households for data collection. Despite the fact that the dispossession and eviction of farmers in the study area began prior to the adoption of the development corridor policy in 2004, the focus of the research was limited to the post-2004 period. The target demographic data consisted of completely and partially expropriated farmer households from these three kebeles. In light of this, according to initial information obtained from the municipality of Burayu Town and the regional land management bureau (ORDMB), between 2005 and 2020, more than 5,097 households were expropriated to give way for urbanization-induced developments.

According to the municipality's incomplete records, only 1,058 households were registered as having had their land expropriated and/or received cash compensation between 2005 and 2020. As demonstrated in the document, some farming households had their land expropriated without compensation, while others received money, but the quantity of land they lost as a result of expropriation was not recorded in the roasters. There were 196 households on the list with such missing information. The researcher addressed these concerns by opting to use the compensation payrolls of the three case study kebeles which contain all of the relevant information only. As a result, the investigator used as the research population all expropriated farming households with full information stated on the compensation payrolls of the three kebeles between 2005 and 2020. In light of this, only 862 expropriated households had complete information, which was utilized to compute the sample size for the study. According, a standard formula for the

determination of sample size for a finite population (Kothari, 2004) was used to arrive at the sample size as depicted below.

$$n = \frac{(z^2) (p) (q) (N)}{(e^2)(N-1) + (p) (q) (N)},$$

Where: n= required sample size, N= total population=862; Z= Confidence interval at 95% which is 1.96; e=8%; P= 0.5 and q= 0.5.

$$n = \frac{(1.96^2) (0.5) (0.5) (862)}{(0.08)^2 (862-1) + (1.96^2) (0.5) (0.5)} = 128$$

Data from the municipal administration revealed that the number of households who were expropriated and received compensation between 2005 and 2020 in the three case study kebeles were 397 from Gefersa Nono, 286 from Gefersa Burayu, and 179 from Gefersa Guje kebeles respectively. Following this data sample sizes for the three kebeles were computed as follows:

- Gefersa Nono kebele: $(397/862) (128) = 59,$
 - Gefersa Burayu kebele $(286/862) (128) = 42,$ and
 - Gefersa Guje kebele $(179/862) (128) = 27.$
- Total = 128

Finally, the systematic sampling technique, i.e. the K^{th} rule, was used to determine the sampling interval and the households for the household survey were chosen accordingly. In the final implementation of the K^{th} rule adjustments were made when problems were faced to get a willing participant.

The second major set of sample respondents were land administration professionals from the regional state (2 participants); Burayu town (2 participants) and the three case study kebeles (3 participants). In-depth interviews were conducted to collect data from carefully selected knowledgeable key informants of elderly households from the case study kebeles (6 participants), regional land management officials and experts (3 participants), the mayor of Burayu Town, land development and management officers, and valuers (8 participants) at the town level. The main reason for including these participants is to learn about their perspectives and concerns about the current urban expansion trend, the implementation modalities of expropriation measures and effects on the expropriated households.

Furthermore, focus group discussion (FGD) was one of the data collection strategies used in this study to gather data from first-hand sources by involving different segments of the population. Based on this, four independent focus groups were convened, with participants including expropriated farming households, officials from the town and kebele administrative bodies, land administration officials, and experts. The numbers of FGDs were determined based on the size of the study population: two focus group discussions (FGDs) in Gefersa-Nono and one in each of Gefersa-Burayu and Gefersa-Guje, consisting of 6 to 8 members in each case (a total of 24-32 participants). The researcher prepared open-ended questions in order to establish a pleasant environment for FGDs. The reliability of primary data collection instruments is increased by utilizing measures that are less reliant on researcher bias, such as structured instruments that include open-ended and closed-ended questions. Furthermore, to simplify the surveys and eliminate ambiguity, they were translated into Afan-Oromo and then back to English for analysis. The sampling technique, sample size and response rate is shown in **Figure 3.3**.

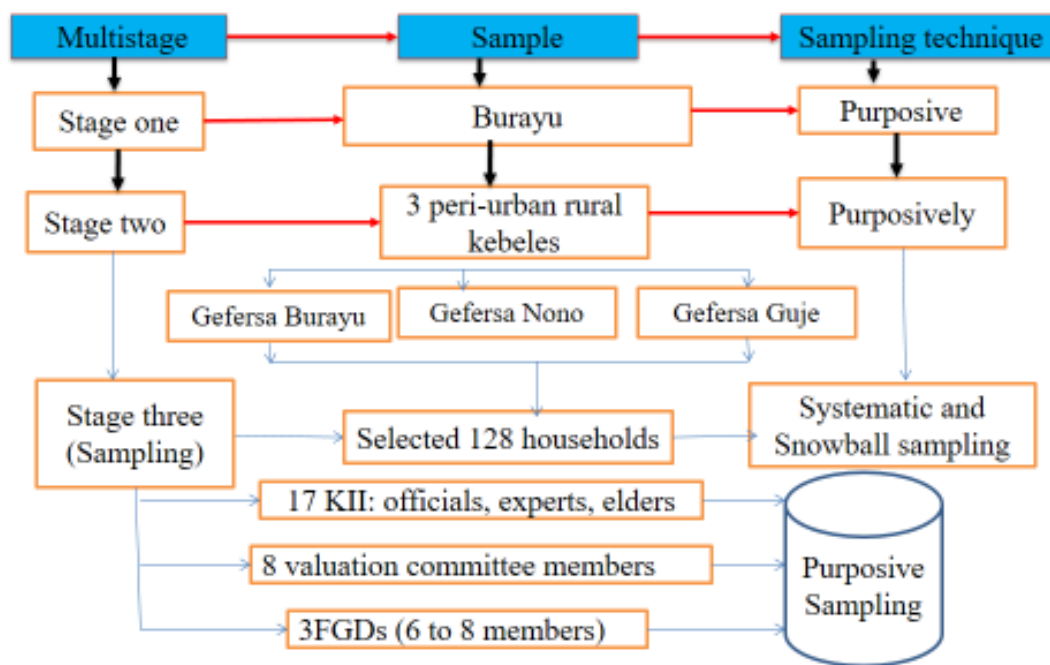


Figure 3.3 Sampling technique, Sample Size and Response Rate

3.6. Methods of data analysis

The analysis section is the heart of the research project, where the findings and interpretations of the study are discussed in depth, making it an important section of a research. The analysis of data in any study is dependent on how the data was collected and the purpose for which the findings should be used (Kumar, 2011). The data analysis methods used in this research are describe in the following two sections.

3.6.1. Spatiotemporal Analysis Using Remote Sensing and GIS Techniques

Human-made activities that occur across time and space particularly in urban areas for the purpose of development alter the natural landscape. As a result, such unprecedented activities result in horizontal expansion of urban settlements into surrounding rural areas, particularly in developing countries, necessitating close monitoring and scientific management methods. Traditional methods of gathering demographic and environmental data, for example, are unsuitable and inaccurate for in-depth analysis of ever-complicated and broader situations. For that reason, data from earth observation systems have been available since the invention of satellite imageries in 1972. Hence, satellite imageries provide an opportunity to collect relevant information to study various spatial, temporal, and spectral scales.

It is possible to extract pertinent data for the study of a variety of topics, especially those that are geographically and temporally related to a research region, through the integrated use of remote sensing data and GIS techniques. Satellite remote sensing is distinct for its repeatable and large spatial viewing capabilities, as well as multi-spectral capabilities for detecting land cover dynamics. On the other hand GIS is a powerful tool for mapping, displaying, and monitoring ecological changes in spatial settings. It is possible to monitor and map a spatial location at various levels, such as local, regional, or global, in order to make decisions for any development agenda by using data from remote sensing and applying GIS techniques. Currently, the availability of various resolution satellite imageries from different sources, such as free Landsat images from the USGS, makes analyzing the spatial-temporal aspects of any landscape very cost effective in order to make sound decisions. The availability of such satellite imagery is critical in managing unprecedented growth of urban areas towards the surrounding rural areas via scientific methods.

In terms of remote sensing, land cover is any material that directly interacts with electromagnetic radiation. This interaction results in a degree of reflected energy that affects the tone of an area in satellite images. Tone alone might not be sufficient to distinguish the various cover types. Although context, pattern, and texture may also be used, empirical studies supporting remote sensing of land features show that different land covers are increasingly separable with measurement of tones in discrete wave bands.

Analyses of LULC change via spatial modeling are useful for tracking change dynamics, determining optimal patterns of land use change, assessing growth effects, and making probabilistic predictions. Several modeling approaches allow for LULC simulation and projection. These models have proven to be excellent quantitative tools for monitoring and modeling LULC (Sohl & Claggett, 2013). Individual models have various flaws, as a result, hybrid modeling approaches are commonly utilized to solve these shortcomings for land cover forecasting (Ruidas et al., 2022). The agent-based models, such as the CA-Markov, which blends cellular automata with Markov chain models, are the most extensively used hybrid modeling methods (Xu et al., 2019). The model benefits from integrating the capabilities of cellular automata to represent spatial heterogeneity in a complex set with Markov's lengthy forecast. Integrating dynamic modeling techniques can alleviate the drawbacks of a single model because the unified used models will supplement each other (Huang & Kadali, 2008). Furthermore, integrated models that employ combination modeling methodologies will provide a better understanding and enhanced land use change modeling (Parker et al., 2003). In light of this, many researchers have used CA-Markov model to monitor and simulate LULC changes all over the world (Wei et al., 2015). Accordingly, this approach is used in this research to acquire reliable results for Burayu Town.

Urban decision-makers work in surroundings that are complicated and constantly changing, therefore they need current knowledge that is provided by effective data extraction tools. Although the urban environment is thought to be transformed, it still comprises of the natural and artificial environments, both of which are influenced and changed by humans. Cities today are encroaching on their surroundings without considering the negative social and environmental effects that their "urban footprint" is having on all spheres of life. Urban areas themselves are changing due to the transition from one type of land cover to another, which is a global process.

Post Classification

Landsat5-TM, Landsat7 ETM+, Landsat5 TM, and Landsat8 OLI were all used in the study, along with other auxiliary data collected. The LULC map classifications were generated using the Random Forest Package from the Comprehensive R Archive Network. Focus group discussions and key informant interviews were also conducted to create a triangulation.

Accuracy Assessment

Both the Kappa coefficient and the overall accuracy (OA) are frequently used accuracy measurements (Liu et al., 2007). A random sampling approach is frequently employed in land cover assessment. For independent validation in this study, annual fixed validation samples were used. In comparison to training sample extraction, different sampling methods and sample distributions were used. First, we created validation samples at random for each LULC class. Then, based on local knowledge, we established our experience with sample interpretation. Subsequently, fine-resolution images in Google Earth (GE), reference data from interviewees, archive maps, and group discussions were used to verify the 1990, 2000, and 2010 classified satellite images of the study area. Furthermore, for the purpose of assessing the accuracy of the classified image of 2020, ground truth points were collected using handheld GPS during field observations as well as Google Earth; discussions with elders were also used to identify the LULC type of the samples. In order to identify the land cover classes to which the ambiguous land cover types belonged, ground-truthing was done with the assistance of the elderly local farming community. To confirm the quality of the validation samples, we rechecked the modified samples over the entire time period using time-series Landsat data and Google Earth images.

The overall accuracy and kappa coefficient were calculated using Equations 4 and 5, respectively.

$$\text{Overall accuracy(OA)} = (\sum_{i=1}^r x_{ii})/x \dots\dots\dots (\text{Eq4})$$

where xii is the diagonal elements in the error matrix, x is the total number of samples in error matrix.

$$\text{Kappa Coefficient (K)} = \frac{n \sum_{i=1}^r x_{ii} - \sum_{i=1}^r x_i + x + i}{n^2 - \sum_{i=1}^r x_i + x + i} \dots\dots\dots (\text{Eq5})$$

where r is the number of rows in the matrix, x_{ii} is the number of observations in row i and column i , x_{i+} and x_{+i} are marginal totals for row i and column i respectively and n is the total number of observations.

Model Evaluation

Upon calibration and validation, a scenario-driven CA-Markov model technique was employed to anticipate future LULC changes. We simulated LULC alterations under business as usual (BAU) scenarios using the Markov-cellular automata (M-CA) model. The images from 2000 and 2010 were utilized for calibration and optimization of the Markov chain technique, while the image from 2020 was used to validate CA-Markov predictions (Koko et al., 2020). The changes between two time periods (time 1 and time 2) are modeled using real land cover maps in order to forecast the land cover map at time 3. The simulated land cover maps (time 3) are compared to the real map (time 3) to validate the model. Furthermore, the land cover map from 2000 is the earliest image (time 1) and 2010 is the most recent land cover map (time 2) to simulate the projected 2020 map (time 3), which will be compared to the real map from 2020. In light of this, the simulated land cover map was compared to the actual map to verify the model's accuracy. The 2020 classified land cover map was used as a foundation map to anticipate potential LULC in 2030 and 2050 using transition probabilities from 2010 to 2020.

As stated in the preceding section, the study profited from the compilation of data from numerous sources. Similarly, many data analysis methodologies and tools are used in this study. Given that the topic of the investigation included qualitative and quantitative data, an integrated combination of both approaches were used in data gathering and analysis. The spatial data was analyzed using a combination of image processing and GIS software programs. For the analysis of the socioeconomic data Multivariate logistic regression and Paired sample t-test were used in this research.

3.6.2. Socioeconomic data analysis

Regression analysis was used to analyze the socioeconomic data obtained from the household survey. This analytic method is a modeling technique that looks at how an outcome and an independent variable are related (Pallant, 2020). Furthermore, a paired-samples T-test technique was used to compare the mean of a single group that was looked at two distinct times (Tong & Chen, 2002). In the current research, the paired t-test was used to identify the effects of urban

expansion by comparing land holding size, crop yield production and market value of houses before and after the land use change. In addition to Microsoft Office, SPSS software (version 26) was utilized for statistical analysis of the socioeconomic survey data of representative households. For the analysis of qualitative data collected through interviews and focus group discussions, concepts were taken from the responses and analyzed correspondingly. Theoretical arguments and empirical studies from the literature on the trends of LULC alterations, expropriation, horizontal development of urban centers and their impacts on the livelihoods of farmers were analyzed.

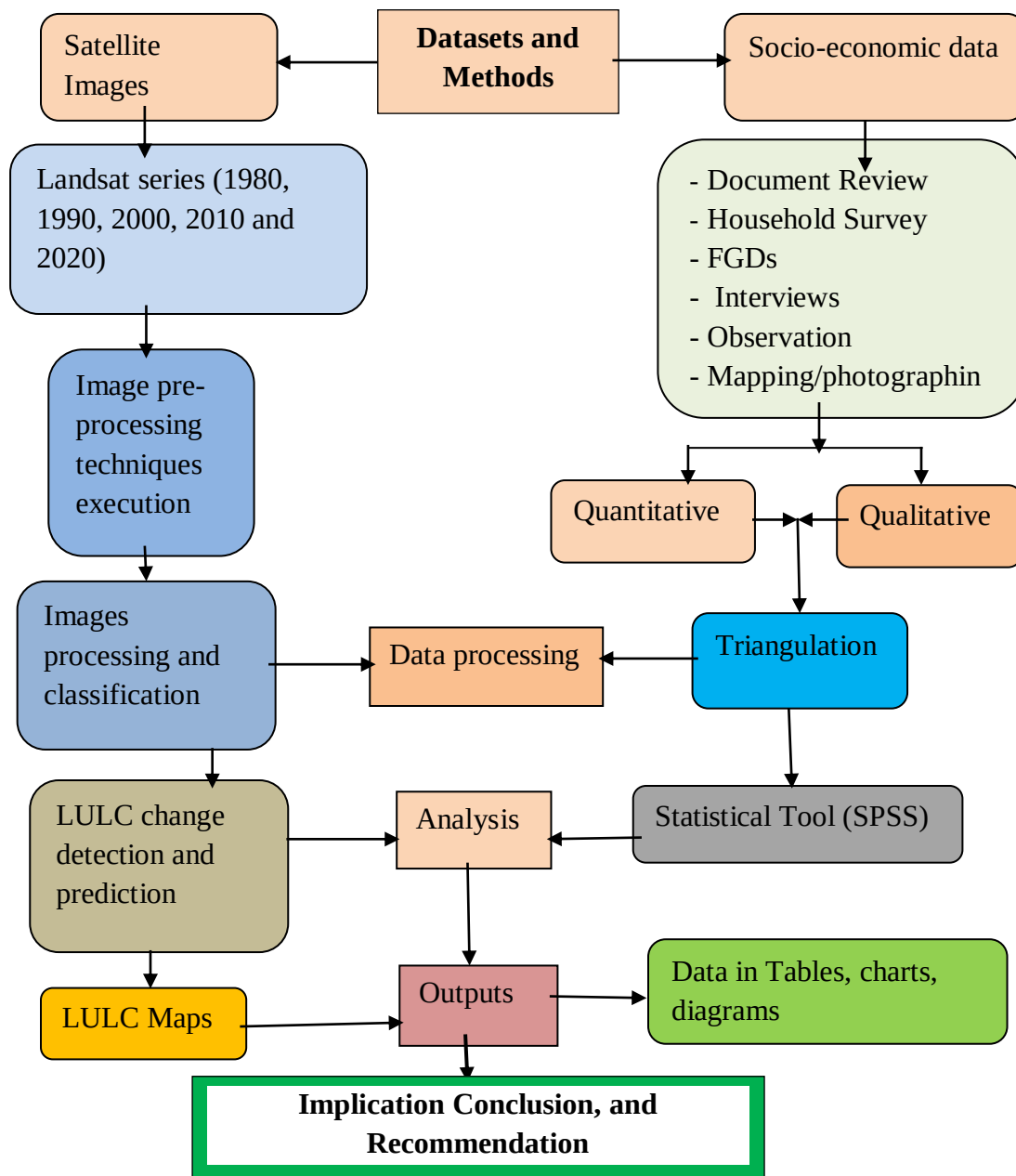


Figure 3.4: Datasets and Methodological Flow Chart (Compiled by the author)

The triangulation approach is employed between quantitative and qualitative sources of information to capture critical information that may be lost during the field survey and document analysis, as well as to validate information that may be one-sided. The datasets and methodological flow chart in **Figure 3.4** shows the following process.

- Satellite images that are freely available for the appropriate times are selected and secured for the selected periods.
- Image pre-processing techniques are applied and Image is processed and categorized.
- Land use –land cover changes are detected (and predicted); then
- LULC maps are produced that are verified with ground-truthing where ambiguities exist
- Parallel to the satellite image analysis, socio-economic data is gathered, analysed and it is used to supplement the satellite image processing task.
- Socio-economic data is analyzed and results are presented in tables and graphs.

CHAPTER IV: RESULTS AND DISCUSSION

This chapter presents the findings and discussion of the findings along the specific objectives of the research. First, findings of the analysis of the trends of historical spatiotemporal LULC changes and forecasting for the future are presented. Second, the analysis and discussion of laws pertaining to property rights and expropriation laws and the practical implementation of the laws during expropriation and compensation for urban expansion are presented. Third, the impact of urban expansion on the livelihood of farming households is discussed. The results of the research in the three objective areas are discussed in sequence in light of former knowledge on the issues and the current revelations from the study.

4.1. Monitoring and Predicting Land Use/ Land Cover Changes

Globally, the landscape of the natural settings particularly in developing countries such as Ethiopia has undergone dynamic changes as a result of various factors. Among these factors the unplanned utilization of land poses challenges to achieve sustainable development. The study of such dynamic changes using old methods, such as surveying, is time-consuming and has various limitations. Thus, multi-temporal digital satellite data can be used to detect the magnitude and nature of changes in spatiotemporal dimensions with the intent to manage scarce resources using scientific methods for long-term sustainability. Accordingly, this section looks into the dynamics of land use and land cover changes in Burayu town between 1980 and 2020 using satellite images retrieved from the USGS repository, and forecasts for 2030 and 2050 so as to understand transformations in the landscape which could be used to advise policy makers and urban-regional planners to achieve sustainable development.

In this analysis the area under investigation for LULC change is delimited as the area of Burayu Town as provided in its 2014 master plan. This area (the 9,057 ha) was adopted as the area for comparison of LULC changes in the different periods for the following reasons. 1) The pre-2014 development plans/master plans did not provide detailed delineation of the urban areas they represent which could be used to compare changes. 2) the satellite maps show the land use class of the time they were taken reasonably clearly. It was also possible to have ground control points through key informant participation to delineate areas for comparison with the 2014 master plan. Hence the LULC change over the study period could show the intensity of change per land use

class and this knowledge could be used to understand the change modality and use it for informed policy making and planning practice.

4.1.1. Analysis of land use/cover changes

The land use/land cover classification used in this analysis is based on the FAO scheme presented in Table 3.3 in this dissertation. Accordingly, based on the classification of satellite images into different LULC categories (agricultural, built-up, vegetated lands, grasslands, and water bodies) statistical data were derived for further analysis and inferences in land cover size, amount of increase or decrease in the land cover value during the study periods. Accordingly, the data secured from classified images was applied to analyze the LULC changes of Burayu town in area in hectares, the amount of growth or decline in the land cover value over two successive periods, the rate of changes in the values, and in particular the trend of the built-up area expansion at the expense of other LULC classes (**Table 4.1**). These five main LULC classes were developed via shift from one LULC class to another during classification. This is so, for example, the built-up land cover class was constructed from a number of other land cover classes such as shifts from grassland, vegetation, agricultural, or water bodies.

Table 4.1: Land use/cover change between 1980 and 2020

LULC Categories	Land use/cover change									
	1980 LULC		1990 LULC		2000 LULC		2010 LULC		2020 LULC	
	Ha	%	Ha	%	Ha	%	Ha	%	Ha	%
Agricultural lands	2488.0	27.8	2783.8	31.1	2647.3	29.5	2553.4	28.5	1324.1	14.8
Built-up	71.0	0.8	157.6	1.8	498.2	5.6	1438.5	16.1	4161.8	46.4
Vegetated areas (Trees)	3083.0	34.4	2977.2	33.2	2235.1	24.9	2325.5	26.5	1919.0	21.4
Grass land	3182.0	35.5	2926.2	32.7	3474.4	38.8	2505.7	28.7	1455.1	16.2
Water body	139.0	1.6	119.1	1.3	109.4	1.2	139.6	1.6	103.3	1.2
Total	8963	100	8963	100	8964	100	8963	100	8963	100

Source: Own computation from classified images

The mapping of LULC change alone is insufficient to investigate the overall transformation in order to design possible management systems for efficient utilization of natural resources. As a

result, it is very important to associate such changes in every date observed with the major drivers and various other parameters that explain why one land use has gained and the other/s have lost and why a class of land use dominated the others during each period.

4.1.1.1. Land use/cover analysis of the 1980

The satellite imagery of 1980 used in this study was taken five years after the Derg regime changed the modality of land ownership with Proclamations No 31/1975 and No 47/75, which nationalized all rural and urban land. The two proclamations changed the former private ownership of land government ownership; in rural areas the ‘land to the tiller’ protests gave use rights to farmers while in urban areas extra rental houses were confiscated and made property of the government and the former tenants were given secure rental rights for indefinite period of time. According to the statistical data produced from the classified image of 1980 (**Figure 4.1**), which is provided in table 5.1, grass land, vegetated land, and agricultural lands accounted for 35.5 percent, 34.4 percent, and 27.8 percent, respectively, while built-up area accounted for just 0.8 percent. The 1980 data portrayed the prevalence of agriculture over all other land use classes indicating the dominance of rural communities and their mode of life. Built-up area was quite tiny in comparison to other LULC groups. Burayu was designated as a rural administrative unit in 1972 under the West Showa At biya (county) of Walmara district, despite the fact that some urban public goods existed and served the residents. Furthermore, according to data from the profile of Burayu town the majority of the inhabitants were engaged in agricultural activities for the sustainability of their livelihoods.

In the Pre-1975 period, the Ethiopian system of land tenure was based on the feudal system, as stated in the literature review section of chapter two. This meant that different groups of people, including the government, the church, the community, and private individuals owned different sizes of land. Urban centers in Ethiopia, especially the large ones like Addis Ababa city, Jima town, Harer, Gore, and others, have suffered from unplanned and spontaneous growth as a result of the various ownership patterns of land tenure. The Derg administration abolished landlord privileges and altered the rights of land ownership in both rural and urban areas. In urban areas, the change in ownership rights discouraged illegal settlements to some extent. However, and paradoxically, the nationalization of urban and rural lands, as well as the confiscation of extra houses, exacerbated the housing shortage in urban centers, particularly in larger urban centers

like Addis Ababa. This was due to the law which made land based commodity production illegal and lack of a system to replace the former landlord based rental housing development system.

The 1980 land use-land cover situation shown in Figure 5.1 for the areas which now became Burayu Town indicated that core urban center of Burayu Town itself was more of an agricultural area. The built up area stretched along the Addis Ababa-Holeta main highway. Furthermore, the tree covered land is more in the east (adjacent to Addis Ababa) and in the north (which is mountainous area). Grass land and agricultural land are interwoven indicating the interchangeability of the two land use classes in the normal rural way of life and land use scenario. The water body shown on the satellite image is a manmade water reservoir, the Gefersa Water Dam built in 1938 (later modified in 1954) and the smaller dam located north of the main dam was built in 1966.

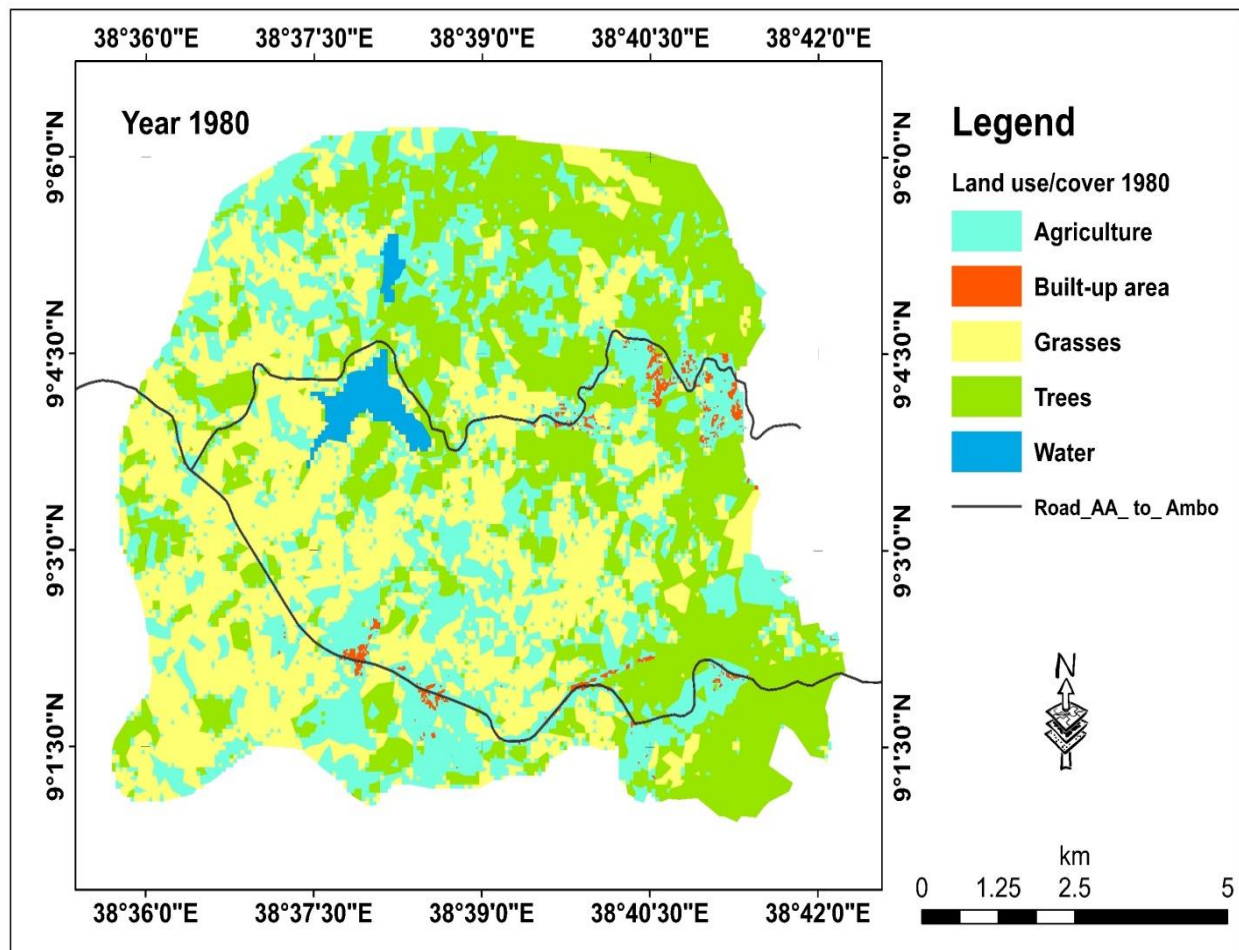


Figure 4.1: Land use/cover of Burayu Town (1980/12/25)

4.1.1.2. Land use/cover analysis of the 1990

The LULC statistical data for classified 1990 satellite picture (**Figure 4.2**) demonstrated that grass land, vegetated land, and agricultural areas accounted for 32.7 percent, 33.2 percent, and 31.1 percent, respectively (**Table 4.1**). Furthermore, between 1980 and 1990, the built-up area of the town rose by 121.5 percent, making up 1.8 percent of the LULC as a whole. In light of this, the growth in the built-up area indicated the town had been expanding horizontally, encroaching on various types of land usages, including agricultural fields, in the nearby rural areas. The built up area is seen to have encroached on to agricultural and grasslands which were serving as the primary sources of income for the local community.

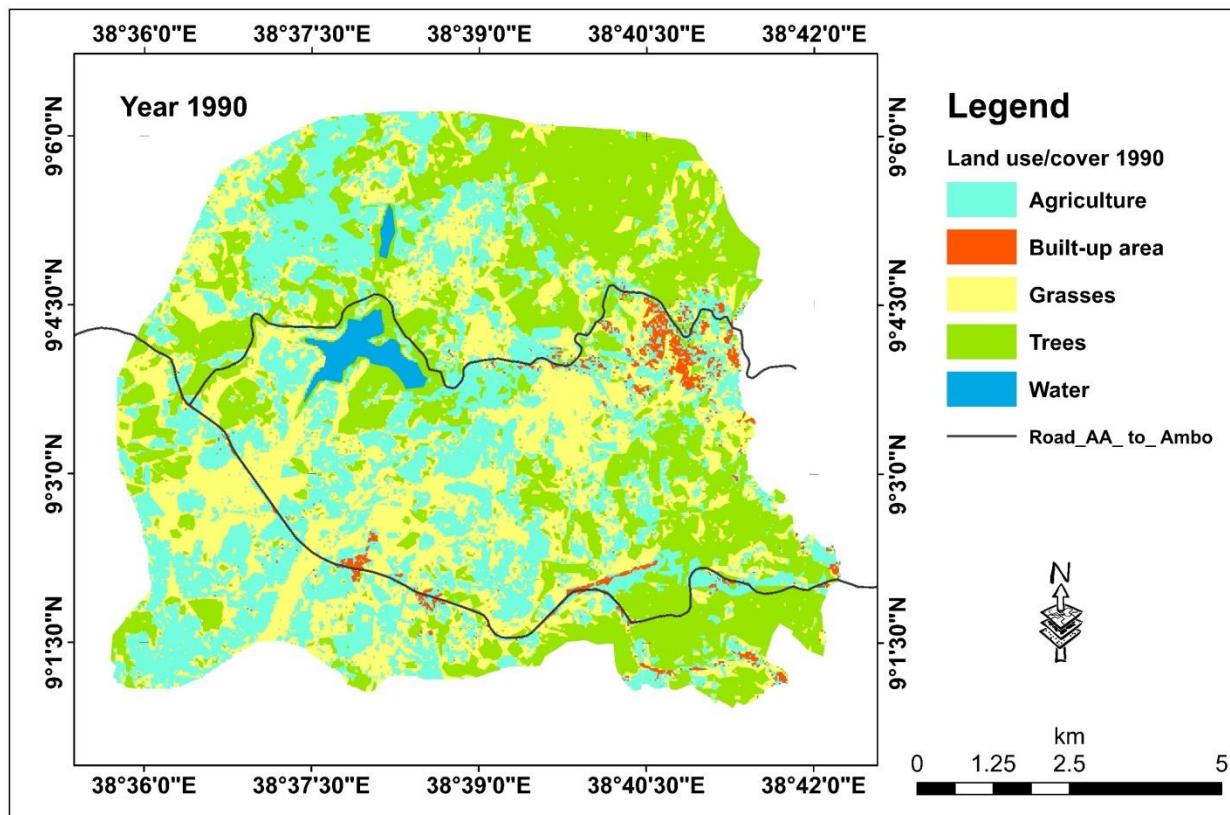


Figure 4.2: Land use/Land cover (1990/12/18)

In spite of being established as a settlement in 1946, Burayu Town had a population of only 4,138 in 1984 as per the Central Statistical Authority of Ethiopia (CSA). After the 1975 nationalization of all lands, squatter settlements were discouraged in the town due to government control on the construction of additional buildings and fear of the community to lose their

property through confiscation. Thus, with the increment of the town population, housing shortage remained the primary social and economic issue. By 1986 certain changes in home production were considered through the engagement of the private sector; however, housing shortage persisted with no proper corrective action being taken. This implies that even if the Derg regime made some adjustments in residential unit production through the involvement of housing cooperatives and the private sector, it did not adequately respond to the housing need. There were driving forces behind population increase of the town and the subsequent increase in housing need. These include migration in search of job opportunities, search for low-cost rental housing compared to Addis Ababa, and in search of land for the construction of informal buildings, i.e. economic factor; and due to the proximity of the town to the capital city of Ethiopia, Addis Ababa i.e. geographic factors.

The 1990 image shows the land use changes made up until 1990. In comparison to the 1980 image, agricultural land increased by about 12%; the built up area more than doubled (121%) while the vegetated area decreased by 10% and the grassland decreased by 8%. The water body showed a slight change and this might be due to drought than change in land use. The increase in the coverage of agricultural land could be thought to be due to the increase in the number of new inhabitants in Burayu town and the leasing out of agricultural land to these new comers by former landholders.

4.1.1.3. Land use/cover analysis of the 2000

The statistical data retrieved from the classified image of 2000 (**Figure 4.3**) revealed that 24.93%, 38.76%, and 29.53% of the land was vegetated, grassland, and agricultural land, respectively (**Table 4.1**). Additionally, the built-up area and the water body accounted for 5.56 and 1.22 percent, respectively.

The 1990s saw a significant policy change in Ethiopia. In spite of the retention of the public ownership of land, the EPRDF government which took power in 1991 introduces sweeping reforms in the economic, administrative and political sectors. For instance, the decentralization policy of the government facilitated the injection of funds into regional states and generated investment in regional towns as well as in the metropolitan area of Addis Ababa. Furthermore, the government paid close attention to the development of residential units. There was also an action taken in the direction of market reform policy, which assisted the participation of the private sector in various economic sectors including in housing production. Accordingly, many

private real estate developers took land from Addis Ababa as well as in almost all urban centers of the Oromia Special Zone surrounding Addis Ababa (which includes Burayu town).

In urban centers which experience population increase and investment activities rural areas surrounding towns are usually reclassified under town administrations. The same was true for Burayu Town. According to the 1994 census report, a total of 20,329 people were residing in Burayu town of which 10,302 were urban residents and 10,027 rural residents in the reclassified kebeles under the town's administrative settings. During the same decade, Burayu town was given legal recognition in 1996 as an urban administration unit rather than as one of the kebeles in the Wolmera district as was the case before.

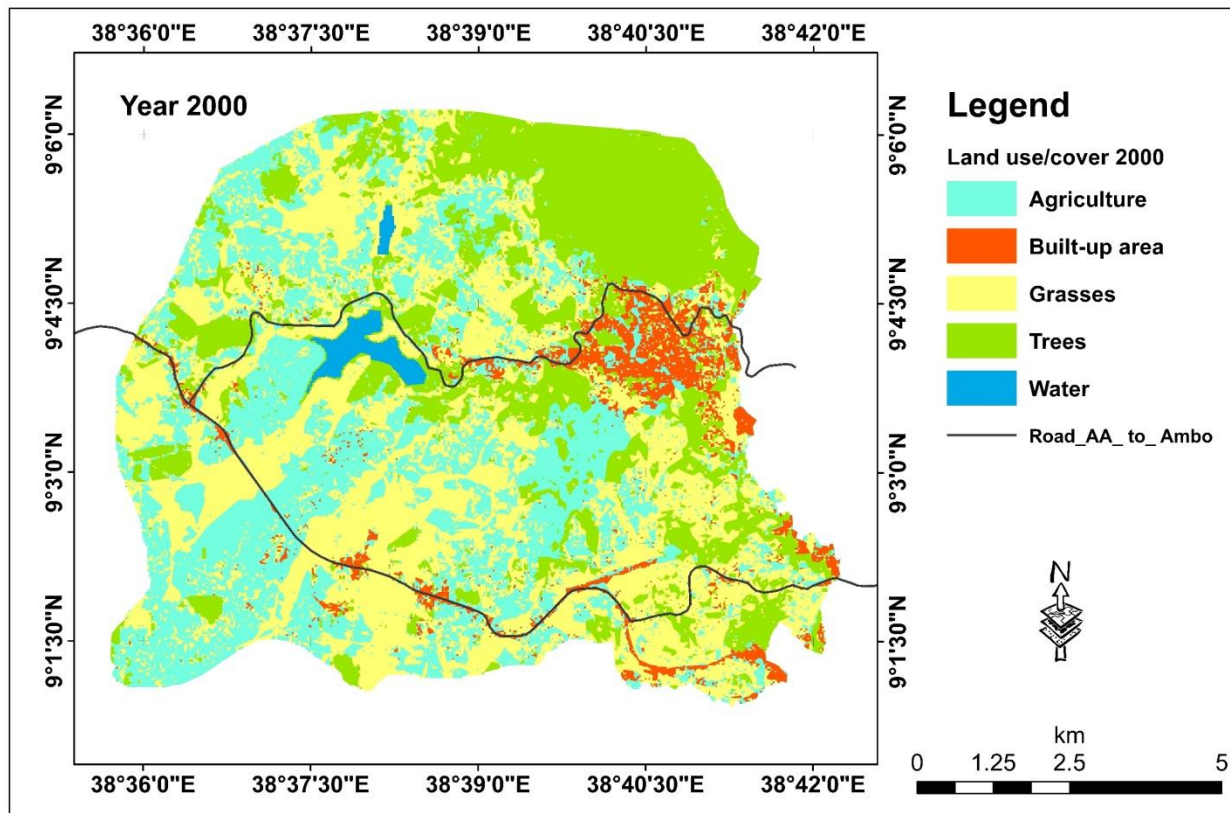


Figure 4.3: Land use/cover (2000/12/05)

According to the classified images from 1980, 1990, and 2000, the built-up area has gradually expanded over time. This trend indicated that the local agricultural population was being evicted as the town grew horizontally into the surrounding areas.

4.1.1.4. Land use/cover analysis of the 2010

According to the statistical data of the classified image of 2010 (**Figure 4.4**), as shown in table 5.1, vegetated land, grass land, and agricultural land accounted for 26 percent, 28.7 percent, and 28.5 percent, respectively. While the built-up area and the water body account for 16.1 percent and 1.6 percent, respectively.

The government of Ethiopia developed and implemented industrial development policy in 2004 aimed at attracting local and foreign investors in order to create job opportunities. Accordingly, in 2005, the government established industrial development corridors across the country, choosing 32 urban centers from four regional states of Oromia, Amara, South nation and nationality, and Tigray. In line with this, eight of the 32 planned urban centers for industrial corridor development were in the Oromia Special Zone Surrounding Addis Ababa (Finfine), of which Burayu was one.

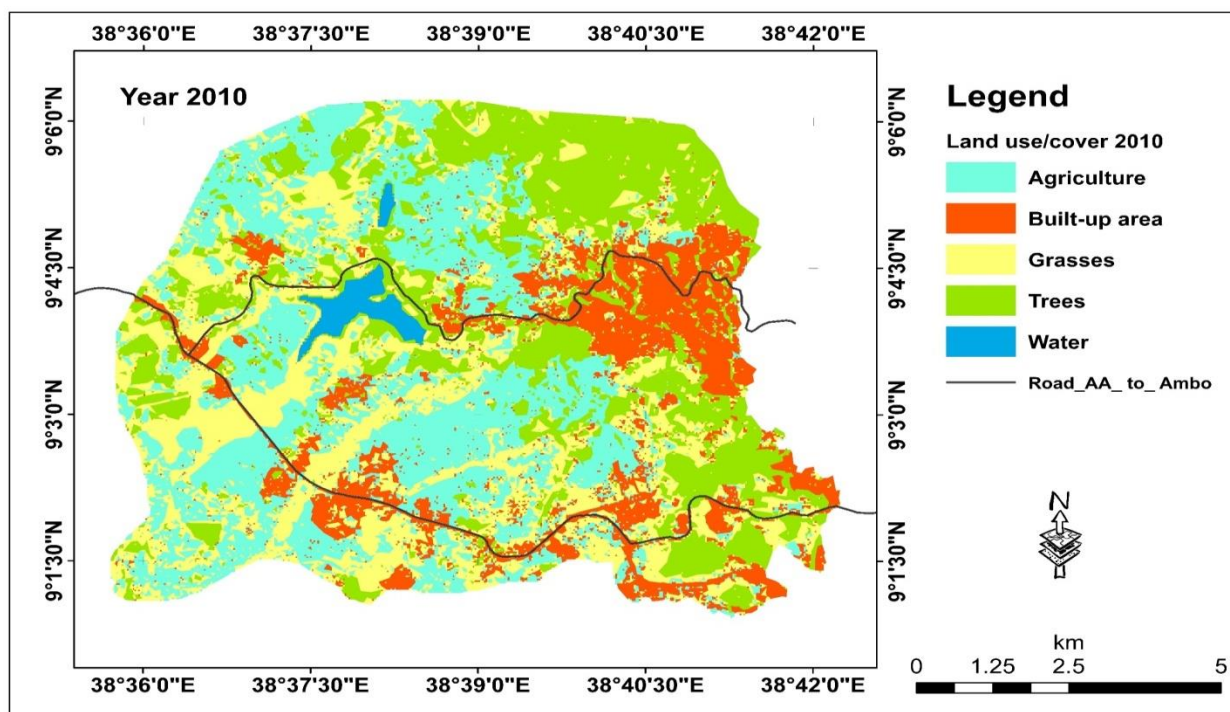


Figure 4.4: Land use/cover (2010/12/09)

Burayu town was given zonal level administrative status in 2006 within a span of just ten years since it was recognized as an urban center. A zonal level administrative status relegates units to the third tier of government structure (after federal and regional tiers). The zonal administrative status of Burayu boosted its importance as a preferred location for investment and residential

areas. In accordance with this, the town reclassified additional adjacent rural areas under its administrative jurisdiction and organized them into six kebeles; namely: Burayu Keta, Leku Keta, Gefersa-Burayu, Gefersa-Guje, Gefersa-Nono, and Melka-Gefersa. As a result, according to the report of the central statistics agency of Ethiopia in 2007, the population of the town rose to 63,873, implying that it increased by more than three times compared to the previous census period in 1994 (which was 20,329).

The other contributing factor for the expansion of Burayu town was the informal land transaction due to fear of losing use rights by forced expropriation by the municipality. As stated in the 1995 Constitution (Article 40/3), land ownership is vested in the government and people of Ethiopia and the use right could be revoked by paying compensation. However, as will be shown in Section 5.2 of this dissertation, landholders sell their land informally (under extra-legal condition) to willing buyers in fear of unfair compensation payment by the municipality. . In light of this, the proliferation of informal settlement got worse in the town and the surrounding areas. According to Burayu town administration, over 45% of the population of the town reportedly lives in these informal settlements. Even though there was informal construction in all six of the newly incorporated kebeles, its severity was exponentially greater towards the outskirts, where land was more easily accessible and generally costs less than in the center. Thus, a significant amount of land was converted from rural land use like agriculture, forestry and grassland to built-up areas like residential, commercial, and social service land uses.

The 2010 satellite map shows the town has grown along the major asphalted highway connecting Addis Ababa to Holeta via the new highway through Ashewa Meda and the old route through Asco. In addition to the linear development along the asphalt roads, the built up area extended in every direction by side of access roads (such as Ashewa Meda to Fistula Hospital; the municipality office towards Ane Dima; and Kella to Menagesha Forest). Generally speaking, construction took place without taking into account the provisions of the development plan of 2001 and its revised version of 2006.

Furthermore, the proximity of the town as well as its suitability for residential and investment activities due to the presence of various infrastructure, access to labor force, and other natural resources have attracted many people, resulting in the expansion of the town outwards to rural areas. In addition to the aforementioned points, the establishment of the Oromia Special Zone Surrounding Finfine in 2008 has become one of the main factors for attracting various industrial

developments and creating job opportunities. For that reason, many rural areas have been invaded by formal and informal methods of expropriating land from agricultural communities, with unfair compensation valuations and payments. As a result, many farming communities have been evicted from their land which was their main source of income. As seen in the classified images from various times, the trends of horizontal expansion of urban areas have been increased over time at the expense of adjacent arable and other LULC categories.

4.1.1.5. Land use/cover analysis of the 2020

According to statistical data obtained from the 2020 image (**Figure 4.5 and Table 4.1**) the built-up area has greatly increased at the expense of other land cover classes and accounted for almost half of the total area of the town, i.e. about 46.43%. It has nearly tripled since the previous decade while the LULC classes of agriculture and grass have decreased by half over the previous decade, accounting for 14.77% and 16.23%, respectively.

Although the government of Ethiopia launched a number of initiatives, including tax incentives and swift procedures for domestic and foreign investors, the employment possibilities they have generated did not lower the unemployment rate in the nation. Burayu is a town where recent investment growth has been observed in all industry types, ranging from light to heavy industries. Almost all of the investments seen in the town are from the private sector, which include trade, hotel and tourism, manufacturing industry, and social services. As indicated under Section 4.1.4 of this dissertation, between 2009 and 2014 about 430 hectares of land was allocated to investment out of which real estate investment occupied approximately 87 percent.

In addition to the above policy the government also revised the urban land lease holding through proclamation No 721/2011. The implementation of this law prompted the municipality of the town to embrace the adjacent rural areas of the Wolmera district as the site of expansion via a reclassification mechanism in its administrative settings. As a result, the 2006 Integrated Development plan of the town was revised in 2014, and the neighboring rural areas were reclassified under town administration, which brought the total area under the town's jurisdiction to 9,057 hectares. Accordingly, the municipality prepared a large amount of vacant land for various land uses such as commercial, social services, and residential through expropriation mechanisms and transferred the plots to third parties through leasehold modality.

In the 2010-2020 decade following the implementation of the urban land holding modality through lease system, the construction of various structures and buildings such as the establishment of manufacturing industries, warehouses, social services, residential buildings (through real estates, housing cooperatives, government sponsored condominiums, as well as individual houses) increased at an alarming rate. Furthermore, the population of the town grew at an unprecedented rate due to the economic, political, and geographic factors. According to the municipal administration of Burayu Town, the population of the town was estimated to be 375,653 in 2019 and by 2022 it was estimated to be around 495, 000. To this end, the town administration allocated 3,000hectare of land to cooperative housing developers with a total membership of around 15,672persons (BTA, 2020).

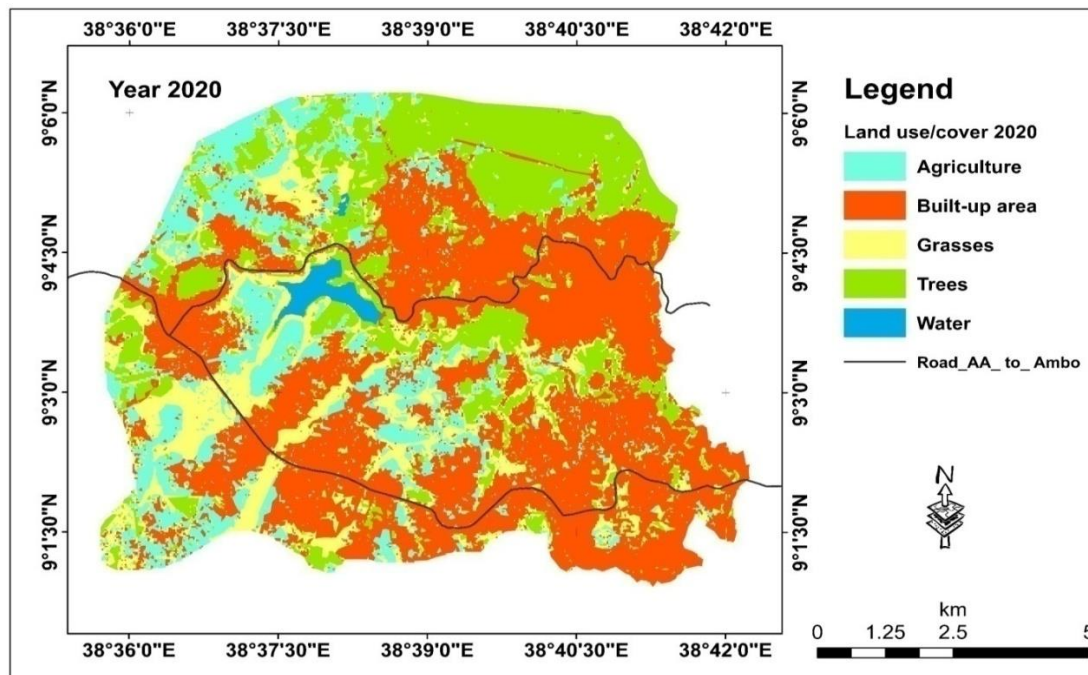


Figure 4.5: Land use/cover (2020/01/19)

According to the 2019/20 performance report of the OLDMB, the town has taken the top status in the proliferation of informal settlements at the regional level. Furthermore, one of the main reasons for the horizontal expansion of the town was identified as being the poor imbalance in the demand and supply of land especially for residential buildings. The difference between the informal market for land and the compensation payment by the municipality, and in some cases expropriation without paying compensation, was one of the main causes for the informal sell of plots and the rampant proliferation of informal settlements.

4.1.2. Change Detection for Burayu town (1980 – 2020)

The landscape of any spatial setting is in a state of continuous change due to different factors such as human activities, natural disasters, and so on. A number of spatiotemporal scales are perceived as an alteration of the physical character of the land. As a result, changes in different LULC of an area are understood by the amount of specific land cover class increasing or decreasing when measured in terms of real coverage. Changes in certain LULC have an effect on others because gaining and losing land covers comes at the expense of other land covers in that area. Accordingly, **Table 4.2** and **Figure 4.6** below show the dynamics of change detection in Burayu town across the study period of 1980 to 2020.

Table 4.2: LULC change analysis: % of area change in hectare

Classes	1980	1990	2000	2010	2020	% Change (1980-2020)
Agriculture	27.76	31.06	29.53	28.49	14.77	-12.99
Built-up area	0.79	1.75	5.56	16.05	46.43	+ 45.64
Grasses	35.50	32.65	38.76	27.96	16.23	-19.27
Trees	34.40	33.22	24.93	25.95	21.41	-12.99
Water	1.55	1.33	1.22	1.56	1.15	-0.4
Total	100	100	100	100	100	
Note: The total area of Burayu town as provided in the 2014 master plan is the basis for comparison for all years. This implies, the changes in land use classes is against a fixed area of 9,057ha (i.e. taking 9,057ha as 100%)						

Source: Extracted from classified images of 1980, 1990, 2000, 2010 and 2020

Along with mapping the land cover of all classes during each period of the study, it is critical to compute between successive decadal LULC changes in order to illustrate the continuous trends of spatiotemporal patterns in the study area. For instance, the built-up area of the town has been increasing significantly from the beginning to the end of the study time, i.e. +45.64. This implies that the built-up area expanded at the expense of other land use categories. However, the remaining LULC change detection dynamics of grass land, vegetated land, agricultural land, and water body account for -19.27, -12.99, -12.99, and -0.4, respectively, between 1980 and 2020. In general, **Figure 4.6** below depicts the overall trends and patterns of LULC change of Burayu town between 1980 and 2020.

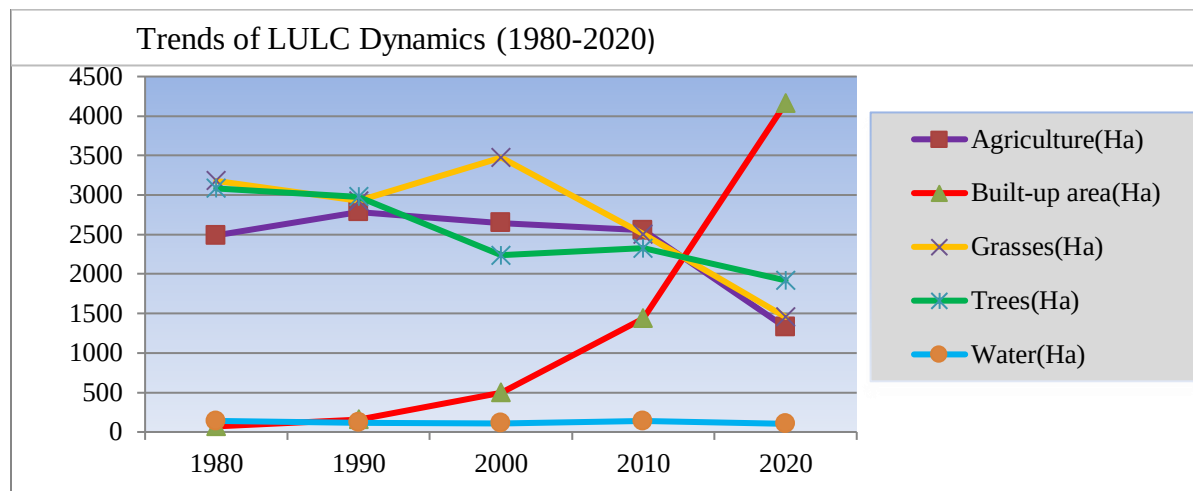


Figure 4. 6: Trends of land use/cover change (1980-2020)

4.1.3. Land use/cover change matrix for Burayu town

Change matrix is the process of identifying differences in the state of any phenomenon by observing it at different time intervals such as LULC change (RidLu et al., 2011). This suggests that anthropogenic effects and/or natural factors have both contributed to changes in land cover in a specific geographic context. The LULC of the urban periphery experiences changes as a result of demographic, economic, political, and geographic proximity factors (Kanianska et al., 2014). In the process of change detection analysis, the changing matrix plays an important role in exploring the actual trends that have occurred. Hence, this method is useful for determining whether or not a LULC change exists between two time series. It also shows the trends, magnitude, and nature of changes that have occurred in each category of land cover classes. Changes may not occur in some cases if there is no difference between the previous and latest values.

It is essential to comprehend the interpretations during the process of conducting change matrix in order to analyze the change detection of the study area. In order to calculate the change matrix of two periods, LULC data must be entered into the rows and columns of the analysis table (as shown in Table 5.3). Accordingly, the column values of the matrix represent the magnitude of the class for the first year of analysis (in the case of Table 5.3 that is 1980) whereas the row values show the magnitude of the class in the final year of analysis (that is 1990). Some diagonal values will be created when having established the change matrix and these values show the magnitude of the unchanged values of the corresponding class that remained without change and emerged in the initial and final images used for the analysis.

Table4.3: Land use/cover transformation (1980 -1990)

1980	Classes	Agriculture	Built up	Grasses	vegetation	Water	Row Total	Class Total
	Agriculture	1050.84	0	1272.69	469.53	4.95	2798.01	2818.53
	Built up	20.25	68.94	22.5	40.86	0	152.55	154.17
	Grasses	830.43	0	1280.88	770.22	3.87	2885.4	2907.18
	Trees	555.66	0	581.76	1785.24	21.06	2943.72	2966.31
	Water	0.63	0	7.65	0.54	109.44	118.26	119.16
	Class Total	2457.81	69.12	3165.84	3066.48	139.32	0	0
	Class Changes	1406.97	0.18	1884.96	1281.24	29.88	0	0
1990	Image Difference	360.72	85.05	-258.66	-100.17	-20.16	0	0

Source: Derived from the Landsat images of 1980 & 1990

The concept of '*class total*' is also essential. *Class total* values in the row matrix represent the magnitude of the class in the corresponding column, whereas class total entries in the column represent the total magnitude of the class in the final year in the corresponding row matrix. In line with these, the LULC change matrix of the study area between 1980 and 1990, 1990 and 2000, 2000 and 2010, as well as finally between 2010 and 2020 are depicted below in **Tables 4.3, 4.4, 4.5, and 4.6** below respectively.

By gaining mostly from the vegetated area (40.86ha), grassland (22.50ha), and agricultural land (20.25ha) the built-up area has risen more than twice during 1990 compared to the preceding 1980 in the area. Additionally, the area of agricultural land expanded in 1990 as a result of the encroachment of a sizable portion of grassland (1272.69ha), vegetation land (469.53ha), and water body (4.95ha). On the other hand the amount of grassland, vegetation, and water bodies dropped by 258.66 ha, 100 ha, and 20.17 ha, respectively, between 1980 and 1990.

Table4.4: Land use/cover transformation (1990 -2000)

1990	Classes	Agriculture	Built up	Grasses	Vegetation	Water	Row Total	Class Total
	Agriculture	1445.94	0	898.38	334.26	0.9	2679.48	2679.57
	Built up	125.37	152.73	155.70	54.99	0	488.79	489.42
	Grasses	1014.93	0	1447.11	945.99	1.8	3409.83	3409.92
	Trees	216.45	0	387	1606.41	11.13	2221.29	2221.29
2000								

	Water	0	0	0.09	4.5	104.13	108.72	108.72
	Class Total	2818.53	154.17	2907.18	2966.31	119.16	0	0
	Class Changes	1372.59	1.44	1460.07	1359.9	15.03	0	0
	Image Difference	-138.96	335.25	502.74	-745.02	-10.44	0	0

Source: Derived from the Landsat images of 1990 & 2000

The built-up area has grown by 335.25ha, as indicated in Table 5.4, as a result of the addition of a lot more land from grassland (155.70ha), agricultural land (125.37ha), and vegetated land (54ha). The change of government in 1991 opened the way for informal sell of land and the proliferation of informal settlements in addition to the formal ways of building residential buildings. Similarly, grass land increased by 502.25ha as a result of gaining additional land from agricultural land (1014.93ha), vegetation (945.99ha), and water bodies (1.8ha). On the other hand agricultural land, vegetation land, and water bodies were reduced by 138.96ha, 745.02ha, and 10.44ha, respectively. As seen in **Table 4.5**, gains from a variety of land use categories, including agricultural land (213.12ha), grass land (502.38ha), and vegetative land (218.97ha), contributed to an increase in the built-up area of 933.57ha between 2000 and 2010. The vegetative cover and water body both increased by 100.35ha and 29.16ha, respectively. The fact that there was a decline in the amount of grassland and agricultural land, respectively, by 132.75ha and 930.78ha, demonstrates how much the town had grown outward into the adjoining rural kebeles.

Table 4.5: Land use/cover transformation (2000 -2010)

2000	Classes	Agriculture	Built up	Grasses	Vegetation	Water	Row Total	Class Total
	Agriculture	1490.04	0.09	869.4	187.29	0	2546.82	2546.82
	Built up	213.12	488.52	502.38	218.97	0	1422.99	1422.99
	Grasses	721.26	0.45	1391.76	365.4	0.27	2479.14	2479.14
	Trees	250.47	0.36	638.01	1431.09	1.71	2321.64	2321.64
	Water	4.59	0	8.19	18.36	106.74	137.88	137.88
	Class Total	2679.57	489.42	3409.92	2221.29	108.72	0	0
	Class Changes	1189.53	0.9	2018.16	790.2	1.98	0	0
2010	Image Difference	-132.75	933.57	-930.78	100.35	29.16	0	0

Source: Derived from the Landsat images of 2000 & 2010

Table 4.6: Land use/cover transformation (2010 -2020)

2010	Classes	Agriculture	Built up	Grasses	vegetation	Water	Row Total	Class Total
	Agriculture	920.88	0	363.06	35.55	0.27	1319.76	1319.76
	Built up	1070.91	1422.99	1000.8	613.35	0.09	4108.14	4108.68
	Grasses	429.03	0	794.79	234.63	17.28	1475.73	1475.91
	Trees	126	0	319.68	1437.84	19.35	1902.87	1902.96
	Water	0	0	0.81	0.27	100.89	101.97	101.97
	Class Total	2546.82	1422.99	2479.14	2321.64	137.88	0	0
	Class Changes	1625.94	0	1684.35	883.8	36.99	0	0
2020	Image Difference	-1227.06	2685.69	-1003.23	-418.68	-35.91	0	0

Source: Derived from the Landsat images of 2010 &2020

As shown in Table 4.6, the built-up area increased by 2685.69ha between 2010 and 2020, at the expense of agricultural land (1070.91ha), grasses (1000.8ha), vegetation (613.35ha), and water body (0.09ha). The remarkable horizontal development of the town toward the outlying areas resulted in a reduction in other land use categories, including agricultural land, grassland, vegetation cover, and water bodies, by the amounts of 1227.06ha, 1000.69ha, 418.68ha, and 35.91ha, respectively. These findings are represented in **Figure 4.7**, which shows the loss and gain of different LULC classes from 1980 to 2020.

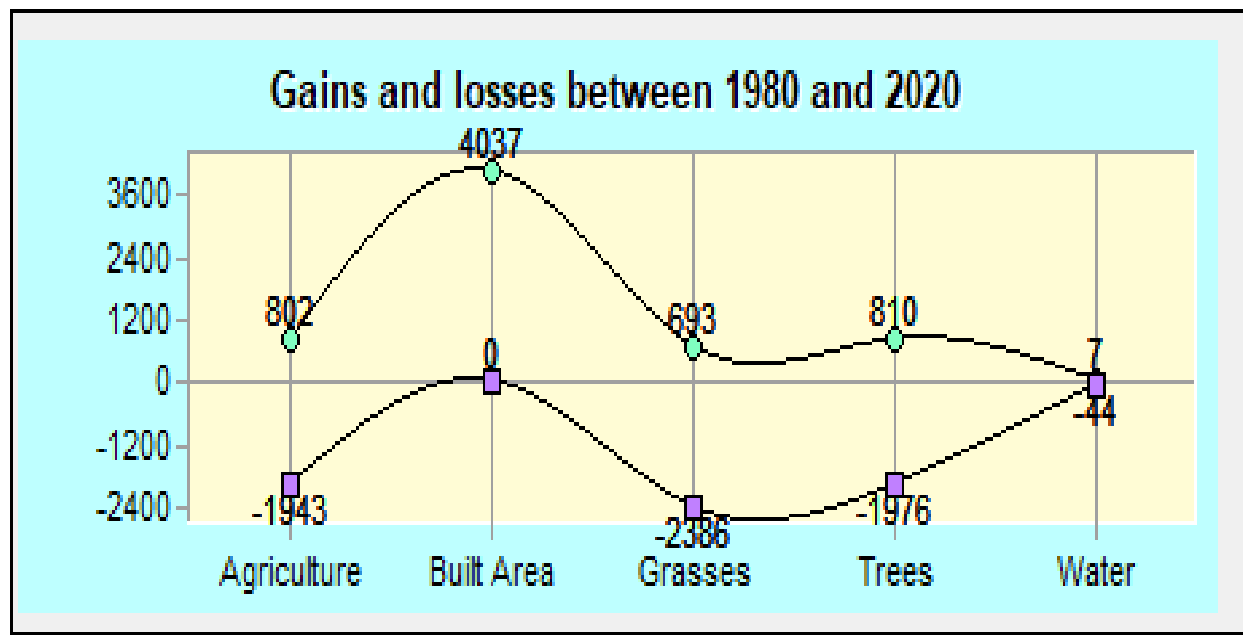


Figure 4. 7: Gain and lose of LULC of Burayu town (1980 to 2020)

According the LULC change analysis as depicted in Figure 5.8, agricultural land gained 802ha but lost 1943ha during the study period. Similarly, grassland gained 693ha while losing 2386ha, vegetation cover gained 810ha as losing 1976ha, and water bodies gained 7ha while losing 44ha. In general, the net change in various LULC classes during the course of the study period is depicted in **Figure 4.8**. The net change in built-up area between 1980 and 2020, as shown in figure 5.8 above, was an increase of 4037ha. While other land uses had a net drop in change due to the horizontal growth of built-up areas into neighboring regions, including agricultural land, grassland, vegetation covers, and water bodies, were 1140ha, 1693ha, 1166ha, and 37ha, respectively. In general, previously rural land use functionalities have been dramatically changed into the built-up of the study area, Burayu town, as a result of a variety of factors including demographic factors, economic factors, environmental factors, political factors, and geographic or proximity factors. As a result, such unprecedented horizontal expansion of urban areas into surrounding rural areas necessitates policy and planning intervention.

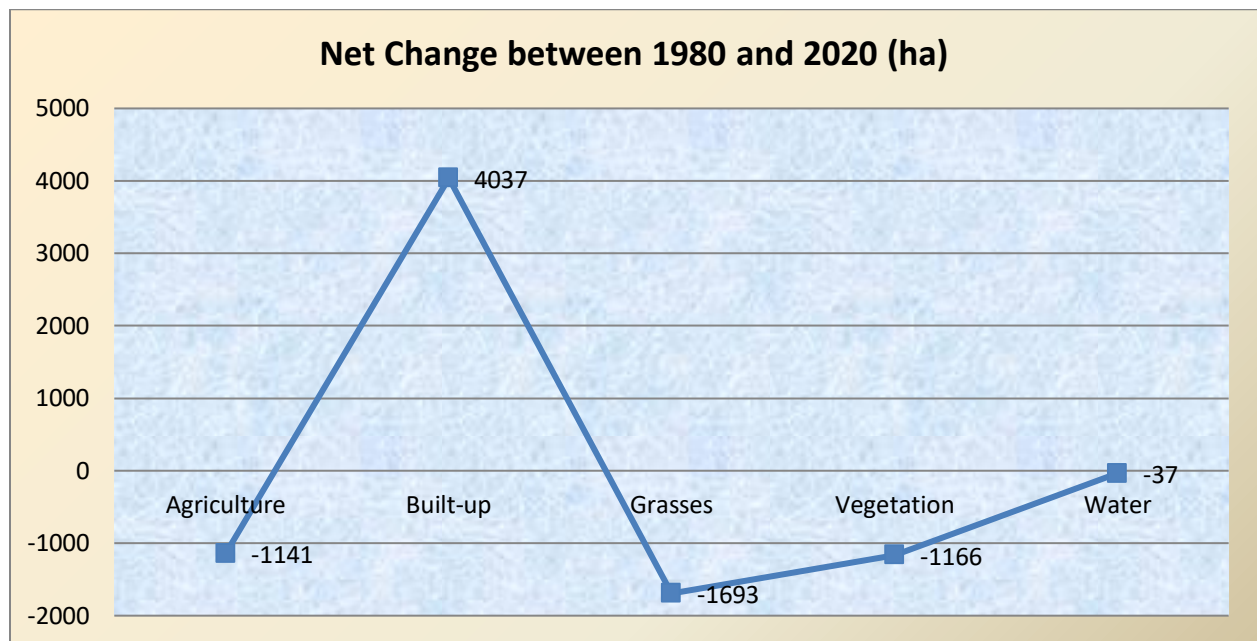


Figure 4.8: Net change LULC of Burayu town (1980 to 2020)

4.1.4. Spatial-temporal analysis of Burayu town built-up areas

5.1.4.1. Dynamic LULC Change Index

The horizontal expansion of the town has been continuous, with varying rates and directions towards the surrounding rural areas, as built-up areas detected from satellite images of 1980, 1990, 2000, 2010, and 2020 (**Figure 4.9**). In light of this, the built-up areas of the town in 1980 were limited or concentrated around Fili Doro, Ashewa Meda, and slaughterhouse in Burayu Keta kebele along the main road connecting Addis Ababa and Ambo. The horizontal expansion of the town was revealed in the 1990s around the previous settlement areas along transportation outlets to Addis Ababa, as well as around Fili Doro and Ashewa Meda corridor. By 2000, residents were undertaking an unprecedented proliferation of formal and informal settlements to address the housing shortage in Addis Ababa.

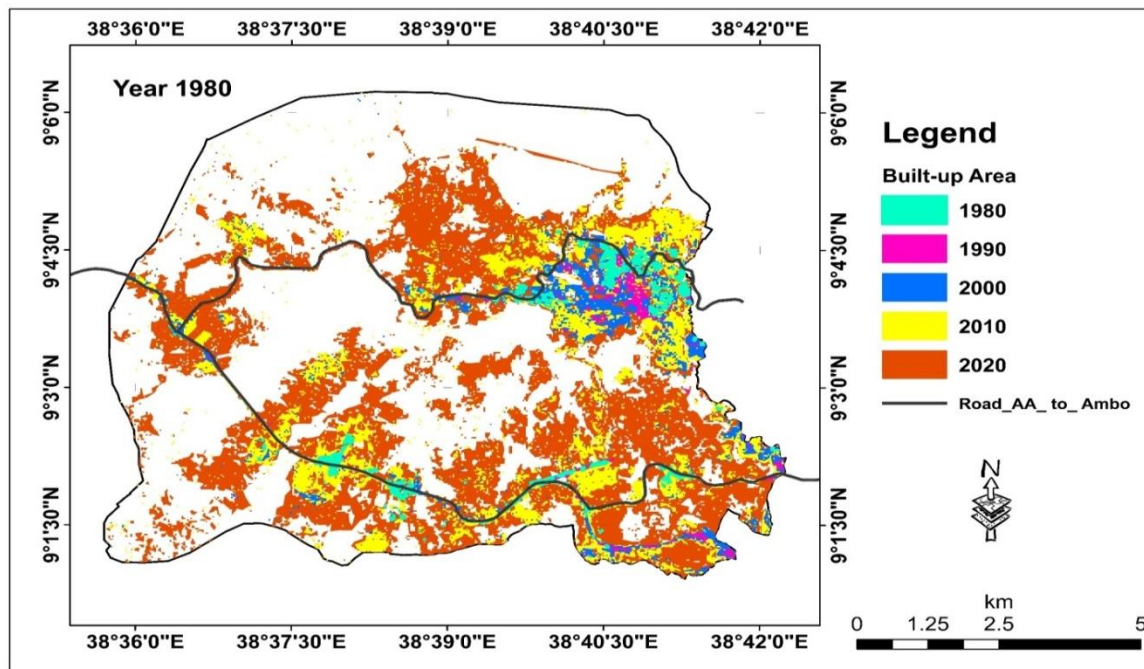


Figure 4. 9: Overlay Map of Built-up Area (1980-2020)

In 2010, the built-up area of the town was dispersed around the town as a result of many causes, such as government measures aimed at attracting both domestic and foreign investors. Numerous immigrants moved to the town in search of job, causing demographic shifts that put a strain on the infrastructure already in place. As a result, in 2020 the town invaded the majority of the nearby rural land uses in an effort to accommodate the constantly growing population and economic activity, which were unplanned and unstructured in comparison to certain municipal efforts to keep an eye on them. Nowadays, the town's horizontal expansion has surpassed the administrative area limit, causing agricultural communities to suffer as a result of the loss of their only source of income through unfair compensation payments. The overlay map of built-up areas between 1980 and 2020 is depicted in figure 4.10 above to capture the trends of settlement patterns.

The spatial-temporal change analysis shows how much spatial dynamics are present in different time series. An important indication that might reveal the scope of urban growth is the degree to which spatial structures alter. In order to use this information as an input for creating potential management mechanisms, it is crucial to determine how dynamically an area is changing. The study quantified the LULC dynamics after assessing the change detection. In light of this, the dynamic LULC change index compares and determines the amount or degree of dynamism of

each class of land use in the study area. According to Zhao et al. (2012), the formula for calculating dynamic change index or rate for each class is depicted in the formula Eq.(6) below.

$$K = \frac{U_b - U_a \times 1/(T_2 - T_1)}{U_a} \times 100\% \dots\dots\dots \text{Eq (6)}$$

Where; K is the rate of LULC change, U_a is area of a certain LULC type at the beginning; U_b is area of a certain LULC type at the end. T (T₂-T₁) = Change in time between beginning and end of assessment period or year. The higher index or rate indicates the fastest possible speed of change for the same area between two separate seasons. According to Li et al. (2003) the level of urban expansion is divided into five types:

1. slow speed expansion, at (K ≤ 5);
2. low speed expansion, at (5 < K ≤ 10);
3. medium speed expansion, at (10 < K ≤ 20);
4. rapid speed expansion, at (20 < K ≤ 25); and
5. high speed expansion, at (K > 25).

The LULC classes of the study area were assessed in order to identify their level of dynamism. Accordingly, the dynamic LULC change index over the whole study period for agricultural land, grass land, vegetation, water bodies, and built-up areas were -1.16%; -1.33%; -0.95%; - 0.67% and 144.04% respectively. This implies that the dynamic LULC change index identified the built-up area as the most dynamic land cover type. In line with these standards the dynamic LULC change index of the built-up area for the whole study period between 1980 and 1990, 1990 and 2000, 2000 and 2010, and 2010 and 2020 are calculated and depicted below.

I) Built-up area Change Rate (1980 – 1990)

$$K = \frac{\text{Builtup 1990} - \text{Builtup 1980} \times 1/(1990 - 1980)}{\text{Area of Built up in 1980}} \times 100\%$$

$$K = \frac{156.95 - 71 \times 1/(1990 - 1980)}{71} \times 100\% \quad K = 12.11\%$$

II) Built-up Change Rate (1990 – 2000)

$$K = \frac{\text{Built up 2000} - \text{Built up 1990} \times 1/(2000 - 1990)}{\text{Area of Built up in 1990}} \times 100\%$$

$$K = \frac{498.21 - 156.95 \times 1/(2000 - 1990)}{156.95} \times 100\% = K = 21.74\%$$

III) Built-up Change Rate (2000 – 2010)

$$K = \frac{\text{Built up 2010} - \text{Built up 2000} \times 1/(2010 - 2000)}{\text{Area of Built up in 2000}} \times 100\%$$

$$K = \frac{1438.46 - 498.21 \times 1/(2010 - 2000)}{498.21} \times 100\% \quad K = 18.87\%$$

VI) Built-up Change Rate (2010 – 2020)

$$K = \frac{\text{Built up 2020} - \text{Built up 2010} \times 1/(2020 - 2010)}{\text{Area of Built up in 2010}} \times 100\%$$

$$K = \frac{4161.77 - 1438.46 \times 1/(2020 - 2010)}{1438.46} \times 100\% \quad K = 18.93\%$$

VII) Built-up Change Rate (1980 – 2020)

$$K = \frac{\text{Built up 2020} - \text{Built up 1980} \times 1/(2020 - 1980)}{\text{Area of Built up in 1980}} \times 100\%$$

$$K = \frac{4161.77 - 71 \times 1/(2020 - 1980)}{71} \times 100\% \quad K = 144.04\%$$

The dynamic LULC Change Index of built up area as compiled from the satellite images of the study town revealed a continuous speedy rate of horizontal expansion towards the surrounding areas as shown in the dynamic LULC change index calculation above and summarized below:

1. K=12.11% for 1980-1990; Medium speed expansion
2. K=21.74% for 1990-2000; Rapid speed expansion
3. K=18.87% for 2000-2010; Medium speed expansion
4. K=18.93% for 2010-2020; Medium speed expansion
5. K=144.04% for 1980-2020; High speed expansion (cumulative change rate over the study period)

In accordance with this, **Table 4.7** below depict the contribution of each non-built-up land use categories to the built-up areas over the whole study period (1980-2020). The varying degrees of gross and net contributions were made by each LULC class to the built-up area between 1980 and 2020. In light of this, agricultural land (1260 ha), grassland (1336 ha), vegetative cover

(1440 ha), and water bodies (Nil hectare), totaling 4036 ha, contributed to the growth of the built-up area.

Table 4.7: Contributions of LULC classes to Built-up area (1980 to 2020)

LULC Classes	Changed to Built-up area (ha)				
	1980-1990	1990-2000	2000-2010	2010-2020	1980-2020
Agriculture	20.25	125.37	213.12	1070.91	1260
Grasses	22.5	155.70	502.38	1000.80	1336
Vegetation	40.86	54.99	218.97	613.35	1440
Water	0	0	0	0	0
Sum of increase in the period (ha)	83.61	336.06	934.47	2685.15	4036

Source: Computed from satellite image of the study area (1980-2020)

4.1.4.2. Average Annual Rate of Built-up Area Change

The average annual growth rate for an urban region is known as the average annual rate of change in built-up area. This rate reveals the yearly trend of horizontal development of urban areas towards the nearby rural areas (Seto et al., 2011). The shift in horizontal expansion in terms of the absolute area can be seen in the annual average rate of change in urban expansion. In line with this, according to Fan et al. (2017), the average annual growth rate of the urban area is determined using the formula in Eq. (7) below.

$$V_T = (S_b - S_a) / T \dots \dots \dots \text{Eq (7),}$$

Where, S_a and S_b represent the urban area for the beginning and end years of the assessment period; T represents the duration of assessment period, and V_T represents the annual change rate.

The most notable characteristics of urban growth is the progressive increase in horizontal expansion of urban districts toward neighboring rural areas. During the research period, Burayu town experienced an average yearly rate of change of 100.93 hectares as shown in **Table 5.8** and **Figure 4.10** below. The trends of the average yearly rate of change in the horizontal development of Burayu town were slow and consistent up to the end of the 1990s, as shown below in **Figure 4.11**, but after that period, its growth patterns became very fast in comparison to earlier decades. Then, as a result of factors including demographics, economics, government policies to draw in domestic and international investors and political aspects like the reclassification of the neighboring rural kebeles under the town administrative setting the trends of average annual growth of the built-up area have been in a state of dynamic at unprecedented

rate.

Table 4.8: Average Annual growth rate of built up area of Burayu town

Categories	Year				
	1980 -1990	1990 -2000	2000 -2010	2010 -2020	1980-2020
Urban area growth (ha)	83.61	336.06	934.47	2685.15	4036.00
Av. growth rate (ha/year)	25.02	59.832	175.212	268.569	100.93

Source: Extracted from satellite image of the study area by the author (1980 – 2020)

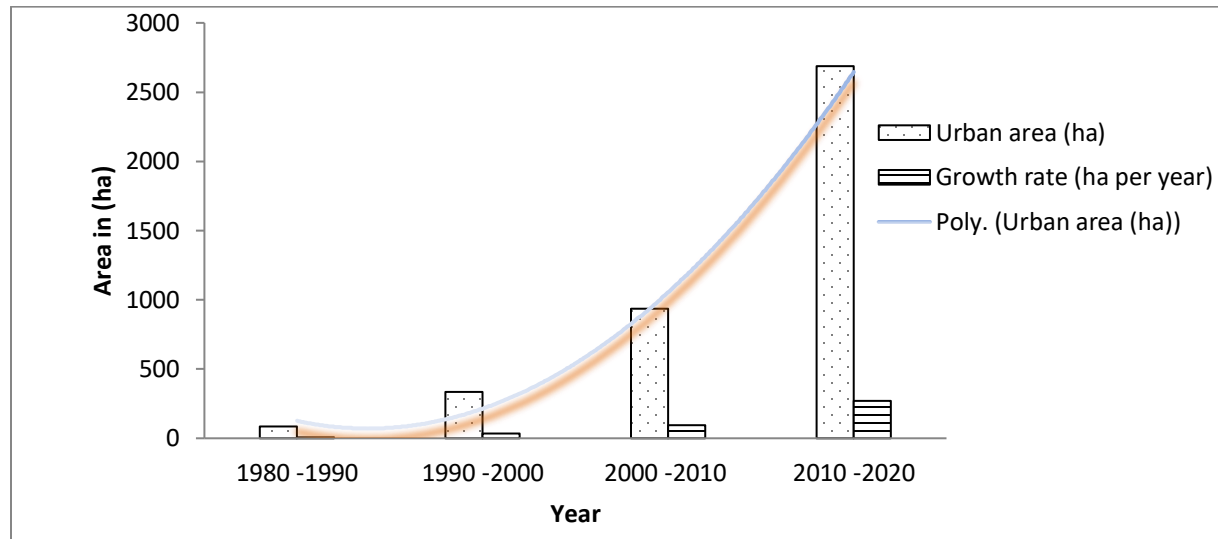


Figure 4.10: Trends of Average Annual growth rate of built-up area of Burayu town (1980 – 2020)

4.1.4.3. Intensity of Urban Expansion

The urban area intensity index (UII) describes the speed and intensity of horizontal expansion of urban areas. The high values of UII depict the status of the fastest rate of urban expansion towards surrounding rural areas that means a large amount of non-built-up area are transformed into urban land uses for the purpose of different land use categories whereas small UII values are indicative of lower rates of expansion in urban areas and suggest that fewer nonurban areas have been taken. According to Fan et al.(2017), urban area intensity index introduces regional urban area to carry out standardized treatments. This makes the expansion rates of different periods of urban use more comparable. It also clarifies the relationship between urban and non-urban areas during expansion towards the surrounding rural areas. In accordance with this, the formula stated in equation Eq (8) below is used to calculate the UII.

Accordingly,

$$UII = ((U_b - U_a)/TLA) \times 1/T \times 100\% \dots\dots\dots Eq (8),$$

Where: UII is the urban expansion intensity index, U_a and U_b denote the earlier and later period of urban area respectively, TLA is the built up area within the study, and T is the length of the study period in years.

According to Hu et al. (2007), the urban area intensity index value is classified into different categories to express the speed of expansion of urban areas towards rural areas. The index value is divided into four categories:

- 1.92 and higher- high-speed expansion;
- 1.05 –1.92 -fast speed expansion;
- 0.59 -1.05 - medium speed expansion; and
- 0.28 - 0.59 - slow speed expansion.

Accordingly, **Table 4.9** below shows the study region’s urban intensity index that was retrieved from the satellite images. The UII for Burayu Town shows a steady high speed expansion during the four decades and an average of 2.46% for the whole period.

Table4.9: Urban intensity index of Burayu town between 1980 and 2020

Category	Year				
	1980 – 1990	1990 – 2000	2000 – 2010	2010 – 2020	1980 - 2020
Urban intensity index (UII) in %	5.52	6.85	6.56	6.54	2.46

Source: Extracted from satellite images of the study area (1980 to 2020)

4.1.5. Factors of urban transition

In our analysis of Burayu Town we have shown that the main driving factors of the expansion of the town are related to demographic, economic, and political factors such as government policies. We have seen that the population of the town has been steadily increasing as a result of both natural population growth and migration. The population of the town in 1984, 1994, and 2007 was 4,134, 20,329, and 63,889, respectively (CSA, 2007b). In accordance with this, the demographic trend of the town during the first decade (1980–1980), second decade (1990–2000), third decade (2000–2010), and the fourth decade (2010–2020) increased by 118.4%, 442.2%, 111.2%, and 53.7%, respectively, while the built-up area increased by 119.7%, 217.5%, 188.7%,

and 189.3% during the same time span (**Figure 4.12**).

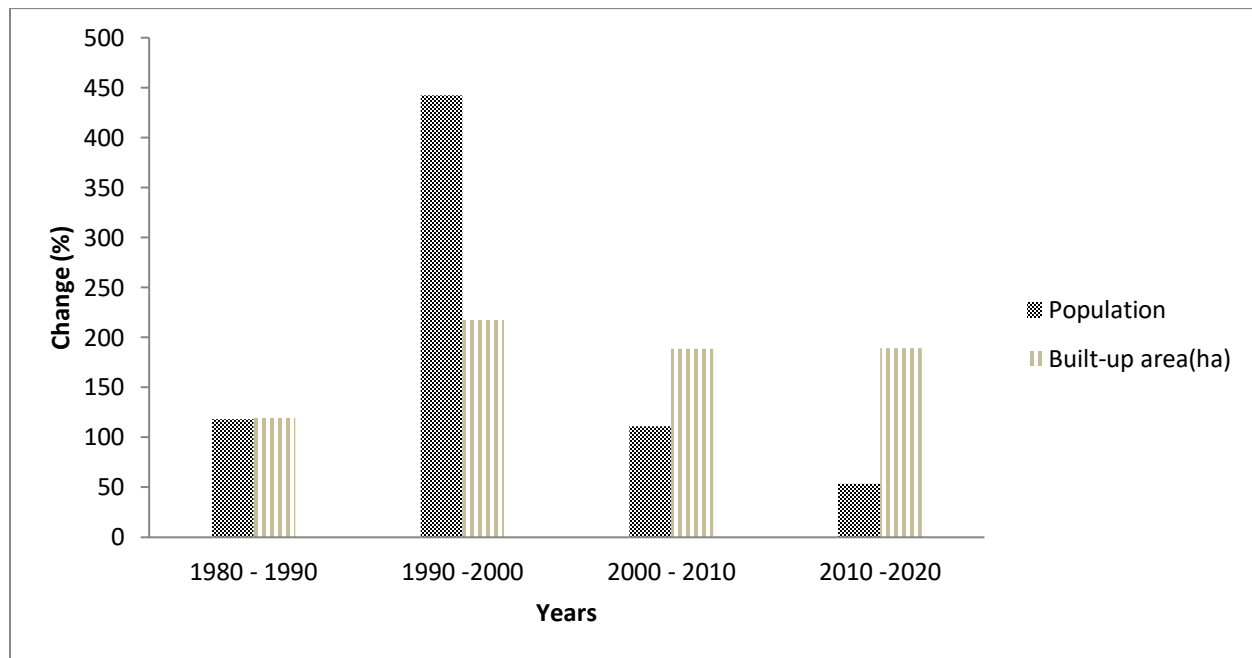


Figure 4. 11: Trends of Burayu town population and built-up area changes (1980 – 2020)

The demand of urban land has skyrocketed due to a variety of factors; most notably the spillover effect from Addis Ababa, as well as government policies aimed at attracting both domestic and foreign investors. These have prompted the reclassification of neighboring rural areas under the administrative setting of the town.

The population increase in the first three decades was dramatic while the last decade saw a modest increase. On the other hand the increase in built-up area indicated consistent growth with near-similar intensity over the whole study period. Furthermore, population growth, built-up area expansion, and time have a strong mathematical exponential function (**Figure 4.12**). The study revealed that the built-up area is growing at a faster rate (10.36 % per year) than the population growth rate, which is growing at a rate of 9.63 % per year.

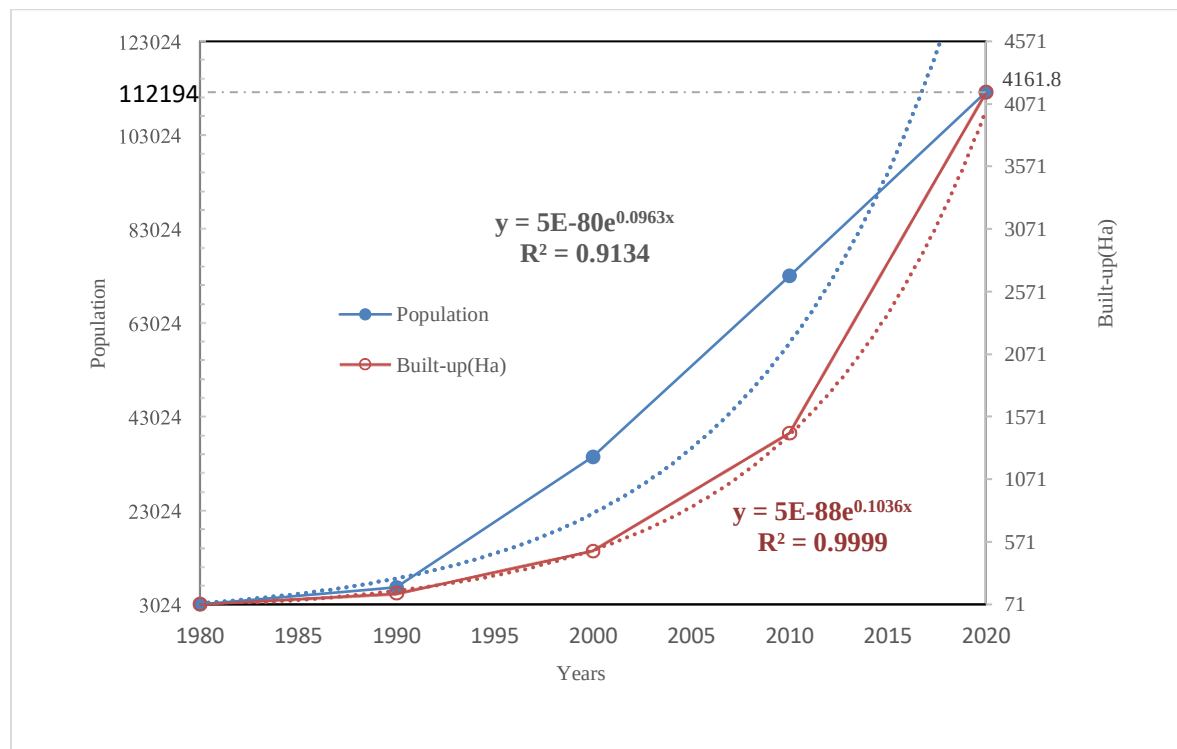


Figure 4. 12: Exponential relationship between population, built-up area and timeframe of Burayu town

The results of the exponential relationship comparing built-up area, population growth, and timeframe in the study area is supported by the findings of Bhatta(2009)that urban centers in developing countries do not always become more compacted due development. Furthermore, similar to the findings of this study, many authors report that unprecedented urban population growth results in haphazard expansion of urban areas towards rural areas (Jenberu & Admasu, 2020; Mohamed et al., 2020; Yar & Huaifu, 2019).As a result, comprehending the distinctiveness of urban growth necessitates a study of the relationship between population and built-up areas (Dewan et al., 2012). Accordingly, the per capita Land Consumption Rate (LCR), an index used to measure horizontal expansion of built-up area through population, was calculated using Eq (7) below (Sharma et al., 2012).

$$\text{Land Consumption Rate (LCR)} = \frac{\text{Built-up area}}{\text{Population}} \dots\dots\dots \text{Eq (9)}$$

Accordingly, the per capita land consumption rate (ha per person) during the research period was 0.023 (1980), 0.024 (1990), 0.014 (2000), 0.02 (2010), and 0.04 (2020). The computation shows a gradual rise in per capita consumption. This could be attributed to the growing demand for more urban land for a variety of purposes. Similarly, the findings of other studies revealed that

low-density utilization patterns encourage outward expansion of urban areas to the peripheral areas at the expense of farming communities (Al Tarawneh, 2014; Haregeweyn et al., 2012; Kombe, 2005).

4.1.6. Possible future land use/ cover changes

The government of Ethiopia has implemented a number of economic and political changes over the last three decades, particularly since the fall of the Derg regime in 1991, with the mission of properly utilizing land, attracting local and foreign investors, and facilitating job opportunities for the country's ever-growing population. In light of this, the government established a national industrial development corridor by selecting 32 urban centers, including the study area, Burayu City (Taye, 2013). Since 1990, Burayu town has experienced remarkable horizontal expansion, necessitating a careful study of the possibilities of LULC changes in the future in order to make informed decisions about the proper utilization of land. The prediction for 2030 and 2050 has been carried out using the historical LULCs (1990 - 2020) of Burayu town.

4.1.6.1. Simulation and Model validation

The IDRISI software was used to simulate the integrated CA-Markov model based on a number of elements and constraints to produce possible transition zones, such as the 2010 built-up map, slope gradient, principal road network, and water bodies. Nonetheless, aquatic bodies and built-up areas are significant impediments to LULC transformation. Using the transition probability matrix between 2000 and 2010, the simulated 2020 LULC map was generated (**Figure 4.13**).

The predicted LULC map for 2020 was validated against the actual classified LULC map for the same year to demonstrate that the LCM model can reliably anticipate LULC changes. K-indices and other statistics in TerrSet were used to evaluate the effectiveness of LCM in forecasting the 2020 LULC. The validity of the LCM of the CA-Markov model was assessed using this approach. Good agreement between the projected and actual LULC map is indicated by all of the k-index values >80% (Leta et al., 2021). The validation statistics present a kappa no (Kno) value of 0.9160, kappa location (Klocation) value of 0.9762, kappa locationStrata (KlocationStrat) value of 0.9762, and kappa standard (Kstandard) value of 0.9072. It can be shown that the model is better able to forecast the LULC in location (spatial) than in quantity for Burayu because the Disagree Quantity (0.0533) is higher than the Disagree Gridcell (0.0167). The result of the study revealed the effectiveness of the model to use in subsequent land cover simulations. As a result,

we used the classified 2020 LULC map in conjunction with the transition probability matrix between 2010 and 2020 to predict land cover for 2030 and 2050.

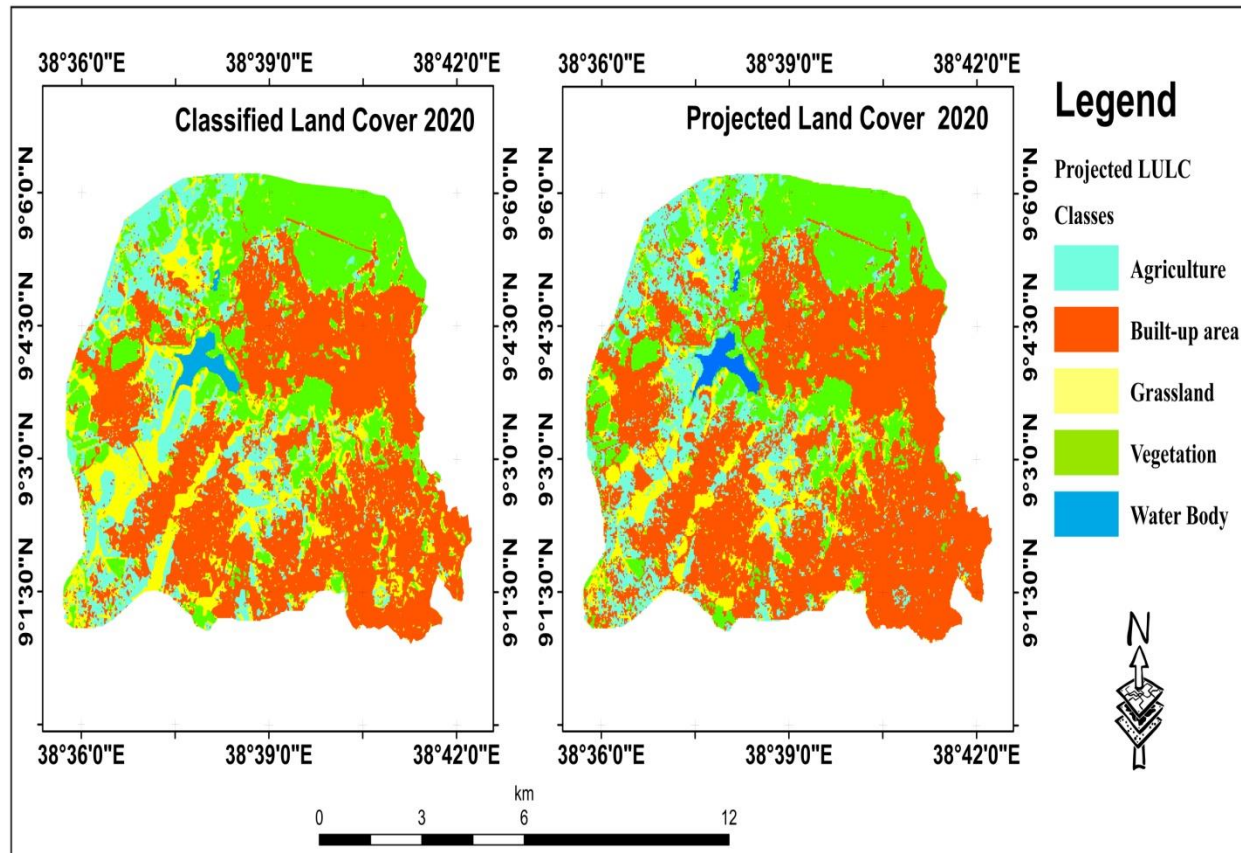


Figure 4. 13: Classified and Projected 2020 map of Burayu

4.1.6.2. Land use/cover change prediction for 2030 and 2050

The LULC for 2030 and 2050 were projected based on the historical LULC trends between 2010 and 2020 using LCM transition probabilities adjusted using an MLP–MC spatial model (Figure 4.14). This study revealed that all LULC classes would continue to fall, except the built-up areas.

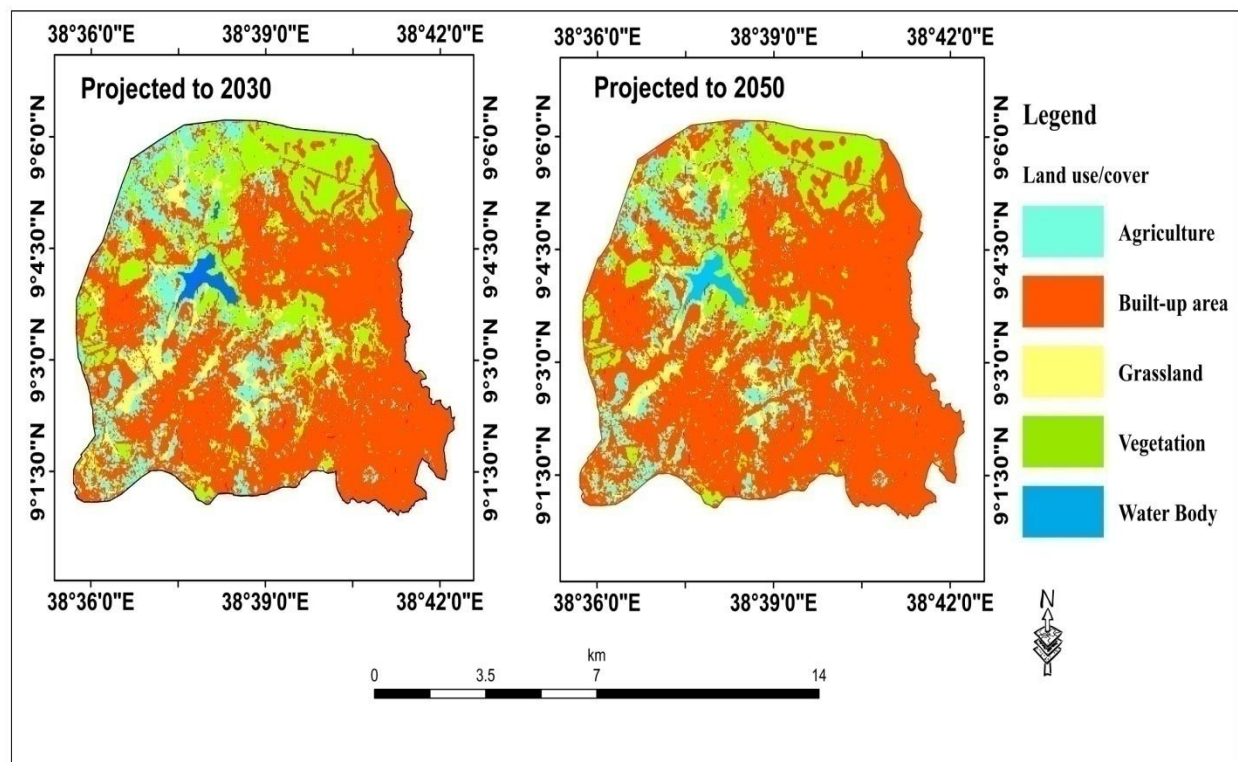


Figure 4. 14: Predicted land use/land cover for 2030 and 2050

Agricultural land, for example, will fall from 1,142.64 hectares in 2020 to 881.45 ha in 2030 and 881.45 ha in 2050. On the other hand, like in previous years, the built-up area will increase from 4108.68 ha in 2020 to 5326.83 ha in 2030 and 6043.59 ha in 2050. This research indicates that the expected reduction in agricultural land, grassland, and vegetation, will be worsened by the expansion of built-up areas. Agricultural land (397.26ha), grassland (502.74ha), and vegetated land (318.69ha) are likely to be converted to built-up areas between 2020 and 2030. Furthermore, between 2030 and 2050, built-up regions gained land from grassland (157.41ha), agricultural land (282.6ha), and vegetated land (276.75ha). Built-up areas are predicted to increase by 27.99% between 2020 and 2030, and by another 13.46% between 2030 and 2050, at the expense of other land uses such as agriculture, which is expected to drop from 1,324.1ha in 2020 to 881.45 ha in 2050 (**Table 4.10**).

Table 4.10: Statistical distribution of the modeled LULC in 2030 and 2050

LULC Classes	2020		2030		2050		2020 – 2030		2030 – 2050	
	Area (Ha)	Area (%)	Area (Ha)	Area (%)	Area (Ha)	Area (%)	Area (Ha)	Area (%)	Area (Ha)	Area (%)
Agriculture	1319.8	14.8	1142.6	12.8	881.5	9.9	-177.1	-2.0	-261.2	-2.9
Built up	4108.7	46.1	5326.8	59.8	6043.6	67.9	1218.2	13.7	716.8	8.1
Grasses	1475.9	16.6	753.7	8.5	573.8	6.4	-722.3	-8.1	-179.8	-2.0
Vegetation	1903.0	21.4	1584.2	17.8	1307.4	14.7	-318.8	-3.6	-276.8	-3.1
Water	102.0	1.1	102.0	1.1	102.0	1.1	-	-	-	-
Total	8909.3	100.0	8909.3	100.0	8909.3	100.0				

Source: Extracted from simulated LULC for Burayu town (2020, 2030, and 2050)

This projection is consistent with previous studies undertaken in Ethiopia, which found that government-led urban development plans and socioeconomic factors had a significant impact on the predicted expansion and development of built-up regions (Bulti, 2017; Weldegebriel et al., 2021). Similarly, it is predicted that an unsustainable natural environment would soon transform into built-up areas like Addis Ababa and the adjacent Oromia satellite towns as a result of excessive human activity (Mohamed, 2020)⁶.

4.1.7. Historical and predicted LULC changes

The enormous horizontal spread of Burayu town into surrounding rural areas has harmed the natural landscape and has become cause for the displacement of farming people from their agricultural land and other natural resources. The historical and predicted LULC changes from 1990 to 2050 reveal that agricultural land is expected to decrease dramatically, from 2783.8ha (32.25%) in 1990 to 881.45ha (9.89%) in 2050 (**Figure 4.15**). In contrast to the aforementioned points, the built-up area has been consistently growing at an unprecedented rate to the detriment of other LULC categories. In this view, the built-up area in 1990 was 156.9ha (1.76%) and is anticipated to be 6,043.59ha (67.83%) in 2050. The findings of this study are consistent with those of many others, particularly in metropolitan cities that have developed horizontally at the expense of neighboring rural land uses such as arable land, forest land, grassland, and so on

⁶It is to be noted that Burayu Town was incorporated into Shaggar City in 2023 (i.e. after the data collection period of this study). The Shaggar City master plan has the aim of encouraging urban agriculture within the urban boundary of the City. If this new plan for the city region of Shaggar City is implemented as planned, there could be chance that finally urban-rural linkage could display synergetic growth rather than the parasitic nature of former urban expansion experiences in Ethiopia.

(Dias et al., 2019; Ewane, 2021; Jin et al., 2019). Burayu town's expansion is similar to the urban growth in Nepal's Tarai region, a populated area experiencing rapid land-use change due to urbanization and other causes after 2016, where it was predicted to increase linearly, using similar methods to the current research, by 199 km² by 2026 and 165 km² by 2036 (Rimal et al., 2020).

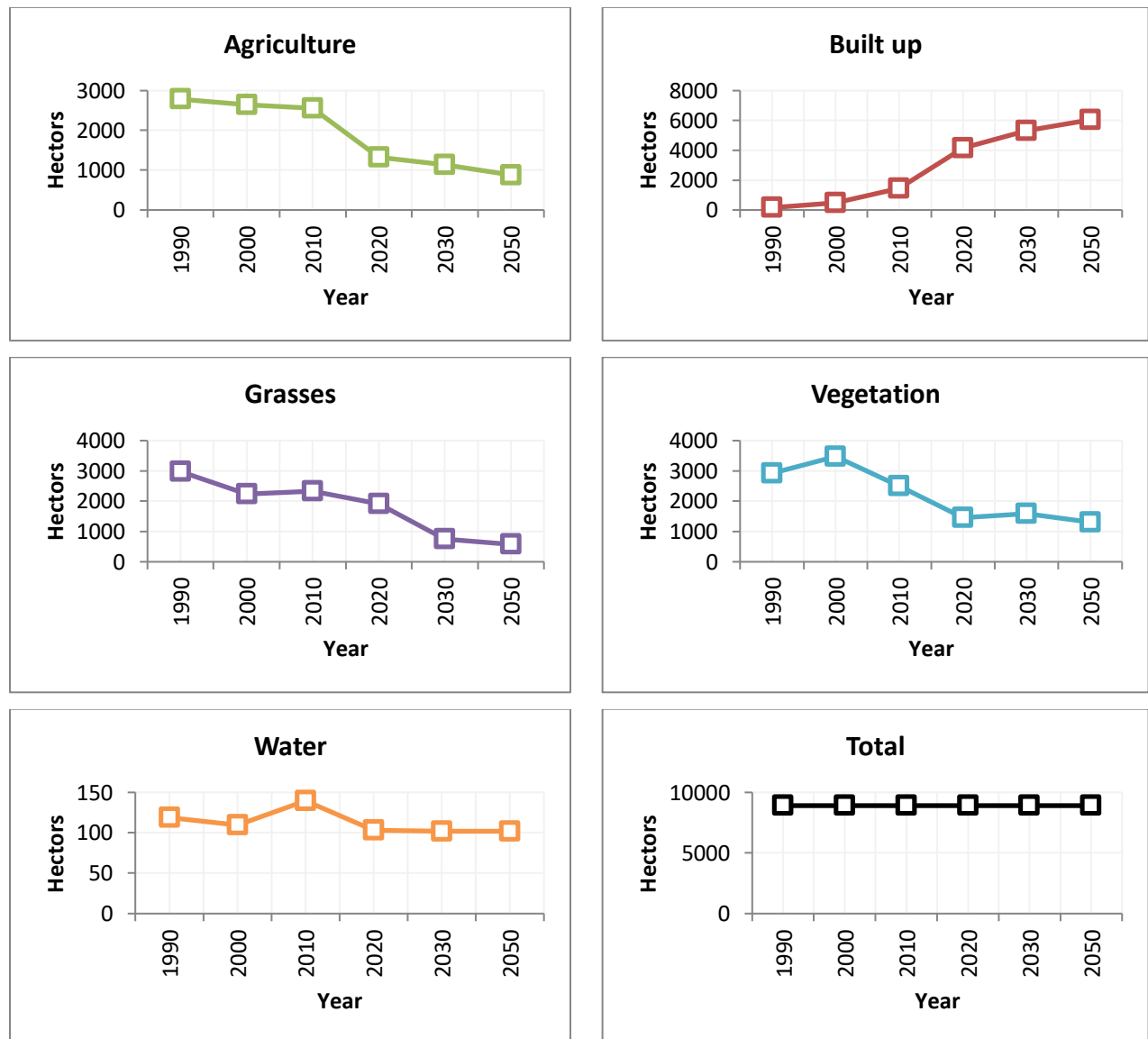


Figure 4.15: Historical and simulated LULC for Burayu town (1990 - 2050)

Unless the government manages to restrict urban construction, this development will cause a future decrease in the nation's agricultural land and obstruct the state's ability to achieve sustainable urban expansion. As a result of natural growth or/and migration, the population is expanding, and more natural resources are required to meet their demands for food, energy, and

building materials (Westlund, 2017). Therefore, policies that call for rapid urban growth and expansion without offering a harmonious link between human activities and the ecological environment need to be changed in order to balance the expansion of urban areas and preserve the natural environment in Burayu town. Urban planners and other local authorities will benefit from the knowledge of expansion characteristics in their efforts to efficiently regulate land uses and control the intricate changing dynamics for a better result.

In conclusion, the study of land use-land cover change dynamics of Burayu town has shown that the main change in land use between the 2014 master plan and the 2020 satellite map is that the urban agriculture, recreation and parks, forest and green areas are changed to built-up area; in the master plan the northern and southern parts of the town had a buffer zone, but the actual situation reveals a near-merger of the two parts of the town. The area bordering Addis Ababa in the south-eastern part of the town has become a near-complete built-up area in contrast to the master plan which proposed urban agriculture and open space and environmental protected area due to its terrain. Moreover, the western part where the main road from Burayu proper meets the southern new road through Ashewa meda, is over-developed into built-up area as opposed to the proposal which has substantial area designated for urban agriculture and park. So the analysis has shown that the change is not simple physical growth of built-up area but the expansion exhibits violation of the existing master plan provisions.

4.2. Understanding Expropriation laws and their implementation under a scenario of public ownership of land in Ethiopia

4.2.1. Introduction

Governments must build public facilities and infrastructure that promote safety, security, socioeconomic advancement, and environmental protection in order to support sustainable development. The acquisition of land in accordance with national legislation without jeopardizing private holding or usage rights is a crucial first step in the process of delivering such amenities and infrastructure. In light of this, governments in every nation maintain and use the authority to seize private property for public uses that are motivated by the need to foster economic growth and raise citizen well-being. Although every sovereign state has the "power of eminent domain" to serve the public interest, actions of governments may have a detrimental effect on the livelihoods of people whose assets are taken if such power is not applied properly.

The Oromia Special Zone, in particular Burayu town is one of the metropolitan areas where an unprecedentedly high rate of population increase and development activities has been taking place. The expropriation of farming households and depriving them the sole source of income-producing agricultural land by the Burayu town administration with unfair compensation payments and without designing rehabilitation schemes has left peri-urban dwellers exposed to various livelihood insecurities. The unfair compensation is related to public ownership of land which does not view land as a property requiring compensation. This has aggravated the prevalence of urban poverty as expropriated persons lose their hard-earned properties without fair compensation.

Even though land expropriation is done for a variety of purposes, many individuals would question whether such an action was lawful. In light of this, the main priorities of this case study is to evaluate the legitimacy and method of forced acquisition, the suitability of the applied valuation techniques, and the reasonableness of the compensation paid by Burayu town. The consistency of these practices with Ethiopian expropriation and compensation payment law, conceptions of property rights, and theories of fairness and justice were all examined in *Chap.2.7* of this dissertation. The views and the understanding of project affected persons about land tenure modality, the leasehold system and expropriation, valuation and compensation practices is presented in the following sections.

4.2.2. Socio-economic profile of the respondents

The socioeconomic situation of respondents of research projects is studied as it is considered to have a correlation with the issues under investigation. Accordingly, this study attempted to analyze and present data pertaining to the socio-economic attributes of the respondents, such as gender, age, educational background, and family size so as to understand the impacts of expropriation. This is based on the premise that expropriation and relocation has different types of impacts on different socio-economic groups. The key socioeconomic profile of the respondents is shown in **Table 4.11**.

Both genders were included (72% male, 28% female) in the data gathering so as to gain their perspectives on the effects of urban expansion and expropriation on their livelihoods. Regarding to age distribution, approximately 79.4% of the sampled households were between the ages of 25 and 64 while 4% of the household heads in the survey were under the age of 24 and 17% were over the age of 64. This indicates that a sizeable portion of the displaced households are highly

vulnerable due to old age as it will be difficult for them to participate in new income-generating activities.

Table 4.11: Socioeconomic profile of the respondents

Independent Variables	Category of data	Frequency	% of occurrence
Sex of respondent	Male	92	72
	Female	36	28
	Total	128	100
Age of respondent	≤ 24	5	4
	$25 = X \leq 44$	47	37
	$45 = X \leq 64$	55	43
	> 64	21	17
	Total	128	100
Level of education	Illiterate	59	46
	Elementary School	43	34
	Secondary School	19	15
	Tertiary school (12+)	7	6
	Total	128	100
Household size	0 to 2	17	13
	3 to 4	48	38
	5 to 6	55	43
	≥ 7	8	6
	Total	128	100

Source: Household survey, 2021; n = 128

Data on educational status was gathered as it plays a significant role in determining the livelihoods of households. According to the survey 46.1% of the household heads surveyed were illiterate, 33.6% were elementary school graduates, while 14.8% have attended secondary school, and only 5.5% have tertiary level education. Nearly half of the sample respondents (46.1%) lacked basic education as seen in table 5.11. This number is consistent with the nationwide trend of most rural households being illiterate. Uneducated farmers find it extremely challenging to get urban jobs which require technical expertise. Hence the educational status of the sample households is indicative of the hardship that expropriated household would face when incorporated to urban areas.

The majority of household members in rural settings engage in the production process, but the situation is different in urban areas; as a result higher household size could be a liability. Household size could provide insight into various social and economic conditions of households. In this research the household survey indicated that household size of:

- up to 2 persons make up 13.4%
- 3–4 persons make up 38.3%;
- 5–6 persons make up 42.6%, and
- Greater than 7 persons makes up 5.7% of the surveyed households.

4.2.3. Perception of respondents on current land tenure modality

Globally, land tenure has become a hotly debated issue because it is one of the core foundation of an economic system, belongingness, and strength for any country (Toulmin, 2009). In light of this, some countries prefer private ownership of land while others prioritize public ownership modality of land. This research conducted an opinion survey in the town of Burayu as a reference to determine how farming households perceived the current land tenure modality in Ethiopia. The findings of the study revealed that around two-thirds of the respondents (67%) preferred the current land tenure modality of Ethiopia. This means that the majority of respondents preferred the current public ownership land tenure system and declared it is a good ownership modality. Similarly, a survey conducted by the Ethiopian Economic Association discovered that 61% of farmers prefer the current public ownership of land tenure system (EEA, 2002). Furthermore, Gebremedhin and Nega (2005) found that 68% of farmers prefer public ownership of land as opposed to private ownership. Likewise, according to the findings' of the study by Nega et al. (2003), the public ownership of land tenure modality in Ethiopia is regarded favorably by 56% in Oromia and 61% at the national level. The most common reason given by those polled who support the current land tenure system is the availability of land for the provision of public goods (56.25%), more secure land tenure (16.41%) than the previous system, and the ability to exercise one's rights (14.84%). Similar with the findings of this study, numerous researches also demonstrated the significance of public ownership of land due to the availability of land for the provision of public goods, such as educational and healthcare facilities (Besley & Ghatak, 2001; Banerjee & Somanathan, 2007). Data on the perception of surveyed households on land tenure modality is presented in **Table 4.12**.

Table 4.12: Authentication of respondents' satisfaction with the current land tenure system

Opinion on current land tenure system	Reasons to validate	Response categories	
		Frequency	Percent
Satisfaction	Availability of land for public goods provisions	72	56.25
	More secure land tenure than before	21	16.41

	Fair distribution of land	16	12.50
	Opportunity to exercise own right	19	14.84
Dissatisfaction	Fear of land loss due to public ownership	78	60.94
	Injustice in land distribution	23	17.97
	Not being able to sell and buy land	2	1.56
	Problem of implementation by officials	25	19.53

Source: Household survey, n=128, 2021

In contrast to satisfaction with the current land tenure system, 60.94% of the sample respondents are afraid of losing their land due to government ownership. In addition to this, there is dissatisfaction with the way regulations related to land are implemented by administrative bodies (19.53%) and injustice in land distribution (17.97%). In contrast to the perception of the majority of the respondents to this study, Belay (2003) stressed the disadvantages of the current land tenure modality's long-term performance as a result of which it has not become a remedial solution to Ethiopia's socioeconomic problems. Many studies have criticized the current land tenure modality of Ethiopia from a perspective of its impediments to the orderly transactions in land based properties (Ambaye, 2015; Tareke, 2019; Dibaba, 2020; Leta et al., 2021).

The study looked at how people perceive public ownership of land and how expropriation affects the livelihoods of local farming communities. The study discovered that the current land tenure was recognized as a better mechanism for gaining rights to land for the provision of public goods and securing tenure rights than the previous land tenure modality. The comparison of tenure system by the respondents is limited to what they know before the current system. Although the majority of the respondents preferred public ownership of land in comparison to private ownership, the poor implementation practice has been cited by all to have compromised the benefits to the public.

4.2.4. Opinions on the land lease holdings scheme

Governing laws or rules that a government initiates must be based on the needs of the general public in order to be effective. Theoretically, it is not easy to say a policy or regulation is beneficial or bad at the moment of initiation until it is tested in practice. People can express their delight or disappointment after seeing how a law is implemented in practice. The Ethiopian government enacted and implemented the leasehold of land proclamation with the intention of serving the public in accordance with the 1995 constitution. The constitution stipulates that land belongs to the state and the people of Ethiopia and as there is differential capacity amongst

citizens in the use land, the leasehold system was applied to bring back benefits to the majority from those who use land for economic purposes. The main intention of the lease proclamation (No. 721/2011) was to facilitate the demand for the development of an efficient, effective, equitable, and well-functioning land use system, the maintenance of a strong but controlled free market economy, and the formation of an open and responsible system for managing land that ensures the rights and obligations of the leaser and the lessee. In light of this, the ultimate aim of lease law is to balance the allocation of resources in order to uphold equity and sound governance. However, when it comes to practical application, respondents to this study have both favorable and unfavorable opinions on the leasing statute (**Table 4.13**). Accordingly, the findings of the study revealed that 96% of the participants view the unfairness of land ownership through the lease modality. Furthermore, regarding to the issue of whether or not the lease law has facilitated the housing needs of urban inhabitants, 97% of informants said that the leasing law has not satisfied urban residents' housing needs. According to the lease holding proclamation No. 721/2011, everyone has the right to take part and purchase land based on the established rules and regulations. Urban land distribution through auction, however, is unfair given the low economic capabilities of the majority of urban dwellers. This implies that the poor and middle-class urban dwellers are left out of the game by this type of land supply. According to the focus group discussion, the tender-based supply of land cannot fairly serve the general public and has not adequately met the needs of the populace for shelter. Regarding the beneficiaries of this method, a person with sufficient funds can compete anywhere in an urban area. Such circumstances allow affluent individuals to monopolize urban land by offering the highest price per square meter at auctions.

In light of this, queries like: “Who stands to benefit the most? if the lease holding proclamation had a detrimental effect on society, what workable solutions would you suggest?” were asked and the responses are tabulated in **Table 4.13**. The findings of the study revealed almost all respondents (99%) strongly agree that the lease law favored the wealthy and only 1% of the respondents do, however, think that the middle class has benefited more. Surprisingly, none of the respondents thought that the land leasing provision helped the underprivileged.

The assessment findings call into doubt the reality on the ground and the significance of the lease proclamation's objectives. The proclaimed objective of the leasing modality was to benefit the public in multiple ways, including economy, social welfare, and equitable distribution of

resources among the population. But the fact on the ground showed that the practical implementation had produced fundamentally opposite reaction, i.e., its objective had been misaligned, as the remarks of the general public suggested. Participants in this survey suggested that, contrary to the government's intentions, the lease modality of the land ownership system has a negative impact on the general public, especially the poor. The opinion survey revealed that 58% of respondents proposed amending the leasing proclamation, 25% suggested passing a new land law, and the remaining 17% wanted the law to be repealed altogether.

Table 4.13: Questionnaires for household survey on the leasehold system

Variable	Number of respondents	Percentage	
		Yes	No
1. Does society receive a just and fair benefit from the land lease-holding proclamation?	128	4	96
2. Does the land lease holding modality mitigate the shortage of the supply of land for urban housing?	128	3	97
3. Which social class has profited most from the land leasing proclamation?	128		
High income	127	99	
Middle income	1	1	
Low income	0	0	0
4. What feasible solutions would you suggest if the lease holding proclamation had a negative impact on society?	128		
Modify	75	58	
Repeal current law	22	17	
Enact new law	31	25	

Source: Household survey, 2021; n=128

In contrast to the opinions of the majority of study participants, officers from OLDMB emphasized that the lease proclamation has positively contributed to address the housing shortage and infrastructure issues facing citizens, as well as to create favorable environments for the efficient management and utilization of land. On the other hand contrary to the regional land development and management bureau's viewpoint, the Burayu Town Land Development and Management Office asserted that the lease modality of land holding system threatens the poor, especially indigenous ones, because it has further marginalized the peri-urban dwellers (deputy head of the office). In addition to the deputy head of the land office, a 48-year-old farmer and head of a household in the Gefersa-Nono kebele of the town of Burayu, during interview that ‘the same family members or other land grabbing individuals may win and collect in such a

manner many plots of land by organizing themselves in a way that impacts the equitable distribution of public resources. Asserted'

4.2.5. Expropriation, valuation and compensation

4.2.5.1. Mode of land acquisition by the evicted farming households

The history of land tenure modalities in Ethiopia shows various means of accesses to urban and rural land for both citizens and developers. In view of this, the majority of research participants (63%) declared that their family possessed land during the fall of the imperial regime and the establishment of the Derg regime in 1975. Additionally, 12% of the respondents asserted that they received land through inheritance from family members who had acquired it in a variety of ways. Furthermore, when land was redistributed under both the previous and current governments, 16% of respondents got land through the permit system. On the other hand, the remaining participants reported that they acquired land through private purchase (9%). According to the findings from the focus group discussion many of the local households have benefited from the government allotment of land at various times while others had informally inhabited the land for many years before the government granted them use rights.

4.2.5.2. Duration of residence in the study area

The length of time spent in a certain location influences the type and amount of assets that a person can own. In light of this, an attempt was made to evaluate the households based on the length of time they spent in the research area. Thus, 91% of respondents stated that they had lived in the area their entire lives and are completely reliant on the land of their predecessors and grandfathers. Only 9% of the respondents had lived in the study area for fewer than forty years. The majority of farmer respondents stated that regardless of the monetary compensation, they preferred their land and the location where they had lived for a long time.

4.2.5.3. Land expropriation in the Study Area

Expropriation has been used by various countries across the world to acquire privately held land for the purpose of developing a range of public goods for the benefit of the masses. However, various studies have revealed that in many cases, land expropriation for development purposes occurs in a hazy procedural manner that disregards the governing rules and regulations, such as without due attention for the participation of the concerned property owners and with unfair compensation payments. In most cases, such dispossession has occurred in peri-urban areas

where the availability of land invites the concerned municipal authorities to acquire and transfer land to third bodies for various development projects using the government's sole land acquisition tool, expropriation. This is a very serious concern in many developing nations where the process of rural-urban migration, demographic change, and urban horizontal expansions is widespread.

Urbanization and land loss by any means, whether through government expropriation or the transfer of use rights of agricultural households to third parties, are interconnected processes. The ongoing process of urban expansion and loss of arable land in Burayu town is similar to that which has occurred in many other Ethiopian municipalities. The built-up area of Burayu town has increased by 4090.8ha from a mere 71ha in 1980 to 4161.8ha in 2020. This implies that the built-up land has expanded by over 580% over the last four decades.

Planning in advance the need of land

Any expropriation process should be based on the governing legislation; in the Ethiopian case the 1995 constitution, the expropriation and compensation payment Proclamation No. 455/2005, and Regulation No. 135/2007 are the main legal provisions for expropriation. As discussed in the introductory section of this subsection, there is need for planning in advance of expropriation. This means that during the planning stage, the notion for the necessity of land for the construction of public goods must come from a public firm with a desire to execute development activities. It is not only the need for land but money for compensation has to be set aside before commencing expropriation process. In relation to this issue, the deputy mayor of Burayu town for land development and management stated that request for land may come in mid-year where there is no budget for compensation or even though the required money is set aside at the conclusion of the fiscal year in June, there may not be request for the preparation of land required for the projects. Moreover, in most cases there is no farmer representation in the formulation of the development program prior to the initiation of expropriation. Such a practice increases the inconveniences of expropriated persons as they are not made part of the planning process.

Identification and notification for expropriation of land

Identifying the land required for the projects to be executed, as well as the owner of the assets to be expropriated is one of the most important issues in the expropriation process. In some urban and most rural areas in Ethiopia, land use title deed is not fully registered and may necessitate

court ruling. Furthermore, one of the important challenges that must be addressed in the process of expropriation is how municipalities explain the importance of projects to landholders. Though this stage is critical to understand the perception and concerns of persons who would be affected by the project, it is seldom given attention.

As per the expropriation laws, identifying the land required for development projects based on the structural plan of the town and the respective owner of the land to be expropriated should be done during the preliminary stage. However, as a 52-year-old farmer (Ato Itefa Cala) in Gefersa Burayu kebele stated that the practical situation in the research area demonstrated that all such operations were carried out whenever the concerned bodies needed to expropriate land. Furthermore, all focus group discussions held at different research kebeles indicated that their land was expropriated throughout the year based on the interests of the town administration without their prior knowledge. One of the critical issues to be questioned is who has the power to designate a land for a public purpose and what projects are considered public purpose. Officers from lower ranks designate lands expropriate-able for projects that are to the benefit of private individuals. Even though the Ethiopian law provides for what is public interest/purpose, the delegation of the power to designate areas for expropriation seems to have expanded the power of officers and the resultant inconsistencies in expropriation.

In Ethiopia, the fundamental purpose of notification in the process of expropriation is simply to notify that the person's holding is to be expropriated. In such circumstances, there is no room for valuing public engagement in development ideas. This is an abuse in itself, since the governing law requires public engagement as the foundation of the success of any projects. In light of the aforementioned concerns, an attempt was made to analyze the facts about how farmers were informed about the expropriation of their lands by using Burayu town as a case study area. Accordingly, the findings of this study revealed that property owners obtained information about their lands' designation to being expropriated from a number of sources, including local officials, public gatherings, friends, and others. The government used a variety of strategies to spread information throughout the community. In light of this, the findings of this study revealed that the most popular and commonly used modes of information transmission to local farming households and to individuals whose properties were to be expropriated were through local leaders (58%), meetings (36%), friends (4%), and others (2%). Additionally, a 48-year-old head of a farming households (Ato Berhanu Gutu, in Gefersa-Guje kebele), stated that when the

family's sole source of income, which was only 0.8ha of arable land, was disposed of, the kebele chairman informed him orally that the property would be expropriated for the benefit of the community. Moreover, participants in focus group discussions held in all three sample kebeles indicated that local leaders, either the kebele chairman or the got leader, made an effort to enlighten the farmers. Respondents further indicated that several public meetings were held to inform the public that the government needed the site for development purposes. Then, in a written letter, landowners are notified, and a meeting is called to discuss land acquisitions modalities. Nearly all of the informants related about the discussions by emphasizing that the meetings were nothing more than a warning to farmers not to protest against the development project that the government is undertaking for their benefit. In general, during this early phase, the processes of anticipating the requirement for land for the execution of public works; identifying the geographical location of the required land and ownership of the land should be conducted; but the reality stands in contradiction to the provisions of the governing laws.

4.2.5.4. Possession of land by sample respondents prior to and post expropriation

The rapid rate of urbanization stimulates demand for land from surrounding rural areas, resulting in the dispossession of land from farming households. Globally, natural population growth and migration, as well as the spillover impact of various development efforts in urban centers, result in unprecedented horizontal spread into surrounding rural areas. Various researches conducted throughout the world reveal that land ownership by farming households has decreased as a result of the spread of urban areas into peri-urban areas. Many approaches have been used by governments to acquire properties held by individuals or overturn use rights on land for various development activities. In Ethiopia, expropriated farming households may retain their residential house while their farm land is expropriated. In some cases, expropriation is in stages; part their land could be taken and the farmers continue to farm the remaining land. In light of this, an assessment of land possession before and after expropriation was undertaken in the study area to learn about the implications of expropriation and related concerns and the result is shown in **Table 4.14** below.

The findings of the current research showed that prior to expropriation 25% of respondents had land which was less than 2.5ha and half of them (50%) had land between 2.5ha and 5ha (**Table 4.14**). Furthermore, the remaining respondents owned land between 5ha and 10ha (24.2%); and

larger than 10ha accounted for less than one percent (0.8%). Findings of other studies revealed that due to the low compensation payment by municipalities, informal ways of land transaction by landholders themselves their possession of land gradually declined. As a result of the expropriation of their principal sources of income, almost all (94.5%) participants in this study are left with less than 1.5ha, while only 5.5% of the respondents have land that is more than 1.5ha.

Table 4.14: Landholding size before and after Expropriation

Distribution of Landholding size range in ha					
Before expropriation			After expropriation		
	Qty	%	< 0.5ha	0.5 ≤ X < 1.5ha	X ≥ 1.5ha
<2.5 ha	32	25	28	3	1
2.51 ≤ X < 5 ha	64	50	47	15	2
5 ≤ X < 10ha	31	24.2	12	15	4
≥10ha	1	0.8	1	0	0
Total	128	100	88 (68.75%)	33 (25.75%)	7 (5.5%)
Average Size of landholding in ha			0.67		
Stand. Deviation			0.293		

Source: Household Survey, n=128, 2021

One can extrapolate from this how the government's unsecured land tenure as well as injudicious land utilization hurt the livelihoods of local agricultural households by reducing the size of arable and other natural resources in the pretext of development and public interest. Such dispossession of land has substantial effects on the production and food security of farming households, as well as those urban communities that rely on agricultural products harvested by the surrounding rural groups. To overcome such unprecedented rates of urban expansion and unplanned utilization of scarce resources, the government should enact friendly laws that benefit all segments of society, particularly the mutual benefit that includes the surrounding rural farming households.

4.2.5.5. Income of respondents before and after expropriation

Agricultural land, on which the lives of local farming households rely, is a significant source of income generating resource for them. In many cases, rural communities do not compromise or lose the areas they are born and transferred from their ancestors or earlier family members. Many developing countries prioritize urban development above inclusive and mutual development with surrounding rural areas, motivated by a dichotomy of urban and rural development programs

rather than an integrated one. Such development initiatives promote urban areas at the expense of rural areas. These developments have multifaceted negative consequences, such as unprecedented rate of demographic shift by immigrants seeking employment opportunities; lack of basic infrastructure, and pushing local governments beyond their capacity to accommodate the ever-increasing exodus. The assessment of the economic dimension of farming households included all assets owned by them at any given time, such as agricultural goods and animal husbandries. In light of this, an assessment of the economic condition of agricultural households in connection to land possession before and after expropriation was conducted for the Burayu town (**Table 4.15**). To better comprehend the economic position of research participant farming households, monetary values were calculated using the Ethiopian Birr as the measurement unit (ETB).

The detailed ramification of income categories by the study found out that in comparison to their income before expropriation, the over 2,500ET earners fell from 20.31% to a mere 0.78% after expropriation. Similarly, the proportion of earners between 1,001 and 2,500 ETB per month dropped from 46.09% to 8.59% after expropriation. On the other hand, the proportion of earners between 500 and 1,000 ETB per month increased from 26.57 % before expropriation to 53.91 % after expropriation while the less than 500ETB earners surged from 7.03 % to 36.72 % after expropriation. In summary, the proportion of higher income earning households (more than 1000ETB category) fell from 66.4% to mere 9.37% while the proportion of low-earning households (less than 100ETB category) surged from 33.6% to 90.63%.

Table 4.15: Monthly average income of households before and after expropriation

Income level in ETH	Before expropriation		After expropriation	
	Frequency	Percentage	Frequency	percentage
Less than 500	9	7.03	47	36.72
Between 500 and 1,000	34	26.57	69	53.91
Between 1,001 and 2,500	59	46.09	11	8.59
Greater than 2,500	26	20.31	1	0.78
Total	128	100	128	100

Source: Household survey, n = 128, 2021

This means that expropriation of land without proper consideration for agricultural households has resulted in precarious livelihoods for the expropriated households which may eventually end affecting the social and economic situation of all household members in the long-term. Even if expropriation is one of the methods used by governments to acquire privately held land use

rights for public purposes, it is advisable to confiscate the rights and privileges of farming households for the benefit of others as such measures stand against social justice practices. Instead, mechanisms in which expropriated households are not victims of urbanization require adaptation strategies that benefit all community members especially those affected by projects.

4.2.5.6. Participatory nature of the expropriation practice

The notion of community participation encompasses various forms of cooperative action aimed at resolving societal issues or problems. According to Stroessner et al.(2009), participation is the involvement of people in their development agendas with significant role playing to which they belong. This implies that participation is the process by which a community can address its own shared problems, i.e. as a transformative tool for social change. As stated in the 1995 Constitution of the government of Ethiopia, every individual has the right to obtain information and participate in activities that may affect their wellbeing. Accordingly, land acquisition is to be planned and implemented in a participatory manner as stated in Proclamation No 455/2005. Involvement of the community at the planning stage is one of the major prerequisites for making development plans more effective and beneficial to those that the plan is envisaged to help. The ultimate successful implementation of any project that is conceived for the public benefit should identify stakeholders who will be impacted by the actions. The assessment carried out in Burayu town to learn about the perceptions of agricultural households regarding their participation in the overall expropriation proceedings is presented in **Table 4.16**.

Table 4.16: Participation of respondents in the process of expropriation

Respondents' participation categories	Response Categories			
	Yes		No	
	Frequency	Percent	Frequency	Percent
Were you informed about the purpose for which your plot of land was needed before the takeover?	19	14.80	109	85.20
Were you informed about the relevance of the project to be developed on your land prior to expropriation?	5	3.90	123	96.10
Were you given the chance to challenge the expropriation process?	3	2.34	125	97.66
Were you given the chance to bargain on the amount of your compensation pay?	6	4.69	122	95.31

Source: Household survey, n=128, 2021

The study found only 14.80% and 3.90% of landholders were informed prior to expropriation about why their plot of land was required and the importance of the project to be developed on their land, respectively. Also, only 2.34% were allowed to challenge the legality of expropriation processes, while only 6 persons (4.69% of respondents) were able to bargain on the amount of their compensation payments. In general, the overwhelming majority of respondents were not involved in the process of expropriation and compensation (**Table 4.16**).

One of the interviewees' from Gefersa-Guje kebele of Burayu town stated the following about his participation in various stages of the expropriation processes:

'Most of the time, the lower level of government tiers, such as the kebele chairman and their cadre members, make every argument and concord in the name of the local farming households without our common ideas. So, as citizens, we have the right to express our own ideas for any development project to be undertaken in our community, but only a few people who have close ties to and act as government appointed representatives pass false information to officials. Such false reporting has an impact on project creation and implementation because; in official terms development projects are dependent on the participation and interest of the general public. The cadres and the hand-picked representatives create rift between residents and the government itself'.

According to the federal expropriation and compensation payment proclamation No. 455/2005, when a decision is made to expropriate a landholding, the landholder is notified in writing about the term within which the holding must be vacated and the amount of compensation to be paid. In light of this, the Proclamation requires the responsible bodies to prepare specific data regarding the land required for the works and transmit it to the organs entitled to expropriate land and receive approval from them at least one year before the start of project activities. The minimum period for vacating a holding is stated to be 90 days from the day compensation is paid, whereas the period for land with no property is reported to be 30 days after receiving notice of expropriation order. The date of notification of expropriation, as specified in article 4 sub-articles 4 of proclamation No. 455/2005, is the starting point for counting the period during which the landholder must abandon his properties. However, FGDs with all participants of the three sampled kebeles revealed that the municipality acted in contravention of such governing laws. Almost all of the expropriated farming households confirmed that they were not informed

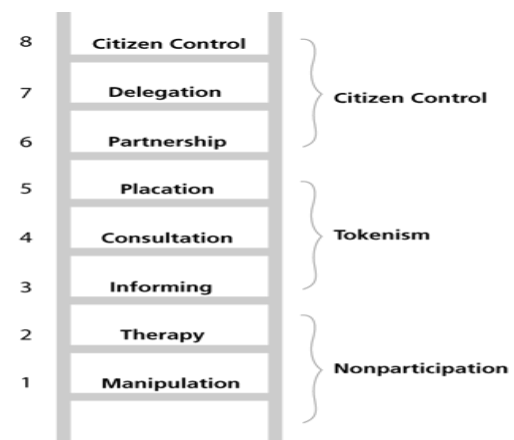
in time, were not engaged, and did not receive support for coping with the new urban ways of life throughout the expropriation process.

This research revealed that all of the development programs where farmers were expropriated in Burayu town were planned and implemented in a top-down manner, which means that the general public had no information and were not consulted properly in matters that affected their wellbeing. Thus, the already decided agendas, such as type of development projects, the location and area of land to be expropriated, and the amount of compensation payments are informed to the community, as opposed to the guiding procedural principles in the expropriation and compensation laws of Ethiopia. In the case of Burayu town few selected persons were consulted, and appeasement and/or intimidation tactics were implemented. The type of participation applied in the expropriation projects in Burayu was at best level 2, i.e. tokenism (Fig. 4.16).

In general, the engagement of concerned entities in any development effort is a critical component that governments should pay close attention to from conception to implementation, as well as managements that foster a sense of belongingness among the masses are important for long-term sustainability.

Arnstein, (1969) identified 8 ladders of citizen participation ranging from low to high citizen control. The 8 stages were categorized broadly into three categories:

1. *Non-participatory*
 - Manipulation, and Therapy,
2. *Tokenism*
 - Informing, consultation, and placation
3. *Citizen control*
 - Partnership, delegation and citizen control



Arnstein's Ladder (1969)
Degrees of Citizen Participation

Figure 4.16: Ladder of Citizen Participation

Source: Adapted from Arnstein, (1969)

4.2.5.7. Familiarity with governing laws of expropriation process

Any legally binding provision stipulates that every individual has the right and the obligation to know about the provisions of the law as lack of knowledge of the law does not exempt citizens from trespassing legal provisions. In this line of argument, the property owner has to be aware of

the overall governing laws and regulations. In light of this, an investigation was done on the extent to which expropriated farming households and valuers were aware of the norms and regulations governing expropriation, valuation, and compensation law provisions, the rights and obligations of the different parties to the expropriation process. The intention was not to evaluate the legal knowledge of expropriated households, but to learn about legal literacy at the most basic level. In accordance with this, the survey data indicated that 99.22% of the respondents knew very little about expropriation and compensation laws (**Table 4.17**).

It has been revealed that practically all dispossessed agricultural households were unaware of the provisions of the expropriation and compensation laws, or that land rights were also governed by particular land laws. So, landholders did not have a thorough understanding of their rights regarding expropriation and compensation. Similarly, property valuers may not have sufficient knowledge of expropriation and compensation laws. This was well supported by the findings of the field survey; valuers did not have proper knowledge of the laws. A lack of such awareness on the side of project-affected households hinders the possibility to take cases to court and seek corrective measures when compensation payments are not as per the law.

Table 4.17: Knowledge about expropriation and compensation laws

Respondent categories	Knowledge about expropriation and compensation laws (%)		
	Know very well	Know partially	Do not know
Expropriated persons	-	0.78	99.22
Valuers	12.50	87.50	

Source: Household survey, n= 128, and interview of valuation committee members, 2021

In many situations, property valuers lack adequate knowledge of the expropriation and compensation payment legislation. The findings of the field survey revealed that 87.50% of the valuation committee members know the governing rules of expropriation laws marginally while 12.50% of them are well-versed in the law. Furthermore, one of the participants in the FGDs held in Gefersa-Nono kebele claimed that not only illiterate farmers but also some educated valuation committee members were ignorant of the expropriation legislation. This demonstrates how difficult it is to correctly implement the rules if both dispossessed households and property valuers are unaware of the legislation. The ambiguity in the expropriation legislation may cause misunderstanding, leading to delayed implementation and, in some situations, conflict among stakeholders.

4.2.5.8. Stakeholders perspective about compensation payments

Land is the main source of earning for a rural family where food cultivation and animal rearing are crucial. Farmers understand that the subject of land is a serious matter and that losing land means losing their primary source of income and subsistence. Thus, one can imagine how enraged they would be when they were initially notified of expropriation. In light of this, even if fair compensation is paid, owners are still dissatisfied, and the expropriation and compensation payment processes become burdensome obligations. When the concerned property owner is marginalized, they are unable to bargain on the procedure of expropriation as well as the amount of compensation payments, and the situation escalates and may lead to conflict.

In Ethiopia, the amount of compensation and its fairness depend on the main part on the location of the property to be expropriated, the valuation approach used, the understanding of the valuers about the governing laws, the skill of the valuers, the approved rates by the administrative region for the evaluation time, and the availability of financial resources. In some circumstances, the administrative body violates the rules and regulations of expropriation and decides the amount of compensation to be paid to be within the available financial resources of the institution. As a result, the valuation methods are purposefully biased in order to keep compensation amounts low enough to be accommodated by existing financial resources. Many studies conducted in Ethiopia found that the primary drivers of compensation payment insufficiency are the outdated compensation rates, which do not take into account the market worth of the property, and the techniques utilized to determine compensation. Such disparities in valuation procedures from location to location result in the inequitable application of the idea of fair compensation; as a result, expropriated persons are not treated uniformly.

As stipulated in the 1995 Constitution of Ethiopia and laws enacted subsequent to it, it is prohibited to transfer land through sale or other method of exchange by individuals. According to proclamation No. 455/2005 and regulation No. 135/2007, the properties to be compensated include the loss of land use rights, property placed on the land, and any permanent or temporary improvements made to the land. On the other hand, the valuation procedure used to establish the amounts of compensation to be paid has been the main source of contention because it is contrary to the market worth of the properties. As evidenced by recent experiences, there is subjectivity and a lack of consistency in the approach. There is no fixed standard valuation formula in the expropriation and compensation legislation; as a result the compensation rate used

in the research area was fixed arbitrarily. It fluctuated from time to time and from place to place as well as variations based on who pays the compensation (federal government or regional government). The valuation method considers the average annual yield of the previous five years multiplied by ten to determine the amount of compensation to be paid for the loss of arable land without taking into account location values of the land (when converted to urban use) and other factors that must be considered in the valuation process such as inflation. Based on this rate, dispossessed agricultural households in Burayu town were asked to express their thoughts about the fairness of the compensation payments granted to them by the municipality. Accordingly, the findings of this study revealed that despite various types of complaints, 96.87% have received compensation payments, while 3.13 % did not. Among these, 98.44% of them asserted the compensation payment was very unfair while the remaining 1.56% reported that it was unfair. This suggests that almost all respondents thought the reparation payments paid to them for expropriated property were unfair (**Table 4.18**).

Table 4.18: Perception about compensation payments

Queries categories	Response of respondents (%)	
	YES	NO
1. Did you receive any sort of compensation?	(96.87%)	(3.13%)
2. Do you believe the compensation payment you received was fair or reasonable?		
Very unfair	(98.44%),	
Not fair		(1.56%),
3. Levels of Satisfaction		
Very dissatisfied	(89.84%)	
Dissatisfied		(10.16%)

Source: Household survey, n= 128, 2021

The displaced agricultural households complained about the amount of compensation due to faulty property inventory and valuation methods; underestimation of property values based on non-market indicators, as well as the misunderstanding of government-assigned valuator about government ownership of land. They also noted that, despite the government's assurances that they would benefit from the implementation of social and economic development initiatives, they were not usually enabled to enjoy the benefits, especially in the instance of private sector investment. One of the predicted benefits of investment is the provision of job opportunities for affected landowners. During the field visits in Burayu town, there was a lot of animosity toward investors. A discussion held in Gefersa-Nono kebele around industrial village reiterated the fact

that investors, let alone to make an effort to employ expropriated landholders or members of their families, such as their children, some of the would-be investors did not even undertake the investment project for the last twenty years. Hence, the survey revealed that 89.84 % of the expropriated households were very dissatisfied while 10.16 % of the sampled respondents were dissatisfied with the amount of compensation payments they had received (**Table 4.18**). This demonstrates that nearly all of the respondents were dissatisfied with the compensation paid. This means that the amount paid as compensation was unjust and insufficient, and it remains as the central concern that the municipality must tackle. Furthermore, the FGDs and key informant interviews conducted in the research town found that the majority of affected people considered that all relevant elements affecting the value of expropriated property, whether directly or indirectly, were not taken into account when the assets were evaluated. Moreover, there was no possibility for strong bargaining between landholders and the municipality because the valuation procedure did not consider the market value that existed on the ground. Moreover, the valuation method is a cost replacement approach which is based on unit rates that are not timely updated, has various subjectivities built into the local administrative entities on expropriation processes. The impoverished and underprivileged households are typically the victims of such expropriation processes. The case of improper compensation is presented in **Box 4.1**. In many circumstances, if land expropriation is done at the request of a private investor, cash compensations alone was paid for expropriated land and no replacement land was provided to the expropriated person. This was because compensation in kind was impracticable as spare land cannot be secured, particularly in metropolitan areas such as Addis Ababa and its surrounding areas.

Box 4.1: Unfair compensation

One of the informants from Gefersa Burayu kebele, (Ato Kore Terfa; 58 years old) stated that his land which was located near the municipality office in town, was illegally expropriated by the municipal authorities and transferred to an investor who is the relative of one of the municipal officers. In lieu of his 5,000 square meters, a mere 220 square meter was given to him in another place to build his residence where there was no public facility. He stated that the land had been held and used by him and his family throughout his life until he was expropriated. It was difficult for him to generate income to rebuild his residence because the compensation payment was very small, he was old and without regular income. He was severely disadvantaged and vulnerable, and evidence suggested that this was one of the primary reason why his land was picked for expropriation.

Finally, he decided to file a lawsuit in the Woreda court. Ato Kore Terfa did not have the services of a lawyer and had no knowledge of court procedure, both of which worked against him. After numerous court appearances, the court ruled that the municipality should pay better compensation based on the market value of the property. However, that market value was for the constructed property only, which does not include the location value of the land.

(Field survey, 2021)

Poor valuation system has been identified as a major cause of land-related expropriation conflicts in many parties of the world (Li et al., 2015). In Burayu Town, in addition to the above points the members of the valuation committee asserted that the valuation was based on judgments set by the town council. Thus, the expropriation and compensation payments were skewed because it relies on the willingness of administrative bodies. In light of this, a survey was conducted to ascertain the perspectives of the valuation committee members on the current compensation payments. The findings of the study revealed that the overwhelming majority (87.50 %) agreed that the current expropriation processes do not take into account the restoration of affected households. Furthermore, all experts asserted that no relocated households were assisted to establish his/her own businesses with the compensation payments they received. As a result, as all experts agreed, the loss of key income sources with unfair compensation payments, and ignorant of coping techniques had a detrimental influence on the livelihoods of dispossessed communities. They also asserted the unfairness of the assessment system and suggested the need for government intervention to alleviate the downsides of the expropriation process.

Furthermore, a comparative study was conducted to determine whether or not the typical compensation amounts paid are greater or less than the typical market price of properties (**Table 4.19**). The open market value of properties was used in this study as a reference for such assessments. The expropriators were entrusted with determining the market value of the expropriated assets by comparing it to the prices of comparable sold assets. In order to prevent responders from being biased, the researcher made an effort to persuade them to transmit the real data. Data gathered from property valuers and government officials were utilized as a reference to confirm the accuracy of the information obtained from expropriated persons. In light of the aforementioned considerations, the actual compensation granted to all impacted individuals in Burayu town is 49.7% less than the average anticipated open market value of comparable

properties. It is evident that the percentage difference from open market value varies from 32.9% in Gefersa-Guje kebele to 58.8% in Gefersa-Nono kebele when the sample is divided into various geographical sub-sample kebeles. Burayu Town has a lower percentage disparity between actual compensation paid compared to open market value for geographic sub-samples compared to Addis Ababa; the disparity in Addis Ababa is about 46% in Kolfe-Keranio while it is 94% in NifasSilk-Lafto (Alemu, 2012). The presence of significant percentage discrepancy between the average actual compensation received and the average anticipated open market value also reflects the inadequacies of the compensation. For instance, in Gefersa-Nono-kebele, people who were affected by expropriation, on average, received just around 41.2% of the open market value than what they anticipated. Similar to this, in Gefersa Burayu and Gefersa-Guje-kebeles, those who lost their land as a result of the expropriation procedure received only about 59.2% and 67.1%, respectively. The affected parties were expecting higher prices from the open market, but the values of compensation they received were lower.

Table 4.19: Comparison between average compensation paid and the anticipated open market value of properties

Description	Name of sample kebeles			Full sample
	Gefersa-Nono	Gefersa-Burayu	Gefersa-Guje	
Actual compensation paid (N)	4,551	3,317	2,006	9,874.0
Open market value of property (N)	11,057	5,601	2,990	19,648.0
Difference between compensation paid and open market value	-6,506	-2,284	-984	-9,774.0
% of the difference relative to open market value	-58.8	-40.8	-32.9	-49.7%
Average actual compensation paid	77.1	77.1	77.1	77.1
Average open market value	187.4	130.3	115.0	144.2
Comparison of average actual compensation paid to average open market value in per cent	41.2	59.2	67.1	53.5%

Source: Household survey, n= 128, 2021

As stipulated in of Proc.No. 455/2005 (article 4/3) in case of expropriation of property the compensation payment should be made in advance. Even though some municipal officials claim that compensation payments are made in advance, focus group discussions with distressed farming households in various sample kebeles, as well as field observations, revealed that in many cases, compensation was not paid in advance for the expropriated property; cash was paid partially in advance and the remainder was paid after the land was taken over, or at times the remainder was never paid.

Furthermore, it is usual for post-surrender compensation payments, whether partial or complete, to be prolonged for extended periods of time. The failure to pay full compensation in advance is attributed to the length of time it takes to inventory properties, value them, and decide the amount of compensation, as well as the lack of necessary skills to complete these duties on time. Regarding the justification offered by the municipality, the governing rules stated that all such work should have been completed a year prior to the handover of sites. This means that the municipality carried out the expropriation operations in violation of the laws and regulations established in the 1995 Constitution and Proc.No. 455/2005. Moreover, on some occasions, no compensation was paid at all. For instance, municipal officials believe that the legislation permits them to use quarry resources for free, or that because people want to have a road traverse through their villages, they are uninterested to pay compensation for individuals affected by the infrastructure. In light of this, appraisal techniques are often purposefully biased in order to keep compensation amounts low and be within budget. This is a gross violation of rights to compensate the lack of competence to properly prepare budgets, conduct valuation properly and also due to corruption in some cases.

A particularly concern related to the non-payment of compensation in advance is the practice used by the municipal administration of acquiring land holdings through threats. Not only have people involved in focus group discussions and privately interviewed landowners revealed numerous cases of expropriation without payment of compensation, but local officials have also admitted in many occasions that they must use force to dispossess farmers from their holdings despite knowing that landholders have not received compensation. Certain impacted persons revealed in focus group conversations that they had to sign the agreement to the confiscation of their properties because they were afraid of being arrested.

4.2.5.9. Use of compensation payments

In Ethiopia, the expropriation law provides for, and expropriators promise, varied training on how to use compensatory monies to build new income-generating businesses, as well as opportunities for employment through governmental assistance. In violation of such provisions one of the main defects of the expropriation process discovered during the survey was that the municipality dispossessed private holdings without paying attention to how compensation payments were to be used in the process of generating new income to sustain life in the new urban way of life. Even if the compensatory money provided to them is insufficient, few of them

have recently begun small businesses, while others have put it to other uses. There may also be those farmers who lack the knowledge and skills required to invest in a profitable business. The money given to them is cash, which can be used for a variety of purposes other than non-agricultural income generation. In light of this, an endeavor is made to reach the heads of dispossessed farming households in order to figure out how they are using their compensatory payments. Thus, according to the findings of this study, more than half of the respondents (53 %) used the compensation payment for consumption. Furthermore, approximately 27% of the respondents used the money for leasing agricultural land, 11% used the money for animal rearing and the remaining 9 % used the money for petty business (**Figure 4.17**).

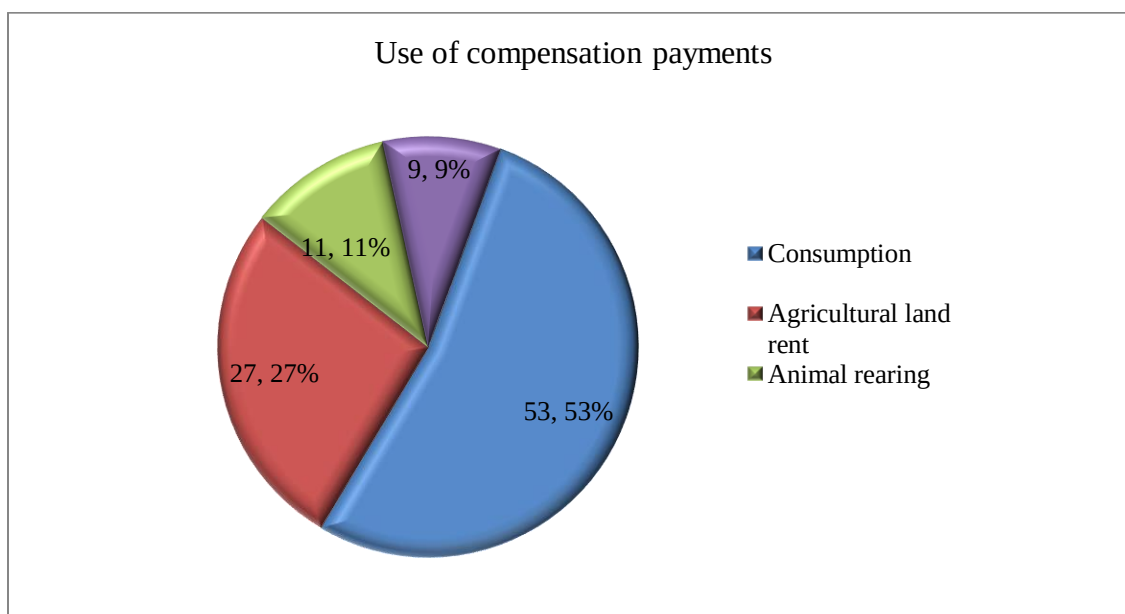


Fig. 4. 17: Utilization of compensation money (Source: Household Survey, n=128, 2021)

After losing their agricultural land, farming communities were not engaged in off-farming activities, making it difficult to sustainable livelihood strategies. The municipality also failed to keep the promises that were made before the confiscation began. In light of this, several studies in Ethiopian urban centers have discovered that farming households spend their compensation payments on consumption as well as agriculture related activities by leasing land from faraway places from their residential sites. Households that overspent on food and alcohol deplete their savings and have no way of rebuilding their lives. Many among them grew disappointed and desperate, and in such circumstances they began working as day laborers, which still do not appear to be viable. Thus, the situation indicates that these individuals are at risk of becoming

food-insecure. One of the primary goals of land expropriation is to benefit the masses while protecting private property owners who have been evicted from deterioration of their livelihood.

To come across such safety of life as mentioned in the governing laws of expropriation, administrative bodies should be conscious of the ways in which these families utilize their compensation money in producing new off-farm income generating activities rather than relying on their previous accustomed agricultural chores. In contrast to the findings of this study, dispossessed farming households in other countries are enabled to use compensation payments to engage in off-farm activities that generate long-term income for their livelihoods (Xaba, 2018; Chau, 2019; Lu et al., 2022). In general, urban growth in Ethiopia has been shown to erode the social assets of the expropriated farming community, diminish social connection, and disperse families to various regions in quest of economic possibilities.

4.2.5.10. Resistance to expropriation

The primary goal of community engagement in various development agendas is to foster a sense of belonging in all elements of ongoing or planned activities. This suggests that any development project should consider the interests of end users as well as the benefit of the masses rather than negatively harming them. Even though the 1995 Constitution and the expropriation of property in proclamation No. 455/2005 stipulated private owners' assurances in which compensation must be paid in advance of disposing of their properties, the current situation exists in contravention of such governing laws. In Ethiopia, particularly in farming households that rely on land for sustenance, the loss of land equates to the loss of livelihood because of different reasons. Accordingly, many expropriation processes are fraught with controversy due to the ambiguity of regulating legislations, inadequate implementation by administrative authorities, affected by subjective decisions, and other factors. In light of this, questions were presented to the sample respondents in an attempt to determine their primary motivation for resisting expropriation (**Table 4.20**).

Likewise, focus group participants claimed that the dispossessed land was not utilized as was anticipated. In many instances land was left inactive for a long period of time by the expropriators, with no development. Furthermore, the field survey results revealed that, despite the fact that the expropriated persons refused to give up their land, the process of confiscation was carried out without enabling them to participate in the assessment and measurement of their land ownership. In several instances, expropriated households were not credited for the plants

they had grown. They were not even permitted to take the trees. The majority of landowners who were impacted were quite disappointed with the payment they received. This is why they were against the confiscation procedure. If the early landholders had used their land, they could have made a significant amount of money for themselves and the community. According to one of the FGD members in Gefersa-Nono kebele, he lost 4.5ha of arable and pasture land inherited from his parents 20 years ago, and leaving him with 360 square meters on which he built a house to live in. Compensation money of roughly 85,389ETB was paid for the expropriated land; however it was only used for consumption. The family's livelihoods have been jeopardized. This demonstrates that the participants were dissatisfied with the dispossession which does not include rehabilitation measures.

Table 4.20: Reasons for reluctance to expropriation

Reason for resistance	Relevance of the reason								Total	
	Very important		Important		Less important		Not important		No	%
	No	%	No	%	No	%	No	%		
Unfair compensation	99	77.34	26	20.31	3	2.35	-	-	128	100
Attachment to property	55	42.96	39	30.47	31	24.23	3	2.34	128	100
Mostly out of public interest	23	17.97	16	12.50	49	38.28	40	31.25	128	100
Poor participation process	87	67.97	21	16.41	17	13.28	3	2.34	128	100
Unclear execution procedure	92	71.87	16	12.50	13	10.16	7	5.47	128	100

Source: Household survey, n=128, 2021

In conclusion, the expropriation and compensation laws lack clarity and fall short of international accepted norms regarding the rights of expropriated persons. Moreover, the practice is also not consistent with the provisions of the legislations enacted to guide expropriation. The study revealed that compensation payments vary by project, property valuation is done by persons who have limited expertise in the area and not only compensation payments are delayed contrary to the law but also some households were expropriated without compensation. Thus the practice is found to have compromised the rights of expropriated persons. Urban expansion is not supposed to be implemented at the expense of farming households whose livelihood is based on agriculture but as we will show in the next section, expropriation for urban expansion has affected persons engaged in farming at the outskirts of Burayu town.

4.3 Impacts of urban expansion and land expropriation on the livelihood of farming households at the urban periphery of Burayu town

4.3.1. Introduction

This section examines the effects of urban expansion and expropriation of land for urban expansion on the means of survival of farmers who reside at the peripheries of towns in Ethiopia, using Burayu town as a case study area. As stated in the multi-stage selection of the study area in Chapter Three, the town of Burayu has undergone unprecedented rapid changes in its physical, socioeconomic, and environmental aspects. This is observed to have been facilitated by national level policies on economic development (particularly the industrial corridor policy) and land acquisition for urban expansion through not only its power of eminent domain but also the government ownership of land policy. The public ownership of land and the attendant mistreatment of property holders during expropriation and the inefficiency in land management has both initiated and also encouraged farming households to sell their farmland to third parties despite the fact that it is expressly forbidden by the provisions of the constitution and land policies and farming households do not have other skills to generate income in a sustainable manner. These acts have various consequences on the livelihood of the farming community as well as on the town.

The conversion of land use legally and through informal means has had impacts on the livelihood of farming households living at the periphery of the town. The paradigm for sustainable livelihoods views land as a natural asset that is vital to rural livelihoods. The relationship among loss of land, livelihoods, and the fragility of households is an important issue to consider while researching the impact of development projects on farming households in the long run. Impact assessment in scenarios such as expropriation and dispossession of community asset poses long-term impacts on livelihoods, hence, the Sustainable Livelihood Model is used to assess the key implications of land expropriation in social, economic, and other aspects, or simply the impacts on livelihood assets.

4.3.2 Urban expansion and its implications to the study area

Unprecedented urban expansion and its consequences extend from households to global scale. In many circumstances, particularly in developing countries, uncontrolled horizontal growth of urban centers most of the time crosses existing municipal boundaries. Burayu town is an

independent administrative unit that shares borders with the adjacent Special Zone of Oromia as well as Addis Ababa city. The majority of urban expansion-related issues come from government policy aimed at attracting local and foreign investors in order to provide employment opportunities. One of the first attractions for investors is the public ownership of land and the ease to expropriate existing landholders. The consequences of such practices are significantly more obvious in Burayu town because it borders Addis Ababa, the country's primate urban center which generates great demands for land.

In Ethiopia, the dichotomy of urban and rural development policies are based on the urban-biased paradigm, i.e. favoring urban centers at the expense of surrounding rural areas. This has a negative impact on the sustainable growth of both entities. Although the government promoted agriculture led industrial development policy in the 1900s and 2000s there was no significant improvement in the agricultural sector. People migrated to urban areas due to various reasons among which rural push factors played a dominant role. This study identified the main causes of unprecedented horizontal urban expansion and its various implications for Burayu town.

4.3.2.1. Drivers of rapid urban expansion in the study area

This study intended to investigate the underlying cause of the horizontal growth of Burayu town through policy analysis and ground validation through information from displaced communities. According to the survey of households, the town has been rapidly expanding since the 2004 reform. Furthermore, all of the interviewees agreed that the increase in the built-up area of the town has come at the expense of agricultural land. According to the household survey, 56.3% (72) the cause of urban expansion was due to increase in investment while 43.7% (56) believed the main cause was migration to the town. Furthermore, nearly half of the respondents (67) indicated that the increased investment pressure on the town, hence cause for urban expansion of Burayu was due to its proximity to Addis Ababa. The policy analysis indicated similar results: that the establishment of various investment projects in the town was due to its proximity to Addis Ababa, and the rural to urban migration (first to Addis Ababa and then urban-urban migration to Burayu town) in search of job opportunities contributed to the expansion of Burayu town towards the periphery areas.

Furthermore, all interviewees confirmed that the town's unprecedented horizontal expansion occurred after the town was given *Grade 1* urban status by the Regional State and the federal government adopted policies that attracted investment to the town. The *Grade 1* urban status and

the designation of the town as one of the investment corridors attracted many people to settle in the town and this situation aggravated the need for more urban land for the development of various facilities which include housing, work and recreation.

In addition to the foregoing, FGDs held in all of the three sample kebeles revealed that their land had been taken over by the municipality with an unfair compensation payment, allowing the government to lease it to investors. This practice exacerbated the town's horizontal expansion as speculation on land increased and informal transaction of land became rampant. However, the speculation did not result in immediate development of the converted land; rather although the land was not available for agriculture, it remained vacant disrupting the orderly growth of the town. Moreover, the discussants also described that because of the recent development initiatives the natural landscape is changing to a significant degree. Within the last three decades, the nearby arable land, forest, and open fields, which were used for various purposes such as agricultural production and pasture fields, are now occupied by investment projects, residential houses, and other structures. The analysis of data on factors of expansion of Burayu town (**Table 4.21**), show population growth through natural ways and growth of the urban area through reclassification did not score much in the household survey. The general causes of horizontal expansion identified by the respondents agree with most other findings of urban expansion studies where the town under consideration is located near a bigger entity with better facilities (Tadele, 2020; Tong & Chen, 2002). This is in line with the general firm location theory where firms choose locations that maximize their profits and individuals choose locations that maximize their utility (Dempsey, 1960).

Table 4.21: Respondents' view of factors for the expansion of Burayu Town

Cause of expansion of Burayu town		Case study Kebeles							
		Gefersa Burayu		Gefersa Nono		Gefersa Guje		Total	
		Count	N %	Count	N %	Count	N %	Count	N%
Increase in investment	Yes	30	71.4	30	50.8	12	44.4	72	56.3
	No	12	28.6	29	49.2	15	55.6	56	43.7
Migration: Rural-urban and urban-urban	Yes	20	47.6	20	33.9	16	59.3	56	43.7
	No	22	52.4	39	66.1	11	40.7	72	56.3
Proximity to Addis Ababa	Yes	22	52.4	30	50.8	15	55.6	67	52.3
	No	20	47.6	29	49.2	12	44.4	61	47.7
Natural population growth	Yes	3	7.1	6	10.2	2	7.4	11	8.6
	No	39	92.9	53	89.8	25	92.6	117	91.4
Reclassification of rural areas as urban	Yes	2	4.8	3	5.1	1	3.7	6	4.7
	No	40	95.2	56	94.9	26	96.3	122	95.3
Total No. per kebele		42		59		27		128	1

Source: Household survey, 2021; n=128

Urban expansion may be associated with land tenure modality, social structure, and economic performance; it is also associated with demography, economic, and political conditions of a country. Though to a varying degree, both developed and developing countries experience urban expansion. Essentially, urban expansion is a combination of three fundamental processes. First, rural to urban migration has been a major source of urban growth. Rural-urban migration is motivated by perceived economic prospects (the urban pull) and insecurity for personal development and economic concerns (the rural push). Second, there is a natural increase in population, which is caused by increase in fertility and a lowering of death rate. Third, reclassification of rural land under urban boundaries brings more population to the towns. Thus, these factors drive increase of urban areas by engulfing adjacent rural areas.

Ethiopia has an open policy for urban and industrial growth, which includes the increase of investment opportunities. The growth of existing urban centers, as well as the formation of small and intermediate towns in regions, has offered important evidence of an optimistic tilt toward urban development in recent years. Although Ethiopia is one of the least urbanized countries, it is also one of the fastest urbanizing countries in the world. The country's primate city, Addis Ababa, is expanding into neighboring peripheral kebeles and the towns adjacent to it, like Burayu, do the same due to Addis Ababa's push and pull factors. Burayu town is the highest recipient of the impact of urban expansion of Addis Ababa compared to other towns in its vicinity.

4.3.2.2. Impacts of Burayu town horizontal expansion

Urban centers are not only sites of prospects, but they are also areas where many difficulties are concentrated for a variety of reasons. Based on the management techniques that are employed, urban centers could become '*engines of growth*' attracting investment from both local and foreign sources; or become challenges, particularly those producing a variety of environmental issues for both urban centers and the nearby towns (Choithani et al., 2021). While urban centers generate wealth and are centers of innovation and job creation, they are also massive consumers of land. In light of this, struggle for resource between urban and rural areas has become a concern.

A household survey was conducted comprising 128 respondents with a view to understanding the consequences of urban expansion on households who were expropriated to give room for urban expansion. The main issues of analysis were inquiry to know if urban expansion has

affected expropriated households; if so to what magnitude. Analysis of the survey data showed that the rapid expansion of Burayu town into the peripheral kebeles has had various impacts on the affected households (**Table 4.22**) as shown along the following aspects.

Urban expansion and employment opportunities

As the extent of urbanization grows, farming communities look for alternative off-farm job opportunities to supplement their income. In line with this the respondents of the household survey were asked to reflect about the opportunities and challenges of expansion of Burayu town. In a gained-not gained job opportunities questionnaire, 56.37% of the respondents reported that they have gained access to jobs while 43.63% reported not having access to jobs after relocation. The gender disaggregated data for those who gained access to jobs, were 65.2% of men and 61.1% of women respondents (**Table 4.22**).

According to Samat, after relocation due to urban expansion, skilled young people have more employment opportunities in both formal and informal sectors compared to other age groups. However, data from the household survey in the current study does not conform to this generalization. The data from Burayu shows that for the under 45 years of age 61.5% (32 out of 52) have access to jobs, for the 45 to 64 years group, 60% (33 out of 55) and for the over 64 years group, 76.2% (16 persons out of 21) have secured jobs. The absolute number of jobs secured by relocated persons is low and agrees with other findings (Choithani et al., 2021), but the relative chance of securing employment is observed to favor the over 64 years' group. The in-depth interviews revealed that although farmers were expropriated and lost their land, the intended developments on their land were not implemented; so sufficient jobs were not created. Consequent to this, the expropriated households had to re-engage in farming however small their plots might be and also by renting from others. On the other hand the younger group look for engagements that are in line with their aspiration in the modern sector but the sector is not developed yet.

Table 4.22: Impact of urban expansion across socioeconomic characteristics

Factors and conditions		Gender (%)		Age (%)			Education (%)	
		Male	Female	<45	45-64	>64	illiterate	Educated
Land expropriation status	Partly	66.3	38.9	57	60.4	59	62.7	55.1
	Fully	33.7	61.1	43	39.6	41	37.3	44.9
Displacement level from land/home	No	66.3	38.9	57	60.4	59	62.7	55.1
	Yes	33.7	61.1	43	39.6	41	37.3	44.9
Perception of Compensation	Fair	8.7	11.1	5.7	7.5	23	11.9	7.2

payment	Unfair	91.3	88.9	94	92.5	77	88.1	92.8
Pre-emptive informal land selling act by households	Yes	57.6	63.9	68	52.8	55	52.5	65.2
	No	42.4	36.1	32	47.2	46	47.5	34.8
Economic status after expropriation	Declined	95.7	86.1	94	90.6	96	93.2	92.8
	Improved	4.3	13.9	5.7	9.4	4.5	6.8	7.2
Improved access to basic services after expropriation	Yes	90.2	91.7	91	92.5	86	86.4	94.2
	No	9.8	8.3	9.4	7.5	14	13.6	5.8
Improved market Access after expropriation	Yes	72.8	61.1	64	75.5	68	64.4	73.9
	No	27.2	38.9	36	24.5	32	35.6	26.1
Job opportunity after expropriation	Yes	65.2	61.1	61.5	60	76.2	67.8	60.9
	No	34.8	38.9	38.5	40	23.8	32.2	39.1

Source: Household survey, 2021; n=128

One of the respondents from an interview session with over 45 years' men in 2021 expressed that he was employed as a security guard at a factory near his home and earns 1,200 Eth. Birr per month (about USD25). He also cultivates crops on his land that was left after expropriation. In doing so he meets his family's basic needs. However, farming as a job opportunity will gradually diminish and the expropriated persons will be confronted with the issue of adaptation as a result of the need for new ways of income generation.

Urban expansion and access to market

Urban expansion is assumed to improve access to markets thereby improving the possibilities to deliver goods and services without incurring much transportation costs and get income by households. The household survey data was used to check the level of access to markets by expropriated households. The analysis indicated that about 69.5% (89 out of 128 households) of the surveyed households reported having improved access to market, while 30.47% (39 out of 128) of the interviewed persons declared that they did not get improvement as a result of urban expansion (**Table 4.22**). The gender disaggregated data shows more men reported better access to market compared to women (72.8% Male and 61.1%Female). About 64% of the under 45 years of age indicated they have better access to market while those who declared better access to markets by the 45 to 64 years range was 75.5% and 68% for the over 64 years of age group. The market accessibility data indicates relative satisfaction as age increases. This could be as a result of the perception difference about distance to and opportunities from markets by the different age groups. Elderly persons may appreciate reduction of distance to markets much more than the younger generation. The perception of access to market by the education level of interviewees was also analyzed to understand the relative impact of urban expansion on the

group. Improvement in access to markets was reported to be better for the more educated than the illiterate persons (73.9% and 64.4% respectively).

Distance affects the accessibility of market. The household survey indicated that households in Gefersa-Burayu and Gefersa-Nono have better market access than households in Gefersa-Guje kebele which is farther away from market places compared to the other two kebeles. The presence of market access options for households grows with the increase of urbanization provided that the affected persons have opportunities to produce and sell commodities. This might be an area to investigate as a rehabilitation strategy for farmers who are left with some land after urban expansion.

Accessibility of basic services

Generally, urban centers provide better access to basic facilities than rural areas; but the quality of the service and its accessibility to different groups depends on location and on socio-economic factors. Accessibility of basic facilities was analyzed using gender, age and educational level data of expropriated households. Accordingly, both gender groups reported to have better access to basic services after relocation (90.2% and 91.7% respectively; **Table 4.22**). The different age groups agree that the accessibility of basic services is better now than before; whereas some difference was observed between the different educational groups: more respondents from the better educated group felt they have better access to services compared to the proportion of the other group (94.2% and 86.4% respectively).

The development of good infrastructure was reported in the in-depth interviews to have provided households more opportunities to participate and improve their incomes. The municipal official also claimed that farmers near highways have begun to engage in commercial activities to sell their products. The different FGDs revealed that relocated households have benefitted from the development of various basic services (educational facilities, health institutions, potable water, electricity utilities, and communication lines). This observation is similar to other studies in country as well in Kenya (Mekuriaw & Gokcekus, 2019; Mandere et al., 2010). On the other hand the unplanned spread of urban centers into surrounding areas has a negative impact on the natural environment as well as on the livelihoods of nearby farming communities. In light of this, some of the drawbacks of urban expansion as revealed by the research are presented in the following sections.

Level of land expropriation and displacement from former residence

The preceding discussion concentrated on the economic benefits enjoyed by relocated households. However, there are drawbacks due to urban expansion too. For example, even though urban expansion creates more job opportunities in non-agricultural sectors, most local farming households are involved in low-skilled and low-paying jobs such as security guard, garbage collection, petty trades, and so on. The rapid rate of urban expansion stimulates demand for land which is still in non-urban function, resulting in the dispossession of assets of farming households. The household survey showed that for the majority of respondents (57.81%) the loss of agricultural land was partial, whereas 42.19% of the respondents were fully expropriated and had to resettle elsewhere. The distribution of fully expropriated persons along gender lines is 31 out of 92 for male respondents (33.7%) and 22 out of 36 for women respondents (61.1%). On the other hand the proportion of displacement from former location disaggregated by age group shows that 43% of the under 45 years age group, 39.6% of the 45–64 years age group and 41% of the over 64 years group were displaced. Proportion of full expropriation disaggregated by education level attained by household heads shows that 37.3% of the illiterate group and 44.9% of the educated household heads are fully expropriated (**Table 4.22**).

The full and partial expropriation of land exerts various pressures on the dispossessed households. On one hand the partial dispossession seems preferable to the other as it allows households to continue doing what they were doing before; but the reduction in the size of land reduces their ability to produce as much as was before. This has a hidden impact of making households half employed. The fully expropriated may find it difficult to cope as they have lost all resources they were accustomed to produce for their livelihood but the perception that they have no point of return to the former way of lifestyle as farmers may prepare them better to cope with the transformed condition. However, key informant interviewees argued that partially dispossessed farming households were perceived as having a better opportunity to recover faster than the fully dispossessed families if they use their asset effectively.

Unfair compensation payment

The overall urban expansion program in Burayu Town was implemented with minimal participation of the project affected households. Issues of consultation regarding the planning of new projects and expropriation and compensation processes should have been discussed prior to decision to develop areas. The analysis of data in this research revealed that the main factor for

the improper development process is the public ownership of land which gave power to the municipal authorities a free hand to expropriate landholders. The provision which allows for considering improvements on land and movable properties only as properties worth consideration for compensation places landholders at a disadvantage. The perception of municipal officers implementing expropriation is shaped by the public ownership of land; that they feel they are custodians of public property and this perception influences their actions during all stages of the expropriation process.

As per the household survey data presented in **Table 4.22**, the majority of respondents (91.3% male and 88.9% female) viewed the level of compensation to be unfair. Disaggregated data by age category shows over 90% of the under 64 years and 77% of the over 64 years' felt the compensation paid to them for their expropriated assets was unfair. Nearly all respondents in the different educational groups viewed the compensation payment to be unfair. In some cases no payment was paid for the lost land. A key informant related his situation as having lost all of his grazing land and tree grove without any compensation as the officers viewed land to belong to the government and grazing land does not represent improvement of land. The main areas of dissatisfaction of expropriated households is the none-participatory practices of municipal officers in the determination of areas to redevelop, what assets to consider for compensation; and the compensation amounts. This situation was observed in other studies in Ethiopia too (Alemu, 2015).

Pre-emptive sale of land by farmers to land speculators

General economic and population growth coupled with conditions which do not have proactive land supply for development usually create conditions for informal land transactions by various actors. Minimal compensation payment by the government is blamed for the initiation and selling of land in informal ways. The informal transfer of land use rights has negative consequences; the sellers lose land which otherwise would have earned them income from agricultural production for a long period of time until expropriation is effected while the municipal administration is faced with all the difficulties of handling informal settlements. Farmers who sell land informally may secure better pay compared to the official compensation rate but the piecemeal sale of their land results in misuse of the money and result in the gradual deterioration of their livelihood.

Information was gathered from the household survey to understand the acts and perceptions of household heads about informal land transactions. Out of the 128 sampled households, 59% (76 household heads) testified to have sold land informally. Disaggregation of this data by gender shows that, 57.6% of men and 63.9% of women household heads have sold land informally (**Table 4.22**). Data on age group and their participation in informal land selling shows, the younger age groups (below 45 years) are observed to have engaged more in land sell (68% of them) compared to the 45 to 64 years group (52.8%) and the over 64 year's group (55%). Data on informal sell of land practice by the better educated persons was observed to be more (65.2%) than the illiterate group (52.5%). It could be speculated about the reasons for the difference in proportion of land sellers. The plausible reason is that the under 45 years group would want to move out of agriculture while the over 64 years want to cling onto their long accustomed occupation. In the case of the proportion based on educational status, the better educated seem to prefer settling in urban areas than prolong their agricultural practice. These situation seem natural and they are confirmed by the household survey.

The practice of informal land sell was disaggregation by kebele to understand the practice (**Table 4.23**). According to data from the household survey, more respondents from the kebele which is nearer to the urban center (Gefersa Burayu) were engaged in informal sell of land, followed by the farthest kebele (Gefersa Guje) and lastly the kebele in the intermediate location (Gefersa Nono). The land in the urban center fetches more money and the chance of keeping it underdeveloped is low. Those at the farthest location are attracted to sell their land by the better offer of informal land buyers (usually through brokers) compared to the official compensation whereas landholders in the middle area are in a dilemma: they may be prolonging the sale of their landholding until the land appreciates better. The disparity between demand and supply equation is the main reason for the engagement of informal land speculators who seem to target locations for immediate gratification (near town center) or more benefit in a prolonged time (farthest from town center). The in-depth interviews revealed that land prices decreased as one moves outward from the town center as is normal general knowledge on land value gradient.

Land speculation is usually high in situations where there is political unrest or when urban areas are not managed properly. Such situations aggravate informal transaction (or grabbing) of agricultural land by land speculators(Kasa et al., 2011). Likewise Pradhan (2017b), discovered that most vulnerable areas for land grabbing are strategic locations in the transition zone. The

result of the current study is in agreement with this observation by other researchers. In Burayu Town, land expropriation without appropriate compensation and the unilateral decisions on the manner of relocation have prompted landholders to informally sell their land. This act exposes them to land grabbing which may seem beneficial to them initially but eventually renders them to loss of their livelihood.

Economic status after expropriation of land

The main objective of this research being uncovering the impacts of urban expansion on the livelihoods of expropriated households, data was gathered on the before and after expropriation economic status of expropriated households.

In this research the household data was analyzed to understand impacts of expropriation of land across gender, age, and educational status as well as by location of the expropriated households. Data disaggregated by gender shows 95.7% of male households and 86.1% of female respondents reported that expropriation of their landholding has downgraded their economic status. This accounts for 93% (119 of 128) of all respondents (**Table 4.23**).

Table 4.23: Perception of respondents about urban expansion parameters by kebele

	Indicators	Gefersa Burayu		GefersaNono		GefersaGuje	
		Count	Column N %	Count	Column N %	Count	Column N %
Land dispossession	Partly	28	66.7%	20	33.9%	27	100.0%
	Fully	14	33.3%	39	66.1%	0	0.0%
Displacement from their land/home	No	28	66.7%	20	33.9%	27	100.0%
	Yes	14	33.3%	39	66.1%	0	0.0%
Compensation payment	Fair	4	9.5%	3	5.1%	5	18.5%
	Unfair	38	90.5%	56	94.9%	22	81.5%
Pre-emptive informal land sale by households	Yes	30	71.4%	30	50.8%	16	59.3%
	No	12	28.6%	29	49.2%	11	40.7%
Economic status after dispossession of land	Declined	40	95.2%	56	94.9%	23	85.2%
	Improved	2	4.8%	3	5.1%	4	14.8%
Access to basic services	Yes	39	92.9%	55	93.2%	22	81.5%
	No	3	7.1%	4	6.8%	5	18.5%
Market Access	Yes	32	76.2%	50	84.7%	7	25.9%
	No	10	23.8%	9	15.3%	20	74.1%
Job opportunity	Yes	32	76.2%	33	55.9%	17	63.0%
	No	10	23.8%	26	44.1%	10	37.0%

Source: Household survey, 2021; n=128

The data analysis across age groups and education level shows similar situation: over 90% by both categories declared that their economic status has declined after expropriation of their land as shown in **Table 4.23**. Data gathered by kebele shows that the overwhelming majority in all

three kebeles reported decline of their economic status after expropriation of their land with minor reduction in the proportion of households reporting economic impact as the location recedes from the town center: 95.2% for Gefersa-Burayu –central area; 94.9% for Gefersa-Nono-middle area; and 85.2% for Gefersa-Guje, farthest from the center.

A logistic regression coefficient was used to estimate the odds ratios for each of the independent variables in the model. A logistic regression analysis was conducted to predict the presence or absence of an outcome based on values of a set of predictor variables (**Eq (2)**). The result of the analysis showed that, the economic status of female respondents was 13.71 times more likely to be improved after urbanization as compared to male (AOR = 13.71, 95%: 1.61–116.79). Similarly residents whose land was not sold were 9.17 times more likely to be improved after land expropriation as compared to their counterparts (AOR = 9.17, 95%: 1.05–79.86). Those who were far from municipality were 13.84 times more likely to be improved after their locality was converted to urban as compared to those who were nearest to the urban center (AOR = 13.84, 95%: 1.36–141.08). The study of the relationships of socio-economic factors and economic status after expropriation, (i.e. age, migration, compensation paid, education and relocation) were not significantly associated with economic status of the study participants (**Table 4.24**).

Table 4.24: Multivariate logistic regression of factors influencing economic status of residents after expropriation

		Economic status after expropriation of land				Total	Adjusted odds ratio AOR (95% CI)	P value
		Declined		Improved				
		Count	%	Count	%			
Gender	Male	88	95.7	4	4.3	92	1	
	Female	31	86.1	5	13.9	36	13.71(1.61-116.79)	0.01*
Age	<24	4	80.0	1	20.0	5	1	
	25-44	46	95.8	2	4.2	48	0.04(0.00-1.14)	0.06
	45-64	48	90.6	5	9.4	53	0.28(0.02-4.46)	0.37
	>64	21	95.5	1	4.5	22	0.07(0.00-2.80)	0.16
Migrated	Yes	52	92.9	4	7.1	56	1	
	No	67	93.1	5	6.9	72	2.04 (0.29-14.37)	0.48
Compensation paid	Fair	11	91.7	1	8.3	12	1	
	Unfair	108	93.1	8	6.9	116	0.52(0.04-7.35)	0.63
Land/grabbing (informal land transfer)	Yes (transferred)	72	94.7	4	5.3	76	1	
	No (not sold)	47	90.4	5	9.6	52	9.17 (1.05-79.86)	0.04*

Near to municipality	Yes	85	95.5	4	4.5	89	1	
	No	34	87.2	5	12.8	39	13.84(1.36-141.08)	0.02*
Had Job opportunity	Yes	74	90.2	8	9.8	82	1	
	No	45	97.8	1	2.2	46	0.02(0.00-0.56)	0.02*
Educated	Illiterate	55	93.2	4	6.8	59	1	
	Educated	64	92.8	5	7.2	69	1.44(0.26-8.07)	0.68
Displacement from their land/home	No	70	93.3	5	6.7	75	1	
	Yes	49	92.5	4	7.5	53	0.84(0.12-5.75)	0.86

Source: Household survey, n=128, 2021.

*- significant at 5% level of significance

Research conducted in Kenya indicated that loss of agricultural land resulted in the deterioration of the livelihood of households living at the urban fringe (Mandere et al., 2010). The findings of the study in Debre Tabor town, Ethiopia, revealed similarly that horizontal urban expansion of the town has adversely affected the socioeconomic conditions of expropriated households; the current research has similarly shown that expropriation of land has resulted in the decline of the economic status of expropriated households.

4.3.2.3. Expropriation and Transformations in livelihood assets

As presented in the theoretical review part, the livelihood framework identifies five main asset classes, namely, natural, human, financial, social, and physical capitals. The ability to use these resources influences the capacity of a household to maintain its current way of life. The sustainable livelihood system offers a way to determine how livelihoods are influenced by organizations, policies, structures, and cultural norms (DFID, 2001; Hammill et al., 2005). One could argue that time modifies resources which influence the capacity of persons to cope with changes in livelihood assets. This might be true in current times as modern resources such as information and technology may modify the way persons interact and conduct transactions of traditional assets. In the current research the households involved in livelihood change being farmers, the impact of IT is not appreciable, hence, its impacts are not analyzed.

Impact of expropriation on natural capital

Natural capital encompasses natural resource stocks, such as land, water, minerals, soils, and others, that help individuals to maintain their livelihood. This study focused on land resource and the changes in income as a result of the shift in land use. As we have seen in the previous sections, the size of land holding of each household has decreased significantly as different land use classes were converted to built-up areas. In this regard, a survey was carried out in order to

determine the land holding size of households in the research areas before and after expropriation. Accordingly, the findings of the study has revealed that before expropriation not more than 25% of the households had an average landholding which is less than 2.5 ha whereas after expropriation, the percentage of households who have less than 1.5ha surged to 94.5% (**Table 4.14**). This suggests that the average landholding size of the sample households has shrunk to a point where they were no longer able to support themselves.

According to interviews and discussions with the various respondents, land in the study area was historically used for the cultivation of food crops, and rearing animals. As Burayu town grew in size and complexity over the last three decades, all sites that were formerly used for agricultural purposes were invaded or occupied by residential, industrial, commercial, manufacturing, service, and other activities, resulting in insecure livelihoods for the indigenous farming households. One of the informants from Gefersa-Nono Kebele explained that he used to grow cereal crops for both domestic consumption and for selling on markets in Addis Ababa and Burayu Town. The main change in the past 30 years was the transformation of what were formerly rural areas into urban function and the proliferation of buildings on the landscape.

The quantity of agricultural production is directly related to land size; so it is not difficult to comprehend the changes in the income of expropriated households. To understand the impacts of urban expansion, a paired sample T-test was conducted to assess the relationship of landholding size, crop production, market value of housing, and income status before and after expropriation. The analysis revealed that crop production per household has decreased by more than half (from about 40 quintals to less than 20 quintals) for the partially expropriated households and those who were fully expropriated had lost all income from land (**Table 4.25** and **Table 4.26**). The findings on impacts of urban expansion on the natural capital in this research are similar to the findings of other researchers (Hammill et al., 2005b; Kombe, 2005b).

Impact on physical capital

Physical capital consists of basic infrastructure and commodities required to maintain the standard of living of a household. Housing is one of such capitals which is considered among the most significant basic necessities of human beings. Data from the household survey was analyzed to understand impact of urban growth on the equality of houses and the appreciation/depreciation of house values; the result of the analysis is presented in **Table 4.25**.

Table 4. 25: Paired Sample T-Test of land holding size, agricultural production and housing value before and after expropriation

Categories parameter			Pair 1	Pair 2	Pair 3
			Land holding size in ha before expropriation - Land holding size in ha after expropriation	Crop yield in quintal before expropriation - Crop yield in quintal after expropriation	Market value of house in Birr before expropriation - Market value of house in Birr after expropriation
Paired difference	Mean		2.76	30	657,812
	SD		1.42	14	694,932
	Standard Error Mean		0.13	1	61,423
	95% Confidence Interval of Difference	Lower	2.51	28	-779,359
		Upper	3.01	32	536,265
t-test			21.94	25	-10
Degree of freedom			127	127	127
P value			<0.001	<0.001	<0.001

Source: Household survey, 2021; n=128

According to key informants, some households had improved their home conditions with the compensation money they received for their land. The improvements include building extra rooms for rent and increasing the size and quality of their houses. According to the key informants the anticipated selling value of average-sized housing was less than 50,000 ETB⁷ in the mid period of the study (2010-2015) before the formal annexation of the case study kebeles into urban areas. However, the same property was estimated to fetch more than ten times the former price during the interview time. This was possible only for households who were partially expropriated and had the luck of retaining their residence. For the majority of households who were fully expropriated and were relocated, the situation was different. The meager compensation money either did not come in one installment, or, even if paid, it was not enough to buy a residence in urban areas; or again, it was not enough to construct a house and restore their livelihood to the pre-expropriation status.

Table 4. 26: Paired sample statistics of income per month, land holding size, and yield production per hectare before and after expropriation

Paired Samples Statistics						
Land dispossession			Mean	N	Std. Deviation	Std. Error Mean
Partially expropriated	Pair 1	Income per month before expropriation	7748.0000	75	351.19872	40.55294
		income per month after exp	6737.3333	75	869.26084	100.37360
	Pair 2	Land holding size in hectare before expropriation	3.3400	75	1.33599	.15427

⁷1 USD was equivalent to about 20-30 ETB during the indicated mid study period while in 2021, 1 USD was about 50 Ethiopian Birr).

		Land holding size in hectare after expropriation	.9800	75	.68002	.07852
	Pair 3	Crop yield in quintal before expropriation	48.80	75	13.250	1.530
		Crop yield in quintal after expropriation	26.07	75	10.536	1.217
Fully Expropriated	Pair 1	income per month before expropriation	6311.3208	53	1030.43314	141.54088
		income per month after expropriation	4939.6226	53	1020.81032	140.21908
	Pair 2	Land holding size in hectare before expropriation	3.3302	53	1.45094	.19930
		Land holding size in hectare after expropriation	.0000	53	.00000	.00000
	Pair 3	Crop yield in quintal before expropriation	40.09	53	15.550	2.136
		Crop yield in quintal after expropriation	.00	53	.000	.000

Source: Household survey, 2021; n=128

Impact on social capital

Social capital is a complex concept; it encompasses social structure, relations, networks, various alliances, and group interactions including shared values, trust, and customs particular to an area. It may not be based on transactional values but rather hinge on reciprocity values. In the Ethiopian tradition, people socialize in informal alliances like “idir,” “iqub,” and “mahber”⁸. Most communities are connected to one another through one or more informal association. These alliances develop between members of the same religion, home-group of people who migrated from the same area, neighbors who lived together for period of time, friendship acquired through belonging to a social class who have developed sense of trust and commitment to supporting each other in times of need. Focus group discussions revealed that in their earlier location, nearly everyone in the village belonged to one or more community associations. However, the relocated households are faced with new neighbors and their relationship with the former neighbors has been disrupted due to the relocation. This implies the social capital that the households used to have in their former location is lost now.

Impact on financial capital

Financial capital refers to the savings accessible to people in times of need to meet their demands. Cash on hand, access to credit; earnings from jobs, remittances, and other liquid assets are considered financial capital. In rural areas, money secured through the sale of homemade

⁸*Idir* is a traditional mutual help association usually used to support in funeral arrangements; *Iqub* is a traditional saving and credit association; while *Mahber* is an association of friends, country people, and religious group or generally of ascribed group.

artifacts, crops, vegetables, fruits and animals constitute their financial capital. Moreover, Iqub, acts as a saving and loan institution. The formal commercial banks are not accessible to the rural community for loan as they require formal guarantee, a situation that none could fulfill. As a result of the expropriation, both the partial and fully expropriated households are affected by the expropriation with regard to their financial capital. There are efforts by the municipal administration to facilitate access to microfinance institutions and the establishment of small and micro-enterprises, but none were in place during the gathering of data for this research.

Impact on human capital

The term “human capital” refers to the capacity of individuals and households to call to duty their status to earn a living. The skills that households have, the quantity and quality of labour a household could command to engage in earning an income constitute human capital. The urban expansion in Burayu Town did not consider rehabilitation of expropriated households. The urban economy is heavily reliant on education and skills other than agricultural skills. As per the data on household heads, 46% of the respondents did not have formal education at all. The illiterate and those who have completed elementary school education make up 80% of the total sample households (**Table 4.11**). This indicates the level of unpreparedness of the rural households to an urban economy. In fact those who have reported to have secured jobs were invariably engaged in low paying casual manual jobs. Moreover, large family size in urban areas may not contribute to improving the household income as it does in rural areas. Therefore, the expropriation of land to give way for urban expansion was reported to have eroded the contribution of human capital to improving their livelihood.

Synopsis of the impacts of expropriation

Land is an irreplaceable natural resource particularly for farming households who rely on it for their livelihood possibilities. Many governments use expropriation to acquire privately held land for various purposes based on the urban-biased theory. In Ethiopia, where the majority of the people are engaged in agricultural operations, land is the primary source of income that requires careful maintenance. As depicted in the findings of this study, the respondent farming households have faced issues such as food scarcity, loss of social capital, landlessness, and other difficulties.

The findings of this study revealed that 43.75 % faced impoverished livelihood, and 33.59 % became landless as a result they have faced food shortages and other challenges. On the other

hand, 15.63 % and 7.03 % of the respondents reported to have faced loss of social bonds and other problems respectively as summarized in **Figure 4.18**.

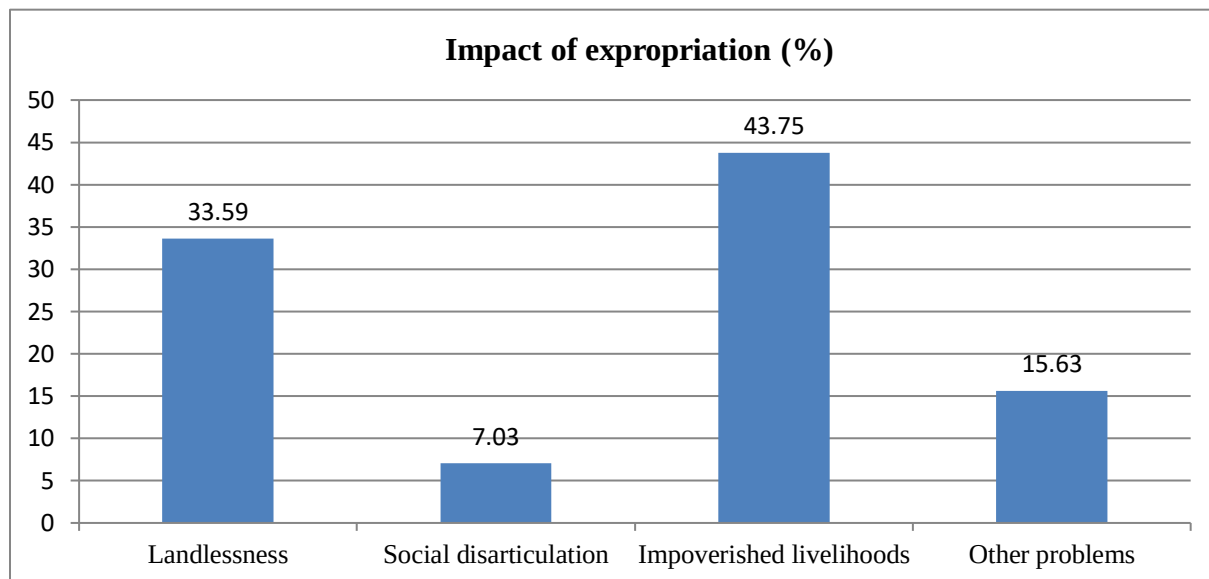


Figure 4. 18: Impacts of expropriation

Source: Household Survey, n= 128, 2021

4.3.3. Livelihood coping strategies of expropriated households

Land tenure system has a significant impact on the livelihoods of property owners, particularly farming communities that rely on land for subsistence. Thus, taking such income-generating resources away from such households has a negative impact on their way of life and demands them to look for other possibilities in order to survive. The expropriation of land was supposed to create new jobs for the displaced people and for others; but the jobs when they were created, did not provide opportunities to the expropriated households. To adapt to the changing conditions, households could choose to apply farm solutions, non-farm strategies, a combination of the two, or even other possibilities.

As depicted in the analysis of impacts of expropriation, for the expropriated households, natural, human, social, financial, and physical assets are disrupted, resulting in a variety of pressures and a lack of trust in their ability to earn a living in an urban setting. The study revealed the strategies of expropriated households to cope to the changes befallen on them through key informant and focus group discussions.

The FGDs with local leaders in all of the three kebeles revealed that farming was the most common occupation for nearly all of the peri-urban residents prior to expropriation. However,

after the annexation of the kebeles by the urban administration, the proportion of respondents engaged in agriculture constituted 58.6% of the interviewed households, and only in Gefersa-Guje kebele, does agriculture which includes crop farming and animal rearing still maintains its supremacy as all of the interviewed were still engaged in agriculture (**Table 4.27**). The means of income for the relocated households tends to be toward trading (wholesale and retail; 17.2%), manufacturing, and construction (11%); service sector (10.2%), and mining/or quarrying (3%) as shown in **Table 4.27**. The data on livelihood coping strategies shows there is no disparity of engagement on the basis of gender: both men and women engage in farming and trade nearly equally. The age disaggregated data shows about 59% of the above 24-years age group are engaged in agriculture, and the majority of illiterate household heads (63%) are engaged in agriculture too (**Table 4.27**).

Table 4. 27:Coping strategies of expropriated households

Factors of analysis		Coping Strategy after expropriation					
		Agriculture	Trade	Manufacturing& construction	Service	Mining/Quarrying	Total
Total interviewed	Count	75	22	14	13	4	128
	%	59	17	11	10	3	100
Gender	Male	61	13	7	8	3	92
	Female	14	9	7	5	1	36
	Total	75	22	14	13	4	128
Age	<24	3	1	1	0	0	5
	24<45	27	10	4	5	2	48
	45<64	32	7	4	8	2	53
	>64	13	4	5	0	0	22
	Total	75	22	14	13	4	128
Education	Illiterate	37	9	5	6	2	59
	Elementary	22	9	5	5	2	43
	Secondary	12	2	3	2	0	19
	Tertiary	4	2	1	0	0	7
	Total	75	22	14	13	4	128
Kebeles	Gefersa-Burayu	28	8		6		42
	Gefersa-Nono	20	14	14	7	4	59
	Gefersa-Guje	27					27
	Total	75	22	14	13	4	128
	%	58.6	17.2	11	10.2	3	100

Source: Household survey, 2021; n=128

The town has a lot of high-quality subterranean water, which is another natural resource that has attracted water bottling companies. The companies that make bottled water have been drawn to the area, including Top Water, Gold Water, and Daily Water. According to municipal officials, the Gefersa-Guje and Gefersa-Nono kebeles are areas where significant employment for the local population is generated. Some people are still able to access land for farming despite the rapid land conversion, allowing them to benefit from the market for fresh farm produce. The majority of them practice agricultural intensification or have diversified their sources of income in response to shrinking farm sizes. The transition from crop farming to animal rearing, which requires less land, is another adaptive method. In this regard, poultry farming is especially prevalent. Sample livelihood strategies employed by expropriated households in the three case study area of Burayu Town are presented in **Box 4.2** below.

Box 4.2. Livelihood strategies of expropriated households

1. *Tale of a 34 year old from Gefersa-Nono:*

He used to cultivate wheat, teff, and vegetables for sale using the family land. Now, he can no longer cultivate as much land as he used to do before because the municipality has expropriated most of the family land. Currently he rents land from other farmers, significantly farther away from his home. In addition to cultivating crops, he also works in sand and stone quarries to supplement his income.

The transition from crop farming to rearing of animals, which requires less land, is another adaptive strategy. In this regard, a poultry farmer's tale is presented below.

2. *Tale of a poultry farmer from Gefersa-Burayu:*

One family turned to chicken farming as a survival strategy. However, the family's farmland was taken over by the government for urban functions. Luckily, the family has informally sold some of their land to developers and has earned a decent income. Following a few failures, this family acquired the essential expertise in poultry management and started to earn a profit. At the time of the field visit, they had roughly 800 birds, which were laying more than 500 eggs per day. The couple are planning to relocate to a larger piece of land they had purchased to expand their business.

A third option is where household members in total or the head of the household migrates to a bigger urban area (in this case to Addis Ababa) in search of employment opportunities. This type of livelihood coping mechanism is the last resort as the act dislodges them from their former home place or worse the family may disintegrate totally.

3. *A Gefersa-Guje farmer's future view:*

For more than 38 years, a couple who lived in the Gefersa-Guje kebele owned and maintained an animal-rearing business alongside crop farming. They lost all land through expropriation. The woman

started petty trading, purchasing farm products from nearby rural areas and selling them in Burayu town but the husband had to resort to casual labour only. The husband is thinking of moving to Addis Ababa to find work.

Source: Focus Group Discussion, 2021

4.3.4. Outcomes of Livelihood Strategies

Livelihood outcomes are the accomplishments of livelihood methods used to overcome the burdens caused by the decline or expropriation of assets. The many livelihood strategies that may be adopted by different individuals rely on their desire for the condition prompting them to choose from one or a variety of methods available. Individuals may not be able to participate in all offered possibilities due to a variety of restricting constraints. The primary purpose of analyzing livelihood outcomes is to comprehend the consequences of the strategy that someone chose. For a thorough analysis of such problems, focus group discussion is vital in order to capture an entire lookout of how effective the people are in their choice. In reality, measuring the level of well-being, which is an indicator of the success of livelihood outcomes, is very challenging as every household's strategies differ widely, so do the livelihood outcomes for all families.

The outcome is also determined by each individual. A few individuals attempted to deposit their compensatory savings in the bank and have been engaged in all other areas until they decide to put their funds into a productive job. A number of the farmers who received compensation for a major portion of their property have launched building materials retailing outlets as well as services such as shops and restaurants. The researcher has also observed a small number of households who built other accommodations for rental and began to earn some money. The vast majorities of farmers were observed to be very cautious in managing the compensatory payments, indicating that they grew pessimistic and thus didn't put their money into a business. In some cases their pessimism has led them to being irresponsible and alcoholics as a result. The whole issue boils down to the giving of money to farmers without equipping them with knowledge on how to manage such a liquid asset.

In assessing the effect of the current land expropriation, it is reasonable to categorize the effects on outcomes as either positive or negative based on replies from project affected households. When any project is initiated in a specific location, whether large or little, two complementary but conflicting circumstances arise: those who earn from the project and others who lose as a

consequence of the project. Based on this realism, the present study illustrates the beneficial consequences of the confiscation practice as well as the adverse consequences experienced by expropriated households in the study areas. Urban development and investment in various sectors creates non-agricultural employment opportunities which, when guided properly, could serve as a platform for improvement of the livelihood of citizens.

4.3.5. Factors that mitigate the negative effects of urban expansion

Urban expansion presents opportunities and challenges with varying degrees depending on how it is handled. On the opportunities side, urban growth improves resource use efficiency, increases social interactions and promotes innovation. However, urban growth does not come without negative consequences. Respondents in the household survey as well as key informants were requested to present their perspectives on possible remedies to address the adverse impacts of urban expansion. The results of the data indicated that 30.5% of the sampled respondents advocated for proper land utilization and management; and 26.6% of the respondents suggested enacting and implementing effective urban development policies which would mitigate the effects of urban expansion (**Figure 4.19**).

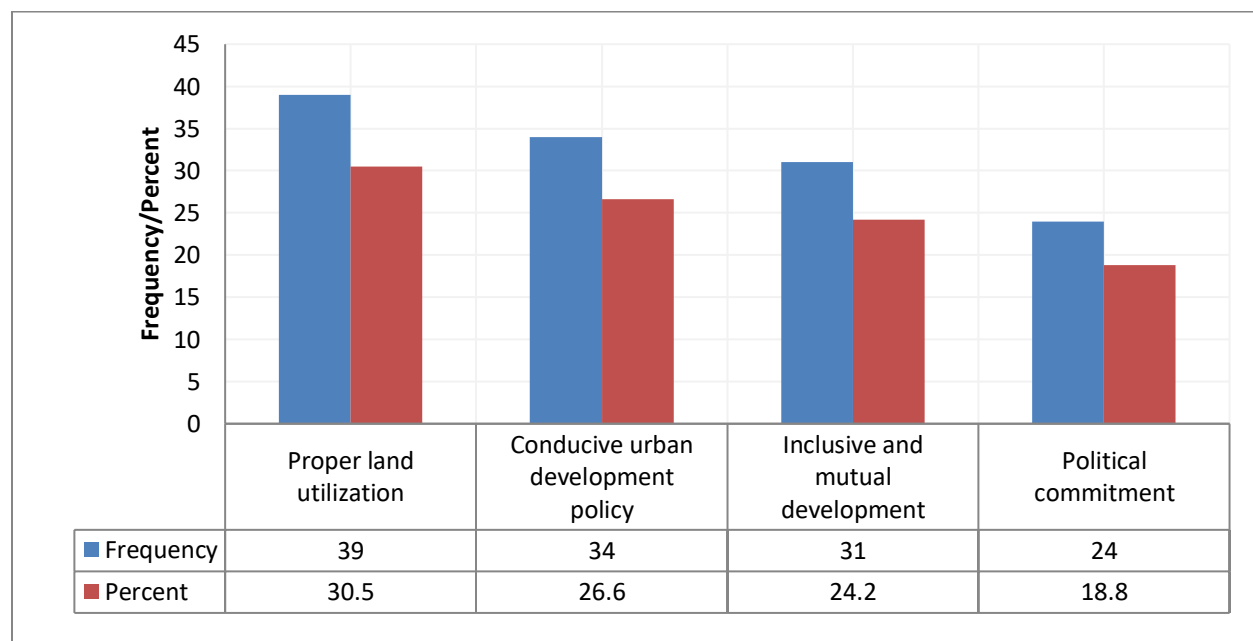


Figure 4. 19: Mitigation of the impacts of urban expansion, Source: household survey, n=128, 2021

The leasehold policy was seen to benefit the economically better off individuals while ignoring marginalized communities. In line with this, 24.2% of the respondents advocated for inclusive development, and 18.8% of the respondents suggested for political commitment to eliminate the

negative effects of urban expansion. This may require redefining public ownership of land and the relative power of municipal officials and landholders. The active participation of relevant stakeholders at all stages of development planning and implementation could mitigate the current one-sided approach and help to design mutually integrative urban-rural development projects.

Urban biased approach to development is one of the major causes for informal transaction of land and the proliferation of informal settlements. Similar to the current study, the findings of Tadele(2020)have revealed that viable urban development necessitates proper legislations, participatory land management, and political commitment to foster mutually beneficial developments for both urban and rural entities.

CHAPTER V: Implications of the findings for sustainable urban development policy formulation and planning practice

5.1. Summary of findings

The study has shown unprecedented horizontal expansion of Burayu town has occurred due to government expropriation of land and the informal transaction of land. Public ownership of land was seen to have affected the involuntarily displaced farmers by not paying proper compensation, and not planning restitution measure so as to cope with livelihood changes. In this regard, the purpose of research being unfolding what is obscure so as to influence the way we act with the new revealed reality, it is critical to assess the developments that are likely to occur while taking into account the current realities on the ground. The research has tried to identify the key policy and planning possibilities that would enable the sustainable development of urban areas in general and that of the study town in particular, which if implemented would help to balance the increasing urbanization and the demand for land for residential and investment use with fair and just treatment of expropriated households and upkeep of the environment. In this chapter, the findings of the research are used to question the status quo in land policy and urban planning, and the manner of execution of urban development in Ethiopian taking lessons from Burayu town. A summary of the findings along the three key objective areas are presented first and the key issues are discussed in detail.

A. Land use land cover change related findings

The main findings of the research on the manner of LULC change could be summarized as follows:

1. The intensity of land use land cover change follows socio-economic changes not only in the jurisdiction of the urban center under study but also at regional scale of which a study area is a part. Therefore studies of LULC changes have to identify factors that impact local decisions. In the case of Burayu the most critical factors of LULC changes were proximity to Addis Ababa and national industrial development policy. It may be necessary to study in depth development policies of Addis Ababa to tally the extent of impact of each development policy on LULC changes in Burayu; in the current study, the approach was limited to study of the resultant impact without delving into the contribution of each sector policy.

However, population growth and the need for more housing; the manner of housing development and its inability to provide access to decent and affordable housing, Addis Ababa's limitation to allocate land for investment timely and sufficiently; the concentration of facilities in and around Addis Ababa were identified as factors which influenced location decision of firms in Burayu.

2. The use of satellite images to study LULC changes is a growing practice as opposed to traditional ground surveying techniques. This study introduced ground-truthing approach to correct anomalies in satellite images. This makes the approach more accurate while retaining its cost and time effectiveness. Moreover, LULC change predictions were introduced as a method for understanding urban expansion if situations persist as is. This helps urban development managers to plan ahead by getting hints of what would be the situation if proper measures are not taken.

B. Expropriation for urban expansion

The study of expropriation laws and practices revealed several issues which could be declared novel in the area for the Ethiopian case. The key findings include the following.

1. The right to own property and the right not to be expropriated without due process of law enshrined in the Ethiopian constitution is misinterpreted to the extent that any local authority could expropriate land/property holders for purposes that are marginally of public interest. This case goes contrary to international law on property right. According to the findings of this study, the practice of land expropriation for urban expansion in Burayu, any development other than for personal residence could be declared public interest. The issue of who determines what is 'public interest' was a key finding with wider implications for sustainable urban development.
2. Public ownership of land was found to provide land managers/urban administrations uncontested power on this vital resource. Regardless of the laws about compensation and urban planning, decisions which have wide impacts on the community are not taken in a participatory manner. Property valuation is not done by professionals, payments differ based who is the promoter of projects. In general in expropriation and compensation practices, lack of transparency was observed to be a norm rather than an exception.

C. Impacts of urban expansion on livelihood of farmers

Urban expansion is mainly enlargement of land occupied by urban functions. This implies land which was not occupied by an urban function is converted to an urban land use. Hence, urban expansion entails expropriation and displacement of households which were leading a non-urban or quasi-urban livelihood. The current study found out that households living at the outskirts of Burayu town have endured a variety of livelihood threatening experiences. The main findings include the following:

1. Farmers were displaced without proper compensation payment and rehabilitation schemes in place
2. Compensation rate being below market, farmers/landholders opt to sell their land. This has promoted informal development, and piecemeal selling erodes households' asset
3. The urban sector not developing in similar pace with the growing demand for urban jobs. Moreover, those who are displaced are not prepared for urban jobs, hence their livelihood is endangered.
4. Coping mechanisms include re-engagement in urban agriculture, diversification of economic activities, and developing rental rooms.

The findings of the research could inform future policy making. The main implications of the findings for planning and urban development practice are discussed in the following sections.

5.2. Public ownership of land and rights on Land

Land tenure has been evolving in Ethiopia more radically since the turn of 20th Century. The former view of all land belonging to the emperors and chieftains was changed to private ownership with varied rights over land in 1901. The private land ownership system was overhauled to a public ownership of land in 1975 where individuals were granted use right only. A different version of public ownership of land was instituted in 1995 which retained public ownership of land but with a regional autonomy for its management. Later a leasehold system was enacted to provide for the allocation and management of land. As stated in the theoretical review section, all governments have the power to expropriate land for the common good of their citizens. This implies the former land holder being a citizen will benefit from the takeover

similar to others but should be compensated for the loss as a prior user of land (Bala, 2008; Eggertsson, 1990). There being no confusion on the ‘power of eminent domain’ of the government, the question is on rights of individuals over the land they occupy prior to expropriation. The issues that have policy implications could be discussed along the following lines.

5.2.1. The debate about public purpose

Public ownership of land does not negate the rights of individuals over the land they occupy, albeit in subtle ways. The ultimate goal of public ownership is to give better access to land, more security of tenure and fair distribution of scarce resources like land. The issue is how ownership and use rights are understood in legal terms and how the laws pertaining to them are used in practice. This is so in the determination of public purpose for which land is to be expropriated.

The expropriation laws empower the state to seize privately held property for "public purposes." As per Article 2(5) of Proclamation No. 455/2005, the public purpose is defined as the use of land outlined as such by a judgment of the authoritative in accordance with an urban structural plan or neighborhood development plan in order to safeguard the people's desire to gain either immediate or indirect advantages associated with the utilization of the land and to strengthen viable socio-economic advancement. In this provision "public interest" is not defined properly nor is the authority to determine ‘public interest’. This situation has provided authorities to seize property for whatsoever cause. This definition is broad, to a point where officials may be capable of categorizing any endeavor as benefiting the common good if they so decide. The same decree does not demand disclosure of the establishment of public purpose and allow property owners to contest the validity of such decisions at the outset. This enables the state to deploy the authority of eminent domain without publicly determined public purpose which in effect damages individual landholder rights and severely disrupting the land market, leading to government interference in land acquisition that might have been accomplished through private bargaining.

In light of this, the legislation needs to be modified to include clarification of the meaning of "*public purpose*" by specifying activities that clearly serve the public interest, as well as protection for landholders from unjust actions by restricting the range for administrators to act unilaterally.

5.2.2. Compensation principles

In the Commonwealth countries and others where land is privately owned, there is a 'just term of recompense approach,' which aims to fairly compensate individuals when their property is taken over (Chan, 2003). The market value of an expropriated property is considered just compensation in the United States for proprietors who have been dispossessed (Bigham, 1970). On the contrary, recompense in the United Kingdom is determined by the concept of benefit to the owner. The value to the owner attributes related combines market value and extra losses incurred by the property owner (Bowman & Ambrosini, 2000).

In Ethiopia, neither the premise of just terms of compensation nor the value to the owner is addressed in the legislation governing confiscation and compensation payments. Even though the 1995 Constitution states that compensation must be "market value" and "directly correlated to the value of the property expropriated," neither the Constitution nor the expropriation and payment of compensation legislation provide any more explanation. Although there is a wide consensus that market value is the right basis for compensation for property acquired, there may be a widespread belief that a bonus should be provided to recompense the affected person for the compelled aspect of the seizure. Yet, as witnessed in the study area, expropriated property owners have not been compensated based on market value, nor have they received additional payments to protect their reservation values.

The federal confiscation and restitution legislation expressly limited the amount of compensation that can be determined for irreversible land loss. Notwithstanding the fact that compensation for rural dispossessed people is calculated according to the yearly production of the land expropriated. It prevents them from the right to assert the greatest and optimum use value for their land. It does not take into account the importance of the property's location, the possible best use of the land, and other criteria that normally determines the worth of farmland. Compensation for other concomitant economic losses, such as the expense of obtaining other housing, additional expenditures for living in other locations, and losses owing to interrupted production, were not considered when calculating compensation. It is unclear how "commensurate" and "market" value compensation is to be calculated, and whether the quantity of pay is fair and appropriate, without compensating for all of these inefficiencies.

As seen in the study area, the compensation payment provided to expropriated property owners was irreconcilable with the value of the confiscated land, which frequently causes social instability. The fundamental purpose of "fair" compensation should be to put the expropriated property owner in the same financial condition as before the dispossession. To minimize such compensation issues originating from claimants, the legislation must be modified and revised to effectively recompense impacted persons, taking into account all losses incurred in addition to market worth. Additionally, the law should be revised so that displaced landholders get additional subsidy payments when the first displacement compensation is insufficient to preserve their original quality of life, and it should be applied similarly to all affected persons.

5.2.3. Compensation standards

The Federal land administration and land use Proclamation No.456/2005, Article 17, constitutes one of the main contributors to inconsistency in the value of recompense for expropriated individuals. It empowers regions to implement their own rural land management and land use legislation. Article 7(3) of this proclamation stated that if a rural landholder is relocated by the federal government, restitution will be determined in line with Federal land administration law. In the instance of rural landholders being expropriated by regional governments, compensation would be calculated in accordance with the respective regional rural land administration legislation. On the other hand, Article 3 of the Federal Expropriation and Compensation Proclamation No. 455/2005 specifies that determination of what to expropriate and the amount of compensation to pay must be performed by Woreda (district) or urban Administrations. That is equivalent to decreeing that in all regions of the country, woreda administrations and urban areas have the authority to expropriate land holdings in the name of public purpose. Article 14 (2) of the proclamation No.455/2005 solely gave the regions the right to issue directives. This demonstrates that the two Federal proclamations (Nos. 455 and 456/2005) have created gaps for inconsistent application of the laws: in the same regional state two individuals could be compensated different amounts depending on who is paying the compensation.

It is necessary to address such anomalies so as to establish fairness in compensation payment for expropriated persons. The present broad compensation rules should be adjusted in order to tackle the difficulties generated by non-uniform payment rates and regulations. The fundamental rules controlling expropriation and compensation, the rights established in the Federal Constitution,

should be managed uniformly by Regional states in such a way that all property holder in the region are treated equitably.

5.2.4. Valuation methods

The Replacement Cost Approach is the law-mandated process for valuing properties for expropriation. The replacement cost is based on the notion that economic assets that have been harmed as a result of seizure must be replaced with no over or under pay to the affected person. The technique entails the viable replacement of dispossessed assets and guarantees a reasonable sum for property restoration. The replacement cost approach of valuation is founded on the incorrect premise that cost is proportional to value. It violates the fundamental valuation standards for buildings with evidence of yearly profits obtained from properties such as dwelling, business, and manufacturing assets. The income approach is the ideal approach to apply when the properties concerned demonstrate evidence of collecting yearly income.

In the Ethiopian case, the replacement cost method was used for all sorts of buildings in the study area that were affected by expropriation. Furthermore, by law, the cost replacement approach does not take into account asset improvement and appreciation that occurs after the assessment of compensation; nonetheless, the purchase price of replacement property in the neighborhood would be altered. As a result, the replacement cost does not any more replace the lost property. As a result, the compensation package calculated using pre-project pricing is inadequate for allowing receivers to afford comparable assets in a more equitably distributed scenario.

It is proposed that restitution for expropriated property owners be assessed by competent professional property valuers. Furthermore, both the federal and regional expropriation and payment of compensation legislation should be modified so that property valuers are required to employ any of the three standard appraisal techniques they believe is reasonable (*Replacement cost approach, sale comparison/market approach, or income capitalization approach*). However, this requires change in legislation as the current law recognize the replacement cost approach only. To avoid inconsistencies and unfair pay rates, appraisal and compensation methods must be harmonized.

5.2.5. Community participation

The safeguarding of private land use rights, as well as the implementation of reasonable, open, and effective expropriation and compensation practices, are essential to the purposes of expropriation and the provision of compensation statutes. However, the findings of this study demonstrated that these targets were not achieved. One of the most prominent concerns encountered in the study area was the absence of community input and the secrecy involved in determining asset valuations for compensatory reasons. Typically, after the expropriation is approved, the government assigns property valuers to estimate the value of the asset under consideration and arrive at a specific value. Property owners are kept in the dark about the valuation process and property values. This runs counter to property owners' entitlement to know how valuations were conducted and what standards were utilized. If the dispossessed persons refuse, the expropriator frequently warns them for impeding public functions and behaving against the "public purpose." The affected persons have argued that the secrecy of the valuation work increased the possibility of discrepancies and inappropriate use of assessment rates and procedure.

It is advocated that community engagement in expropriation be supported all across the operation. Information should be widely disseminated so that people impacted are fully informed of their entitlements and the processes accessible to them. It should be noted that, despite the use of communicative and participative tactics, the exercise is still one of "expropriation," in which legalized compulsion in the expropriation of land rights from these is permitted. The impacted parties should be able to communicate with the acquisition body and acquire information on the rates and the rationale for compensation. Making these workings public to the property owners will allow the offended parties to examine the actual rates and consider as the principal and evaluate them to the values of surrounding properties. When such activities are publicly disclosed and open to discussion and dispute, valuers will be more diligent in their work, ensuring some neutrality and improving many anomalies observed in the practical example.

Community engagement and openness facilitate the dispossession process and should thus be fostered throughout the operation. So that people impacted are fully informed about their rights and the applicable processes. It is advisable that expropriation procedures be inclusive, open, and responsive to local contexts; and that impacted persons be involved in the process of

determination of areas for expropriation and property valuation. More specifically, the following aspects need attention:

Knowledge about governing laws of expropriation and compensation

Most expropriated farming communities are unaware of the governing legislation, i.e., their rights in the event of a compulsory acquisition. As a result, they are unable to properly enforce their rights in cases where they have been abused during the expropriation, valuation, and payment processes carried out by the respective government entities.

In the field survey, it was discovered that practically almost all expropriated persons were unaware of the expropriation and payment of compensation legislation. They are unfamiliar with expropriation and payment of compensation rules and how they are applied. Many property valuers are also unfamiliar with expropriation and compensation legislation. Although the governing rules strive to promote a just and equitable mechanism that safeguards landholders from unjust and arbitrary actions by regulating institutions, it is not executed consistently and equitably throughout all locations. All parties involved in the expropriation process, including property owners, valuation committees, and administrative entities, should be aware of the legislation. Conferences, lectures, and ongoing professional education may be used to provide knowledge in valuation, innovative conflict resolution, and other relevant areas. The training sessions should be conducted in a participatory manner so that participants can receive practical ideas.

Assistance for expropriated landholders

The suffering of confiscated landowners should not end when they collect their compensation money. They should be assisted in order to maintain some type of sustainable existence, even though they have a different style of work experience outside of their normal setting. According to the study findings, some of the individuals whose landholdings were completely confiscated and even adequately compensated were unable to adjust to their new way of life in a diverse location. Those expropriated people must be assisted in managing the cash they were given in order to put it to productive use that benefits them and their households. Those who have not received compensation may be compelled to leave their homes, and some may suffer irreparable harm. Arrangements could be established to recompense rural families that are unable to adjust

to new urban life with alternative urban agricultural land, allowing them to continue practicing their normal lives.

Expropriated landholders should be given training in skill sets, competence activities, and training programs in operating micro and small-scale businesses. The training should be carried out by a qualified institution established particularly for this purpose. This entity should also keep an eye on and evaluate job opportunities for relocated landholders.

5.3. Implication of urban expansion on the livelihoods of farming communities.

The most visible impact of urban expansion is the change in land use. This change poses multifaceted challenges, particularly to the livelihoods of farming communities in peri-urban areas. One of the primary transformations is the change in the structure of economic activities: agricultural fields start to accommodate urban functions and the people who were once engaged primarily in agriculture get displaced partially or fully to other areas. When displaced partially, they retain their residence but their income from farming is reduced and they had to seek other additional means of living. In the case of those who lose their land fully, the change in the structure of the economy may not accommodate their traditional farming labor force.

Farmers are being evicted from their land in the name of public interest in the study area. The recent land grab for investment purposes by local and foreign investors has resulted in a multitude of socioeconomic such as loss of livelihood, ecological calamities and consequences. That problem is still ongoing, and another wave of land acquisition is likely as a result of the inevitable process of urbanization. A variety of factors will make implementation difficult. In the first place, most of the time, the process of urban development did not provide opportunities for public participation or decision-making, except by authorities who are more concerned with their political affiliation than with the community members who are presumed to be displaced and forcibly removed from their basic source of livelihood. Second, there is no assessment of prior experience with expropriation and displacement of households from agricultural land due to urban expansion. As a result, in my view, and based on the observable reality, without making participatory and inclusive mutual urban development, revisions of the governing laws of expropriation and compensation modality that must be based on market forces, the town and surrounding rural areas will become the major sources of instability.

5.4. Policy Intervention for Inclusive Sustainable Urban Development

Inability in previous and existing plans of Burayu town is not only with the plans themselves but also with their execution and developmental administration in the municipality. The paradigm of town settlement endeavors is unsustainable and demands severe reassessment in many ways. The issue with plan and proclamation execution has a direct influence, notably on land management.

Even in Africa, Ethiopia is one of the least urbanized countries. Nonetheless, the rise of the primate city of Addis Ababa, which is significantly larger than the other towns, has promoted investment and demonstrated the spillover effects on the neighboring satellite towns such as Burayu town, and rural areas, as is characteristic of developing-country metropolitan areas.

The problem that has now emerged in the surrounding areas of Addis Ababa, particularly Burayu, is its uncontrolled, chaotic, and lateral expansion by swallowing most of the arable land, forest, grassland, and others in the surrounding areas via continuous reclassification under the town administrative settings. All of these issues are the manifestation of the absence of effective, responsive, and inclusive urban land and housing policies. Land policy issues have had serious implications on the country, causing unhealthy rivalry for land. Aside from land management issues, the policy of expropriation in the name of public interest has consequences for the farming population, which is entirely dependent on land for livelihood. Tremendous and unplanned horizontal expansion of the town has had massive consequences and ecological degradation.

In light of the aforementioned points, a comprehensive study of existing policy gaps and barriers to implementation is required in order to achieve sustainable urban development on the one hand and maintain a positive relationship between administrative bodies and landholders in land use and socio-economic dimensions on the other. The dichotomy of urban and rural development initiatives has had a negative implication on the socioeconomic structure of urban neighborhoods in various dimensions. As a result, in the current development situation, rural and urban areas should not be viewed as distinct development places.

5.4.1. Establishing Institutionalized Spatial Planning and Implementation Agency

One of the major problems for the design of inclusive spatial planning as well as its poor implementation based on the approved structural plan of the town has been the lack of institutionalized and formally developed spatial planning and implementation agency, which

results in unsustainable land use and natural resource utilization on the outskirts of Burayu town. Throughout the planning process, community participation was not given the attention it deserved, thus their vision may not be incorporated into the town's structural plan, resulting in a poor implementation that may be invaded by squatter settlements. The Oromia Regional Planning Institute does not give much room for the interests of residents, but in principle, it must pay appropriate attention to the community since the plan is done for the community and not on the detrimental aspects of the community. For example, as a result of inadequate governance and plan implementation, there is a regular buildup in buffered zones as well as overlap on previously title-deeded properties in the town, resulting in conflict among different individuals. The key obstacle to such issues is the lack of an autonomous established town-level spatial planning and implementation body.

Being produced through participatory ways of an integrated development plan is crucial for harmonious development regarding land use, utilization of natural resources, and putting the structural plan as intended via community monitoring. In addition to these enabling the advantage of urbanization, investment, and development is extended to all segments of the community. Good governance is the foundation for such positive outcome. One-sided decision-making by higher government organs, as well as inadequate and inefficient law enforcement in local governments, have resulted in a number of livelihood losses. Investment-related land expropriation in the guise of public interest has permitted extensive land grabs and worsened natural resource exploitation.

Therefore, in order to achieve sustainable urban development, which is the systematic and orderly extension of urban areas, towns must be controlled via the use of creative planning approaches, different techniques, and institutional arrangements, as well as the coordinated effort of partners.

5.4.2. Integrating rural livelihood framework into urban development planning

One of the key development issues is that urban planning is typically centered on the physical part of the plan. In previous plans, the socioeconomic component of the community was not addressed, such as integrating the livelihood possibilities of the people to be deprived in the name of public interest for the sake of urban expansion. This is evident from the practice of Burayu town over several planning eras in the earlier. Apart from the provision of compensation money, no consideration was given to the potential livelihoods of confiscated property owners.

The same trend has continued, and the recently developed structural plan for the town reveals a lack of regard for the farmers who are prohibited from their constitutionally protected rights.

So far, urban planning has had a negative impact on the country, particularly in rapidly growing towns such as Burayu, where urban periphery livelihood issues are rarely addressed in urban policy-making and planning that prioritizes land use, housing, infrastructure, social services, and other factors. As a result, in order to ensure sustainable urban development, the government ought to establish policies and plans that accommodate confiscated landholder livelihoods within urban policy and planning. Numerous researchers in developing countries who are working on this problem have the same viewpoint.

It is undeniable that because of recent developments in the town, land seizure resulted in the loss of land on the periphery, leaving the local farmers without alternate livelihood options. As a result, the old sort of agricultural operation is no longer viable in the area. Consequently, in such circumstances, proactive planning is required in which farmers are included in the advancements taking place in the area rather than providing them with modest cash compensation. As a method for sustaining the livelihood of the impoverished farming population in the areas, vocational and enterprising competencies are required to increase productivity and enable unskilled people to compete and acquire the abilities that are necessary for survival. And hence, policies that provide access to restoration benefits assist them to enhance their livelihood and lay the groundwork for long-term sustainability.

5.4.3. Participatory Planning and Decision Making

In most cases government bodies make decisions without consulting the relevant stakeholders. In light of this, any development plan cannot be sustained unless stakeholders, such as landholders in our case study, are included. Participatory development planning is planning in collaboration with society, and development advice that prioritizes society's participation in the entire process (Bessette, 2004).

The current tendency in urban expansion programs indicates that the farming community is neither consulted nor included in the process of planning and execution. In order to achieve long-term development in urban expansion and other initiatives, it is critical to involve all stakeholders, including the farming community. Hence, prior to program execution, the

agricultural community's consent, understanding, and involvement in the types of development initiatives and decision-making should be prioritized.

Participatory development planning aims to establish a more articulated settlement system in order to vary the services and facilities needed in each area, as well as to provide directions for distributional investment and site considerations based on societal interests. The topic of local development plans within the major urban core and extension sites is one of the most significant but also the most overlooked in the context of Burayu town. Unprecedented urban expansion creates a great strain on the planning process, as it must prepare for new developments while also improving and upgrading the present urban environment. Such operations are rarely practical due to lack of resources. Furthermore, as a result of the municipality's inadequate implementation of the structural plan, haphazard development patterns have become manifestations of the town that used land unwisely via horizontal expansion towards the peripheral areas. In light of this, the town was ranked top in the Oromia region for the proliferation of squatter settlements and unguided development.

5.4.4. Urban Sprawl intervention Policy

Many policies and planning initiatives, including smart growth, containment policies, and growth restraint policies, have been adopted in the Western world to tackle urban sprawl. But so far, in developing countries such as Ethiopia, where organizational and management structures are limited, such strategies are unlikely to be implemented. Local-level growth management and land use regulations, such as encouraging more vertical expansion and in-fill, restrictive and proactive land use zoning for the orientation in which urban growth is predicted, and procedures for formulating farmland exclusion zones on the outskirts of towns, should be supported.

CHAPTER VI: CONCLUSION AND RECOMMENDATIONS

This final chapter closes by presenting conclusions and providing recommendations for long-term development that benefits residents of both urban centers and urban peripheries. The conclusion summarizes the main aspects of the findings along the research objectives while the recommendation presents policy and practice options based on the findings and lessons learnt from the research. Finally a tentative list of research area which transpired from the current research which if investigated would benefit and complement the findings of the research are presented.

6.1. Conclusion

The present study offered practical examples of the transformations occurring in Burayu town in terms of Land use land cover, land tenure modality, and the livelihoods of farming people, as well as the consequences of these alterations for future sustainable development. Burayu town has been undergoing unprecedented horizontal expansion into adjacent rural areas, even beyond its administrative limit. Burayu is one of the urban local governments in Oromia National Regional State that has had the most rapid urbanization since the 1990s, growing from one rural Kebele to a town status in 1996. The proliferation of informal land transactions has puts the local government in jeopardy. Factors attributed to unprecedented LULC changes due to the horizontal expansion of the town include lack of law enforcement capacity by the municipality, scarcity of land supply in comparison to current demands, and unfair compensation payments for expropriated properties which triggered rampant informal transaction of land.

Burayu town has been changing in every way since 2004, when it was designated one of the country's industrial growth corridors. Following this designation, various building activities and job-seeking migrant populations from other towns and rural areas encroached on the town and adjacent rural areas. This circumstance has improved rural-urban contacts across the areas, but it has a range of challenges that have negative impacts on the ecological and socioeconomic setup of the town. The unprecedented horizontal expansion of Burayu town, along with the municipal land expropriation practice, has put the local farming communities at risk, as there is fierce competition for access to land for various urban land uses.

The study used various forms of data gathering strategies to understand the modality of urban expansion of the town and the effects of the expansion on the livelihood of farming householdsat

the urban periphery. The conclusions from the findings of the analysis could be grouped into the following three main categories along the main objectives of the research.

6.1.1. Understanding urban land use and land cover changes:

Urban expansion has to be understood properly in its spatial and temporal aspects using reliable and modern methods such as remote sensing and Geographic Information Systems. The proper understanding of land use and land cover changes provides insight into socio-economic factors that are in play to influence the changes. In this respect, the pace of urban expansion in Burayu town followed policy adoption that made the town an industrial corridor since 2004.

Furthermore, the land use land cover change favored built up areas at the expense of all other land use classes. The favored direction of expansion and why; the disparity between the rate of change in terms of expropriation for urban use and the development of urban functions; the intensity of proliferation of unplanned settlements at different times were revealed by the study. The findings are in agreement with most research results on urban expansion in developing country scenario. However, the intensity of expansion, and directions of expansion are peculiar to each urban center. The use of ground-truthing method as a supplement to satellite imagery is an innovative practice which could extend the use of modern techniques in LULC change analysis. The findings in this research could contribute for understanding LULC changes and inform policy making for urban planning that considers local reality and promote the orderly development of urban areas in the future.

6.1.2. Influence of public ownership of land on expropriation modalities

This study identified not only grievances of expropriated households but also the root causes of the inconveniences encountered by farming households in the process of expropriation for the purpose of urban expansion. The key findings indicated that the critical issue is the way public ownership of land is understood and expropriation related provisions are implemented. The issue of public purpose has been identified as a critical factor for the many inconveniences related to expropriation. The second most critical issue is the anomaly between the understandings of public ownership of land as it relates to location value of properties. The cost replacement method of property valuation considers only improvements on land without the location of the properties. This has resulted in disparity between real market value of properties and what expropriated household get as compensation. Consequent to this, landholders sell their land

informally as a coping mechanism to compensate for the loss of value of their properties. The informal transaction of land in turn promotes informality in urban development.

This research has shown that public ownership of land cannot be viewed as a remedy for the proper use of land resource in an equitable manner. The public purpose concept in land development in Ethiopia stands in contradiction to international understanding of the concept. Real property developed by individuals is observed to be denied its intrinsic nature, the location factor. Moreover, policy without the capacity to monitor implementation is worse than the absence of policy in the first place. The recognition of such situations could provide insight into how to develop urban areas formally and equitably.

6.1.3. Understanding impacts of urban expansion

Urban expansion occurs under the umbrella of socio-economic factors the proper understanding of which helps to deal with the impacts. In this study, the main factors that brought about urban expansion and the impacts associated to it were identified to be public ownership of land and the laws based on it, the low level of urbanization and presence of farming households at the urban periphery areas; lack of expertise to deal with expropriation properly coupled with urban-biased approaches which favored provision of land for would-be investors at the expense of the loss of property by farmers, presence of pull factors to urban areas and the concomitant rapid increase of urban population and the resulting pressure to get more land for infrastructure. The study identified the different mechanisms employed by expropriated households to cope with the livelihood changes brought by urban expansion; the outcomes of the coping strategies employed and the mitigation measures employed by relocated households.

The findings of the research stand in sharp contrast to the declared rights of property holders in Ethiopian laws. The livelihood of expropriated persons is not supposed to be adversely affected by expropriation acts; but in reality household incomes have deteriorated; compensation payments were found to vary based on who is the promoter rather than the actual property itself. International law demands that new developments (including relocation acts) are not supposed to endanger the livelihood of the host community and the environment. The findings of the current research have shown that displaced households have lost their sustainable livelihoods and the expansion of urban land use has not properly considered environmental aspects properly. The results of the findings could help to devise sustainable urban development policies that equitably

address the situation of landholders whose property is expropriated; rehabilitation of livelihoods to be main stream approach in addressing expropriation and relocation related inconveniences and the upkeep of the natural environment for the orderly development of urban areas.

6.2. Recommendations

Urbanization is a process that presents both opportunities and challenges depending on how we manage it. As a result, the current scenario of unprecedented horizontal expansion of Burayu town towards the neighboring rural areas as a result of many driving forces has affected the local farming communities in various ways. In light of this, the study emphasizes the importance of government assistance in modifying inclusive urban development strategies, guiding expropriation laws, and allowing for active community participation in all stages of project planning and implementation so that the outcomes benefit all stakeholders. Based on the findings of this study, the following major points could be considered to address the negative externality of urban expansion, land expropriation practice, and the vulnerability of dispossessed agricultural households in Ethiopia in general, and that of Burayu in particular.

- I. To make the best use of scarce resources, the government should enact and implement policies that ensure the mutual development of both urban and rural communities. For example, the development and implementation of an integrated regional development plan that includes urban and surrounding rural areas; and considers the interests of all parties in the environmental, social, cultural, and economic welfare of society.
- II. The regional urban planning institutes should consider ways to efficiently utilize scarce resource such as land through compact development and vertical expansion of urban areas so as to minimize land usage and loss of natural resources as well as reduce the inconveniences attendant to expropriation.
- III. Policies and legislations are tested in practice to see if they benefit society before they are implemented. Lease law was designed to combat corruption, poor governance and fairness in the usage of public resource, with the ultimate goal of fostering long-term economic development, equity, and equality among citizens. In contrast, the lease holding law of land has demonstrated difficulties in serving the people fairly, hence rethinking is required on how land is accessed by different segments of society.
- IV. Any development agenda should be participatory; that is, based on the benefit of the masses without jeopardizing the interests of future generations. In light of this, it is

advocated that municipal officials provide environments for the participation of relevant stakeholders, such as affected communities, to contribute their perspectives, resources, and skills to make development plans responsive to the needs of communities and ensure ease of implementation and sustainability of development projects.

- V. In addition to the 1995 constitution, steps should be taken to reform present expropriation and compensation laws; especially the determination of what constitutes public purpose. Mechanisms should be in place for ensuring that experts conduct property valuation and affected persons to be involved as part of the valuation techniques as well.
- VI. In many cases, the replacement cost approach employed in estimating the value of properties was found to be insufficient. Income-producing properties necessitate the combined application of income capitalization and cost method of appraisal. The valuation system should be based on market value rather than being biased by administrative methods of valuation.
- VII. To achieve equality and justice, all impacted people should be treated consistently regardless of the expropriating organizations involved or the funding source for compensation.
- VIII. Municipalities should train confiscated landowners on how to adjust to new ways of life and how to utilize compensation payments received in advance of expropriation. Before any expropriation operation, the livelihood rehabilitation plan should be discussed and accepted by all stakeholders.
- IX. Generally expropriation has multidimensional effects on communities residing at the periphery of urban areas. Researchers and planning practitioners should investigate and unveil the unnoticed aspects of expropriation and advocate for inclusive and fair treatment of households who have no power to withstand officials who are equipped with public ownership of land shield to justify their misdeeds.
- X. Finally, a key aspect of sustainable urban development is about proper use of natural resources, about equitable use of resources, and use of proper due process of law in property expropriation. For such processes to take place, good governance and rule of law is mandatory. Policy formulation, enactment and implementation needs to be participatory. Only then will urban development be economically feasible, socially responsive, and environmentally sustainable.

6.3. Further Research

As stated in the problem statement section of this research, studies of trends of urban expansion and the governing laws of expropriation and compensation practices, as well as their impacts on the livelihoods of the local communities at the urban peripheries in Ethiopia in general and particularly in small and medium urban centers such as Burayu, are scant. As a result, the current study can be used to address gaps in the literature about LULC changes, expropriation and compensation laws and practices, as well as impacts of urban expansion which is expedited due to public ownership of land. However, there are still gaps in our knowledge as the contexts under which expropriation is taking place are different in different settings. The following areas are identified as being the main areas for further research, which if studied, could enrich our knowledge and complement the findings of this research.

Research areas in LULC change

1. This research used satellite images and GIS techniques to document changes in land use and land cover at different times. This has enabled the researcher to identify the changes which occurred over ten years intervals. In this fast changing world a decade is a very long period to use data for guiding development. Therefore, mechanisms for acquiring more recent data in short intervals and ramifications of categories so that the data helps to get data for informed decision for urban land management is necessary. In this regard, research could be carried out on the refinement of the interpretation of data gathered through remote sensing.
2. Innovations in technology are very fast these days. One of the areas that is fast advancing is AI technology. The use of AI in predicting LULC changes and how to use the knowledge to plan future land uses could be a useful research area.

Research areas in expropriation, valuation and compensation

3. The current research analyzed the basis of expropriation, valuation methods and laws pertaining to compensation. The expropriation practice was seen to have been thwarted by public ownership of land. Ambiguities in the provisions of the law were used against the expropriated persons. However, there is no sufficient work done on how valuation

and compensation is carried out in different circumstances and the degree of influence on compensation decisions due to the law and corrupt practices.

4. Urban expansion most often negatively affects the expropriated persons. However, on a fundamental level, who benefits from the expropriation is a serious issue not well researched. The current research has revealed that after expropriation of farmers and land was transferred to would-be investors, the land lay undeveloped for many years. Land acquisition and land allocation practices and the social justice attached to it deserve to be investigated in detail to bring back benefits of public ownership of land to the citizens at large without usurping the rights of those who hold land in the first place.
5. The Sustainable Livelihood Strategy is most often used to investigate the impact of expropriation on the livelihood assets of involuntarily expropriated and resettled households. It is an ex-post study of impacts and may reveal peoples' ingenuity to cope with misdemeanors that befall on them due to natural or manmade forces they could not avoid. However, the main purpose of public administration and particularly of urban planning should be to maximize benefits to all and specifically to the disadvantaged and minimize impacts to the extent possible. In this regard, there is no sufficient research done on best practices, such as impact of technology, which have dealt with practical challenges and brought about satisfactory outcomes from urban expansion and expropriation practices. As a result, more studies are needed in the future with a shift from "worries to solutions" to this challenge.

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APPENDIX

Published Articles

1. Talema, A. H., & Nigusie, W. B. (2023). Impacts of urban expansion on the livelihoods of local farming communities :the case of Burayu town, Ethiopia. *Heliyon*, 9(3), e14061. <https://doi.org/10.1016/j.heliyon.2023.e14061>
2. Talema, A. H., & Nigusie, W. B. (2023). Assessment of the dichotomy between public ownership of land, expropriation laws and practices in Ethiopia: the case of Burayu town. *Property Management*, 1–26. <https://doi.org/10.1108/PM-01-2023-0009>.

Submitted Manuscript

1. Spatio-temporal analysis of urban expansion using remote sensing data and GIS for sustainable management: the case of Burayu, Ethiopia" submitted to *Management of Environmental Quality* (Under Minor Revision).
2. Monitoring and Predicting spatiotemporal land dynamics for Burayu, Ethiopia using an Integrated Cellular Automata and Markov Chain approach"; submitted to *Land Degradation & Development* (Under Review).