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PERI-URBAN INTERVENTION AND ITS SOCIOECONOMIC AND SPATIAL IMPACTS ON EARLY SETTLERS OF ADI-DAIRO - MEKELLE CITY

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MASTERS OF SCIENCE IN HOUSING AND SUSTAINABLE DEVELOPMENT

ETHIOPIAN INSTITUTE OF ARCHITECTURE, BUILDING CONSTRUCTION AND CITY DEVELOPMNET, ADDIS ABABA UNIVERSITY

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A THESIS SUBMITTED TO SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN HOUSING AND SUSTAINABLE DEVELOPMENT

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ADDIS ABABA, ETHIOPIA

This thesis is submitted to the Ethiopian Institute of Architecture, Building Construction, and City Development and to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of all requirements for the degree of Masters of Science in Housing and Sustainable Development.

Thesis Title: peri-urban intervention and its socioeconomic and spatial impacts on early settlers of Adi-Dairo - Mekelle city

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Date: May 2020

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(Chairperson) Signature Date

Declaration

I declare that this thesis is prepared for the partial fulfillment of the requirements for the degree of Masters of Science in Housing and Sustainable Development entitled, **"**peri-urban intervention and its socioeconomic and spatial impacts on early settlers of Adi-Dairo - Mekelle city" is my original work prepared by my own effort with the close advice and guidance of my advisor. I also declare that this thesis has not been presented in any university and all sources that I have used or quoted have been indicated and acknowledged by means of complete references.

Bisrat Hadush Nega

_____ _____

Signature Date

Confirmation

The thesis can be submitted for examination with my approval as an institute's advisor.

Yonas Alemayehu Soressa

_____ _____

Signature Date

Abstract

Various studies suggest and forecast rapid urban growth in developing countries. Rapid urbanization in Ethiopia is a formal process in which inhabitants of designated (including) rural villages become urban residents by law. However, its empirical development and the socioeconomic and spatial impact of the intervention on early settlers have not been well documented and its consequences for inclusiveness have not been well understood.

The main contribution of this research is, first, to fill the research gap by providing a more up-to-date empirical study of pre-planning development and intervention of peri-urban settlements in Mekelle and, in particular, in the settlement of Adi Dairo. Second, to know the extent of the inclusiveness of early settlers on the peri-urban planning process and implemented development plan. To achieve this objective, the study used a case study method. The study comprises quantitative and qualitative methods to explore the extent and depth of the problem.

Findings show that the pre-planning peri-urban settlements mainly develop because of demographics increase (fertility), migration and reclassification or demarcation of the area to the city. Thus, the settlement gets denser, economically change from agricultural dominant land use to residence and services use, and change its morphology. Besides, the planning process was weak in the participation of the settlers, lacks documenting existed socio-economic and spatial situation of the settlers, weak analysis, and incomplete LDP especially land use and parcellation. This situation has led economically to losing the primary job, unemployment, unaffordability and extra expense for transport, service and daily consumptions. Socially to marginalization and gentrification. Moreover, spatially leads to demolishing and rearranging their house without compensation, dislocation far from their previous settlement and lack of open spaces. The transformation has also positive impacts on the provision of infrastructure, accessible streets and getting an extra source of income.

To solve the negative impacts, the peri-urban settlement should develop with a different type of developing intervention model within its indigenousness and a thorough analysis of the actual situation of settlements. Besides, the intervention should be in such a way as to help the early settlers transform their lives, increases the quality of life, in a compact form, and inclusive in the planning process and the development plan or design itself.

Keywords: Adi Dairo, impact, inclusiveness, peri-urban, settlement

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Local terminologies

Debri – the local name for G^{+1} house

Gibri – the local name for hectare

Gojo – a new life for the youth on his house and land given got from his parents

Hidmo – Tigray vernacular house

Quana – local temporary building type that made using only stone

Mender – village

Mereba - open space with the compound of traditional house

Metesha /metkel - land which was given by the government for youth

Metsian – traditional robe made of skin

Nebar gebar – existed agrarian person before being part of the city

Nikinikila – one of the games played in the Easter holiday

Acronyms

AAU - Addis Ababa University

CAT – Cultural Association of Tigray

EiABC - Ethiopian Institute of Architecture, Building Construction and City Development

EiT - M - Ethiopian Institute of Technology, Mekelle

GTZ – German Technical Corporation

LDP - Local Development Plan

MU - Mekelle University

MWUD - Ministry of Work Urban Development

M. – Meter

Sq. – Square

UNDP - United Nations Development Program

UNDESA – United Nations Department of Economic and Social Affairs

UNFPA – United Nations Population Fund

USDESA - United Nation Department of Economic and Social Affaire

General Notes

According to the Ethiopian naming system, for Ethiopians, first names are given in the citations of the text; while first names followed by father's name are given in the reference.

All calendars are based on Gregorian unless specified as Ethiopian Calendar (EC) and no drawings are scaled so use dimensions indicated. Unless specified all the tables, pictures, maps, sketches, and graphs are taken/done by the researcher.

Chapter one - Introduction

1.1. Introduction

Currently, the trend of urban growth is already surpassing the capacity of many local governments to provide adequate services and, over the next 30 years, almost all population growth in the world is estimated to be concentrated in urban areas in urban area of global south, and the management and planning of urban growth has become one of the challenges of the 21st century (Chen Zeng and Cohen 2016; 2003). In addition, the effects of constant rapid growth in eastern African primate cities comprise severe housing shortages, congestion and unregulated peri-urban sprawl (Habitat 2014). However, researchers and policymakers must be aware of the facts to avoid being victims of common misconceptions in order to offer effective strategies and sustainable solutions (Farrell 2017).

Peri-urban development has appealed increased attention in recent years, in particular, due to the conflict/competition between urban and rural land use because of peri-urban expansion (Barry Ness 2010). The same document claimed as much of the research in this area has centered on peri-urban concepts and definitions, environmental impacts and impacts on agriculture, which have paid little attention to the assessment of the peri-urban development on household livelihood and income (Barry Ness 2010).

In our country, there are some studies conducted related to peri-urban development. Some of these studies are mainly conducted on the expansion of the city of Addis Ababa and its impacts on the agricultural or farmlands, the livelihood of the community and the environment in the fringe of the city. A study entitled 'urban expansion and the livelihood of the peri-urban agricultural community: the case of Addis Ababa' by Abdissa (Abdissa 2005) is one of these studies. Besides, there are some studies conducted on the general urbanization and peri-urban dynamics in Ethiopia. Some of these are "urban and peri-urban dynamics in Ethiopia" held by Tesfaunegn (Tesfaunegn 2017), 'peri-urban land tenure in Ethiopia' which held to explore the challenges enforced on peri-urban land rights as a result of the growing demand for land for urbanization by Achamyeleh (Achamyeleh 2014). In addition, there is a study entitled "urban land policy vis-à-vis tenure security and the environment" by Sisay which evaluated the practices of policy implementation in practice in Addis Ababa city (Sisay 2012).

Different studies held in different regional cities of our country related to the peri-urban development and its impacts some of the studies held in Bahirdar, by Kassahun which focused on investigative factors of households' livelihood strategy choices and impact analysis of urbanization of Bahir Dar city on peri-urban settlers livelihood strategies (Kassahun 2018). There is also a study by Belachew entitled "expropriation, valuation, and compensation practice in Ethiopia: the case of Bahir Dar city and surrounding" which examines how the expropriation and compensation laws are implemented when privately held land and devoted real properties are sized for public purpose development (Belachew 2013). A study held to assess the impact of urban expansion on surrounding peasant

land in Areka town (Mefekir 2017) and in Hosanna town by Addisyihun which focused on investigating characteristics, causes and processes of spatial transformations happening on transitional peri-urban areas of Hossana town particularly Ambicho and Kidigisa areas are studies held in southern Ethiopia (Hamore 2019). In northern Ethiopia, there is a study held by Mezgebo on the ex-post impacts of urban expansion on the welfare of subsistence farm households included urban locality (Mezgebo 2014).

There are also conducted studies on Mekelle city peri-urban area mainly focused on the urban expansion and its impact on the farm households such as 'the impacts of urban built-up area expansion on the livelihood of farm households, in the peri-urban areas of Mekelle City' by Shushay Mehari (Shushay 2011). These studies are mainly focused on the expansion of Mekelle city and its impact on the farmer's livelihood for those who are displaced.

Thus, the researches in this area are concentrated in peri-urban development and dynamics/transformation its environmental, agricultural and livelihood impacts which gave little attention to the assessment of the peri-urban development and its socio-economic and mainly spatial impact on the early settlers and inclusiveness of these early settlers on the planning process and implemented plan or design. Besides, the studies held on the impacts of peri-urban development on the agrarian settlers, which excludes the other early settlers. Thus, this research entitled 'peri-urban intervention[1] and its socioeconomic and spatial impacts on early settlers: of Adi-Dairo - Mekelle city will fill this vacuum.

1.2. Problem statement

According to the UNDESA[2] report, more than half of the world's people are urban (United Nations 2014). The same document estimated that between now and 2030; the world's rural population expected to remain largely static, while the urban population projected to grow to 1.5 billion people (United Nations 2014). By 2030, which will be 60 percent of the global population Over 90 percent of that urban growth will occur in cities and towns of the developing world, mostly in Africa and Asia (UNDP 2016).

Today's world is rapidly urbanizing, with particularly radical urban expansion projected in developing countries where its effect on the peri-urban area is expected in terms of changes in land use, new forms of household composition, differential access to urban benefits (such as health services and employment) and increased pressure on common natural resources (UNFPA 2007). The same study claimed that urbanization offers new opportunities, but also a dramatic increase in the concentration of poverty and environmental degradation in peri-urban areas (UNFPA 2007). The poor are subject to more stress and shock (Allen and Hofmann 2006).

[1] Intervention is a development intervention that includes structure plan Mekelle city and local development plan of Adi-Dairo settlement

[2] United Nations Department of Economic and Social Affairs

Despite having one of the lowest proportions of the urban population in the world at only 17.2 percent, Ethiopia is rapidly urbanizing and one of the fastest-growing economies on the continent (Arup 2016). And the urban centers are growing at an alarming rate (4.3 percent) resulting in a loss of agricultural land, a loss of agricultural production, and challenges in their livelihoods (Arup 2016), which is the worst in Mekelle and its peri-urban areas (Shushay 2011). Besides, the spatial expansion of the city is suggests the prevalence of urban sprawl and experienced more dispersed horizontal urban growth primarily at the expense of agricultural lands (Fenta, et al. 2017). Urban expansion in Ethiopia Regional cities is putting pressure on the habitats in these hinterlands so that there can be a conflict between urban development and agriculture (Arup 2016). The urban expansion, to the different directions of the city, lacks following of comprehensive planning guidelines (Mary Tahir 2013). In 2006, Mekelle City submitted a new development plan or master plan as a result of a series of work after 2000 on the concept of sustainable development (Okazaki 2009).

Though, the notion of the development plan[3] of the city is sustainable development there are some problems related to the implementation of the plan and the development plan by itself which lacks considering the existed socio-economic and spatial characteristics of the previous or existed settlement and facing many challenges to developing. Thus, studying (empirical study) of the peri-urban development, identifying its socio-economic and spatial impacts and knowing inclusiveness on the planning process and the implemented plan is imperative to solve the negative impacts on the early settlers. In addition, which helps to know the extent of the inclusiveness of Peri-urban intervention for the early settlers by using theme-based evaluation, which is vital to bring the inclusiveness and sustainability of the city.

1.3. Significance of the research

The main significance of the study is to know the drivers of the peri-urban settlement development and bring the inclusiveness of early settlers and sustainability on the peri-urban settlements. Particularly the significance of the study will be:

- To understand the drivers and process of peri-urban settlement development.
- To extract ideas and concepts to solve the socio-economic and mainly spatial impacts of urbanization or urban expansion on the peri-urban early settlers to improve the peri-urban planning and implementation.
- To bring the inclusiveness of the early settlers of the peri-urban area on their settlement development plan.

[3] structure plan or master plan of Mekelle city

1.4. Objective

1.4.1. General objective

The general objective of the study is exploring and identifying the impacts of Peri-urban intervention on the early settlers and to know the extent of the peri-urban development planning and implementation have been inclusive of the early settlers using theme-based evaluation of the planning process and implemented development. Which aimed to meet the overarching idea of the research, one of the targets of the sustainable development goals, inclusive and sustainable urbanization.

1.4.2. Specific objectives

The specific objectives of the research are:

- To know the process of peri-urban settlements development of Mekelle city in general and Adi Dairo in particular development.
- To know the process of the implementation of the development plan and transformation of the study area.
- Identifying the socio-economic and spatial impacts of the transformation on the early settlers.
- To know the extent, the peri-urban development planning and implementation have been inclusive of the early settlers.

1.5. Research Question formulation

Settlements are dynamic interactive environments in which natural, economic and social dimensions are mutually compatible (Sun 2012). Thus, in order to be effective in planning, attention must be paid to the underlying economic and social processes that determine space, and how these trends and energies either help or block meaningful change and then work through the most effective means of enabling sustainable and inclusive cities (UNDP 2016).

The question of compensation for displaced people, the value of expropriated land in terms of location and distance shall not be taken into account for the payment of compensation, which is unfair to those displaced from high land value areas (Sisay 2012). Besides, land rather than reflecting Western models, cities in developing countries have shown that spatial characteristics such as land quality and location are not the only main factors in determining land values and uses, while social, cultural, economic and political influences are of great importance; and circumstances (rural, urban or peri-urban) need to be checked (Nottingham 1999).

Housing issues are functions of mismatch between people's socio-economic and cultural conditions and their housing processes and products (Turner 1976). Thus, their solution policy goals have to be formulated in monetary terms; redressing the imbalance between income and price, prices and costs, costs and incomes and in non-mortality terms; reoriented towards the elimination of

residential dislocation, in the security of tenure, and housing-related psychosomatic disease (Turner 1976).

Some estimations indicate as Ethiopia's urban population will increase three times in the next 20+ years, achieving extreme urban growth more than 5% per year (Arup 2016). And, as discussed earlier, urban centers are growing at an alarming rate, and studies have suggested and projected that this growth does not take into account the current socio-economic and spatial characteristics that put pressure on the ecosystems in these hinterlands, and that there can be a conflict between urban development and the existing settlers. Besides, these urban centers are expanding by seizing of agricultural land with the challenges in their livelihood, which is worst in Mekelle as Shushay discussed (Shushay 2011).

Accordingly, after identifying the title and scope of the study the researcher formulated four research questions. These research questions include question which starts with "how" to answer the process of the settlement development (empirical study), and transformation and "what" to identify and know the socio-economic and spatial impacts of the transformation of the settlement and extent of inclusiveness of the early settlers on the implementation process and the development plan by its self. Based on this the following four questions addressed in this research:

1.6. Research Question

1. How did the peri-urban settlements of Mekelle City in general and Adi Dairo in particular, develop?
    - What were the characteristics of early peri-urban settlement(s)?
    - What were the processes of peri-urban development?
2. How does the implementation of the development plan transform the area?
    - What are the characteristics of the implemented development plan of the area?
    - How does the implementation of the development plan transform the previous settlement?
3. What are the socio-economic and spatial impacts of the transformation on the early settlers?
4. To what extent is the development inclusive for the early settlers?
    - To what extent is the planning process inclusive for the early settlers?
    - To what extent is the implemented development plan inclusive for the early settlers?

1.7. Scope

1.7.1. Thematic scope

The main intention of the research is to understand how peri-urban settlement develops and the implementation of the development plan transforms it, identify spatial and socio-economic related impacts of these transformations on the early settlers. Besides, to know the extent of inclusiveness of the early settlers on the planning process and implanted development plan which aimed to meet one of the targets of the sustainable development goals, inclusive and sustainable urbanization.

One of the sustainable development goals, 'Goal 11[4] says', "makes cities and human settlements inclusive, safe, resilient and sustainable**".** 11.3 part of the goal also says *"by 2030; enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries"* (United Nations 2015). Sustainable peri-urban settlements should reconcile and combine the themes of sustainable development through integration, as long as settlements are complex interactive systems in which environmental, economic and social facets are interrelated (Sun 2012).

Thus, the thematic scope of the study included the spatial development, transformation and its impact on the early settlers and their inclusiveness, of early settlers on the planning process and implemented development, with its socio-economic and other determinant facets that mainly included in the SDGs themes in integration. The inclusiveness is the inclusiveness of early settlers of the peri-urban area, particularly study area early settlers.

1.7.2. Spatial scope

The research held in Mekelle city one part of the peri-urban area of Hawelti sub-city, Adi Dairo[5], which is located on the western part of the city, which was also one of rural settlement demarcated within the Mekelle city since the Mekelle city development plan, Master plan, preparation, 2006. The study area covers 82 ha area with 479 householders was under Enderta wereda6, one of rural administration near to Mekelle city.

1.8. Limitations of the Study

The main limitation of the research was getting of the former officials (planners or architects and other officials) who were part of the implementation of the development plan. Despite these limitations, with the help of the representative of the displaced householders and community leaders, who were part of the documentation and identification of early settlers of the study area, the researcher meets the officials.

[4] One of the 17 Sustainable Development Goals of " the 2030 agenda for sustainable development"
[5] The name of the study area (see figure 5.3)
[6] Wereda – is the third-level administrative divisions of Ethiopia.

1.9. Organization of the research

The research organizes into seven chapters. The first chapter introduces the whole research subject and it comprises different introductory sections. Introduction that presents information about the subject matter, the problem statement that describes the existing circumstances on the subject matter, the objective of the research, relevance of the study in terms of addressing the knowledge gap on the subject matter. Besides the first chapter presented scope and limitation of the study, the research questions are formulated to be answered through theoretical and actual data analysis from the case study, the research approach, and the organization of the research.

The second chapter presents the theoretical basis of the research in which related literature presented and summarized at the end of the section. The third chapter is about the research method implemented to conduct the study. It comprises major sub-topics about the choice of method, selection of case area, sources of data and data collection techniques. In chapter four, the overall profile about Ethiopia, Mekelle city peri-urban settlement development and development intervention in general and the study area, Adi Dairo in specific presented. Chapter five describes the case study area and presents the empirical data from the case which is examined using both qualitative and quantitative analysis techniques. The sixth chapter presents the findings, which distilled from an analysis of the evidence. The final section, chapter seven delivers implications of the findings on housing development policy and implementation and recommendations for enhancing the existing development.

Chapter two - Literature review

2.1. Introduction

Currently, the world is rapidly urbanizing with the spatial expansion of growing cities increasingly influences their rural settlements which makes the peri-urban an important crucial point for urban studies. In the developing countries, in the peri-urban areas outside of urban built-up areas are becoming increasingly important for the sustainable future of cities and their residents (Sun 2012). The trend of urban settlement development is both in size and numbers with growth beyond their temporary limits became more common and challenging for planners and government.

> *"Human settlement development has undergone generations of evolution in response to transforming environmental, social and economic circumstances and changing human needs. In the twenty-first century, the sustainability agenda has bequeathed new meanings on human activities of settlement development and calls for tailored interventions to mitigate the impacts of such activities on the limited resources of the earth and the well-being of the current and later generations"* (Sun 2012:9).

Even though there are numerous researches conducted in different parts of the world on specific issues related to urbanization, urban growth, and urban expansion tried to put their own functional and contextual definitions different terminologies used in different parts of the world for the same area of the urban periphery or peri-urban. However, there is no clear resolution to know which name to use of if any of the following terms interchangeably to characterize the same spatial setting: rural-urban interface, peri-urban or city edge, rural-urban fringe, peripheries, urban fringe, dynamic edge outskirt. The word peri-urban has repeatedly been used to describe newly urbanized zones on the outskirts of cities, especially in developing countries, which are then referred to as the "peri-urban interface" (Adell 1999). For this study, the term "peri-urban" defined as an area, which is newly urbanized or demarked and developed as part of the city on the outskirt of the city.

This chapter of the research reviews the existing literature related to the area of urbanization, peri-urban concept and development, which explains the trends of urbanization, conceptualizations of peri-urban area, and their implications for sustainable urbanization and its socio-economic and spatial impact on the peri-urban settler or communities. The chapter also explores the issue of peri-urban settlement development, as it takes on different theoretical and practical focuses between developed and developing countries, while also signifying common challenges to the long-term viability and inclusiveness of the existed settlement early settlers.

3.2. Meanings and Definitions:

It is important to define the basic essence of important words and phrases in the research topic, which will help to have common ground throughout the study. Thus, working definitions are as follows:

Peri-urban - is a peripheral area or zone of cities where different urban land uses and activities being enforced on a rural landscape and which moves outward and is subject to rapid changes encouraging by human activities (Miljković 2018).

Urbanism - Study of the spatial/physical needs of urban societies (Dictionary 2020).

Urbanization - The conversion process from a rural to more urban society and its degree is the percentage of the total urban population while the rate of urbanization is the rate at which it is rising (UNFPA 2007).

Urban growth - The increase in the number of people who resides in urban area or settlements, which are, measured either in relative or absolute terms (UNFPA 2007).

3.3. Urbanization

Different researchers define the word urbanization in a different way such as Tegenu, citing Oluwasola, defined urbanization is a population accumulation process that proceeds in two ways: by multiplying the concentration points and increasing the size of the concentration points (Tegenu 2010). Imitiyaza and Hussain also defined urbanization as the social process that leads to the creation of cities that brings a change in the economic, social and cultural aspects of society (Imitiyaz 2018). Besides, the physical growth of urban areas can be explained demographically and functionally: while the demographic definition of urbanization is limited to factors such as population size and density, the economic functional definition refers to the territorial concentration of productive activities (industry and service) instead of the population (Tegenu 2010). UNDESA[7] defined as:

> *"Urbanization is a complex socio-economic process that transforms the built environment, converting formerly rural into urban settlements, while also shifting the spatial distribution of a population from rural to urban areas. It includes changes in dominant occupations, lifestyle, culture, and behavior, and thus alters the demographic and social structure of both urban and rural areas. A major consequence of urbanization is a rise in the number, land area and population size of urban settlements and in the number and share of urban residents compared to rural dwellers"* (UNDESA 2019:10).

Urbanization happens because of people moving from rural areas to urban areas, resulting in an increase in the size of the urban population and the size of urban areas, leading to other changes such as land use, economic activity, and culture (USDESA 2014). The same document noted that urbanization has been associated with significant economic and social transformations; for example, urban living is linked with higher levels of literacy and education, better health, lower

[7] UNDESA - United Nations Department of Economic and Social Affairs

fertility and a longer life expectancy, greater access to social services and enriched opportunities for cultural and political participation (USDESA 2014).

According to the UNDESA report, the universal urban population showed 34% of the total population in 1960, but by 2014, the urban population accounted for 54% of the total population and endures to grow (United Nations 2014). Besides, the population living in urban settlements by 2050 is estimated to become 66% which affects, the process of urbanization, all sizes of settlements, thus, villages progressively become small towns, smaller towns develop to larger towns, and large towns become cities (United Nations 2014). Thus, this rising urbanization sometimes leads to socio-spatial and socio-economic inequalities, particularly because of the absence of well-planned urban development as well as inadequate investments (figure 2.1) (UNDP

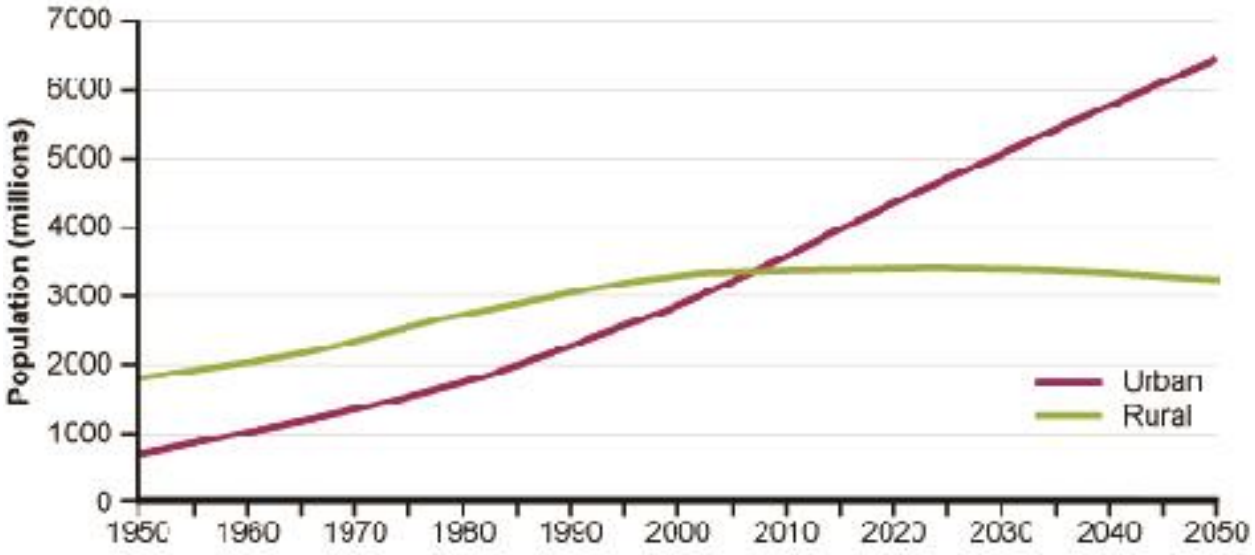


Figure 2. 1 1Urban and rural population of the world, 1950–2050. Source- (USDESA 2014)

2016).

3.4. Urbanization and urban growth in developing countries

Urban settlements in the developing world are growing and evolving at an unprecedented rate (UNDP 2016) which, the urbanization, is resulting by mainly the rural to urban migration and the demographic changes of urban population growth, which presents both challenges and chances for the productivity of cities (Habitat 2012). Particularly, though Eastern Africa's urban settlements are the least urbanized its urbanizing is the fastest sub-region in the world, with its urban population growing by 50% while at the same time the total number of urban dwellers expected to be five times that of 2010 (Habitat 2014). Kyle Farrell's article entitled "The Rapid Urban Growth Triad: A New Conceptual Framework for the Analysis of Urban Transformation in Developing Countries" noted that although the urban transformation is a common phenomenon that happens in all countries, determining factor, trends and outcomes do not necessarily follow an identical cycle (Farrell 2017).

Davis In his seminal work entitled ' Urbanization of the Human Population', addressed the distinction between urban growth processes and urbanization, as urban growth is an increase in the total number of people living in urban areas, whereas urbanization refers to an increase in the

percentage (or proportion) of the population that is urban rather than rural (Davis 1965). Currently, the urban growth is quite special in developing regions; the explanation, however, is not to be found in an unusually rapid change in urban proportions but in rapid changes in the total population, size to which those proportions are applied (United Nations 1980). United Nations also noted that the process of growth in the urban proportion can grow either through urban surplus in rates of natural increase or as a result of positive net migration and reclassification or demarcation of rural places to urban areas (United Nations 1980).

The mechanisms behind urban growth in developed and different drivers' motivated developing countries, the experiences of today's developed countries during the industrial revolution were mainly the result of rural to urban migration, while in recent times developing countries have been driven by urban natural population growth (Davis 1965). The paradigm theorizes rapid urban growth as a multidisciplinary mechanism informed by the collective contribution of urban growth components and the complex interaction between them, rather than a single theoretical view of urban growth based on migration (Farrell 2017). Farrell addressed the three components of urban growth as they are presented within them: first, economic transformation (migration) of urban pull and rural driving factors (see fig. 2.2), mainly accrediting migration to events underpinning technological and economic change; second, demographic transformation (natural population increase) that fundamentally alters fertility and mortality patterns (Farrell 2017). The third one is the administrative transition (reclassification) is also the process of reclassifying rural areas as urban areas (Farrell 2017).

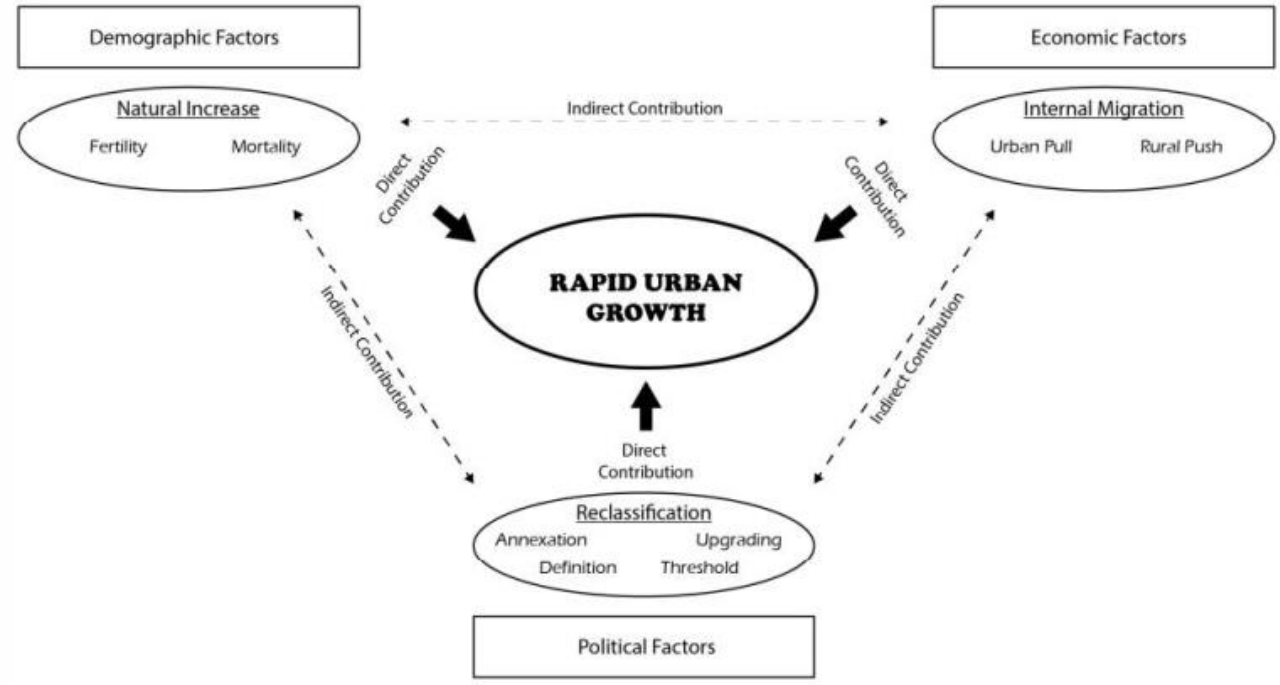


Figure 2. 2 Rapid Urban Growth Triad - source - (Farrell 2017))

Development and urbanization processes are usually characterized either by the loss of "rural values" (loss of fertile soil, natural landscape, etc.) or the lack of "urban" attributes (low density, lack of connectivity, lack of services and infrastructure, etc.) (Allen 2003). However most urban plans and regulatory regimes in the developing world have been incapable of preventing the conversion of rural land to urban use in city peripheries. As a result, the reclassification of ' rural ' to ' urban ' settlements become the second most important determinant of urban population expansion and growth in the developing countries (Habitat 2012). Reclassification might be broken down into three sub-components (see fig. 2.3): the expansion (or contraction) of existing urban borders, the annexation (or surrender) of neighboring settlements, and the addition (or subtraction) of new settlements that extend beyond the defined threshold (Farrell 2017).

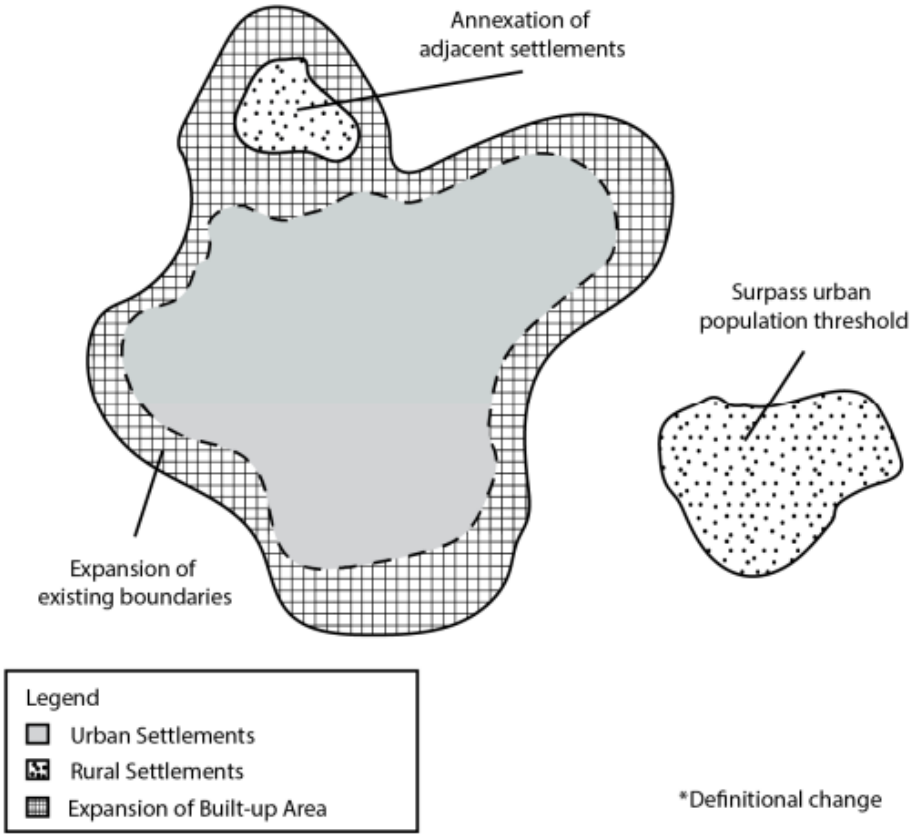


Figure 2. 3 Reclassification typologies -source- (Farrell 2017)

3.5. Urban transition in Developing Countries

Farrell discussed its misconception of the urban transition in developing countries with the evidence described above, given that there seems to be a great deal of confusion in defining the ' unprecedented ' nature of the urban transition taking place in developing countries (Farrell 2017). According to the Farrell analysis and shown in (Figure 2.4), which illustrates the urban transition by average urban growth rates and urbanization level for developed (1875 –1950) and developing countries (1950–2025) at the peak of their urban gradient. Therefore, over the 25 years from 1950 to 1975, developing countries progressed from an urbanization pace of 17.6 to 26.9 percent, which is very similar to today's developed countries between 1875 and 1900, with a rise from 17.2 percent

to 26.1 percent. However, the difference is that the urban growth rate in developing countries during this similar period averaged 4 percent; a rate that is significantly higher than the 2.8 percent experienced in developed countries and similar trends experienced during subsequent periods. Thus, the rate of urbanization in developing countries in recent times is close to that of developed countries at their peak, and urban growth rates are relatively rapid (Farrell 2017).

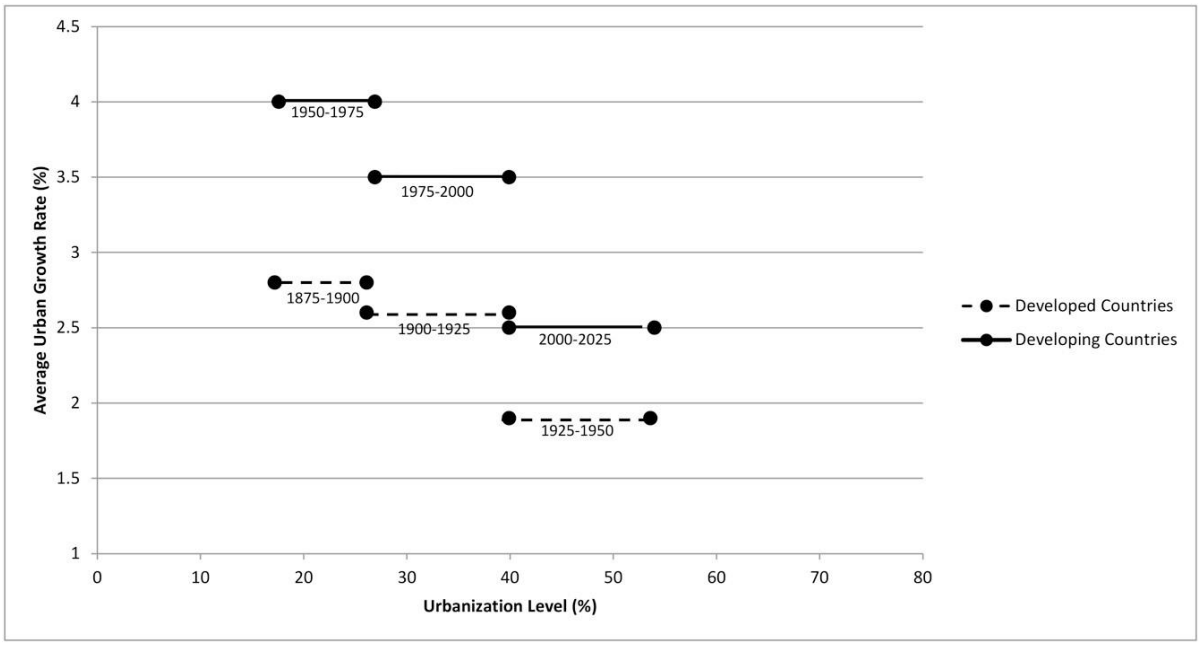


Figure 2. 4 Urban transition illustrating average urban growth rates and urbanization level for developed and developing countries source - (Farrell 2017)

Notes: Lines show an increase in the urbanization level between two points in time of 25-year increments and a constant increase in the average urban growth rate for that period (Farrell 2017).

Another common misconception is that the urban transformation in developing countries follows a process similar to that of historical accounts, with rural to urban migration being the main driver' (World Bank 2009). Current urbanization rates (and implied rates of rural-urban migration) in developing regions are not unique to historical standards, except for the growth rates of urban and rural regions (United Nations 1980).

The overview in the table below (see table 2.1) indicates that urban natural population growth has been the main source of urban growth in developing countries in recent times, accounting for an average of 60.7 percent of urban population growth, which varies from similar studies conducted in developed countries. Farrell also noted that natural growth accounts for approximately 40 percent of urban population growth, and helps explain why urban population growth has increased (Farrell 2017).

Even though evidence shows that urban natural population growth has replaced migration/reclassification as the leading contributor to urban population growth, this has not been adequately identified in the policy arenas in developing countries (Farrell 2017).

Source	*Census Pairs*	*Decades*	*Migration/Reclassification (%)*	*Urban Natural Population Increase (%)*
United Nations (1980) [27]	39	1950s	37.2	62.8
Preston (1979) [14]	29	1960s	39.3	60.7
Rogers (1982) [4]	40	1960s	39.6	60.4
Chen, Valente and Zlotnik	35	1960s	40.7 43.2	59.3 56.8
(1998) [7]	39	1970s	40.1	59.9
	26	1980s		
** Stecklov (2008) [28]*	248	1960s	41.4 38.0	58.6 62.0
		1970s	35.0	65.0
		1980s		
		1990s	38.3	61.7
Average among Sources			39.3	60.7

Table 2. 1 The contributions of migration/reclassification and urban natural population increase to urban growth in developing countries, 1950–2000 - Source: (Farrell 2017)

The development of cities in the developing world is complex, diverse and unpredictable, and slowly space-intensive, which is increasingly referred to as "peri-urbanization" by its cycle of urban growth, mostly taking place in non-contiguous transition zones between the countryside and the region (UNFPA 2007).

3.5. Peri-urban development

3.5.1. Geographic Definitions of the Peri-urban

A PLUREL (Peri-urban Land Use Relationships - Strategies and Sustainability Assessment Tools for Urban-Rural Linkages) project in Europe, defined peri-urban as a zone of transition between urban and rural areas which mainly changes rapidly as the urban area expands and restructures, while in some regions it is wisely managed and preserved (Ravetz, Fertner, et al. 2013). Increasingly, the peri-urban is also known as a spatial type and territory in itself, characterized by a dispersed and non-contiguous fabric of built-up and open spaces close to core areas while at the same time highly inter-dependent and inter-woven with urban areas (Ravetz, Fertner, et al. 2013).

Peri-urban zones are peripheral zones around cities where new urban land uses and activities are being imposed on a rural landscape; they are transient in that as cities grow, their peri-urban areas move outwards (Miljkovic 2012). The process starts with the growth of free-standing cities into their

rural surroundings, absorbing and reclassifying villages into the urban fabric (Ravetz, Fertner, et al. 2013).

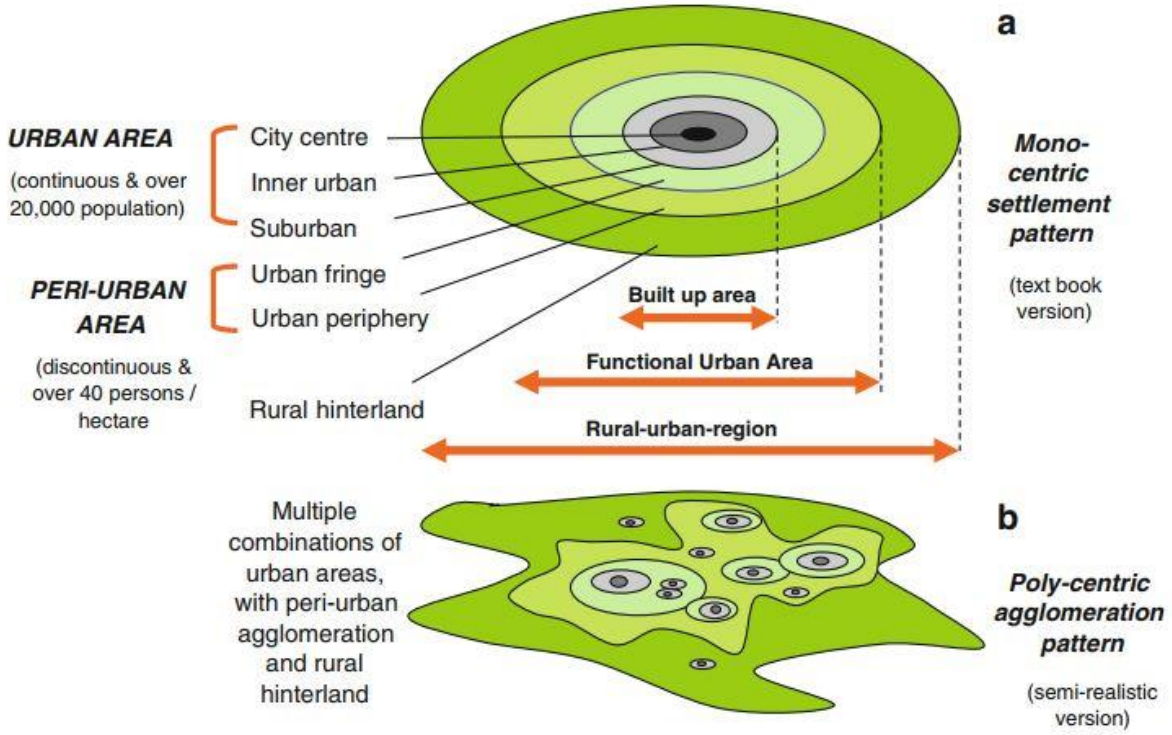


Figure 2. 5 concepts of Peri-urban areas and rural–urban-region source: (Ravetz, Fertner, et al. 2013).

According to PLUREL project, different zones and relationships among each zone of urban spaces from the urban core to rural-hinterland are identified and defined as follows (Ravetz, Fertner, et al. 2013:18): (as shown in figure 2.5)

- ***Urban core:*** *including the Central Business District and the site of many other civic and cultural functions and some public spaces associated with these;*
- ***Inner urban area:*** *generally higher density built development (built-up areas) including residential, commercial and industrial types of uses and some public open and green space;*
- ***Suburban area:*** *generally lower density contiguous built-up areas, which are attached to inner urban areas, and where houses are typically not more than 200 m apart, with local shops and services, parks and gardens;*
- ***Urban fringe:*** *a zone along the edges of the built-up area, which comprises a scattered pattern of lower density settlement areas, urban concentrations around transport hubs, together with large green open spaces.*
- ***Urban periphery:*** *a zone surrounding the main built-up areas, with a lower population density* (Ravetz, Fertner, et al. 2013:18).

Thus, the peri-urban includes urban fringe and urban periphery of the listed zones of the urban space according to the PLUREL project as shown on the picture (see figure 2.5). That is defined

peri-urban area as discontinuous built development comprising settlements of each less than 20,000 population, with an average density at least 40 persons per hectare (Ravetz, Fertner, et al. 2013).

3.5.2. Peri-urban settlement dynamics and transformation

According to different kinds of literature, peri-urban development can be considered as part of or consequence of the wider urbanization process. Though there was a time which land seemed an almost everlasting asset in Africa, population growth and market development have created mounting competition for land resources, especially close to towns and cities, and in the productive, high-value agricultural areas of peri-urban areas (Toulmin 2009). These peri-urban areas, in developing countries, changes outwards in waves (Nottingham 1999). The peri-urbanization is fueled by land speculation who hold land in and around city expecting the land value to increase, encouraged by the prospect of rapid urban growth and these speculators do not bother renting, especially if they fear that users might gain some rights to continued use of controlled rents (UNFPA 2007).

According to PLUREL project in order to explore, the dynamics of peri-urban change and the peri-urbanization process needs understanding not only in physical scales but also in understanding the complexity of the system (Ravetz, Fertner, et al. 2013). Thus, the project developed a five-dimensional framework represent a kind of generic 'story' of how per urbanization takes place (Ravetz, Fertner, et al. 2013). The first feature is the occurrence of urban expansion driven by demographic, social dynamics are caused by population change due to fertility and mortality rates and migration, economic, and employment growth drives the rate of urbanization. Besides, environmental dynamics include fixed geographic features such as rivers, coasts, wetlands or mountains, which shape the pattern of urban development and the last one urban built structures and infrastructure are the components of the physical urban system itself. The second one is, the formation of regional agglomerations, with step-changes in economies of scale taking place, and a new type of peri-urban territory developing. Thirdly, which puts, as the developments are the effects of various deeper political and cultural forces that shape the peri-urban territory. The fourth aspect is where the urban system can go through rapid transitions, with restructuring and radical change. The final part, in this framework, concerns the responses of policy, spatial planning and the governance system itself with aim of solving problems such as; systemic responses to transitions building resilience, adaptive capacity, shared intelligence e.t.c… In practice, the situation is simple and each aspect will overlap and inter-connect with the others (Ravetz, Fertner, et al. 2013).

3.5.3. Conceptualizing the peri-urban and its implication to sustainability

In recent times, though the study to urbanization and developments associated with the peri-urban area has been the subject of many geographers, urban planners, land economists, and sociologists, the word "peri-urban" has no clear and common meaning and concept (Sun 2012). The word "peri-urban" could be used to mean a place that refers to rural fringe areas surrounding

cities and as a concept; peri-urban could be seen as an interface of rural and urban activities and institutions (Narain and Sischal 2007). Whereas as a process it could be thought of as the two-way flow of goods and services and a transitional stage between rural and urban (Narain and Sischal 2007). Peri-urban development in developing countries has been usually recognized to vary from those in developed countries (Woltjer 2014).

Woltjer set out a classification of dimensions that have been established and distinguished between three evident situational dimensions: peri-urban space, peri-urban life, and peri-urban change (see table 2.2) (Woltjer 2014).

Situational issues; the peri-urban area

spatial manifestations (peri-urban space)	▪ *urban-rural interplay (merger of urban and rural activities)* ▪ *Urban expansion (growth into the urban fringe, land consumption, limitations in urban core vs. opportunity in the periphery)* ▪ *connectivity to urban centers (peri-urban activities generate from the center, mobility, and accessibility to the urban core, peri-urban areas as new regional hubs)* ▪ *complex systems of dynamic change (rural, urban, natural and socio-economic sub-systems, intensive flows, contextually with specific and longer-term term structural innovation)*
uses, activities, and innovation (peri-urban life)	▪ *economic change (from agricultural to manufacturing and activities of higher productivity, mixes of urban and rural economic activity, land conversion)* ▪ *social and functional decomposition (inequality and conflict, land fragmentation, social segregation, environmental stress)* ▪ *urban identity (rural society, 'mental urbanization', agricultural production vs. personal amenities)* ▪ *spatial innovation (socio-economic transformation, urban agriculture, agro-tourism, leisure)*
flows and drivers of change (peri-urban change)	▪ *global capital decisions (foreign direct investment, global property regimes)* ▪ *a multitude of land use claims*

Table 2. 2 Generic Attributes of Peri-urban Development- source - (Woltjer 2014:12)

Halkatti also said that a place-based conceptualization of the peri-urban juxtaposed with a ' flow-based ' understanding of the peri-urban, which emphasizes ' flows of development, finance, labor and services ' and the impact of ' processes of rapid economic, sociological, institutional and environmental change' (Halkatti 2003). Recognition of these flows and processes, of the dynamism inherent in peri-urban spaces, is evident in the use of the term's 'space', 'zone' or 'interface' (Sun 2012). Dupont defined the "peri-urban" as an area outside existing urban agglomeration where large changes are taking place over space and time' (Dupont 2005). The term peri-urbanization, therefore, refers to the process in which rural areas located on the peripheries of established cities become urban in character, in physical, economic, and social terms (Webster 2002).

The conceptualization of the peri-urban area has major implications for addressing issues related to sustainability assessment (Sun 2012). In terms of a 'place', the peri-urban presents a situation

that shows a mixed state in which both rural and urban features juxtapose and present challenges to environmental integrity, social justice and economic viability that needs tailored mitigations from a new perspective (Marshall and MacGregor 2009). The 'process-based' conceptualization fails to address the issue of sustainability in that it does not divulge how the specificities of place and location shape the relationships between environmental specificities, social institutions and economic practices (Marshall and MacGregor 2009).

3.5.4. Global peri-urban development

Although the growth of settlements outside the central city region occurs in suburbanized post-industrial cities as well as rapidly developing third-world megacities, due to differences in economic status and social driving mechanisms, peri-urbanization has different characteristics between cities in developed and developing countries (Sun 2012).

3.5.4.1. Peri-urban development in developed countries

Different existing literature on peri-urban settlement development in the developed countries mostly uses the word "suburb" rather than "peri-urban" (Sun 2012). Simon argued; suburbs should be distinguished as principally residential areas already forming part of the built-up urban area (Simon 2008). However, he also noted that there is an overlap in the concepts of suburb and peri-urban and the actual usage of the terms (Simon 2008).

Building and living outside of the city is not a new trend. In the first half of the 20th century, urban planning was strongly influenced by the utopian or garden town of Ebenezer Howard (Sharifi 2015) which was an attempt to balance city and country in what we might view today as a sustainable fashion (Beatley 2009).

The Garden City Ideals

At the beginning of the twentieth century, the centralized industrial metropolis increasingly presented itself as a "whirlpool" that continues to suck in and diminish the liveliness of the society (Sun 2012:9). The same document noted as there was an attempt to escape the crippling density of the concentrated industrial metropolis by Ebenezer Howard suggesting a dream to distribute the population and functions of the metropolis across the countryside, while at the same time maintaining the stability of modern society as a "married country and city" (see figure 2.6) (Sun 2012). The concept of the garden city is based on the idea of combining the attractions of the town with the attractions of the country which develop a completely new spatial structure a 'town-country', or garden city and would be competitive to both town and country, and thus ultimately replace both (SteinØ 2003). As such, the garden city meant to replace the existing cities, rather than to supplement them and which developed around the existing cities in order to, eventually, become like the garden cities (SteinØ 2003).

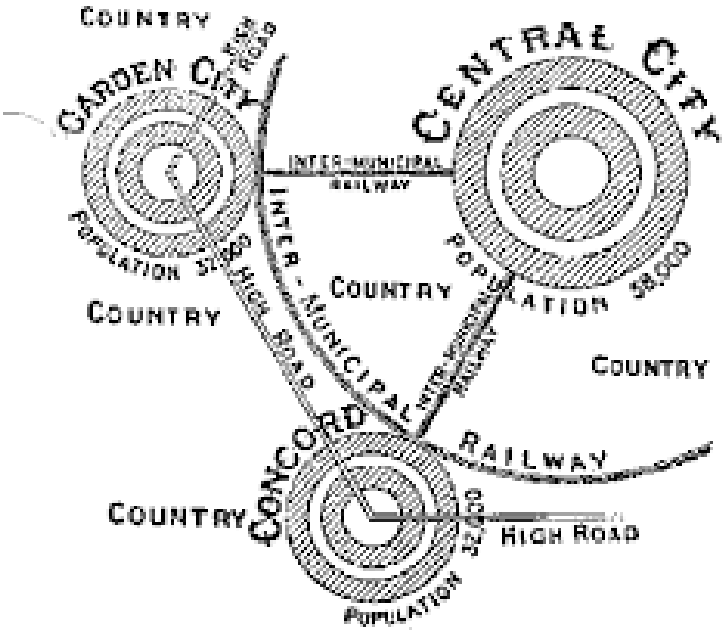


Figure 2. 4 Howard's "The Three Magnets" diagram, which illustrates how the "attractions" of town and country may be combined in the town-country setting. Source – (SteinØ 2003)

Furthermore, the proposals have been suggested between these trends of decentralization and have tried to solve rural and urban employment and housing issues at the same time by removing inner-city slums in which the movement of people to garden cities would create tension in urban areas (Sun 2012). In this theory, some disagreed over whether the task was to rebuild existing cities or to build new "garden cities" in the countryside (Spirn 2011). Geographer and planner Patrick Geddes opposed Howard's approach and said: "Here or nowhere is our Utopia," (Geddes 1915).

The New Urbanism Concept

The idea of Garden cities has been also criticized as the cause of urban sprawl, which threatens many megacity regions, which have concentrated only on ' the provision of safe housing ' and made them ' self-containment ' empty of urban functions and described nurturing housing in terms only of suburban physical qualities and small-town social qualities (Jacobs 1961). For all numerous efforts to build ' self-contained, ' egalitarian neighborhoods with a workhouse balance, the urban environment in the latter half of the 20th century was highly suburbanized (Sharifi 2015). In the United States, the New Urbanism movement was particularly concerned with the development of new cities that would resolve the "failure of modern urban planning" caused by the high proportion of automobile use and the seduction of suburban suburbs (Sun 2012). New Urbanism is anti-sprawl and recommends the creation and restoration of diverse, walkable, compact, vibrant and mixed-use communities (see Figure 2.7) (Plater 1991).

While the urban growth is still seen as inevitable, by the end of the 1990s, the American model of cities had become a warning against which to be avoided, as urban sprawl and associated social

and ethnic divisions had been at its worst, besides, the inner cities continued to decline and become desolate, said Sun siting, Joel Garreau, (Sun 2012).

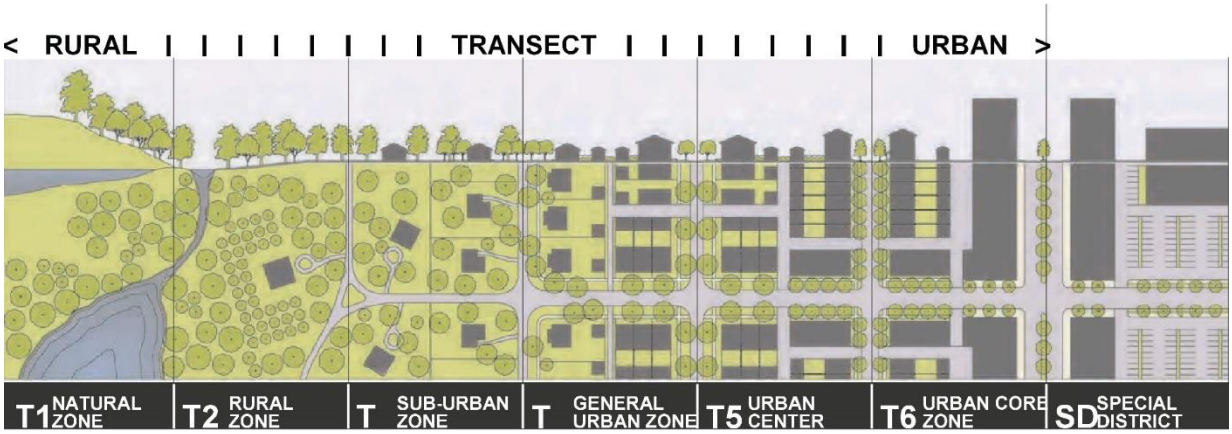


Figure 2. 5 The lexicon of new urbanism, source - (Plater 1991)

Chris Dewolf criticized the new urbanism concept and said as follows:

> *"New Urbanism has led us to neglect the old urbanism. What is wrong with the organic neighborhoods that fill inner cities? They never stopped working, as countless metropolises can attest. Most New Urbanists neighborhoods are Greenfield developments built without context on urban peripheries. Many lack adequate transit service to existing urban neighborhoods, standing alone in a vacuum of more typical subdivisions. New Urbanism tries to fool us into believing it is the savior of urbanity when in reality it is nothing more than a new style of slipshod suburban development which is a pretty veil over common suburbia"* (Dewolf 2002).

Sun criticizes the new urban concept and said that where the movement occurs in the suburbs, it often produces "suburbs in disguise," essentially recreating the very issues that the movement claims to be operating against (Sun 2012).

3.5.4.2. Peri-urban development in developing countries

Current urbanization trends are not only unsustainable but also very detrimental to the quality of life of potential urban dwellers and the world as a whole (UNDP 2016). The rural-urban migration and natural growth of the urban population have led to an increase in the concentration of population and human activities on the fringes of many cities in the developing countries (Sun 2012). Webster argued also as the foreign direct investment in manufacturing caused peri-urbanization approximately large third world cities (Webster 2002). Continuing out-migration into the peri-urban zone is the reason for major conflicts between social, economic and ecological claims on urban development (Zsilincsar 2003).

Although the peri-urban areas of developing countries are home to several non-suburban economic activities, they suffer from pollution, rapid social change, poverty, land-use change and degradation of natural resources due to a lack of clear rules and guidelines on land use and administrative authority (UNFPA 2007). Development of settlements in the peri-urban area often continues to

affect consumption and mobility, urban and rural patterns of development, as well as the livelihoods of an increasing number of people in the peri-urban areas need to be studied in the sense of its own specific set of physical, social and economic conditions (Nottingham 1999).

3.5.4.2.1. Socio-economic issues

The peri-urban area is an issue to many competing interests without an adequate institutional framework to strike balances in a way to relieve poverty, protect the environment, maximize the productivity of human and natural resources (Adell 1999). The immobile nature of economic development and rapid population growth in most developing countries make it difficult for governments to meet the needs of their citizens to provide effective and efficient services (Azeb 2007).

The poor are more exposed to the shocks and stresses of rapid urbanization such as inadequate water and sanitation arrangements (Allen and Hofmann 2006) as well as health hazards (Chirisa 2010). Inequalities in access to basic services between rural and urban areas as well as within urban areas have been typical features of urbanization in developing countries (UNDESA 2013). Peri-urban development usually encompasses rapid social change and at the same time, agricultural communities are forced to adjust to an urban way of life in a short period of time (webster 2006). Cities are confronted with increased spatial inequalities within cities and between cities and the peri-urban areas are often excluded from land-use planning and governance systems present significant challenges for poverty reduction and contribute to inequality (UNDP 2016).

With rapidly growing populations and limited land, urban planning choices will risk creating ' ghettos ' of concentrated poverty, violence, homelessness and inadequate basic services (UNDP 2016). As Allen found out (Allen 1999), because agriculture plays a major role in the local economy, farmers in the peri-urban area of Kumasi, Ghana, whose land has been sold or whose security of tenure is threatened by the development of new residential areas represents the vast majority of the peri-urban poor. They went on to maintain that due to the rising land prices and rents associated with peri-urbanization, emerging problems of growing unemployment and landlessness have been causing increasing vulnerability for the poor (Allen 1999). Furthermore, some agricultural family members may become landless workers, rent or buy land elsewhere to continue farming, change their farming practices or enter the urban non-farm labor market (Nottingham 1999). The obstacles to this change process must be identified if measures are to be effective (Nottingham 1999).

3.5.4.2.2. Environmental issues

According to the UNDP report, urbanization displaces open space such as farmland, wetlands, parks, and forests and reduces water supply as excessive groundwater usage depletes water tables (UNDP 2016). In addition, the peri-urban interface is a heterogeneous mosaic of natural ecosystems, competitive or agro-ecosystems, and urban ecosystems influenced by the material and energy flows required by urban and rural systems (Allen 2003).

Environmentally protected areas, such as watersheds and wetlands, affected by the intensification of agricultural and non-agricultural land use in the peri-urban area, and the loss of unique habitat and biodiversity in these areas is often irreparable (Allen 1999). Besides, urban sprawl, particularly unplanned informal peri-urban settlements, frequently occur in ecologically sensitive or unsuitable areas such as wetlands, estuaries or low-lying flood plains (Habitat 2014). As a result, the region is vulnerable to contamination and depletion of natural resources (UNFPA 2007).

Peri-urban cultivation becomes more problematic and dangerous when the likelihood of a land sale and urban development increases (Simon 2008). Environmental planning and management of the peri-urban interface involved the participation of a wide range of actors, ranging from local communities living and working in these areas to organizations operating at the sub-national and national levels (Allen 2003).

3.6. Inclusive urban development

Upholding inclusive, sustainable development in cities needs concerted public action to mediate conflicts, minimize negative externalities and maximize the benefits associated with size, density and diversity (Habitat 2014). In order to adopt an inclusive approach in housing needs supporting participatory processes and fair housing policies, and addressing housing for vulnerable and special needs groups (Habitat III 2016). According to the Asian bank, inclusive urban development is an outcome of integrated approach of accessibility, affordability, resilience, sustainability principles and defined as follows (lindfeld 2017:3).

> *"Accessibility: the opportunities for safe, secure housing and reliable basic services for all individuals and communities structured within projects and programs. Affordability: affordability of local and national governments to benefit from and have the capacity to support the systematic delivery of shelter, services, and transport to their communities. Resilience: strengthen the ability to resist, absorb, recover from, and reorganize in response to natural hazards without jeopardizing sustained socioeconomic advancement and development."*

3.7. Peri-urban sustainable development

Sustainable development has become an effective paradigm for addressing the rural-urban interface due to its comprehensive view of the environment and the study of various interfaces within the city-region structure (Rojas-Caldelas, et al. 2008). In addition, every society, at every stage of its development, must develop a land tenure paradigm that increases production while upholding sufficient equity to keep society stable (Doebele 1987). Attention needed beyond the normal emphasis on larger city-regions and careful thought of the different settlement typologies that make up African urban spaces, their ties with peri-urban areas, their links to rural areas and the underlying land issues that have an impact on development (UNDP 2016).

Furthermore, UNDP presents five suggestions that might enable planning to go beyond the limited technical activity it has been in many places and enables sustainable and inclusive cities. These suggestions are first argues that informality needs to be a central concern of planners, second the relationship between the many actors that co-produce space and how that interfaces with planning should be considered. Third reflect on the spatial implications of these large-scale investments and how well they relate to broader processes of spatial change, fourth land tenure is a complex issue across Africa and requires careful consideration and the growth of cities cannot be considered without careful consideration of the impacts of climate change in all its dimensions (UNDP 2016).

Un Habitat Report of 1996 held in Istanbul, Turkey, noted that human settlement is not simply accommodation, but an integrated combination of all processes of human activity, including home, employment, education, health, culture, leisure, etc., and other services and structures needed to support them (Habitat 1996). Consequently, sustainable human settlement creation will ensure economic growth, employment opportunities, and social development in harmony with the environment (Habitat 1996). Sustainable Cities need to address related issues of poverty, inequality, and exclusion while transforming productive capacity, avoiding irreversible reductions in social and natural capital and reducing shock-related threats (UNDP 2016).

Sun concluded that achieving sustainable development in these peri-urban settlements is vital to the quality of life and sustainability of human communities (Sun 2012). He also noted that, in order to respond to what will become the future peri-urban areas of understanding the existing peri-urban settlements and where these settlements are in line with the criteria set out in the sustainability agenda, it is important to react and suggested as resources are required to assess them (Sun 2012).

Sustainable urban development aims at restricting radical land claims on the urban fringe to create Compact and compact types of housing construction intended to prevent further dispersion and urban dissolution (Zsilincsar 2003). Sustainable development indicators divided into three dimensions: environmental, social and economic or integrated analysis of the performance of sites, companies and sectors are means to measure progress towards or away from sustainability (Warhurst 2002). Sun Lu defined six research themes, which represent the main elements of the three pillars of sustainable development and respond to the definitions of sustainable settlements, are proposed as the key areas to be addressed for the sustainability assessment of peri-urban settlements with their design principles are set out as follows (Sun 2012):

> *Theme 1: Ecologically responsible development: includes, minimizing energy consumption, minimizing the use of resources, minimizing waste and minimizing site impact.*
>
> *Theme 2: Reduced reliability on automobile use: provision of convenient public transport, designs to encourage walking and cycling, reduction of parking space, good accessibility to public services, schools, and work.*

Theme 3: Quality of life: the education of pollution and improved sanitation: this includes reduction of pollution and improved sanitation; safety; accessibility to public spaces; adequate dwelling space; and affordability.

Theme 4: Minimized land consumption and compact urban form: includes minimization of the loss of rural land; opportunities to perform community agriculture; and appropriate development densities
Theme 5: Social cohesion and sense of community: diversity of household types and social mixing; integrated communities; designs to enhance the sense of community

Theme 6: Public participation in the development and management process: public participation in the decision-making associated with the development and management of a community; provision of a public meeting place in the community.

The benefit of the thematic approach to sustainability assessment is that it removes the uncertainty that the sustainability concept entails and enables the evaluation to focus on a particular aspect of the definition at the same time as retaining a holistic view that incorporates all the themes into the overall calculation (Sun 2012). An inclusive settlement and community allow all groups of people to contribute to creating opportunities, to share in the benefits of providing access to sustainable livelihoods, safe housing, and affordable basic services, and to engage in the development intervention process and design decision-making.

According, to the review of the literature, the study of this paper uses the above-mentioned themes, contextually five of them beginning from the number two. The requirements are used to evaluate the inclusiveness of the early settlers of the study area on the planning and implementation of the structure and local development plan process and development plan or design by itself.

Chapter three - Research Method

3.1. Introduction

As described in the first chapter, the major objective of the study is meeting one of the targets of sustainable development goals, inclusive and sustainable urbanization. This will specifically cover the identifying socio-economic and spatial impacts of Peri-urban intervention on the early settlers and know the extent of the peri-urban development plan and implementation inclusiveness of the early settlers. In order to realize this, the case study method selected as the research method. Therefore, the chapter goes through this study method, types and sources of data, selected case, and techniques of data collection, way of data analysis, data validity and reflections given on the method.

3.2. Methodology

When a researcher comes to the idea of mixed-method research, he needs to objectively collect and analyze both quantitative and qualitative data, and then combine them to answer the overall research question in the study (Terrell 2016). The method draws a relationship and intensity that exists between quantitative and qualitative research methods to explain a phenomenon more thoroughly than is feasible, using either qualitative or quantitative methods alone (Gay and Airasian 2012).

To answer the research questions, which need numeric and non-numeric related data, the researcher used mixed quantitative and qualitative research methods. In this case two of the research questions; the first and second used qualitative data which starts its question with ‘how’ and the last two research questions, the third and fourth research questions, using a mixed research method that needs qualitative and quantitative data.

3.3. Research Method

3.3.1. Selection of method

Terrell, citing Yin, stated two reasons that case study research method makes preferable: first, it is by far appropriate than other methods for research addressing a descriptive, causal or an explanatory question which emphases the study of a phenomenon within its real-world context compared with relying on derived data (Terrell 2016). Besides, it characterized also particularistic, descriptive, and heuristic (Gay and Airasian 2012). This helps to understand an event that happened to a particular person or group at a particular point in time (Terrell 2016). In addition, its ability to deal with full different evidence-documents, interviews, artifacts, and observations-beyond what might be available in a conventional historical study is also, what the case study research method makes unique (Yin 2013).

Thus, the researcher used a case study research method for the empirical study of a selected particular area that needs a description and heuristic understanding characteristics and what happed at a time of development intervention on the study area using different evidence.

3.3.1. Case study site selection

The case that the researcher chose is in the peri-urban area of one of our country's regional capital, Mekelle city. This city is one of the cities that is expanding to the peri-urban settlements and under the transformation of these peri-urban settlements. Thus, the study will help to understand the development of local peri-urban settlement development. Moreover, it helps to know how the development intervention transforms the previous settlement, affects the early settlers.

There are two types of city development plans the structure plan and local development plan which are being implemented in the peri-urban area of Mekelle city. The research held on one of the areas, which are implementing its development plan since 2008. The two reasons for choosing the case study, Adi Dairo, for the research was the closeness to the city with better practicing of the implementation of the plan and to be the researchable size. Besides, the site has spatially different characters and there was information that the researcher, lives within the study area, heard about the challenge of implementation of the development plan of the study area.

3.4. Data Type

In order to attain the objectives of this research, all required data were collected from both primary and secondary data sources. The data includes photo, face-to-face interview from the sample selected householders and selected group discussion, written related literatures, development plan reports, and maps.

3.5. Data Sources

As the researcher tried to explain in the table (table 3.1), The data source for the research are interviews with planners who are working in the municipality of the sub-city and were working in Hawelti sub-city while the implementation of the local development plan of the area now working in Mekelle city administration office. In addition, selected group dwellers those who were committee, the chairperson and the vice-chairman, in documentation and identification of early settlers of the study area, and individually selected householders of early settlers of the study area are also the source for the primary data. Besides, Google Earth maps and observation, sketching and photography and secondary data including development plan report and maps from Mekelle city municipality, statistical and urbanization related literature, and reports data from colleagues who work in Mekelle University and Local Development Plan report from Hawelti sub-city, Mekelle.

3.5.1. Data collection techniques

Data collection continues in two distinct phases with quantitative sampling in the first phase and with purposeful sampling in the second, qualitative phase (Creswell 2014). Examples of evidence widely used in case studies: documents (letters, goals, plans, progress reports and newspaper clippings), archival records, interviews, direct observation, participant observation, and physical objects (Yin 2013). The observation interview technique includes face to face and focuses group interviews for the historic information (Creswell 2014).

In this research essential information collected from the field including pilot tests and main field study. In order to make the data valid, the first phase of fieldwork i.e. pilot test conducted by informal interviews followed by an intensive case study. This study uses mixed research methods to conduct a valid and in-depth study. In this study, quantitative data collected using semi-structured interviews, structured observation and documentation of secondary numeric data reviews collected from published books, structure and local development reports as shown in the table (Table 3.1). The qualitative data are also collected using different methods such as in-depth interviews, selected (focus) group interviews, photography and sketching, documentation and direct and participatory observation (see table 3.1).

3.5.1.1. Qualitative data collection methods

a. In-depth interview

One of the most important sources of case study information, which are to be guided conversations rather than structured questions (Yin 2013). In this research, the in-depth interview was semi-structured which includes a life history where the interviewer wants to find out about the whole, or portion of the interviewee's life history to understand the process of the settlement and housing development, transformation and its impact on the interviewee.

b. Selected (focus) group discussion

This approach is a type of interview, but with a community that focuses on data generated by observation and contact between and from participants (Lunenburg 2008). This is a form of interviewing conducted where there were participants selected from the community members of the early settlers mainly those elders, community leaders and the selected committee on the documentation and identification of the early settlers of the study area. The researcher considering the research objectives predefined the discussion topic.

c. Photography and sketching

This technique is used to explain the real situation of the spatial and physical appearance of the site and the activity that reside within the space. This includes taking a photo of the previous house type, which is not demolished and current characteristics of the settlement and houses. Besides, sketching which includes technical information like measurements, sections, layouts, and descriptions about the situation (condition) and the diachronic development and transformation of the interviewee's houses.

d. Documentation

Documentary information is relevant to any case study topic that may take many forms and should be the subject of explicit data collection plans (Yin 2013). Using this method the researcher collected written documents of literature on the urbanization of Mekelle city, structure plan and LDP report of the study area and other related data.

e. Direct observation

This approach accompanied by a field visit to the “case study site” for direct observations, which serve yet another source of evidence in the case study (Yin 2013). In this method, the researcher used different techniques to document his perception such as mapping, photography, and sketch.

f. Participatory observation

Participant observation is a special mode of observation in which a researcher is not merely a passive observer, but instead assumes a variety of roles in the case study situation and can participate in the events being studied (Yin 2013). Using the participatory observation method the researcher collected data related to the development and transformation of the settlement. This helps to understand how the study area developed and changed by the development with the help of the settlers.

3.5.1.2. Quantitative data collection methods

A. Semi-structured interviews

Case study interviews are of an open-ended nature, in which a researcher can ask key respondents about the facts of the matter as well as their opinions about events (Yin 2013). In this research, these methods include a series of semi-structured questions asked by an interviewer to the interviewee, which includes a fixed choice of answers and open-ended questions that allow respondents to answer freely.

B. Documentation

In addition to primary sources, the researcher collected documents from the secondary source for relevant data. These include published and unpublished reports and researches of Mekelle city development plan and other master’s degree thesis, which includes quantitative data such as statistical reports and demography.

C. Structured observation

The researcher used this technique to identify and count the number of items that exist in the settlements or the domestic places such as, number of rooms in the house, number of public water points, number of taxi stop, numbers of health centers and schools and other infrastructures in the settlement.

3.5.2. Data analysis methods

Quantitative and qualitative datasets evaluated separately in a mixed research method that uses quantitative findings to prepare the qualitative follow-up (Creswell 2014). In this research, data collected using quantitative and qualitative methods are analyzed using appropriate methods and tools. Thus, quantitative data are analyzed using descriptive and inferential analysis methods while qualitative data are analyzed using individual and categorical summaries analysis and cognitive mapping analysis (see table 3.1).

3.5.2.1. Qualitative data analysis methods

Data analysis in qualitative research proceeds together with other parts of developing the qualitative study, namely, data collection and the write-up of findings (Creswell 2014). Qualitative data analysis methods include individual summaries for each case, categorical summaries, which summarize under thematic headings, matrix methods in which individual cases were summarized thematically and cognitive mapping, in which maps are developed showing linkages within the data (Lyons and Doueck 2010)

The study used the following qualitative data analysis methods:

A. Individual summaries to analyze existing situations, transformation and socio-economic and spatial impacts of the peri-urban development intervention.
B. Categorical summaries: to analyze the socio-economic and spatial impacts and inclusiveness of early settlers categorically.
C. Cognitive mapping: is also used to analyze the development and transformation of the settlement and compound data by mapping and evaluating the inclusiveness of early settlers on the development plan or design or spatially.

3.5.2.2. Quantitative data analysis methods

Quantitative data analysis is often divided into two main components of descriptive analysis and inferential analysis (Lyons and Doueck 2010). The descriptive analysis consists mainly of entering data into a structure with rows and columns of data in raw form and converting it into meaningful summaries that show relationships within the data and Inferential Data Analysis encompasses exploring and defining relationships between variables (or subgroups) (Lyons and Doueck 2010).

Thus, the researcher used a descriptive analysis method and inferential analyzing method to summarize and give a meaning for the collected quantitative data and the study involves exploring the relation of sub-grouped variables for better exploration.

3.5.3. Data presentation

3.5.3.1. Qualitative data presentation

Lyons and Douech, citing Chenail, discussed and suggested several ways in which qualitative data may be presented (Lyons and Doueck 2010) and some of these, which are used in this study, are presented as follows (Lyons and Doueck 2010:174):

1. *"Natural: in which data are presented based upon the phenomenon studied.*
2. *Researcher-based chronology: in which data presented in the chronological order in which they were uncovered, or discovered by the researcher.*
3. *Theory-based: in which data are presented based upon developing or developed theory about the phenomena presented".*

The researcher used a natural analysis method for the presentation of qualitative data of maps, observation, documented and interview and chronological order presents the pre-planning chronological development of settlement and houses. Besides, the empirical study of the pre-planning development and planning interventions presented using the theory-based analysis to present data based upon related theories.

3.5.3.2. Quantitative data presentation

Tables, charts, and graphs are data presentations for quantitative data and tables are most useful when they can convey significant information more efficiently than narrative (Lyons and Doueck 2010). The same document noted that these data presentations are meaningful and all be self-explanatory (Lyons and Doueck 2010). Thus, the quantitative analysis presented using a table, chart, and graphs to present data collected from the field and some reports.

3.6. Cases Selection and Sampling

The creation of a good sample involves first identifying the population that the researcher wants to work on considering everyone or everything that could be used as a subject for the study, using the right strategy and selecting a sample that works best for the researcher in the study (Terrell 2016). Terrell also noted, as there are two major approaches for sampling the first one is random sampling, which is used in quantitative studies where the researcher is trying to identify a sample that represents, as closely as possible (Terrell 2016). Secondly, the population it was selected from and non-random sampling which uses for qualitative studies; in those cases, the size of the sample, and the manner by which it is created, is determined by the objectives of the study and the characteristics of the population (Terrell 2016).

Representativeness of a sample is achieved when the sample arranges for an accurate reflection of the characteristics of the total population of the study area (Lyons and Doueck 2010). Therefore, before obtaining the sample, the researcher should clearly and carefully identify the population, including the members to be included, and then ensure that the sample accurately represents the population, this representativeness demonstrates how much confidence the sample can have in generalizing to the population (Lyons and Doueck 2010).

To identify the population size and types early settler households on the study area the researcher took pilot study, observation and informal interviews with some people of the site helps the researcher the general information about the study area and know the characteristics of the population of the early settlers and time that would take for interview per person. According to the information, the area had different types or characteristics of house owners before the development plan implemented and the interview took a long time, more than 1:30 hour. Thus, the interview divided into two for the detailed interview, which was, selected systematically, 6 householders, for the qualitative research which includes different householders with different, locations, current status, ownership, and land acquisition. Accordingly, the researcher selected one old agrarian with the rearranged house, two demolished *Metesha* houses with *Metesha* and bought land acquisition,

two *Metesha* one partially demolished and the one is mislocated[8] and lastly, *Metesha* house which is rearranged. Besides, randomly selected for the quantitative study.

The first step in selecting a sample for a quantitative study is to identify the population working with; which sometimes call this the sampling frame (Henry 1990) and to make this sample representative of these characteristics as possible; this is called the generalizability of the sample to the population (Henry 1990). If the sample is not generalizable, then the results based on the sample are likely not valid, and will not reflect the true values in the population; we call this sampling bias (Terrell 2016).

To make the research representative of the population of the study area the researcher select 55 householders from the total population of 240 randomly from the selected 4 clusters. Thus, 55 early settlers comprising 36 females and 19 males were involved in face-to-face interviews using semi-structured questionnaires for quantitative research. The face-to-face interviews lasted between 50 and 75 min depending on the interests, experience, and knowledge of the respondents to the settlement development process and implementation.

3.7.1. Stratified cluster sampling

The stratified cluster sampling method is a combination of stratified and cluster sampling approaches (Sedgwick 2013). A stratified sampling includes the collection of a simple random sample from each stratum when each member of the study population is allocated to a category or stratum (Henry 1990) while cluster sampling involves grouping the population and then selecting the groups or the clusters rather than individual elements for inclusion in the sample (Kothari 2004).

The researcher first classified or stratified into homogenous characteristics of the study area in terms of the time of development of the area, geographical location and characteristics of the population of the settlers with in the clusters. Afterward, classified into clusters these selected clusters mainly contain all time of development and characteristics of ownership of the study area and determined by their geographical location. Therefore, the researcher classified into eight clusters and four[9] of them selected for the research with a total population of 240 out of the 479 total population of the study area, Adi Dairo. Finally, the simple random sampling conducted to identify the householders for an interview for the selected clusters.

3.7.2. Random (Probabilistic) Sampling

The first step in selecting a sample for quantitative research is to identify the population working with; which sometimes calls this the sampling frame (Henry 1990). If a researcher wants its sample to be as representative of these characteristics as possible; this is called the generalizability of the sample to the population (Henry 1990).

[8] Dislocting is relocating or/and informing to relocate of settlers in other area, which is made by mistake
[9] See figure 5.15

If well-chosen and fairly large but sometimes a sample varies significantly from the population on some important variable note, random means beyond the influence of the researcher and at the mercy of chance and this chance variance is considered an error in sampling (Gay and Airasian 2012).

3.7.2.1. Simple Random Sampling

Simple random sampling is a preeminent technique when a researcher seeks to ensure that the sample is representative of the population from which the sample was chosen, thus reducing sampling bias (Terrell 2016). For this reason, the researcher used simple random sampling for a sampling of the collection of the quantitative research question from the dwellers of the early settlers of the study area. Besides, snowball sampling for the qualitative research question to get some information on the transformation of the area and its effect on the dwellers who already displaced from the neighborhood.

The simple random sampling held using application Rao soft with a marginal error of 5% confidence level 90%, which used the number of the parcel or household as population size. A simple random number application for selection of random household selection is used. Moreover, crosschecked with the sample size calculated using a formula as follows. The sampling unit of the research is householders. The sample size is as calculated below.

Cluster 1 = 71, cluster 4 = 23, cluster 5 = 102, cluster 7 = 44,

Total = 240 householders

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, N is the population size, e is the level of precision.

$n = 240/(1+240*(0.1)^2)$

n = 70.59 = 71 householders

Finite Population Correction for Proportions

If the population is small, then the sample size reduced slightly which, is because a given sample size provides proportionately more information for a small population than for a large population (Israel 1992). Thus, the researcher 71 householders used as n0 calculated sample size for an infinite population to calculate the sample size for which comes 55 householders as follows.

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Figure 3. 1Sample size calculating formula – Source- (Israel 1992)

Where n is the sample size N is the population size. n_o is calculated sample size for infinite population

$$n = 71/ (1 + (71-1)/240)$$

$$n = 55 \text{ householders}$$

3.7.3. Snowball Sampling

Snowball sampling used when samples with the target characteristics are not easily accessible (Naderifar and Ghaljaie 2017). This method is an appropriate technique for the early settler's interviewee which the process involved establishing contacts with a few early settlers' informants who assisted in providing further contacts (Cobbinah and Owusu 2015). Snowball sampling is also a non-probability method, which involves a random selection of subjects that is particularly useful when researchers are trying to reach populations that are difficult to find, e.g. in the case of injecting drug users (Singh 2007).

The snowball sampling held after identifying the randomized householders to be interviewed. This helped the researcher to get the displaced early settlers of the settlement in this method the first people were the planner who tells the researcher as where they relocated and community leaders and representatives showed as where exactly are. This method also helped the researcher get the former planners and officials those who were working in the sub-city during the preparation and implementation of the development plan. Thus, the snowball was helpful for the interview with the stakeholders.

3.7.4. Reflections on Method

As the researcher discussed earlier, from the literature review related to snowball sampling, to find the relocated or peoples who are difficult to find should use snowball sampling and according to some studies, this method might be difficult for generalization. In order to solve this, the researcher made random sampling first and find where exactly the householders of the selected one are. To do so planners and representatives of the area helped the researcher to know where the householder lives. This helps to minimize the generalization problem of the method the researcher used.

Finding information about the early development was difficult and said the officer, as they do not know about the past and lacks information about it. Besides, the official has no information where former officials of the local government office, sub-city municipality and another participant on development are working. Thus, what the research did was communicating with the early settler's representative on some issues and told whom the officials were, what their responsibility was for the development plan implementation was and where exactly they are working.

Collection of data from the early settlers was not easy, especially those who are relocated and the plan demolishes their house, some of them says "you change nothing…so many students of the

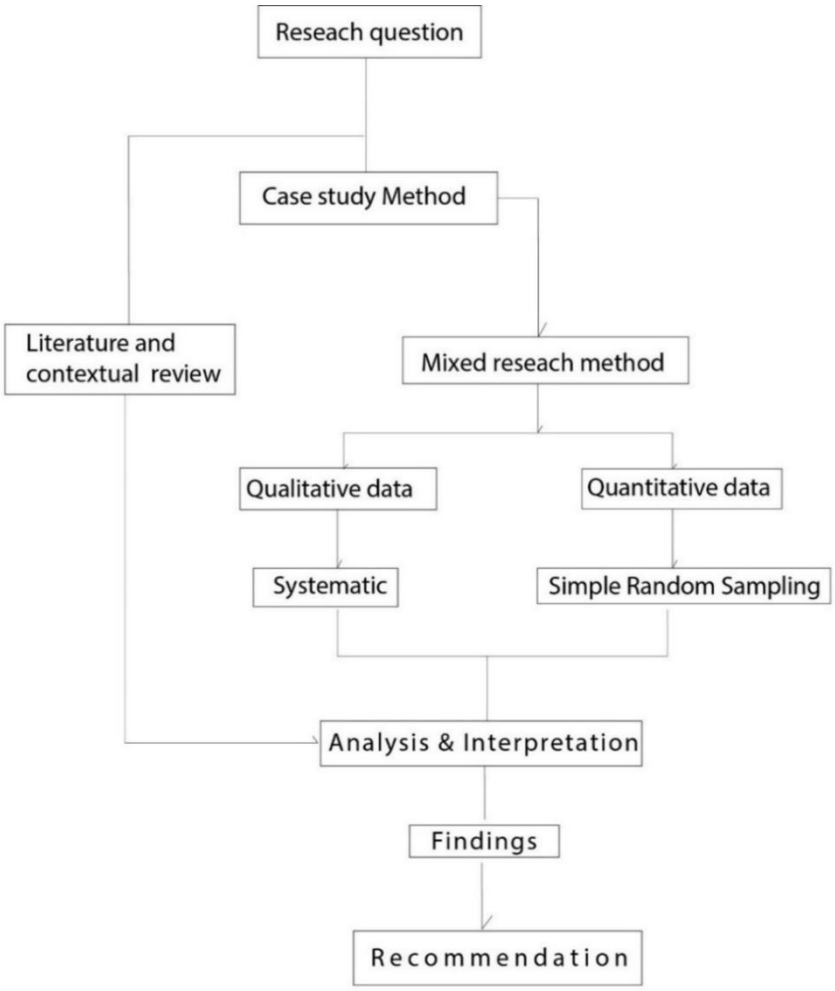
different department come here asked us many times but there is no change at all". Some of them also do not want to take a photo and ask them about their house transformation e.g. one old mother said, when the researcher asked her willingness for an interviewee she said: "ok it is good; I have also one child who will graduate soon". However, after the completion of the interview and the researcher proceed to the sketch, ask here the transformation of the house through time, the time of construction of the houses she said: "This thing is not good! Are you from the municipality?" To solve such a problem, the researcher communicated with the local police station, prepared also one map for the police, which identify the location where crime is high, presented on the index of this research and told them as the research is for education purpose. Even they, interviewee settlers, ask to call to police in the middle of the interview and check.

3.8. Validity of data

Validity tries to assess whether a measure of a concept measures that concept, that is, the extent to which the concept measures the thing it was designed to measure (Singh 2007). Thus, the researcher uses different methods for this study that includes direct observation of the site, collecting secondary data, interview with the officials and selected householders and groups of the early settlers of the study area. A pilot questionnaire survey was carried out before the actual survey was delivered. The pilot survey showed that the respondents understood well what they asked by each question, and the time taken for each respondent to fill in the questionnaire was somehow longer. Thus, some adjustments were made on the presentation of the questionnaire as well as on the wording of some questions according to the response from the pilot survey.

Triangulation, bringing together different types of data, different data sources, or different ways of looking at data to the research endeavor that helps to verify data as well as to increase understanding of the data (Lyons and Doueck 2010). After the data was collected from a different source as mentioned above, data triangulation is done to check the validity of the collected data. The response from the respondents crosschecked by observing the new implementing plan on existed settlement through. Data was crosschecked to one another to assure validity. Reviewing the literature anticipated different situations, and helped the researcher to make direct observations. The researcher used multiple sources of evidence like documentations, Google earth maps, interviews, direct observations, sketches, and photographs. These data were crosschecked with the information collected from former officials of the sub-city, the early settlers, and the administration office. In some of the cases, the researcher modified the interview questions after an observation completed to get data directly related to the research questions. Showing the maps of the houses and development plan, legality documents of the buyers, the legislation of land ownership and lease holding, and ownerships and observation held to trust what the settlers said. In addition, direct observation conducted while the process was happening on the site. Then triangulating or establishing joining lines of evidence that had made the findings as healthy as possible.

3.9. Research design



For the mixed methods, the three most widely used designs are sequential-exploratory design, sequential explanatory and converging design (Terrell 2016). Sequential-explanatory is used when a researcher first gathers qualitative data and then uses quantitative data to help better understand the problem area, while sequential-explanatory design is used in cases where a researcher wants to use qualitative data to clarify or better understand quantitative data, and the latter is a convergent method that collects quantitative and qualitative data (Terrell 2016)

Figure 3. 2 research design

In this research, the researcher collects both quantitative and qualitative data at the time finally interpreted by merging both data using the convergent design method as shown in the picture (see figure 3 .2) which gives equal emphasis for both the qualitative and quantitative data.

No	Questions **Research question**	Data **Type**	**Source**	**method of Collection**	**Method of Data Analysis**
1	How did the peri-urban settlements of Mekelle City in general and Adi Dairo in particular, develop? (background and empirical study)	Qualitative	Municipality maps and reports, colleague and internet (written books on urbanization and peri-urban development of the city) and Google earth(for the peri-urban spatial transformation) and selected group interview	Selected (focus) group discussion Documentation	Categorical summaries and cognitive analysis

2	How does the implementation of the development plan transform the area?	Qualitative	Interview with the settlers and Municipality and planning office and observation and review of secondary data	In-depth interview Focus group discussion Photography and sketching Documentation Direct & participatory observation	Categorical summaries and cognitive analysis
3	What are the socio-economic and spatial impacts of the transformation on the early settlers?	Mixed	Interview with the settlers, observation, and selected group interview	Semi-structured interviews In-depth interview focus group discussion Photography & sketch Direct and structured observation	Descriptive Inferential Individual categorical Cognitive
4	To what extent is the development inclusive for the early settlers?	Mixed	Interview with the settlers	Semi-structured and in-depth interviews focus group discussion Photography & sketch Direct and structured observation	Descriptive inferential categorical Cognitive

Table 3. 2 Research method

Chapter four – Contextual review

Introduction

This part of the research will present the contextual review of the study, which mainly focuses on the urbanization of our country, background, and empirical study of Mekelle city physical peri-urban settlement development of the city through time. This will be in a way that helps to understand the trend of urbanization and the Peri-urban settlements development process in general development and the study area in particular to identify the main factors for the development and its trend.

4.1. Contextual review

4.1.1. Ethiopia

By 2050, the world urban population could reach 6.25 billion, 80 percent of whom would live in developing regions, and concentrated in cities of Africa and Asia (UNDESA 2013). In the next 10-15 years, for the first time in history, the rapid pace of urbanization would also lead to an absolute decline in the world's rural population (UNDESA 2013). Nevertheless, with 17 percent of urban population living in cities, Burundi (10.9 percent), Malawi (15.7) and Uganda (15.6 percent) are among the least urbanized African countries (UN 2012). Nevertheless, Ethiopia has one of the highest urbanization rates, according to the benchmarks of developing countries, which measured[10] at 4.1% (MUDHC 2014).

4.1.2. Urbanization in Ethiopia

Gamst, forty years ago, described the Ethiopian society as "Peasants and Elites without Urbanism" which had a social organization and a high-cultural culture in which cities were absent or without urbanism (Gamst 1970). Still, thirty years later, researchers spoke about "urban deserts" in Ethiopia, given the pace of urbanization, with an average growth rate of between 4.4 and 5.6 percent per year (Golini, et al. 2001) and a large share of the population still resides more than 10 hours of travel time from an urban center (Schmidt 2009). Nevertheless, the country is currently urbanizing rapidly and is one of the fastest-growing economies on the continent (Arup 2016).

According to the unity university literature entitled “Urbanization: Trends, Causes, and Effects” Ethiopia is one of the least urbanized countries in the world today, and only 18% of its population lives in urban areas (Open 2016). The literature also said, citing MWUD, in common with many other developing countries, however, this pattern is changing (Figure 4.1). Ethiopia’s urban growth rate is more than 4.0% per year, which places it among the highest in Africa and the world (Open 2016).

[10] Ministry of Urban Development, Housing and Construction national report on Housing and urban development

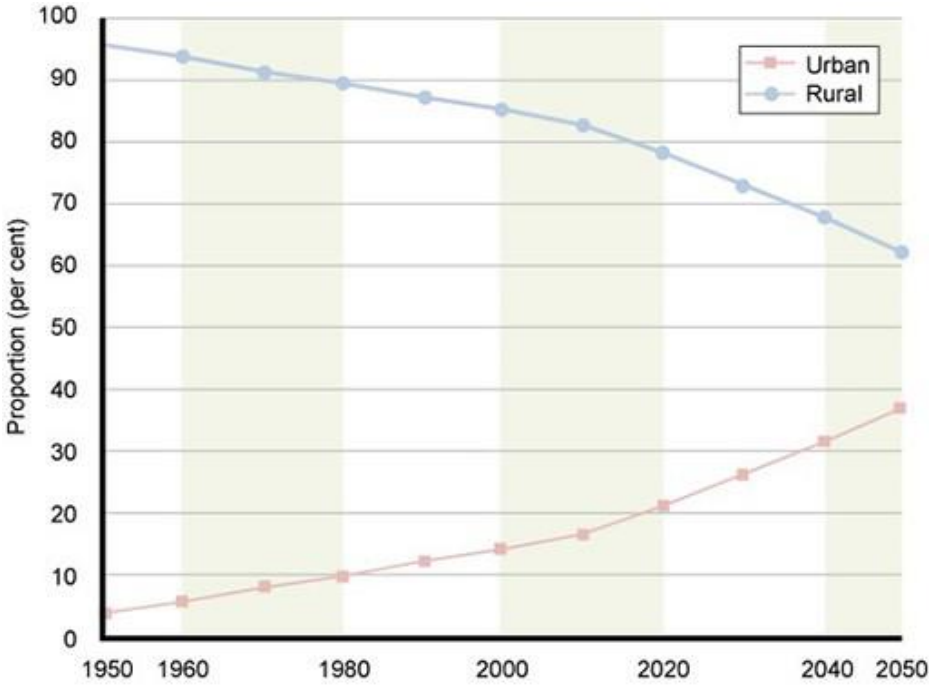


Figure 4. 1Changing proportion of the urban and rural population in Ethiopia (1950 to 2050) –Source - (Open 2016)

The rapid increase in urban populations has meant that peri-urban areas are growing much faster than traditional urban centers and in the transition from rural to urban (rural to urban) areas, often with underdeveloped infrastructure, where health and sanitation services are under pressure and where the natural environment is at risk of degradation (Open 2016). Moreover, defining the boundaries of urban, peri-urban and rural areas is not straightforward and this lack of a clear boundary can make it difficult to assess the size of cities by population or geographical area (Open 2016).

According to Tesfaunegn, rapid urbanization in Ethiopia is mainly due to migration from villages to towns, urban expansion to peri-urban areas and the natural growth of urban inhabitants (Tesfaunegn 2017). Urban expansion to the peri-urban area due to increased demand for land over time is another cause of rapid urbanization in Ethiopia, which leads urban centers to physically extend their boundaries to neighboring rural and peri-urban areas by reclassifying or demarcating additional land where people have focused their lives in agriculture that could be planned and unplanned (Tesfaunegn 2017). The same document also revealed that, like many developing countries, urbanization in Ethiopia, primarily natural urban growth caused by high fertility levels, is now succeeding with urban majorities (Tesfaunegn 2017).

4.2. Peri-urbanization in Ethiopia

4.2.1. Peri-urban settlement development

Currently, in Ethiopia their many works of literature related to the peri-urban settlement development some of these studies discussed as fellows. In his study entitled "Urban and peri-urban development dynamics in Ethiopia," Tesfaunegn described that peri-urban land in Ethiopia is a sphere of unauthorized land transactions dominated by land access and control conflicts and

is a place where major developments are taking place, including informal settlements without utilities, emanating from urban sprawls of rich people in some areas (Tesfaunegn 2017). Urban land policy 'proclamation No. 80/93', for the last 18 years the urban land policy of Ethiopia has created a comfortable situation for corruption, illegal urban land speculation and wealth creation by some groups in Addis Ababa (Sisay 2012).

According to Addisyihun, the main spatial transformations in peri-urban settlements happen due to 'selling' land informally for economic development and fearing expropriation by a government program, and land fragmentation due to densification (Hamore 2019). Large but varying proportion of Ethiopia's urban population is settled in unauthorized and un-serviced settlements and a significant proportion of new housing stock and/or land assets have been provided informally (Tendayi 2009).

The study on the peri-urban land tenure in Ethiopia was also held by Achamyelh aimed to investigate the challenges 'imposed' on peri-urban land rights as a result of the growing demand for land for urbanization noted that urbanization and urban development in Ethiopia are accompanied by contentious land tenure changes (Achamyeleh 2014). In order to address these challenges of urbanization and its effect on the land rights of local per-urban Achamyeleh recommends introducing an inclusive and participatory land development tool like land modification, which can encourage the voluntary contribution of land for urbanization by the local peri-urban landholders themselves (Achamyeleh 2014). The issue of compensation of displaced people, the value of the expropriated land in terms of location and distance is not taken into consideration for the compensation payment, which is unfair for the people who are displaced from high land value areas said Sisay on his study on urban land policy (Sisay 2012).

Mezgebo Said on the study entitled 'Welfare Impacts of Urban Expansion: Micro Perspective from peri-urban Northern Ethiopia' related to the peri-urbanization of Ethiopia" as follows (Mezgebo 2014:3-4):

> *"Urban and rural divisions are still vital in Ethiopia with defined boundaries where the local policies are focused within their boundaries with little room for coordination of activities. To meet the growing demand for urban land use, urban areas usually redraw their boundaries by incorporating rural sub-villages in the surrounding. Incorporation of the sub-villages to the respective town/city administration is usually done in consultation with the rural administration or the regional council. 'Demarcation of revised city/town boundary is enacted after the respective development plan is approved by the local council"* (Mezgebo 2014:3-4).

Mezgebo said also that peri-urbanization in Ethiopia, generally, follows a formal procedure where populations of the targeted (included) rural villages become urban inhabitants by law (Mezgebo 2014). The same document also noted that these villages will be governed by the urban development priorities which is a complete shift in their means of living which leads to farm

households likely face time and resource constraints adapting the urban livelihood systems and benefiting from the emerging employment opportunities (Mezgebo 2014).

4.2.2. The peri-urban settlement development process

4.2.2.1. A formal (institutional) channel

The cycle of land supply for urban development in Ethiopia is largely based on the purchase of land from local peri-urban farmers and the reallocation of land to private developers and others by the government (Achamyeleh 2014). Thus, the urban growth and development process in Ethiopia has four-step these are: first, step of urban growth and development incorporating the peri-urban area into the city administration's master plan and jurisdiction, second and third steps of urban growth in Ethiopia are expropriation and redevelopment of the area by providing basic infrastructure (Achamyeleh 2014). Finally, the final step is a reallocation of the redeveloped land to private developers, investors, and other urban groups through lease contracts based on annual ground rent for a specified lease period (see fig. 4.2) (Achamyeleh 2014).

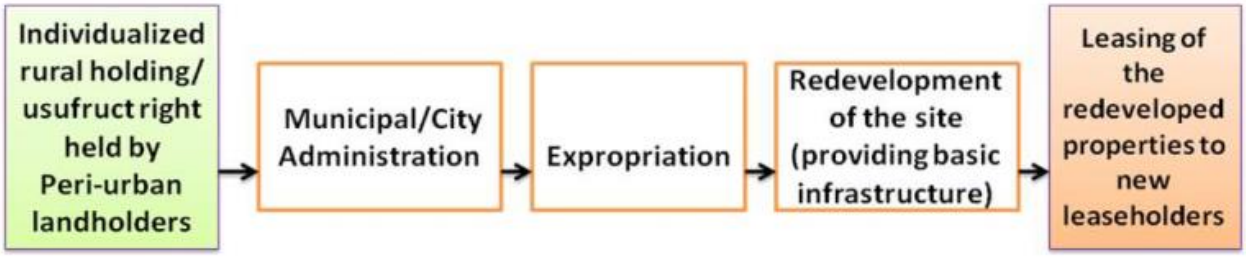


Figure 4. 2 Urban land development process in Ethiopia – source - (Achamyeleh 2014)

Achamyeleh noted that the new beneficiaries of land from peri-urban areas through a lease contract are not local communities, but urban-oriented people engaged in non-agricultural activities that increase the impossibility of turning the rights of local peri-urban communities into urban land rights is a crucial deficiency in the cycle of urban land growth in Ethiopia, which has triggered tenure insecurity in the area (Achamyeleh 2014).

4.2.2.2. The informal channel

According to Achamyeleh, in the Ethiopian context, peri-urban land used primarily for agricultural purposes and held by local farmers is a potential target area for informal development (Achamyeleh 2014). Also, from the point of acquisition and development of parcels, three possible ways in the peri-urban area of Ethiopia may lead to the creation of new built-up interests and rights outside the formal regulatory framework: 1) the forced occupation of vacant state land; 2) the illegal purchase of legal local landholders, and 3) the unauthorized subdivision and construction of land (Achamyeleh 2014).

In this process, After the purchase of the plot and the building of a sub-standard system, the people will settle in the structure and start asking the local government to provide basic infrastructure, such as water, electricity, school and community police, and so on (Achamyeleh 2014). The very critical

and daunting request of the settlers to the local government is the legalization of their occupation and construction (Achamyeleh 2014).

The government's response to this request can take two different forms: the first is the approval of the request and the establishment of a lease agreement with the informal settlers, while the second would be the refusal of the request (see Fig.4.3) (Achamyeleh 2014).

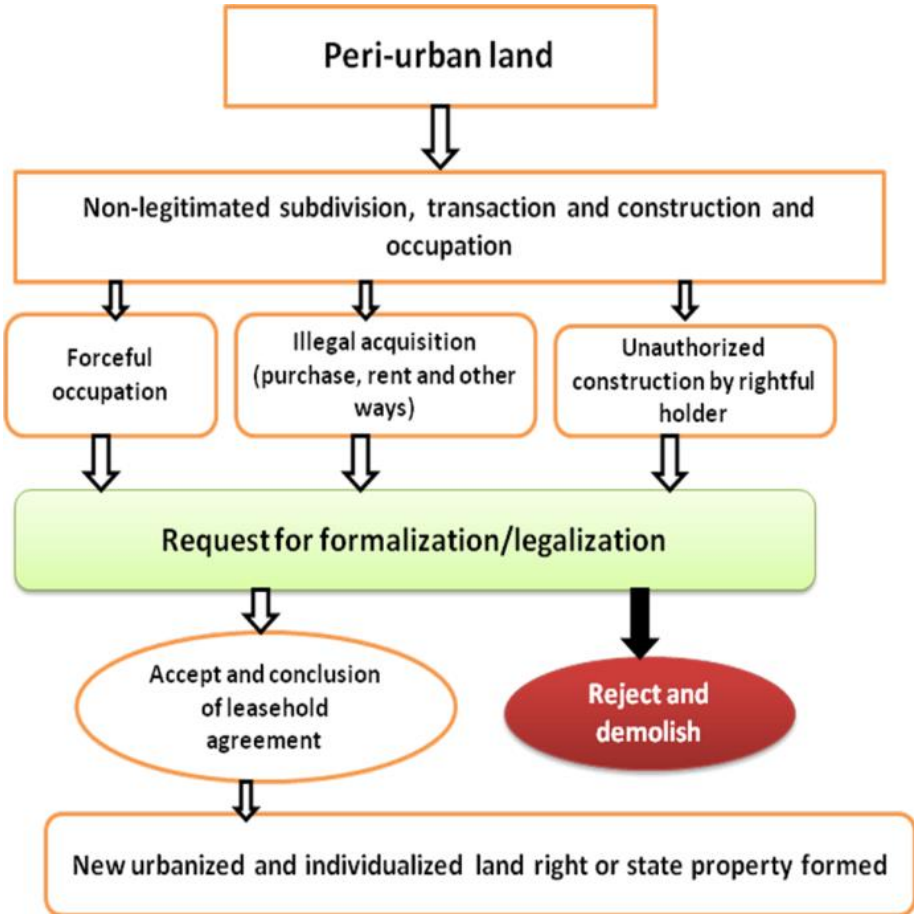


Figure 4. 3 Informal channel of built-up property right formation process - source (Achamyeleh 2014)

4.2.2.3. Binary continuum (new channel)

The process of development occurs in the binary continuum of land rights paths i.e. between informal and formal (see Fig. 4.4). The first is the process of transferring the formal usufruct system to the formal system of urban leasehold rights by expropriation and reallocation, while the second is the transition from informal to formal urban leasehold rights after the legalization and formalization of informal state rights (Achamyeleh 2014).

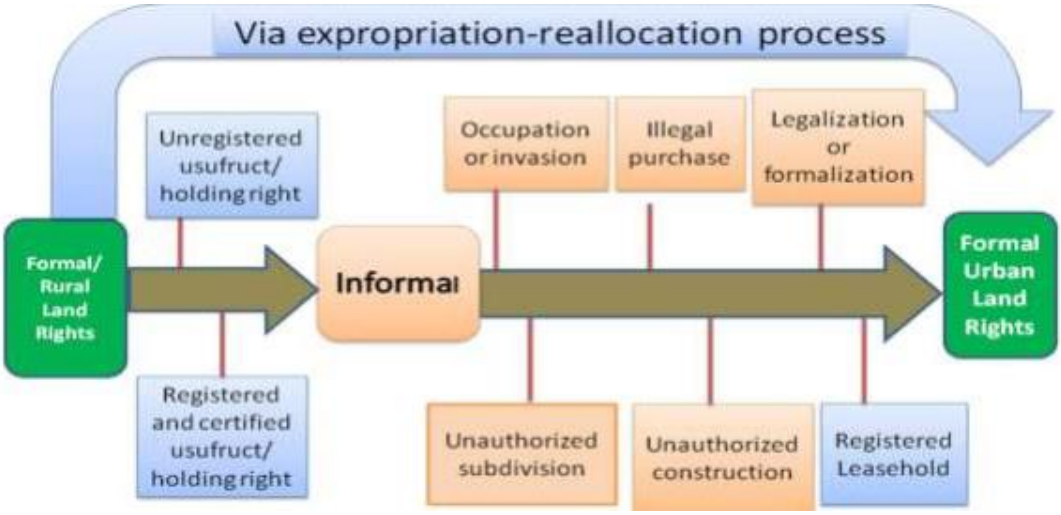


Figure 4. 4 Land rights path on the binary continuum – Source - (Achamyeleh 2014)

The same document stated that informal rights had initially been legally recognized by rural usufruct rights, which had been converted into different levels of informality by local peri-urban landholders or other actors, mainly due to the increasing strength of urbanization (Achamyeleh 2014).

According to the UN habitat report of the 2003 demolition of informal settlement, areas are the worst-case development, which results in the eviction of the community and aggravates the local sense of insecurity (Habitat 2003). There is a growing trend on the part of the government to legalize informally acquired land in the peri-urban areas, which also promotes the breeding of informal land rights, and informal rights can be turned into new formal rights through the formalization process (Achamyeleh 2014).

4.2.3. Impacts of urbanization and peri-urbanization

Like many developing countries, rapid population growth and unplanned development are creating urban sprawl with negative economic, social and environmental challenges that strain the capacity of local and national governments to provide urban residents with even the most basic services of housing, water supply, sewerage and solid waste disposal (Open 2016). According to Belachew, the enforcement of expropriation and compensation law, where privately owned land and attached real property used for public purposes, has a disparity with actual practice in urban and surrounding areas due to the lack of application of standardized methods and procedures, resulting in situations of unequal valuation and compensation (Belachew 2013).

Addis Ababa city's built-up area expansion, which increased by 120.93 km2 within 24 years, is characterized by horizontal growth, leaving the peri-urban environment and livelihoods at risk (Leulsegged, et al. 2011). Abdissa's study in Addis Ababa on urban expansion and livelihoods of the peri-urban agricultural community also indicated that the expansion program implemented was not participatory, marginalized the farming community and envisaged compensation schemes for the loss of assets excluded from youth and women (Abdissa 2005). The effect of displacement on households' livelihood outcomes has a negative difference as compared to non-displacement (Kassahun 2018).

The effect of urban expansion on the surrounding peasant land of Areka City as an advance in infrastructure such as; connectivity, eclectic control, health and educational facilities as positive and loss of agricultural land, the spread of crime, urban pollution, and housing problems as negative consequences of urban expansion for peasants (Mefekir 2017). The peri-urban land rights which have been held by local landholders/farmers and used for the farming purpose are under increasing risk of being eroded and terminated due to urban expansion because of the growing demand for land for urbanization exerts very strong pressure on peri-urban land use and land rights (Achamyeleh 2014). This situation is worst in Mekelle city and its peri-urban areas (Shushay 2011).

4.3. Mekelle City peri-urban settlements development

4.3.1. Background

The City is located on a plateau in the highlands at an altitude of approximately 2000 m above sea level. Its location is strategically central to the province of Tigray, slightly to the side of, but with a good connection to, the main route between Addis Ababa and Asmara (Per Carlsson 1971). Mekelle is the capital of Tigray Regional State, one of the eleven regional states (including two chartered cities) (fig. 4.6) (Okazaki 2009).

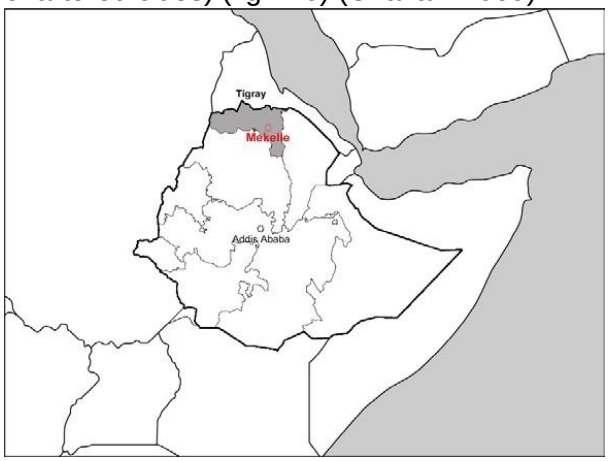


Figure 4. 6 Map of Ethiopia with regional boundaries - source - (Okazaki 2009)

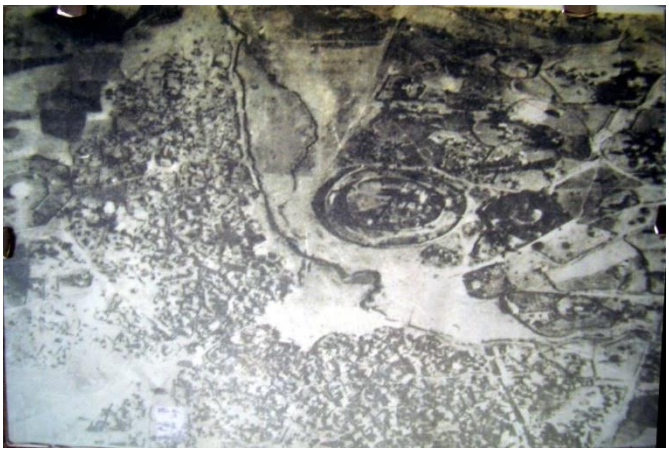


Figure 4. 5 Aerial photos of Mekelle, Italian occupation period, collection of CAT - source - (Okazaki 2009)

The city is also known as the ' City of the North', a rapidly growing city of 300,000 inhabitants in an area of 5 million inhabitants with an ancient trade hub with a potential for greater international scope (Arup 2016). According to the source (Okazaki 2009) this photo (fig. 4.5), was supposed to have been taken by the Italians during their occupation period, that is, about 1935-1941. Yohannes Palace is located in the center with an oval wall around it, while the city area stretches west and south along the May Liham River as a borderline between the palace and the town (Okazaki 2009).

4.2.1. Characteristics of Mekelle city peri-urban settlements

Yohannes IV, Emperor from 1982 until 1889, who came from Tigray, made Mekelle the capital of the empire (Per Carlsson 1971). This was the beginning of the process of urbanization in which the residential sector of its subjects was allocated along the May Liham River and expanded in the form of L, divided into two areas, the North-West and the South (RUPI 2010). The shape of this compound was rather oblique and hundreds of such compounds were

gathered in concentration in the residential sector with a basic concept of planning as "associated hidmo" system that makes it neither 'Cartesian grid system' is shown in Europe, nor' self-dividing system' like in Middle East (Okazaki 2009).

There is a clear difference between ketema[11], where the role of market, administration and concentration of inhabitant, and mender is where people gather regularly for the exchange of their agricultural products and other goods (Okazaki 2009). The same document noted that the basic component of mender is hidmo[12], a vernacular house with circular compound (fig. 4.8) where a family or several families live in this hidmo and the main house, either round shape (tukul) or rectangular shape, several attached buildings stood in order to house the servants and animals (Okazaki 2009). In mender[13], groups of hidmo constitute the totality of the village though there is no notion of street or square in the western sense (Okazaki 2009).

Figure 4. 8 Hidmo: local house in Tigray, photos source- (Okazaki 2009)

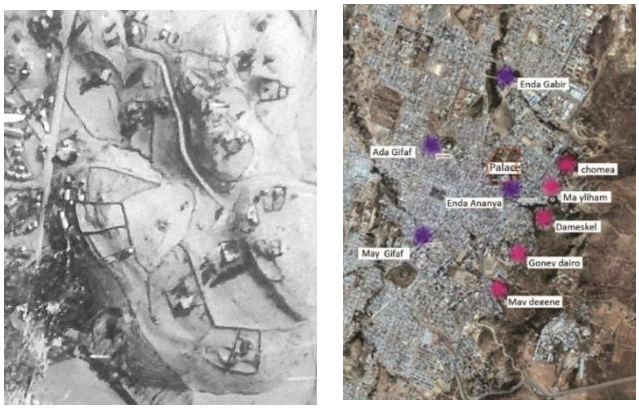


Figure 4. 7 Aerial photo of the Gonay Daeroarea, one of the Peri-urban village in 1960's and location of the villaaes – (left to riaht) - source - (Okazaki 2009)

As described by (Okazaki 2009)following the description of Tadesse Sequar, nine villages mentioned: Enda Meskel, Gonay Daero, May Degene, May Liham, Chomea, Enda Gabir, Enda Anania, Ada Gafaf, and May Gafaf as shown in the figure (fig. 4.7). which had original form of the village with old rural-style compounds having vernacular *hidmo* houses in each middle, and thus the city surrounded by such a kind of settlements (Okazaki 2009). These identified sites of the villages plotted on the map (see fig. 4.7), indicate certain characteristics (Okazaki 2009). Topographical characters are easily recognized and divided in two these are: first five villages are situated on the hillside slope villages were called Dogua, which means "upper area" and second on the contrary four other villages are situated on the lower flat land, was called Kolla (Okazaki 2009). The modern road system could be easily detected by the actual road pattern which differs from the modernized grid system and the villages are organically linked, in particular by the topographical conditions which lead to the north used as access to/from the Kolla (lower Mekelle)

[11] Local name for urban settlement
[12] Tigrai vernacular house
[13] Local name for villages

(Okazaki 2009). The expansion of the administration is the main reason why Mekelle has grown at a faster pace than other towns in the province (Per Carlsson 1971).

4.2.1. Process of the settlement development

4.2.1.1. Mekelle Master Plan by the Italians in 1937

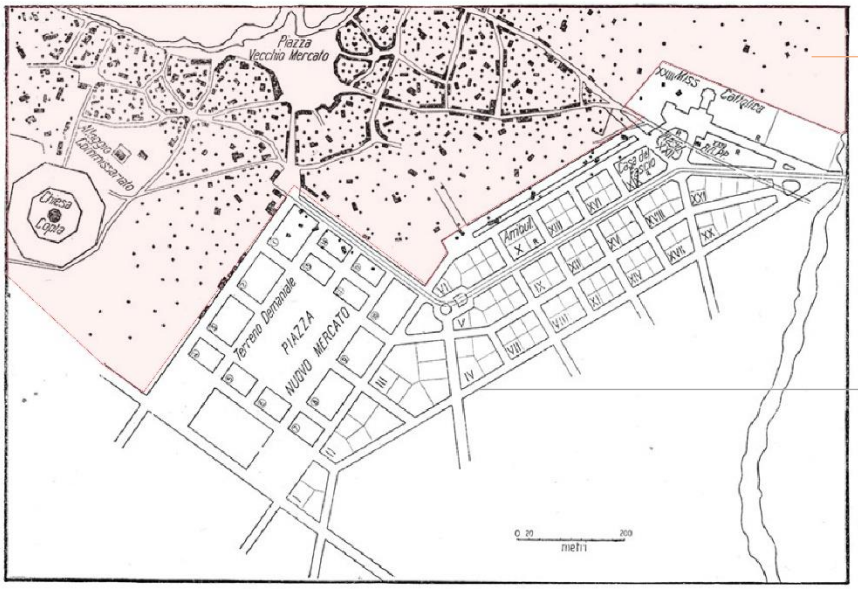


Figure 4. 9 Piano Regolatore of Mekelle by Italians, 1937 - source (Okazaki 2009) and modified by the author

As Okazaki stated the Italians elaborated this master plan, (figure 4.11) called “Piano Regoratore di Macalle” in 1937 after they occupied Mekelle, which was to become the stronghold of Tigray (Okazaki 2009). With this “modernism in urban planning” it was fully implemented: land use, simple division of land by grid pattern, wide streets, and so on, which instituted an alignment policy in the old town, that is, on a parcel facing the street, houses had to be constructed along the boundary of the street, and the notion of these streets was simpler instead of random alleys (Okazaki 2009).
Another element of this modern development, Italian urban planning, was the policy of social segregation between native Ethiopians and Italian immigrants, which was advocated for the Ethiopians to constrain the old town, rendering it unbalanced and oppressive (Okazaki 2009). This indicates as the proposed master plan of the city was very new and with different urban forms by ignoring what was existed before in terms of form social inclusiveness and preservation of the existed and local planning idea.

4.2.1.2. Master planning by NUPI

The Development Plan conceived by NUPI in 1993 referred to the existing land use which was designated by the Municipality in 1991 (Okazaki 2009). Land use could have been developed based on a significant increase in inhabitants towards the outskirts of the city since the 1960s (Okazaki 2009). The demographic curve in this period explains this phenomenon (Fig. 4.12) I, with a population of 22,230 in 1965 and a population of 61,583 in 1984 after 19 years according to the Okazaki analysis (Okazaki 2009).

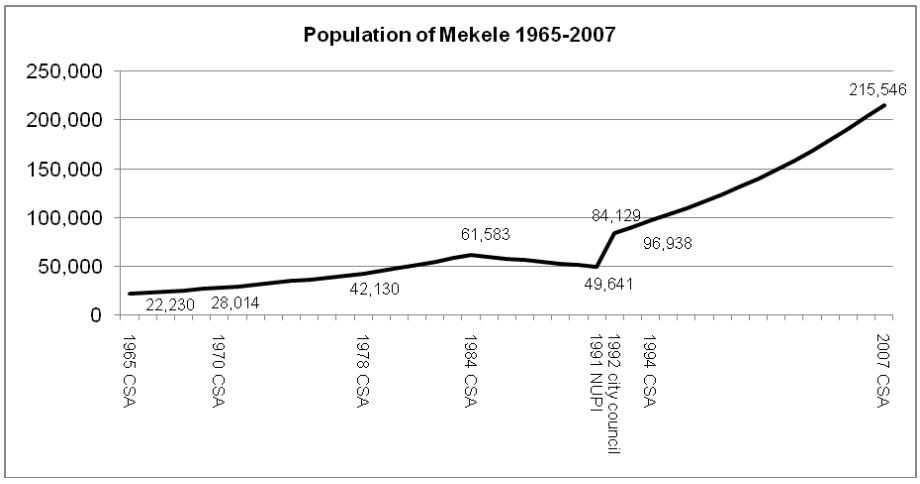


Figure 4. 10 Population shift between 1960s and 2000s, source (Okazaki

While comparing the urban map around 1960 and the master plan of NUPI, the planned area spread considerably towards the outskirts of the city, and Mekelle was divided into 20 *kebels*, with which the outer *kebels*[14] had a much larger surface area than the inner ones, which indicates that the outer ones were much less populated (RUPI 2010).

4.2.2. Demographic Growth and Urban Expansion

Within two centuries, the urban development of Mekelle has shifted from a group of small villages to a provincial capital city while the population has grown a hundred times larger and the transformation of the urban area since the first half of the nineteenth century, divided into six stages, can be seen (Okazaki 2009)(see fig. 4.14-16). As shown in the demographic graph (Fig. 4.15), there have been two major developments related to the sudden increase in population; one is the high birth rate, the other is the huge number of immigrants to Mekelle (Okazaki 2009). The population growth between 1994 and 2007 was also dominated by natural population increase of the city accounted for 78%, whereas migration of people from rural/other areas was about 22% (Fenta, et al. 2017).

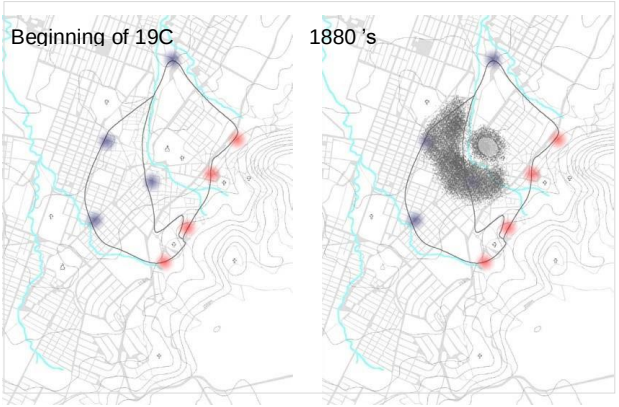


Figure 4. 11 Nine villages were associated following the Parallel to the construction of the Palace by the topographical conditions -Source- (Okazaki 2009)

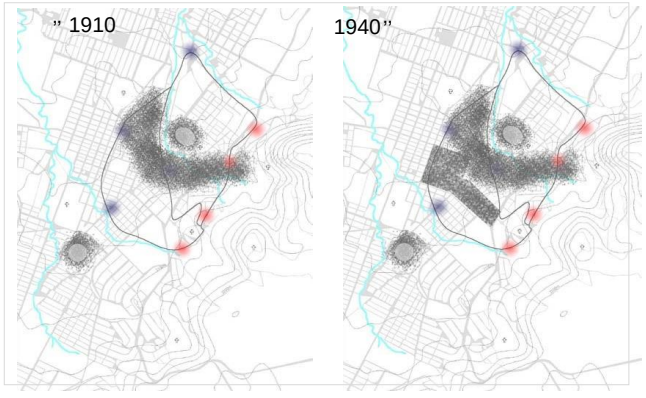


Figure 4. 12 Abraha Castle was constructed and population get denser - source (Okazaki 2009)

[14] is the smallest administrative unit of Ethiopia, similar to a ward,

In terms of urban expansion, relatively lower value of “Shannon’s entropy” in 1984 indicated the compact and homogeneous urban growth or built up area distribution whereas between 1984 and 2014 the value demonstrated a high rate of urban sprawl because of dispersed urban growth spreading over the peri-urban or urban fringe area of the city (Fenta, et al. 2017). This expansion is putting pressure on the habitats in these hinterlands (Arup 2016).

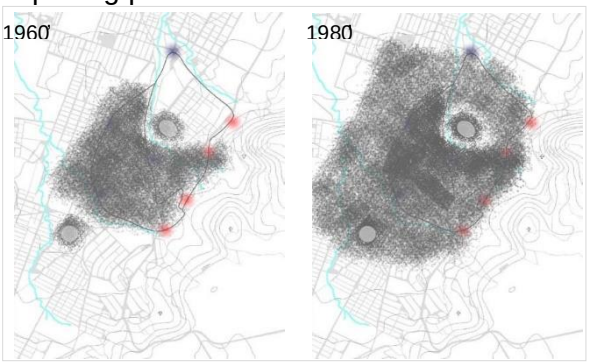


Figure 4. 13 Transformation of Urban Area of Mekelle, source (Okazaki 2009)

In the periods 1984–1994, 1994–2004, and 2004–2014, the city’s population grew by 57%, 52%, and 68%, while, the built-up area increased by 99%, 87%, and 79%, respectively (Fenta, et al. 2017). In the past three decades (1984–2014), the built-up area increased six fold (about 3000 ha) (Fenta, et al. 2017). The same document stated as the 88% of the gain in built-up area was from conversion of agricultural lands, covered 7140 ha (75%) in 1984 and until 2004 it covered more than 60% of the area delineated as the city’s administration zone; but was significantly reduced to 4379 ha (46%) in 2014 (see figure 4.17), (Fenta, et al. 2017)and grows in to different directions without following any comprehensive planning guidelines (Mary Tahir 2013). Besides, the peri-urbanization has diminished the physical asset, particularly livestock and farmland, holdings of the dispossessed (rural-urban) farm households (Mezgebo 2014).

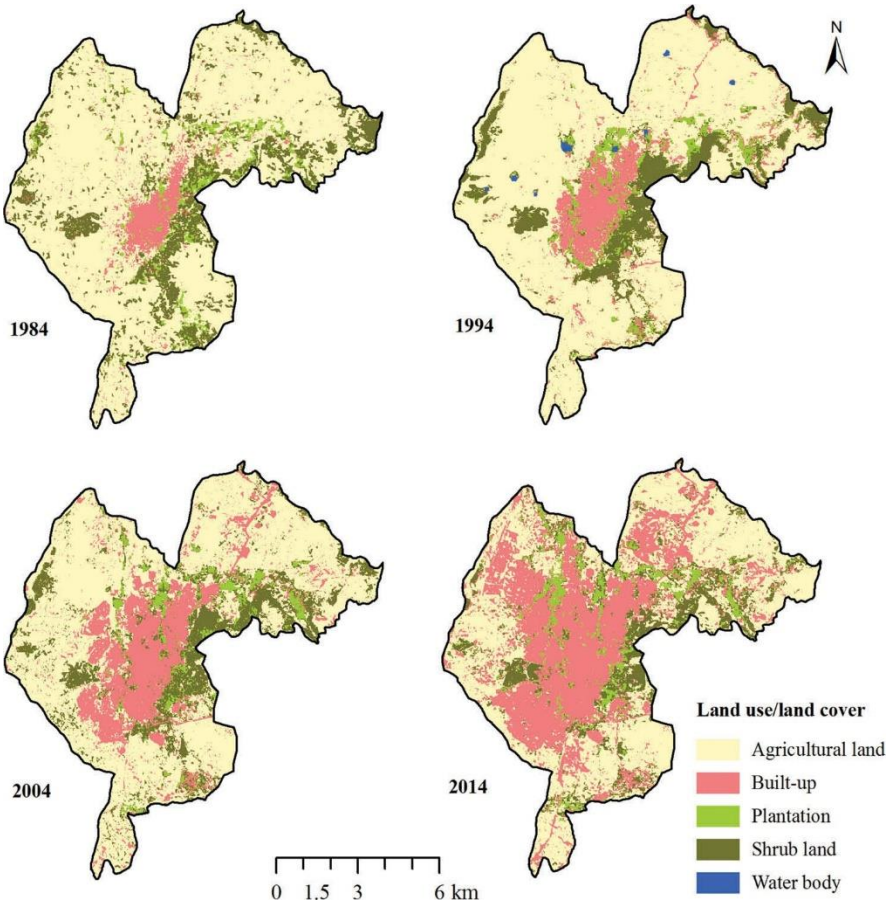


Figure 4. 14 Land use/land cover (LULC) maps of Mekelle City administration zone for the years 1984, 1994, 2004, and 2014 source- (Fenta, et al. 2017)

According to the study on the dynamics of the Mekelle city Increasing trend in "Shannon's entropy[15]" was observed in the past three decades (0.69 in 1984 to 0.89 in 2014), which showed the presence of urban sprawl as shown (fig 4.18) (Fenta, et al. 2017). The exansion was due to increased demand of land for the construction of residential housing as well as the provision of infrastructures in the city (Mary Tahir 2013). Extension type urban development mainly at the edge of the areas built-up in previous years was the predominant type of urban growth of the city (Fenta, et al. 2017).

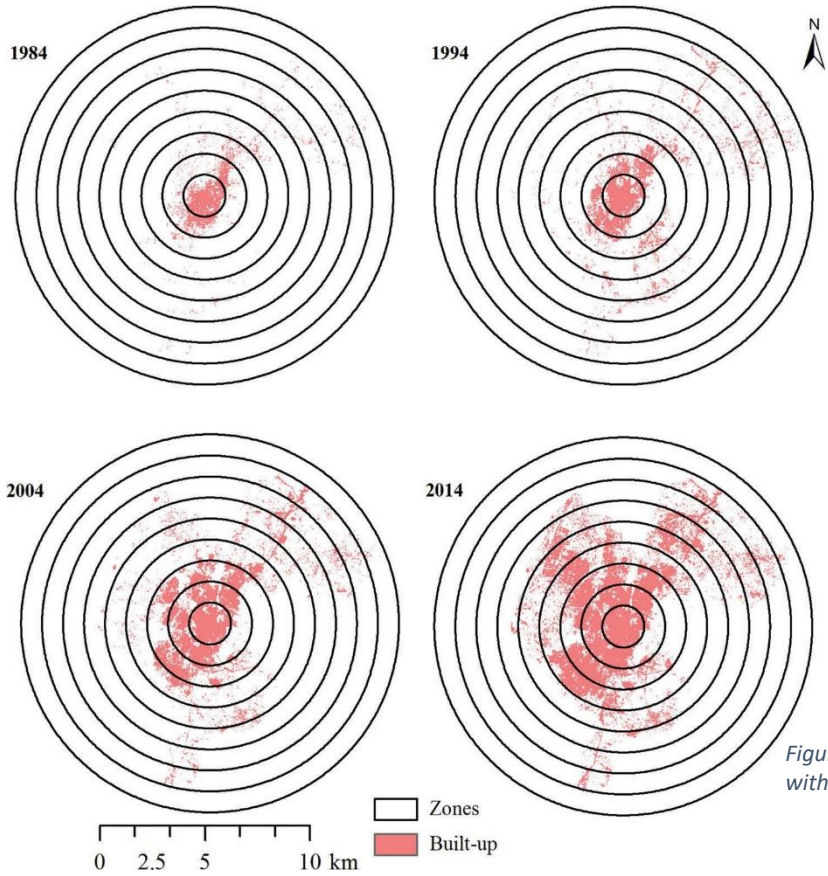


Figure 4. 15 Division of built-up area into concentric circles with radius of 1 km interval-source- (Fenta, et al. 2017).

4.2.3. Land Adjustment and settlement transformation in the Old Town

A large number of masonry houses constructed following the alignment prescription designated by the provincial government (Okazaki 2009). Okazaki noted also citing Tadesse Sequar the Ethiopian population during this period about 12,000 while the report of GTZ indicates 15,000 (Okazaki 2009). The same document suggested that the row house style buildings along the street had two functions: residential and commercial with the adaptation of the old parcels to the street pattern and even divided into smaller parcels, and the hypothetical phase of this land adaptation was as follows (Okazaki 2009:84) (see fig. 4.15):

[15]Used to evaluate, integrated with GIS, the spatial pattern of urban expansion and detect the presence of sprawl (Fenta, et al. 2017)

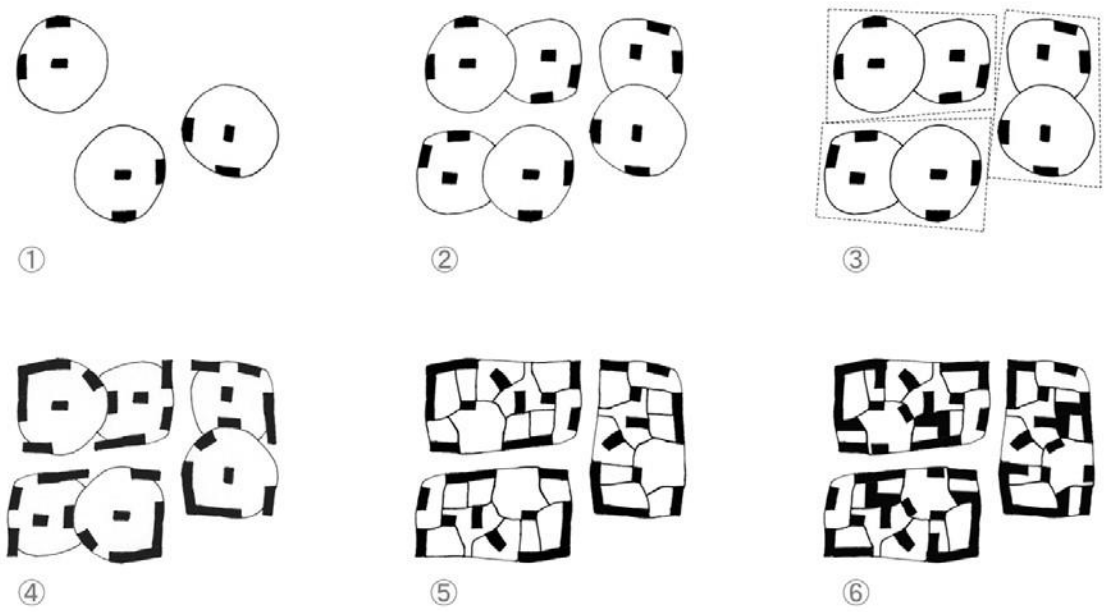


Figure 4. 16 Land adjustment and transformation of settlements of the old town – source (Okazaki 2009)

(1) *"Groups of large-scale residential compounds were generated surrounding the Palace. Each compound stood independently but with a close connection to each other. Paths and alleys penetrate within the gap of these compounds.*

(2) *Augmentation of houses and storage buildings occurred within each compound, corresponding to the demographic increase. Additional buildings filled the spaces between the compounds.*

(3) *After the designation of the master plan, the land adjustment introduced within the Old Town, which should be adjusted by block-and-street type of urban complex.*

(4) *Rowhouse type buildings constructed along the designated streets.*

(5) *At the same time, the ramification of large compounds happened due to the succession of the parcel among the family members, or to the concession to other personalities.*

(6) *The process of ramification and the construction of row houses and walls resulted in definitively in the block-and-street type of built-up area* (Okazaki 2009:84)*."*

4.3. Adi-Dairo early, pre-planning, settlement development

4.3.1. Early Characteristics of Adi-Dairo settlement

This part of the study covers the early characteristics and development of the Adi Dairo settlement, according to the information gained from the selected group's discussion of the study area. Thus, the research base chronological settlement development and transformation of Adi-Dairo presented as follows.

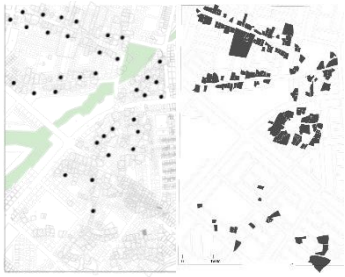
		
1977 - 1980 Only a few settlers were living The main source of income of the settlers was agriculture The land division was held traditional method Land use of the area dominated by agriculture and bare land. A scatted pattern of settlement with a wide farming area at the back of every householder's house	1980 - 1988 Natural population increase Economically were also agrarian and labor (e.g. delivering stone for the Mekelle city) The land division held by Government for youth as *Metesha* (includes for living and agriculture as per the number of the family) There were also newcomers from Mekelle city for a living who got land from the rural administrators.	1989 – 2006 Natural population increase & migration Land sub-division for *Metesha* for the second time which is only for living 20m *20m each which were relatively unplanned, congested and concentrated only in a small area Start living of settlers who got land as *Metesha* by the Derg regime Start coming migrants buying house and demarcation of the area as part of the city

Table 4. 1 settlement development and transformation of Adi Dairo since 1980, made by the author according to the information from selected group in-depth interview

As shown in the above table (Table 4.1) the concentration of the settlers was at first dispersed with few settlers, second, increased adjacent to the street who got land as *Metesha* or *metkel* [16]and the last one shows as the density increases and located near to the city. The detail chronological order development of the settlement presented as fellows.

1977 - 1980

According to the selected group discussion, the settlement economically was dominated by agriculture and settlers were few with the scattered patterns. The area was mainly barren land or without any economic activities or agriculture spatially the Southern part of the study area. The northern part of the study area also had few, about 20 agrarians, householders who were all of the settlers, economically dependent on agriculture. These settlers were started

[16] Metesha/Metkel provision of land for housing for youth by from her/his family's or government

concentrating in this are for living and agriculture in a traditional way of land division from their family.

Since 1980 - 1988

Since then three things happened these are: the first provision of land for the householder who asks in the open area, which is not for farms just only for the living. Thus, the southern part of the area starts getting denser. Secondly, since 1987, the government subdivided and distributed land for the settlers '*gibri*'[17] for a family for farming purposes. The third one is the provision of land for the youth in the form of *Metesha* , 20*20 m area, in the open or barren land though the only few, 3 householders, people took and start living. Besides, there was adding of building within the old compound for households and children as *metkel*.

The open land gets denser and starts filling by settlers that are because of the demographic change of the early settlers and some come from the city. Until that time, the settlers were economically dependent on agriculture though there was a new settler who came from the midtown live within the settlement who were not agrarian.

Since 1989 – 2006

As described in the contextual review on a city level, this time was the time of demographic change, got double, and the city becomes active. Particularly, the Adi Dairo settlement also gets denser because of the natural population growth of the Adi Dairo settlement by itself and other neighbor rural settlements like 'mayhem'. Because of these reasons, the settlement gets denser. Following this, the land was provided as *Metesha* for youth as a group that had 12 members' and division of the parcel was made by themselves using *metsian*[18] as measuring equipment. Moreover, the location of the land provided was near to the city and relatively denser. Though the ideal measurement was 20*20 m area practically most of the plot area was not more than 150 sq. meter, because of the technical error they according to the selected group interview. Economically these youth was engaged in the provision of construction stone for the Mekelle city government office.

At this time government, inform the early settlers or *old agrarians* to give their child part of the land for their child for living, 'dekukum tiklu' as *metesha*. Economically these children of the early settlers were agriculture of their family's land. Giving of land for the youth was not limited to the people who were living with their family but also those who their child was living in the city and working in different governmental institutions. The area of this land was also 400 sq. meter though it had a similar problem in the measurement. There was a commute for widening if it gets narrow, the streets and other spatial issues.

Since 2003, the agricultural land expropriated because of the area become or demarcated as part of the city and get access to electric cities. According to the interviewee, the group said the value and activities of the peri-urban were increasing through time especially after the city

[17] Gibri is local measurement of area of land which is one hectare

[18] Metsian is traditional rob made, traditionally, of skin

of Mekelle increase demography, economic activities, and people got the information, as the settlement is to be part of the city since 2003. Subsequently, the people who got land as Metesha start living had not happened as what happed to the first *Metesha* settlers and new settlers start coming from midtown and start living buying *Metesha* house.

4.3.2. Process of Adi Dairo settlement development

Land Adjustment and settlement transformation

The study area settlement had characteristics of rural settlement with Tigray vernacular house, *hidmo*, style, and construction material with few householders according to the group discussion before 1980th.

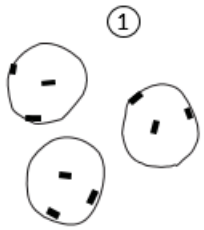
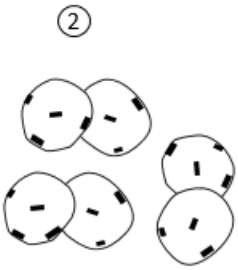
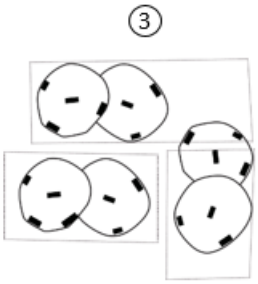
		
1977-1979 Groups of few dispersed residential compounds generated near to the peri-urban part of the city. Each compound stood independently but with a close connection to each other and with the city.	1980-1988 Increasing of houses and storage buildings occurred within each compound and open space in the form of *Metesha*, corresponding to the demographic increase. Additional buildings filled the spaces between the compounds.	1989-2006 After the beginning of the implementation of the structure plan, the land adjustment introduced within the existed early settlement, which should be adjusted by block-and-street type of urban complex.

Table 4. 2 pre-planning Land adjustment and transformation of Adi Dairo settlement- made by the Author using according to selected group information

Since the new regime, 'derge' regime, start subdividing and provision of land for the youth of the rural settlers as Metesha the settlement starts denser because of the demographic, natural population increase, change. Mainly the built-up settlement was not different from what was before. Within 20 years the settlement held another provision of land by the government at the beginning of the 1990th these land and house were different related to what was existed interims orientation, form, density, construction material. Accordingly, the density of the settlement changed from approximately 100 populations of the total area of the study area by 1977 to 29 populations per hectare by 2003. The land adjustment of the settlement

transformation of Adi Dairo is as follows which is drawn from the selected in-depth interviewed early settlers (Table 4.2).

The demographic change and settlement transformation of the study area

The settlement transformed demographically from a few households or hundreds of population to thousand within four decades, though there is no clear and documented socio-economic data. The maps or plot of the study area number increased from 20 householders to more than 450 householders within 25 years.

According to the selected group discussion, in 1980 the settlement had a few populations with agricultural economic activities and wide-open space and bare land. This dispersed character and concentration population had not stayed long. The density changed quickly because of the critical points of mainly the demographic change or increasing, later the urban expansion of Mekelle city towards the study area since 2003.

Chapter five - the Case Study

Introduction

In this section general description of the selected case, Adi Dairo – Mekelle city and the data collected from the study area are presented and analyzed in detail. In the analysis process, the data is stratified and presented through tabulation, mapping, summary, and graphs. In addition, a summary of findings presented at different stages of data analysis and cross-analysis of those findings is presented as well.

The chapter will analyze in a way that contains a city, local development and household level development and transformation, its impact on the settlement and housing and the inclusiveness of the early settlers on the planning process and implementation of the development plan of the latest development plan of the city.

5.1. The case study area

The research held in Mekelle city one part of the peri-urban area of Hawelti sub-city, Adi Dairo, which is located in the western part of the city and part of the new local development plan after the preparation of the latest structure plan.

The study area covers 82 ha area with 479 householders' early settlers that are some part of the area of the Local development of Adi Dairo.

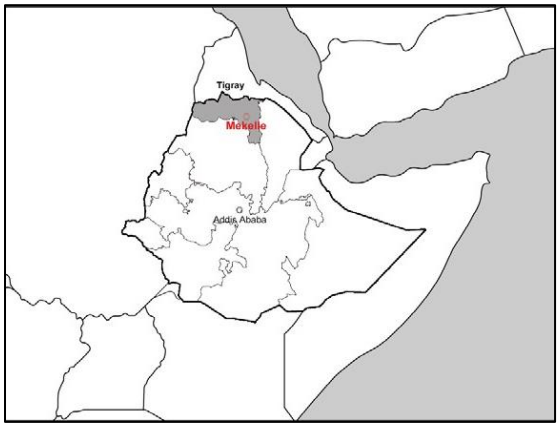


Figure 5. 1 Ethiopia with its regional boundaries - source - (Okazaki 2009)

Figure 5. 2 Mekelle city structure plan and study area – source (MU 2014) – modified by the author

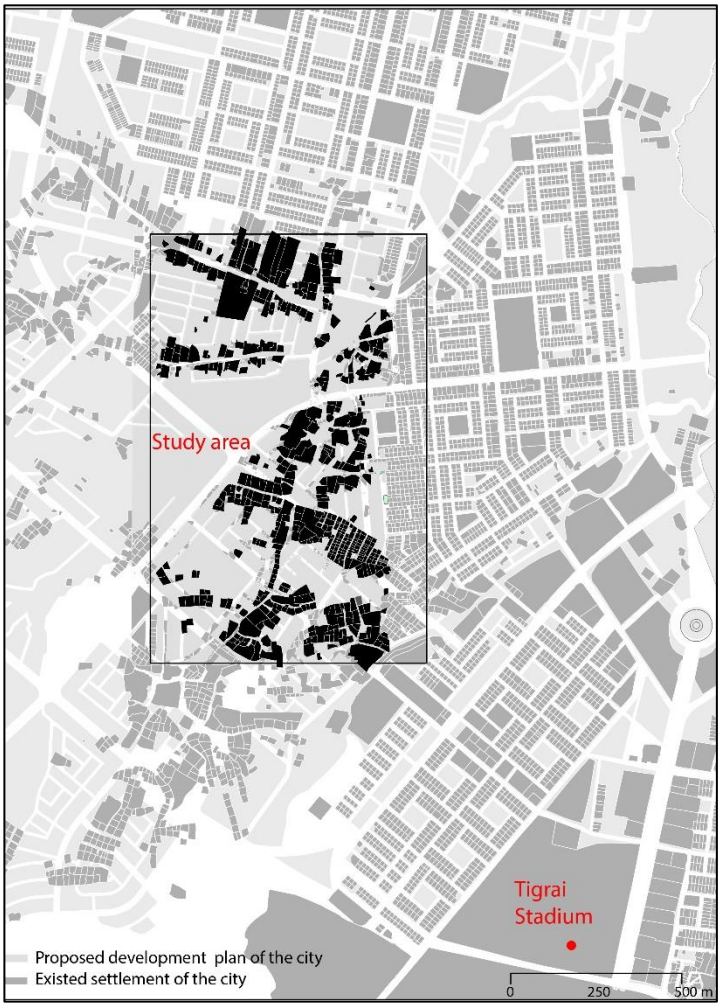


Figure 5. 3 study area location map Made by the author

5.2. Study area (Adi Dairo) settlement pre-planning development

5.2.1. Characteristics of the existed settlement

Socioeconomic characteristics

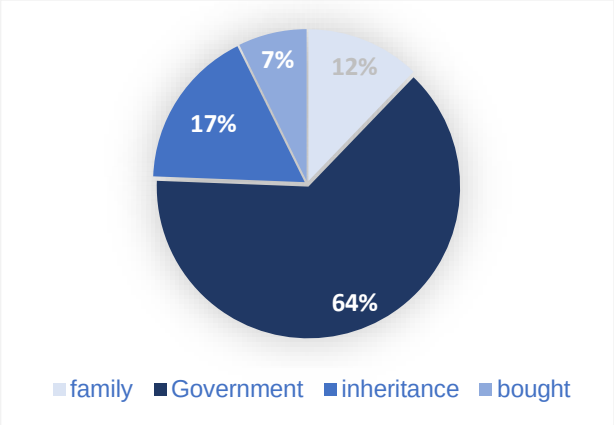
According to the detail interviews with the selected early settlers, there were four kinds of settlers *"nebar gebar"*[19] or old agrarians, children of the old agrarian who get land from their family and government in the form of "*Metesha* " given before 1988 and after 1991 and buyers. Moreover, the morphologically the settlement had an organic pattern, irregular block form with a narrow and spontaneous alley, some dispersed and some dense and scattered houses. The blue color is one

[19] Early settlers who have land for living and farming which is not metesha

of the settlements given by the local administration and using local material "*metsian*" or traditional rope made of leather. Even though the government was planned to provide them 20*20 m or 400 sq. m the actual area of most of the parcel as the plans, as shown in the picture (see fig. 5.4), on the map is less than 150 sq. meter.

Figure 5. 4 existed parcel of the study area while the analysis of the development plan, source- Municipality

Before the development intervention, the main reason for the development and expansion of the residential area was the increase of the population of the early settlers who got land from their family *metkel*, inheritance, *metesha* by the government. The governmental, Derg regime and the current government, provision of land was 20*20 m or 400 areas for youth early settlers according to the data the researcher collected from the detailed interview. Nevertheless, one of the detailed interviewed householders also said: "there was an illegal land transfer from the early settler's agrarian by subdividing the land and saying it is *Metesha* before the development plan implementation and later he/she registered as one of the early settlers' agrarian". The former urban development officer claimed and said, "though it was illegal to sell or buy land of the rural settlement, there were many lands transferred illegally. Using an agreement with each other that says 'I gave him money as a loan but if he did not repay me I will take this much area land' and finally, the moneylender took the land". Such this kind of "illegal" transferring and subdividing land was also another pre-planning development of the peri-urban area of Adi Dairo settlement.



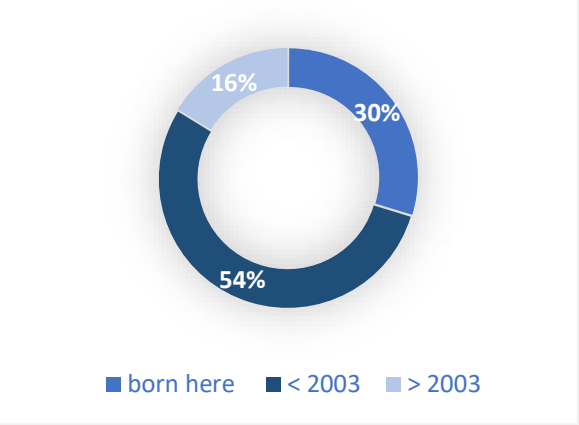


Chart 5. 1 land acquisition

Chart 5. 2 when did you come to this neighborhood?

This graph (graph 5.2) tells us that 84 % of the early settlers came to the neighborhood from 1988-2003, which is before the local development plan preparation and site survey of the study area, and got their land in the form of *Metesha* according to the data from the detailed interview with the settlers. This tells us most of the plots taken by the youth who gets their land after 1988.

The graph (graph 5.1) show also as there were early settlers who bought land and 84 % of buyers come before the implementation of the development plan 2003 and after 1998 and the reason to come to this area is first to get an affordable house which is chosen by two of the seven buyers and one for work. There rest 16% are living in another neighborhood that they relocated after the implementation of the development plan. This tells us that, as there was a land transfer or selling before the area demarcated in Mekelle city. This land transferring claimed by the buyers as it was "done legally" showing an agreement of their transfer (see index).

Related to this according to Asmelash one of the detailed interviewed persons said, "When I was a child…only a few agrarians were living here with wide-area but through time the area got decreased and we had been losing our playing, animal gracing and finally after 2003 we lose our farming area for Mekelle city expansion".

In terms of spatial development, the area had four types of land use residence, agriculture, river, and street. The residential area, which built before 1988, was characterized as lower density housing or built-up area, narrow streets, dispersed house and mainly constructed using local

materials and dominated by agricultural land use. The site had not any well-planned street and transport and other services (health and education) and electric and water supply infrastructures. The area has also lower density.

After the provision of land for the youth as *Metesha* , the second one given by the current government, the density of the area increased and with dense housing, a small plot of area (89-400 sq.) which is unknown by then and built also near to the city. Still, it lacks a proper plan, professional for implementation, some representatives from the settlers and the administrator of the local area.

Figure 5. 5 2009 Google earth image of the site, source Google earth

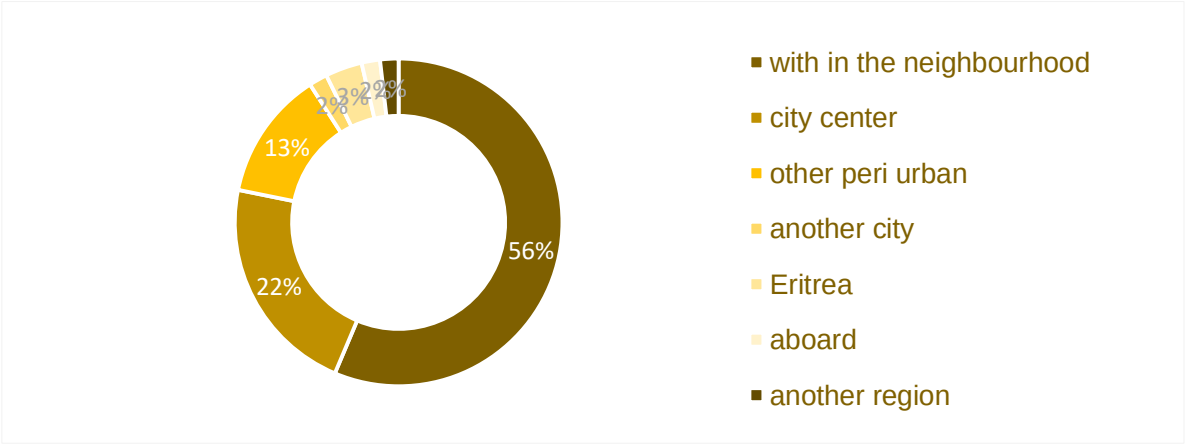
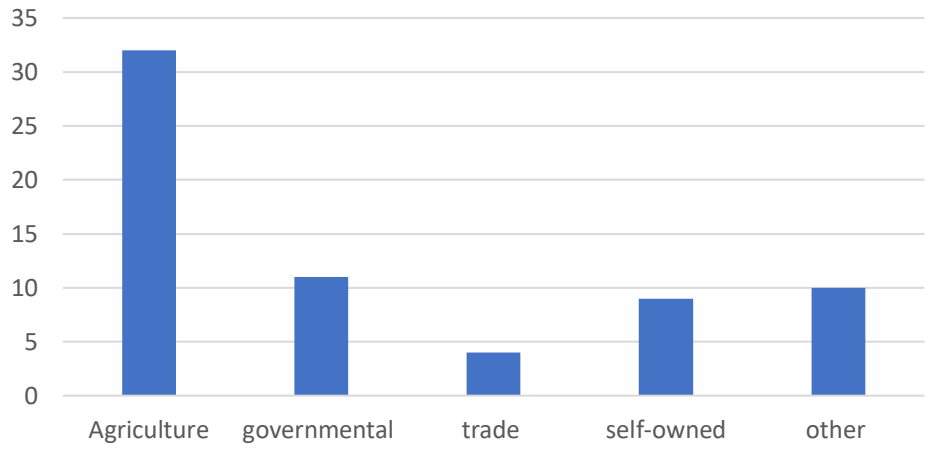


Chart 5. 3 living areas before the household come to the study area

The chart (chart 5.3) revealed that 56 percent of the householders are originally from the neighborhood, 22 % of the settlers come from the inner city of the city 13 % of them also come from other peri-urban areas. The people who came from another peri-urban area of Mekelle city are because of two reasons the first reason is marriage mainly woman and second is to buy a house form the early settlers. Therefore, for the increasing affecting not only by the natural population increase of the early settlers but also people who come from different areas because of marriage or getting affordable houses.

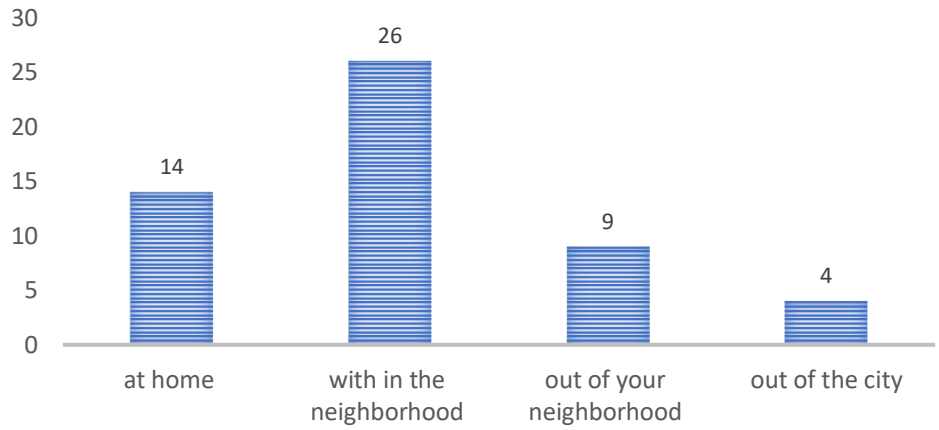
Economically the early settlers' source of income was mainly agriculture. In addition, these governmental and self-owned businesses are also another main source of income of the early

settlers before the development intervention. Though the number is small, there were also early settlers involved in trade and other work for a living.



Graph 5. 1 primary occupation of early settlers

As shown in the graph (graph 5.1), the number of early settlers who involved agriculture that covers more than 58% or 32 householders out of 55 interviewed householders of the settlers. The other dominant source of income early settlers was that of governmental.



Graph 5. 2 showing the working area of early settler's primary work

The location of their working area was 75.5 % within their neighborhood and at home. The early settlers of the study area had also different settlers who works out of the neighborhood and city. One of the interviewees who bought land with one house from one early settler youth of the area and came from the inner city of Mekelle to get affordable house said most of the settlers had bought land with been working agriculture-related works.

These works were also within their house and neighborhood. had also different settlers who works out of the neighborhood and city. One of the interviewees who had also different settlers who works out of the neighborhood and city. One of the interviewees who bought land with bought land with

been working agriculture-related works. These works were also within their house and neighborhood.

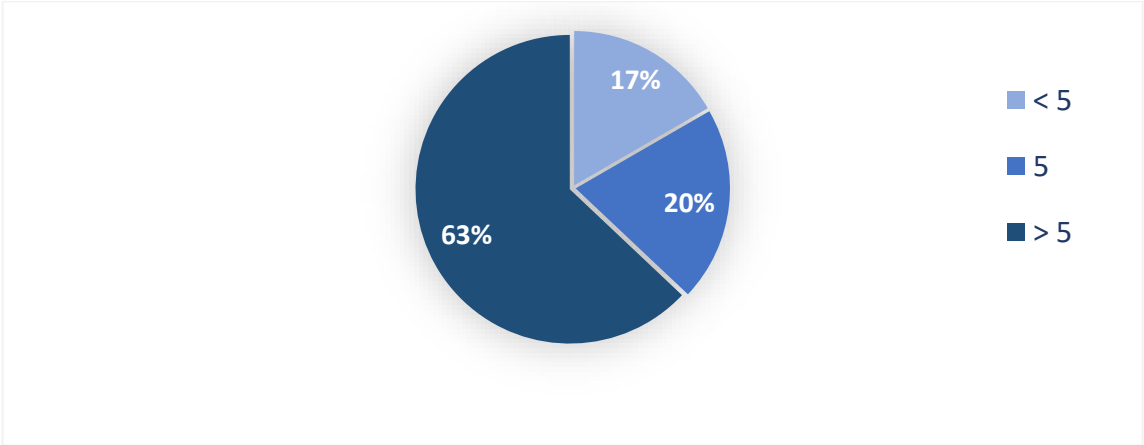


Chart 5. 4 household family size – source- a field study

The field households' survey shows us that the maximum number that is 63% of the early settlers has more than five family size. According to the chart (chart 5.4), the average size of the early settler's householders is six which is more than the national average family size of 4.6.

Physical characteristics

Figure 5. 6 existed street block form and street network – source- (Google earth and base map)

The pre-planning settlement physically was characterized by mainly irregular and in some part linear pattern. The built-up area was also small and relatively on the top area and near to the streets or pathways though the site had not planned and had not standardized street quality. In terms of block size, the area had different sizes and arrangements. One of the interviews early settlers of the study area said, "Mainly the plan was thought to be a parcel of 20*20 meter each for the *Metesha* purpose and with the access of street for all. But technical when the surveyors told us it

was not 20*20m wide plot even was not half of it for most of the settlers and the street was not functioned for the urban purpose most of the street width was 6-10 meter". According to the local development plan report of Adi Dairo, the street pavement was also all unpaved or soil. As the researcher observed and shown in the picture (Figure 5.7) street was narrow when we measure from fence to fence of adjacent parcels but if we measure from building to building it reveals as there were chance not to be demolished.

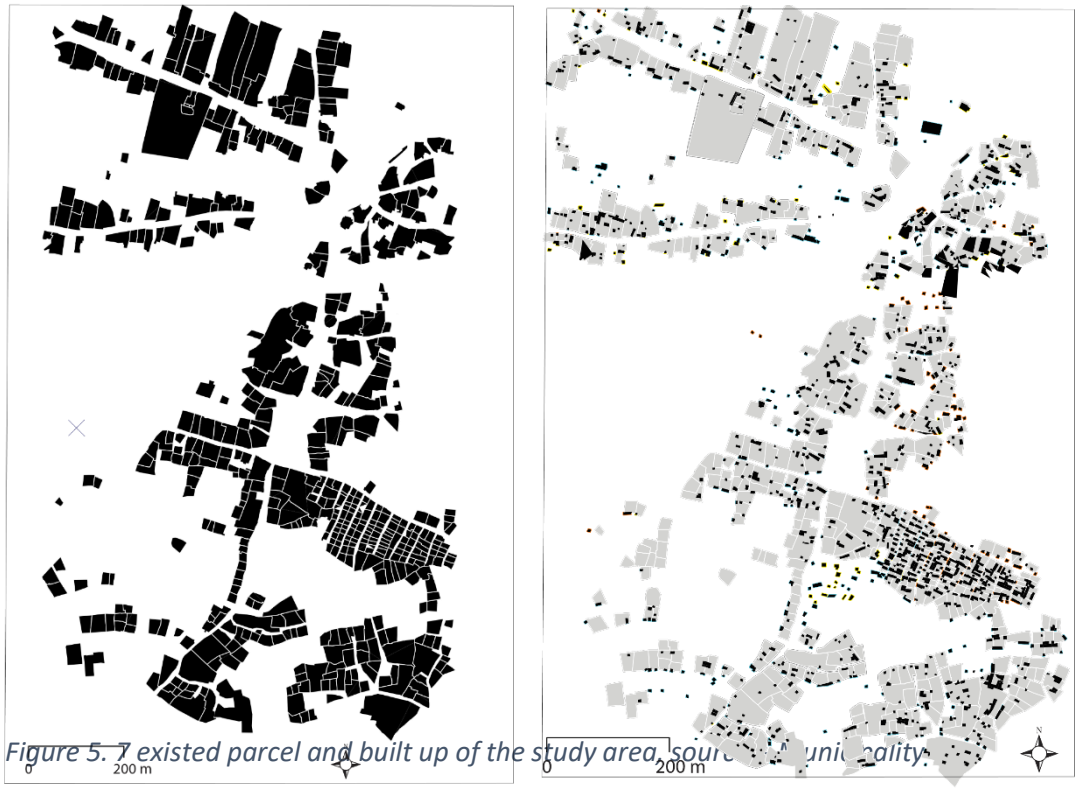


Figure 5. 7 existed parcel and built up of the study area, source: Municipality

The site had different types of parcel size and form. Mainly the built-up area within the compound was cover only a small area but some parts of the area which is the latest *Metesha* given had a comparatively dense plot and built-up area. As it is shown (Figure 5.7 right side) on the map there were also some buildings on the open. Comparatively the built-up area density in the area that is nearer to the city area denser one from the area that is far from the city. When we see in terms of time given or owned the parcel, the parcel got smaller and the density of building also get denser. The area of the rural settlement was decreasing through time because the land was given for the youth twice. If the area is given for, the youth as *Metesha* was implemented as it was planned or they thought the whole area of the study would not have been enough and which tells as the development of the peri-urban need due attention and proper plan.

Generally, for the increasing of the development, subdivision of parcel and built-up area increasing influenced or was mainly because of the natural population increase or demographic change of the population of the study area. What makes different from the land adjustment of the old town peri-urban settlement development of Mekelle city is that the way and location the youth settlers got

land was not within the compound or land of their families' farming area. That was given in another area that was to some extent far from their families' house and was given by the government.

5.3. Implementation of the development plan

5.3.1. Characteristics of the development plan

City development plan - Structure plan

According to the spatial analysis report of the structure plan, it is the first plan prepared in an integrated way and incorporated the three towns in a metropolitan approach that takes about three years and involves different disciplines and delivered different documents and graphics reports (RUPI 2010). The same document said that the defect of the pioneer plan was to collect information from different residences a stakeholder and is the first plan to incorporate Mekelle city, Quiha town and Aynalem town under one comprehensive structure plan (RUPI 2010). This leads to expanding tremendously by encroaching many small villages and towns up to 30km surrounding the center of the palace (RUPI 2010).

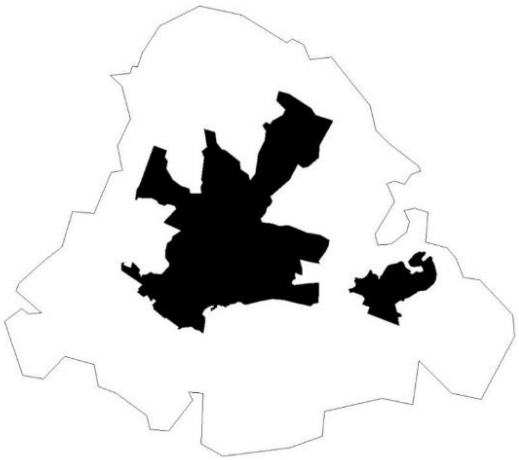


Figure 5. 8 city proper and the current Mekelle city source – (MU 2014)

The city doubled its area within 2 years from 2004 -2006 and now the city planned to cover a 30km radius from the center. Though the city expands to the peri-urban area, the proposal shows that the maximum land use proposed for open space and environmentally sensitive areas. The other land use that covers the big area is that of residence that covers more than one-fourth of the total area of the city proposed (see Figure 5.10).

S/n	*Year*	*Administrative boundary (HA)*	*Administrative boundary(KM^2)*	*source*	*Physical Change from previous referenced year*
1	1963	240*	2.4	MCPPO, 2008	*Base Year*
2	1984	1600†	16	1993 plan	*567% in 21 years*
3	1994	2600	26	MCPPO, 2008	*62.5% in 10 years*
4	2004	10240	102.4	MCPPO, 2008	*293% in 10 years*
5	2006	21000	210	MCPPO, 2008	*105% in 2 years*
6	2014	26444.4	264.4	Estimation	26% in 8 years

Table 5. 1 Urban expansion pattern of Mekelle city at different period, source – spatial analysis by MU

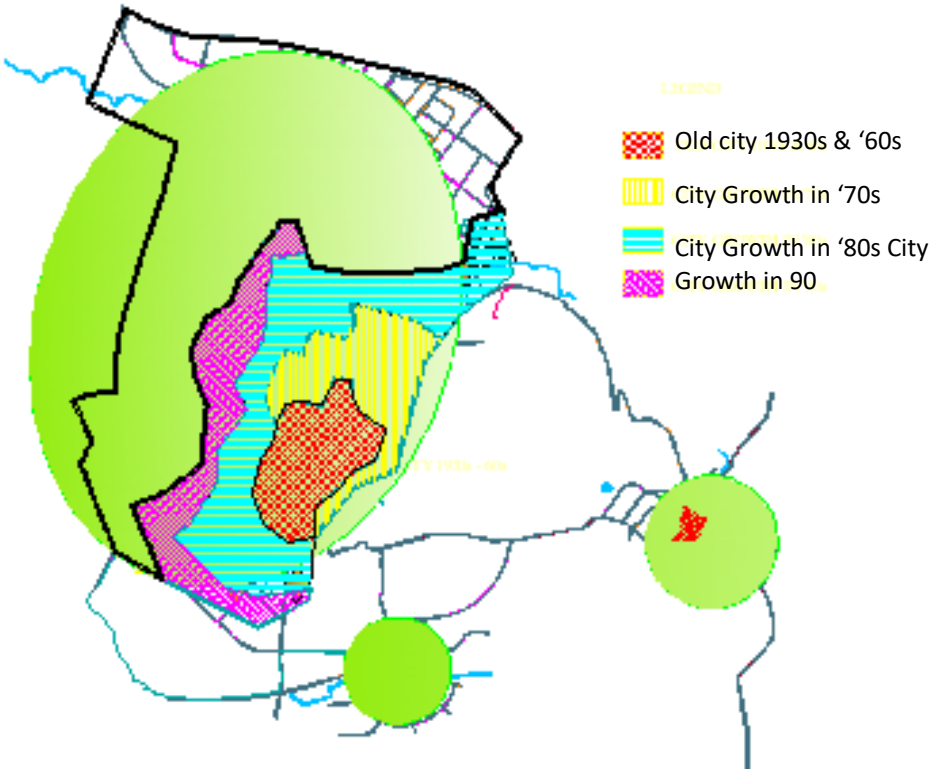


Figure 5. 9 Urban expansion pattern of Mekelle city at different period of time, source – (MU 2014)

Concept of the structure plan

Boundary expansion trends are exponentially growing from time to time. In summary, the table (table 5.1) can give the spatial growth trends of the city for the last 50 years. The city development concept lies in the physical impacts of development works, economic potentials and government policy issues of poverty alleviation and agriculture development led industrialization.

The planning process has gone through different assessments and closely observed the urbanization trend to identify the most influential urban development issues that include key criteria of social livelihood enhancement, the attraction for economic development and addressing the environmental impact components (MU 2014). The same document noted as the city has many vacant areas that are not developed or proposed for such a built-up area as shown in the picture (figure 5.10) which did not stay long yet (MU 2014).

The major land use proposed in the peri-urban area of the city is reserved area, forest, mixed residences and storage, and industries. Currently, some of the agricultural area, which was proposed as a reserved area, is given for the settlers of the city in the form of self-help cooperative housing which covers 82-meter sq. each that covers more than 8.417 square kilometers since 2017. The area is approximately half of the area of the city in 1993 had. The proposed land use of the expansion area shows us as the proposal gave a small proportion of the productive activities and land uses that make settlement more urbanized.

As discussed on the literature review as the physical growth of urban areas can be explained demographically and functionally: While the demographic definition of urbanization is restricted to factors such as population size and density, the economic functional definition refers to the territorial concentration of productive activities (industries and service) rather than population. In this proposed development, plan of Mekelle city the function of the city development proposed on the peri-urban area or expansion area mainly dominated by residences and forests which gave a little attention proposing of productive activities.

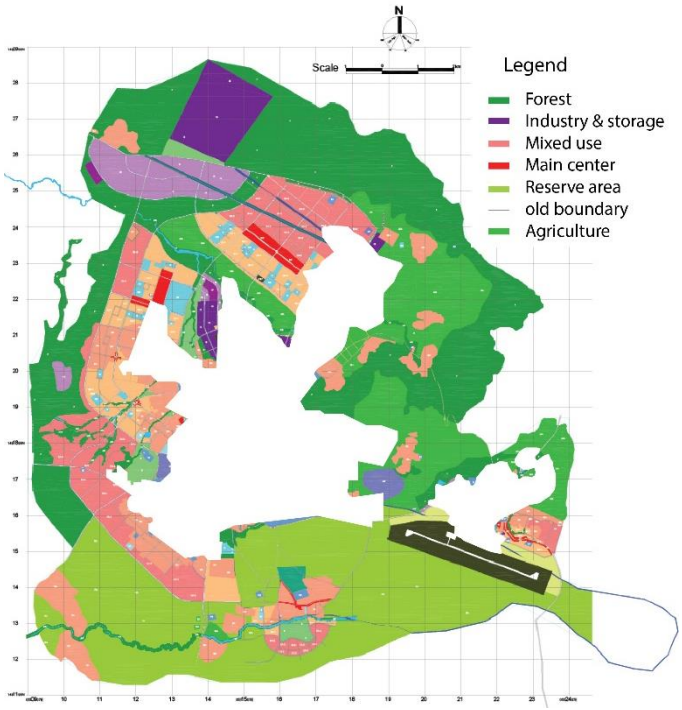
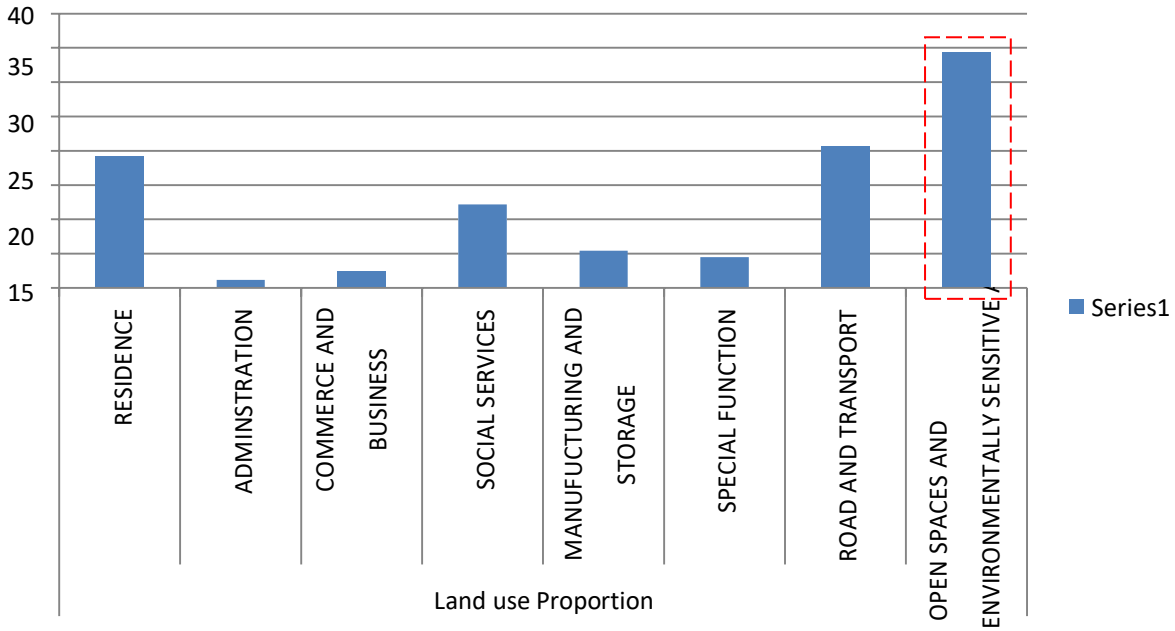


Figure 5. 10 proposed land use map on the expansion area.-Source - (MU 2014)

Though the population increases from 96.828 to 218, 547 populations within 13 years the population density of the city decreases from 3,728 populations per ha (96,938 populations within 26 km2 administrative area) by 1994 to 1,026 population per ha (218,547 populations within 210km2 administrative area). Though the development plan is for the future estimated population, the land, particularly the study area's land, demarcated since the intervention was expropriated. Thus, it is possible to conclude that the Mekelle city expansion development plan neither demographically nor functionally fulfills the urbanization factors. Besides, this shows us as the plan of the intervention lacks achieving one of the themes of peri-urban development which is minimizing land consumption and creating compact urban form mainly the parameters minimization of the loss of rural land and appropriate development densities. Creating opportunities to perform community agriculture, one of the parameters of the theme, is achieved in a city-level plan though it is for a short period and intentionally not for urban agriculture.

The city proposed also to develop on the fertile land of the city the peri-urban rural settlements that seized the agricultural land and demolished money rural settlers' houses. Besides, fulfilling the future land demands of the city, possible impacts due to the transformation of rural agricultural land to urban-related uses and other environmental consequences on both the city and the hinterland areas are to be seen in the future (MU 2014).

The major land use of the overall city proposed land use subcategories is shown in the graph (Graph 5.3). The second chart shows the proportions of the land use subcategories without „open spaces and environmentally sensitive areas.



Graph 5. 3 city proper land use proportions, source - (MU 2014)

The proposed land use result makes similar to what the researcher discussed in the literature review urban transition in developing countries and its misconception with the urbanization of the developed countries that did not consider the characteristics of the city. Besides, according to the structure plan of the city, residential land use is proposed on the outskirts area or with in the existed peri-urban settlements of the city. This shows us that also a new area of land that included the peri-urban area of the city is mainly for the use of residential purposes.

Proposed land use of the study area

The development plan proposed a mixed residence area that mainly used as a residence and a small commercial area in the central area. The plan also considers and preserves the natural features of the site. Besides, the city's future development plan came with widening streets that connect the city with the other regional cities and some arterial streets that flow towards the city center and another local area.

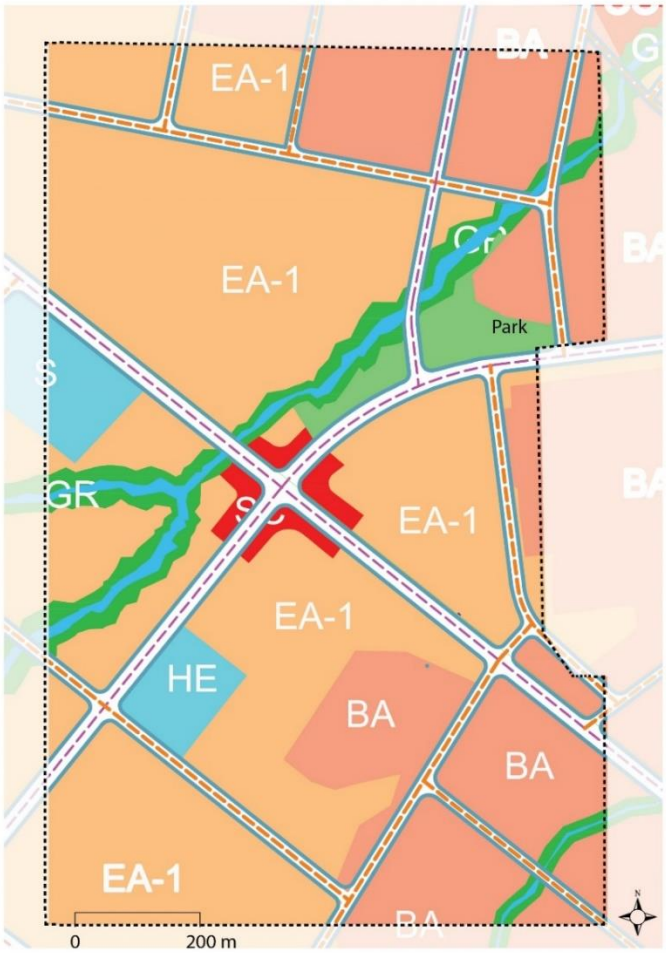


Figure 5. 11 Proposed Land Use of the Structure plan, Source - (MU 2014)

In terms of urban form, what makes similar to the other proposed plan of the city in different times of the past is that it continues with grid urban pattern and without consideration and giving attention to the existed settlements and the actual situation.

The local development plan

Even though the early settlers' primary job was agriculture and the location of the study area is on the peri-urban area of Mekelle city with good natural features the detail, local development plan, proposed land use has no even small plot of the area to perform agricultural activities. In the detailed interview, the dwellers claim that the plan ought to have transitional, from rural to urban, activities such as industries and manufacturing that helps the agriculture on the proposed map.

Another issue the settlers raised was the implementation of the plan was late. The proposal also lacks provision of services and infrastructure, commercial activities. The proposed land use map ignored some parts of the area though it was delineated as part of the project as shown on the map (see fig. 5.12). The structure plan was not the only plan that did not give attention to the existing socio-economic and spatial characteristics of the study area but also the Local development plan as well. The proposed land use also lacks the provision of land for the relocation of the displaced early settlers from the study area because of the street expansion and land-use change. One of the municipality officers, Edris, who participated in the implementation of the plan said the development plan has weaknesses related to a detailed analysis of the settlement spatial and socio-economic backgrounds and had also a technical problem shifting of the plan (see index VI).

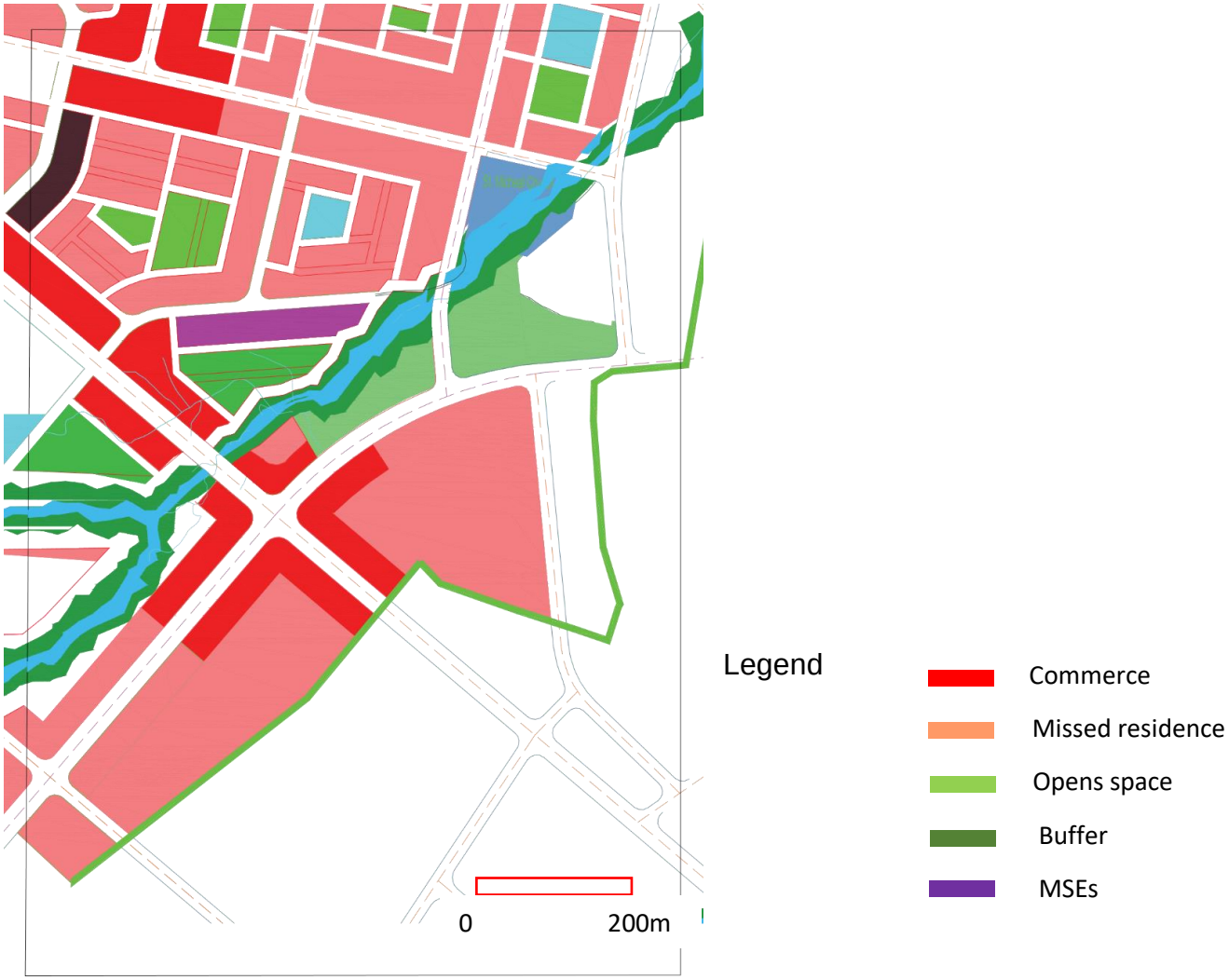


Figure 5. 12 proposed land use of Local Development Plan, source - LDP report

5.3.2. Process of the development plan of the settlement

According to the ex-city development officer (see index III) and the selected early settler's group discussion said the planning process was as follows:

2003 - Analysis of development plan and agricultural land taken by the city.

2007 - Implementation of the local development plan

2007- 2009 - registering and identifying number, ownership family size of old agrarians '*nebar tihzto*'.

2012 – 2019 - the early settlers got land and tittle.

2010 – 2012 - identifying and registering the buyers (he calls them illegal buyers, while the settlers claim as they bought legally and have legal documents as presented in the index)

The plot of the area given for the settlers was 'according to the legislation and lease order of 2009' the officer said. He also claimed as the legislation recommends 100 - 500 sq. meter for old agrarian and early settlers who get land from family recommends 140 sqm, and for buyers 100-500 though

they only provide 100 sq. meter. Besides, if the early settlers get land near to any plot of the area that is smaller than 100 sq.m he/she can add it in the form of a lease landholding system but if they are relocated to another area they will get only 100 sqm, Displaced *Metehsa* – 250 sq. meter.

The process tells us as the documenting and registering of the early settlers was not inclusive for the buyers, of *Metesha* houses, and the time was after the proposal of the local development plan and structure plan. Besides, the settlers who bought land and demolished their house dislocated far from their previous area and got a small plot of an area that is 100 sq.m. The ex-officer of the city development of the Hawelti sub-city (see index III) said' this was proposed to help though they were illegal; the government did a very good thing'. The early settlers also gave different areas of the plot and different locations. These timing and provision of different plots and for similar householders and allocating in the different areas affected them socially and economically and it is not fair.

The other thing the process of the development intervention tells us is that the development plan intervention did not analyze, document and know the existed settlement and settlers' characteristics that held after the proposal or start of implementation of the development. This leads the development intervention conflict, corrupted, makes it challenging, and complicated said the early settlers selected group.

5.3.3. How does the implemented plan transform the existed settlement?

5.3.3.1. Settlement level

Related to the proposed land use and transformation of the area one of the interviewed early settlers, asked, "What is an urban mean if its development plan did not consider us or help us, the agrarians who had been living with agricultural activities?. Is there any development intervention that doesn't help to perform in a modern way or have not any manufacturing, industries that can help us to take our products or gave us space and time to transfer from agricultural life to the urban or modern life". Ms. Timnit, who works as milk production earn 9000 birr per month and 10000 expenditures, said also "we lost our land since 2003 development and the municipality said 'your land is part of the city according to the new proposed structure plan of the city'. However, still "we are working and living the rural area life what makes us urban is the access to the electric city," she said.

> *"We have cows and sell milk 9000 birrs per month but the expense is more than the income. The only profit we have is animal dung. But before the implementation of the development plan, we had our own land for agriculture which covers haystacks and food for us that we are buying now"*

Said Mrs. Said claiming as there should be space that they perform agriculture or train and provide urban-related works and business activities.

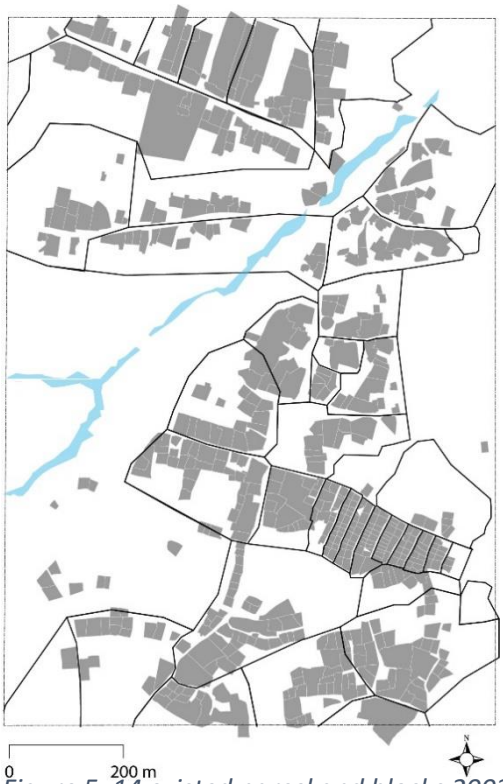


Figure 5. 14 existed parcel and blocks 2003– LDP report

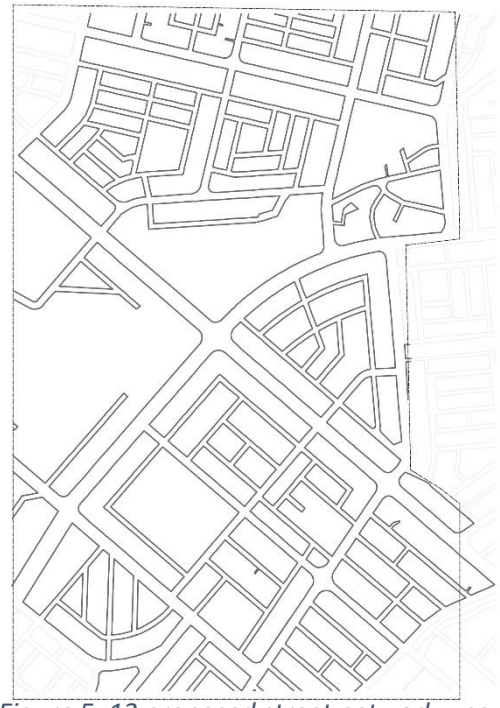
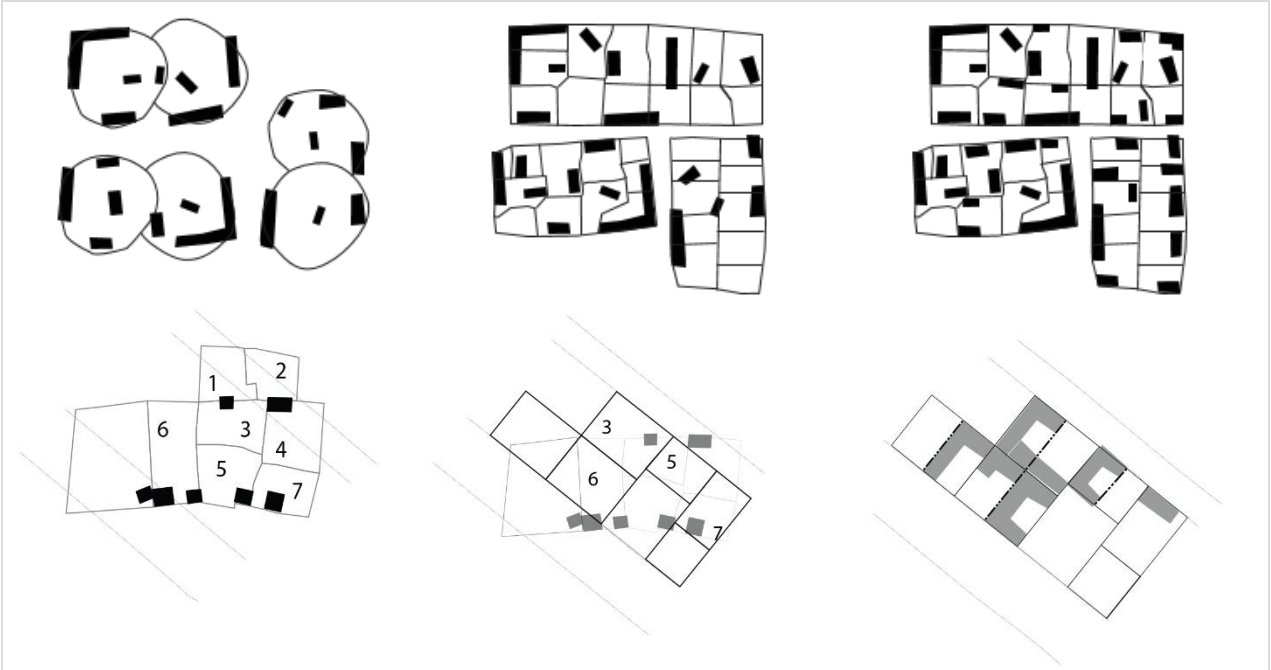


Figure 5. 13 proposed street network – source – Municipality

Spatially the settlement pattern form and land use changed from organic mainly unplanned patterns to the relative grid, agricultural land use to others which have not agricultural use and mainly residences and the activities which ignore more than 50 percent of early settlers. The settlement also transformed from spontaneous alley to access to wide streets that connect the settlement with the city and other neighboring settlements.

The spatial transformation is very incompatible with the existing street layout, block size and form parcel size and arrangement. So generally, the proposed street size is wider than the existing one that creates good access and the street layout by itself ignores what was before even though it had the chance to increase its width without or by minimizing demolishing of existed houses. The block size and form changes with the change of the streets so the proposed blocks are different from what was before and this leads to the transforming or changing of the layout of the buildings towards the designated street. Besides, parcel size and arrangement are now regularized and have a somehow similar size. Open space for the recreation area is small now related to the existing and lacks some householder's access to open space.

5.3.3.2. Land adjustment and transformation after development intervention



2008-2012	2012	After 2012
Legalization or owning of the parcel and knowing where the new parcel of the early settlers is proposed.	Early settlers start getting tittle. Demolishing and rearrange the house to new propose (e.g. parcel no. 2, 3, and 4). Rowhouse type buildings constructed along the designated streets.	After getting the tittle early settlers start selling partial of their parcel and start building a house on the remaining plot. The process of ramification and the construction houses and walls resulted in definitively in the block-and-street type of built-up area.

Table 5. 2 Land adjustment and transformation following the intervention of Adi Dairo - made by the Author

Land adjustment of the settlement after the development intervention was mainly rearranging and formalizing of plots and buildings along the designated street and parcel. In this regard, some of the land or parcel of early settlers expropriated some of them also rearranged and regularized as shown in the table (Table 5.2).

2008 – Now

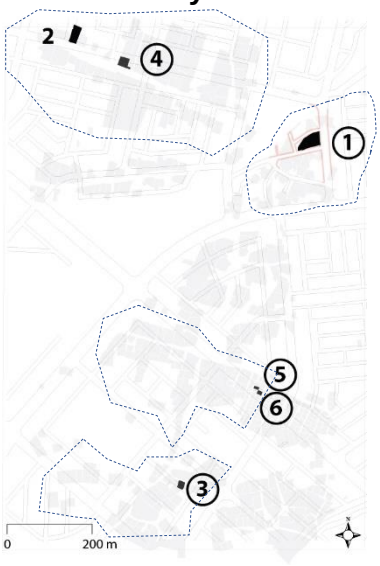
The local development plan started implementing: wide streets implementing, early settlers left with small part land, start building a school, clinics, and other infrastructure and services. According to the interviewee of the early settlers selected group, who were part of the study, documentation, and identification of early settlers, '*nebar gebar*', since 2009 the settlement had a problem on the transition of the documents and socio-economic data of the early settlers to the urban administration. "Though we were part of the study they, documenting and studying ownership and

area of land, later ignore our study and arrested us because we use 3 birrs for copy, they think it is corruption" they, chairman and writer of the documentation, said.

According to the discussion, the transition from the rural to the urban area and life had different impacts such as economic crises and social conflict caused by the lack of documentation and identification of early settlers and sifting of the ownership plot area. In addition to that, corruption, purging of owner's documents and the existence of many ownerships for a single plot of land were impacts of the intervention on the early settlers. These problems solved soon, just after 9 – 10 yeas debate and appealing to the municipality.

To some up, the implementation had a problem of documentation or document transition from the rural administration to urban.

5.3.3.3. Life story and household level transformation



This area discussed in-depth interviewed householder's life-story and housing transformation that includes different types of household status and location (see fig. 5.15) in terms of development, land acquisition and impacts of the development plan on their house such as demolished, partially demolished rearranged and dislocated. Number five and six are dislocated, two and four are demolished, and number three partially demolished and number one is rearranged parcel.

Figure 5. 15 Clusters and location of in-depth interviewed early settlers

Case one - rearranged

The life story of Asmelash Belay

Household head: - Asmelash Belay

Land acquisition of the previous plot – inheritance

Family size – 5

Household profile: -The householder was born and grown up within the neighborhood. Their daylily activities were agricultural and rural kind of life that mainly had wide land, work like flitching water, bringing firewood and playing local sports. After he married, he got land in the form of inheritance.

Socioeconomic and spatial transformation:

Currently, the main income source of this household is governmental work two members of the household work and two of them work on self-owned work that is 11500 Br per month. The householder was working in agriculture before development and relocation. Their main source of

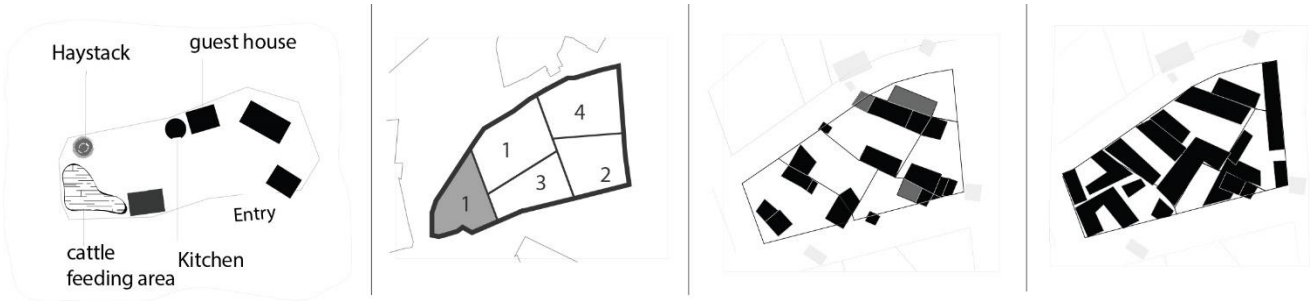
income was agriculture and selling other agricultural products. Their current expenditure is 4,757 Br dominated by the expenditure for food approximately 2,000Br per month. Nevertheless, 1254 Br was their expenditure before the peri-urban development of the area and mainly they had not any cost for food and related. The houses of the plot rearranged as shown in the table (Table 5.1).

Socioeconomic and spatial impacts of the transformation:

According to the interviewee, the impacts of the transformation are losing agricultural products and increasing of cost of transportation and infrastructure. The other negative impacts of the transformation were losing and minimization of open space and recreation areas. The positive impacts of the study area were the provision of infrastructure, transportation that is proximate that is only 5- 10 minutes' walk to get the taxi stop and accessible street, provision of the electric city since 2003 and health center. Besides the householder has also an extra source of income which is renting houses. Now, since the 2019 year, the neighborhood is distributing water by paying around 3100 birrs per household.

This householder is one of the early settlers and part of the early settler's family. The transformation of the house includes all the transformation of the parcel and house with his family or parents. This plot area is partially demolished, and only a small part demolished the house and get land of his own and family within his compound and early settling area. The transformation in this house is mainly economic and physical which led by the demographic change within the housed and the development of the area by the city.

Figure 5. 16 Asmelash's house, the rearranged previous and new houses built after implementation



Before 2000	2003	2009	Now
> 50 ha agricultural land and compound at the center according to the interviewee description and drawn by the author	. Plot area delineation. surveying registered for the compound (family) . Land division by the owner for children (Metesha) remained only '1' for the owner	. got tittle for their land . The owner sold 150 sq. . Children start building new buildings and the compound got denser. . installed infrastructure (water and streets)	. The compound got denser and built new houses adjacent to the street that includes rooms for rent and shops. . get denser

Table 5. 1 Amelash's house transformation

The land of the owner, before the development plan, was very big which is approximately 50 ha including their living compound which had two living rooms one guest house, one kitchen, and some area. The rest area was for farming and use also for playing traditional sports fields like "karsa" football and celebrities of holidays like Merkel *damera*, "nikinikila".

As Mr. Asmelash said the economic transformation of the house in from agricultural income source dominated governmental office work and house renting, especially for the parents, source of income. Spatially there were only a few houses on the center of the compound and later filled with other buildings for the married brothers and now some part of the area sold and the rest we own the. Besides, the buildings now change their arrangement through time towards the street after the implementation of the development plan.

Case two - Demolished

Household head: - Timnit
Land acquisition of the previous plot – Government (Metesha)
Family size – 10

Household profile: -

Timnit was born and grown up within the neighborhood. Since 1983, she got land from government as *Metesha*, which was '*gibri ferikay'* or one and a half hectare wide for living and farming. Since 1990, the family starts living in this house and the half-hectare took. After that, since 2003, the city took the farming land that is the remaining one hectare and the government paid 70,000 Br compensation for the farming area. Thus, the householder left with approximately 1000 Sq. meter including the living area. After the peri-urban development, the municipality gave to the householders 300 sq. meter that was smaller than the standard they said. Thus, the householder was asking the municipality for eight years. Finally, after eight years the householders get an extra

180 sq. meter area of land and now its 480 sq. meter wide though some of the houses are going to demolish by the street.

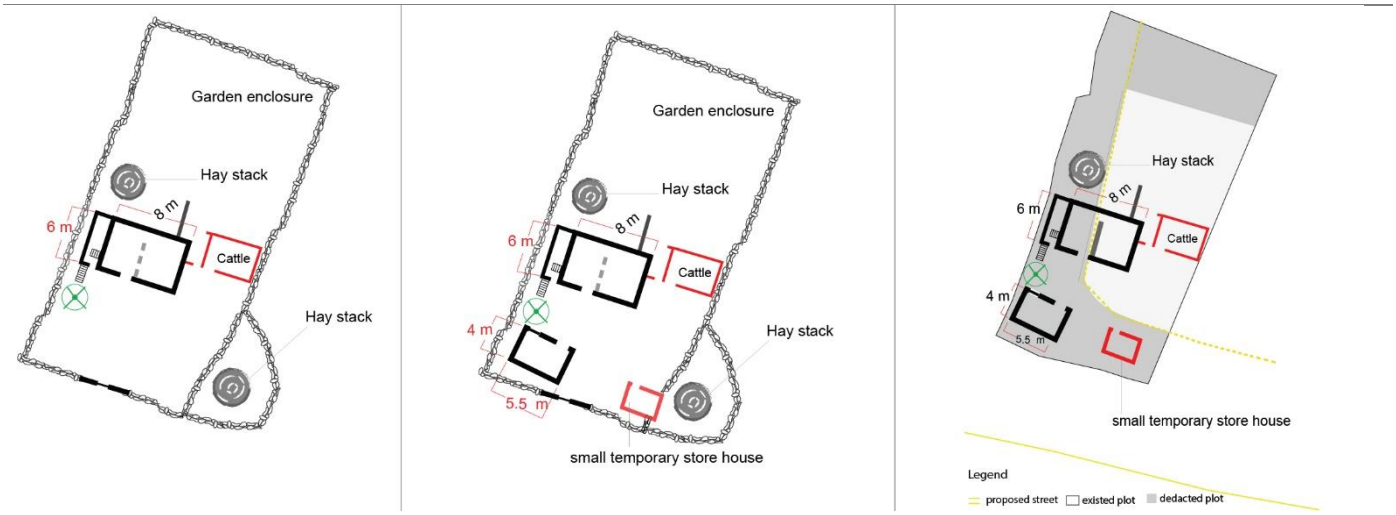
Socioeconomic and spatial transformation: -

Currently, the main source of income is milk production with a total income of 10,000 birrs while at the same time their expenditure for the householder is going to 9000 Br per month and farming by renting land from farmers of the neighbor rural settlement. 2100 Br is for the telephone, school, and water but, 3500 foods and the remaining expenditure is food and other related necessities for the animals which the householder was using and getting from their farmland. The previous house built on their own with only 2500 birr. The house partially demolished by the street and the household will build a new house within the parcel as shown in the table (*Table* 5.2).

Socioeconomic and spatial impacts of the transformation

According to the interviewee, the impacts of the transformation are partial demolishing of her house that asks the householder to the extra expenses. The other negative impacts of the transformation were losing and minimization of open space and agricultural land. Besides the unaffordability of the house that the householders are, planning to build after demolishing their previous house is one threat. The positive impacts of the transformation are the provision of infrastructure, transportation which is proximate which is only 10- 30 minutes' walk to get the taxi stop and accessible street, provision of the electric city since 2003 which helps them to their production and selling of milk though.

As shown in the table (table 5.2) the diachronic development of the house, compound and its relation with urbanization or urban development are presented.



1983 - 1992	1992	2004 -2018
. 1983-Got "*gibri ferikay*" or one and a half hectare land from government as *Metesha* **.** 1990-built their first G+1 "Debri" house	. 1992 built the other one house in front of their children and one temporary storehouse	. The government took agricultural Land . got tittle . 2011 - Informed as their house will be demolished and their plot area is 300 Sq.m.

Table 5. 2 Timnit's house transformation

In 2019 the householder gets the remained area, 180 Sq.m., and has 480 sq. meter now which is approved by the municipality.

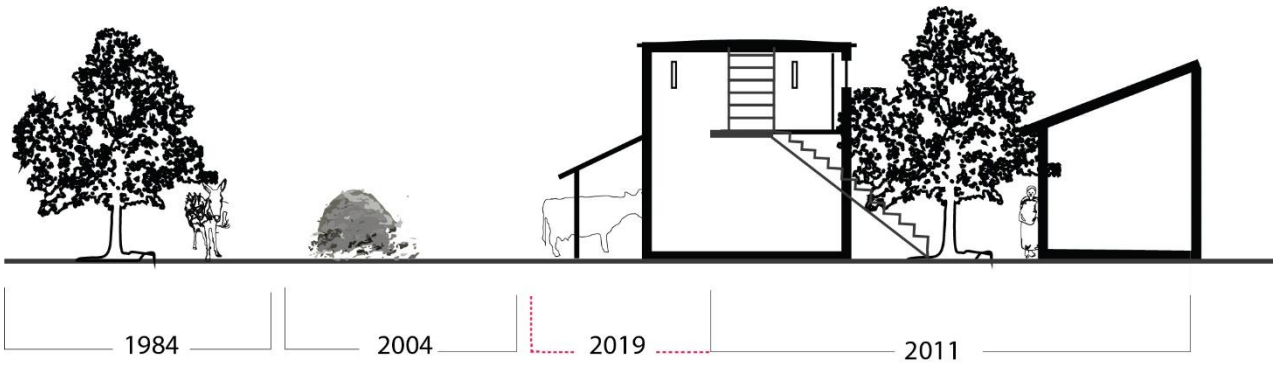


Figure 5. 17 section view of Mrs. Timnit's house

Case three – partial demolished

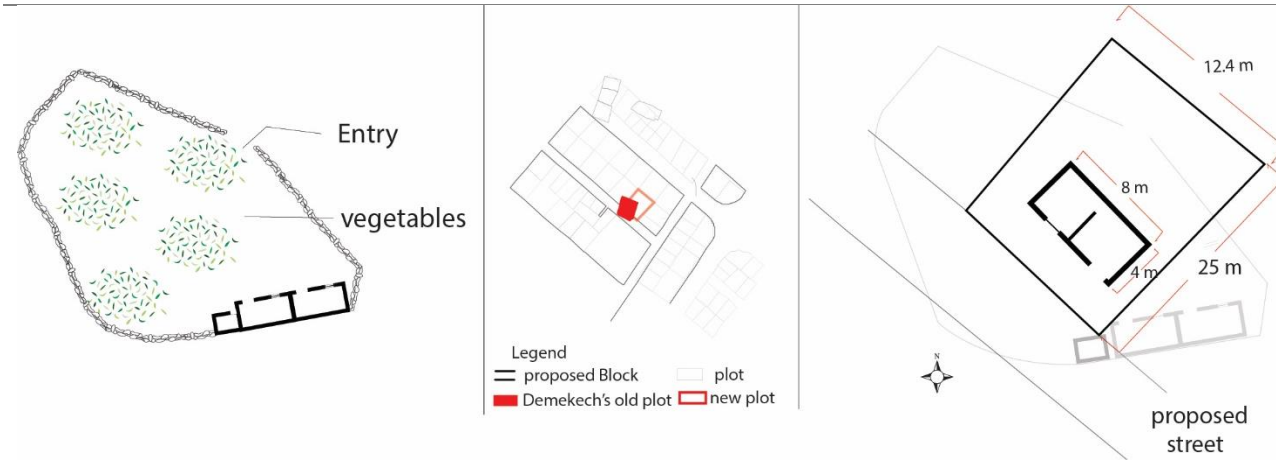
Household head: - Demekech
Land acquisition of the previous plot – Family
Family size – 7

Household profile: -

Demekeh was born in *gereb giba* that is a rural area on the periphery of Mekelle city. She was working in the midtown Mekelle city governmental office for a long period. She came to Adi Dairo after she got land from her family that was 490 sq. meter and build one *qhana* house. However, the municipality released as it is 276 sq. meter by 2016. Afterward, the municipality readjusted and approved 313 sq. meter wide land and she built one house according to the new plan where she is living now.

Socioeconomic and spatial transformation: -

Currently, the main source of income is help from her children. Though the house was *quana* she had built two small houses and one kitchen with only 10,000 Br by her own, without a loan, the other new house was built by the help of her children who gave here 30,000 Br out of the total cost of the new house which costs 50, 000 Br. The previous houses are going to demolish because of the implementation of the street of the development plan of the settlement (see table 5.3).



1999	2003-2016	2016 - now
. Got land 490 Sq.m from family and built one house with 4*3 m wide. . 2000- built one room and one kitchen and start living	. Release newspaper with 490sq.m area.as the householder said. But in the municipality said (on the map) 267 sq.m since . Municipality informed her as here will be partially demolished . got tittle	. Built new house on the new parcel . Got the extra land and after appealing they increase and made 313 sq.m. .

Table 5. 3 Demekch's house transformation

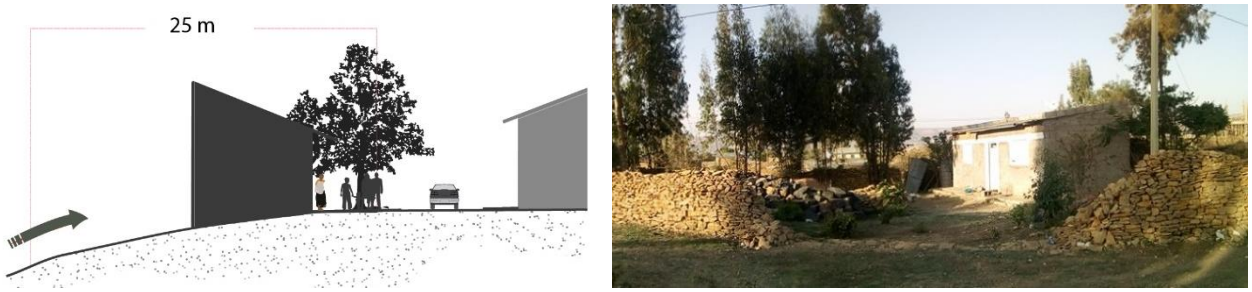


Figure 5. 18 new built building and its topography and newly built house (from left to right)

Socioeconomic and spatial impacts of the transformation

According to the interviewee, the impacts of the transformation are partial demolishing of her house which asks the householder extra expenses. The other negative impacts of the transformation were changing the orientation of the house to the sloppy side (see fig. 5.25) and loss of trees. The positive impacts of the transformation were the provision of infrastructure, transportation which is proximate which is only <5 minutes' walk to get the taxi stop and accessible street, provision of the electric city since 2003.

The development transforms the parcel form demolishing the existed houses and registers at it was 490 as the householder said. Nevertheless, in the municipality said (on the map) 267 sq. meter since 2016 and after appealing they increase and made 313 sq. Meter. The Google earth photo traced to what she told the researcher and the red one got from the base map.

Case four – Demolished and mislocated

Household head: - Kidan Girmay
Land acquisition of the previous plot – government
Family size – 8

Household profile: -

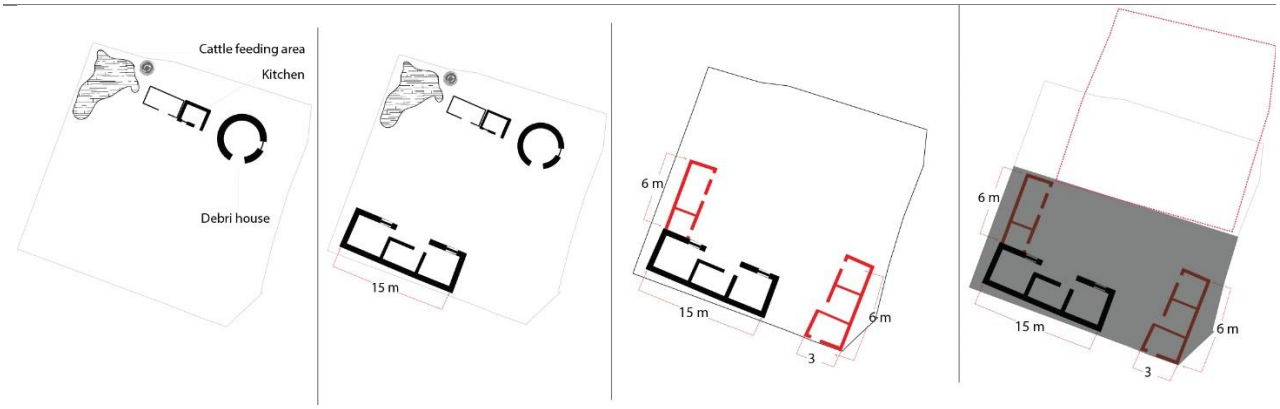
Kidan was born within the neighborhood around the St. Micheal church. She married at the edge of 15 and went to *gerebgiba* or gerialta rural area near Mekelle on the western part. She got land when she became 18 years old, by the Derg regime, and after 6 years the start living in this area. When the municipality implementing the local development plan the 'engineers and planners' informed here as here house is going to demolish without compensation and she will get land as a change in another area which did not know exactly where it was. She claimed and said, "I have extra land here with my even farming area". Thus after six years, the municipality gave here to land on here farming area (see fig. 5.28).

Socioeconomic and spatial transformation: -

Currently, the main source of income is helping from renting houses and some money gets from serving the church by her husband. The householders demolished house which hadn't to demolish which was made by a technical error that the geographic information system expert who works in Mekelle city plan preparation office and was part of the implementation of the local development plan (see table 5.4).

Socioeconomic and spatial impacts of the transformation

According to the interviewee, the impacts of the transformation are demolishing her house, which is going to ask the householders extra expenses for construction. Losing agricultural land with 0.15 cents per sq. the meter was the other negative impacts of the householders. The positive impacts of the transformation were being proximate, which is only 10-15 minutes' walk to get the taxi stop and accessible street, provision of the electric city since 2003.



1985	**1991**	**2003 - 2012**	**2012 - now**
. Got land (land) . Built *debri hidmo* house, kitchen and other related.	. added one guest house and later two additional rooms for children room and	. Informed to demolish their house relocate . Agricultural land with compensation of 0.15 cents per ha. .2012-demolish the *hidmo* house and built an extra new house for living	Informed demolishing of the *hidmo* house was a mistake Got land on here land (will not be relocated) . the remaining house is on the street (will demolish)–(see fig 5.19) . Added also a plot of land after 8 years appealing.

Table 5. 3 Kidan's house transformation

These, with red color *quana* houses (see table 5.3), are built after the demolishing of the old *hidmo* and kitchen, since 2012, using the building materials from the demolished ones because of the miss information given by the municipality. However, as we can see from the table (table 5.3) and the owner checked by the other engineer the *hidmo* house was not on the proposed street. Thus, the householder is now going to demolish all the built-up.

Figure 5. 19 location of the parcel added later and existed house (from left to right)

This demolishing of the house twice is because of miss information or technical error in addition to the lower consideration of the implemented plan to the existed settlement pattern and character. Edris (see index VI) said the mislocation was because of the technical error or shifting of the LDP maps. This mislocation problem does not affect only for Kidan's house but also other settlers as well. She claimed as it is intentional deed or corruption.

5.4. Socioeconomic and spatial impacts the transformation

5.4.1. Socioeconomic impacts of the transformation of early settlers

Economic impacts

The economic impacts of the transformation divided into two the negative impacts that include losing their primary job, adding extra expenditure on the daily activities and infrastructures and increasing unemployment. The positive impacts of the transformation of the settlement are getting some extra jobs, some infrastructures, and services. Even though the early settlers of the study area were engaged in agricultural activities and their main source of income was agriculture the implemented plan ignores proposing areas to perform agriculture.

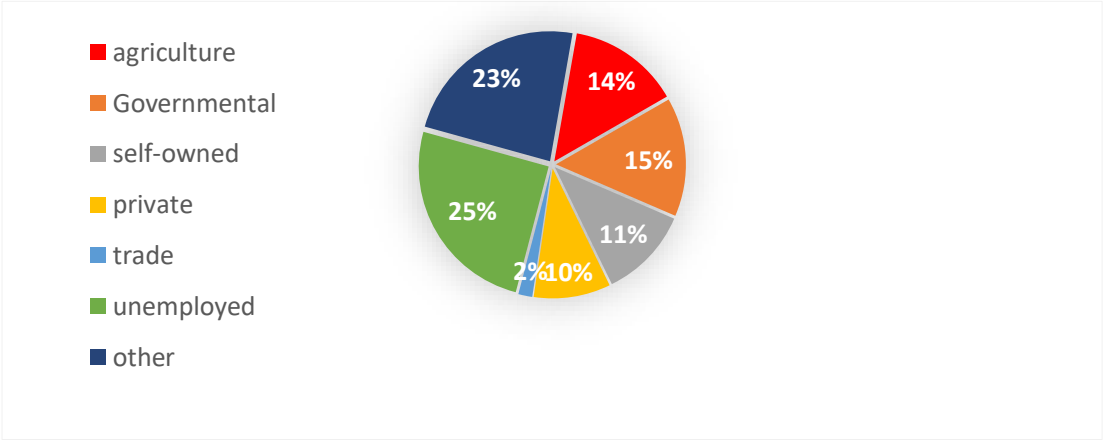


Chart 5. 5

Employment of the early settler's - source field survey

Besides, many settlers as you can see in the chart (chart 5.5) reveal that also as the development intervention brings some extra jobs from some settlers of the area that is mainly renting a house and few of them in construction. There are implemented primary schools and health care offices within the study area that makes the area better than what it was before. The infrastructures such as electricity, road networks are now distributed through the street quality is not good, not fully opened and paved. Lack of potable water as one of the main problems raised by the settles that affect daily activities. This leads them to buy from private water distributors at a high price.

The settlement has now 25% of unemployed settlers, 14% employed in governmental jobs and 15% engaged in private business. There are also settlers who are still involved in agricultural activities, some of them are farming renting land from the agrarians who have land outside of the study area, and the urban boundary as the settlers in the detailed interview told the researcher.

The chart (chart 5.6) tells us that the reason for unemployment of the early settlers of the study area is a lack of employers that is 40 %. Besides, lack of skill and education level that is 44 % that the settlers described as the lack of training and learning of the urban life and business management that helps them to know how to work and live with a complex system of the urban settlement. Moreover, academically some of the settlers are not educated enough to work in the urban areas because the infrastructures and services which help to learn were not accessible around.

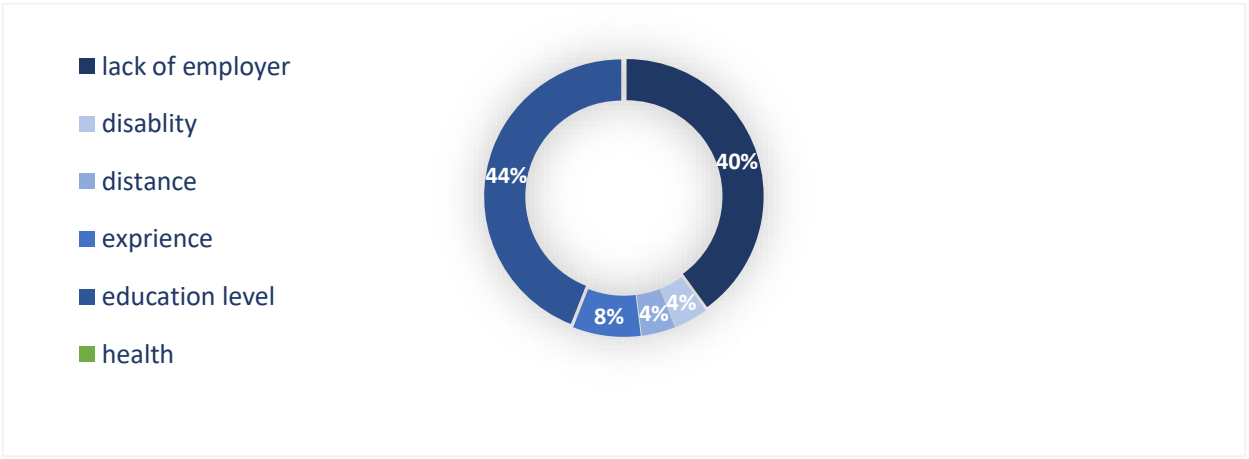


Chart 5. 6 Reason for Unemployment

The other reason for unemployment is that of the lack of employers that covers half of the people who are unemployed because of education level. The other reason for unemployment of the early settlers is lack of experience (8%), distance to the work area and distance to the work area.

The plot of area, compensation for the demolished house and relocation

Economically both the minimization of the plot area ownership and the demolishing house have its own negative impacts on some of the early settlers who are displaced and partially demolished settlers get less than 500 Sq. meter area. For this reason, the settlers ask for the remaining area to be 500 sq. meter and as the settlers said the reason for the decrease of the plot of the area is because of lack of space and the settlers claim that there as there is enough space with the in their blocks. To solve these problems settlers ask and appeal for a long time to get back the land employing a lawyer paying from 25 – 50 thousand birr householders.

The relocated settlers also claim that as they are economically affected by the demolition for two reasons one is they relocated far from the working area second said building our house for the second time without compensation and even some of them did not take their stone and other building materials that were because municipality demolished their house. Building a house for the second time at this time is expensive for the settlers especially when we compare to the previously built houses built by the local material, local builders and small amount. Besides the other relocated

settlers, who got 250 sq. meter within the study area or near to the area where they were living before, claimed the relocated area is not where the government, municipality, promised them to relocate, which was adjacent to the 20 m wide street, similar with what they had before. Now they are living in an area that is located adjacent or in front of the street 10 m wide. Thus, they said that comparatively, they believe they would have been getting better economic advantages if they relocated adjacent to the 20m wide street.

Related to the area the researcher asked one of the ex-city development officers (see index III) he said even the settlers those who had the same criteria can get different plot areas because the proclamation said that e.g. “The old agrarians ‘nebar gebar’ can get land from the 300 – 500, he said. According to this if there is enough area for 500 they can get but if there is not enough area if it is not less than 300 it still can provide only 300 sq. meter.”

Social impacts

The transformation of development of the peri-urban area has social impacts on the relocated early settlers of the fairness of compensating and dislocation, segregation and gentrification discussed below in detail.

Fairness and dislocation

The Development Plan has as issues of fairness on early settlers self-owned settlers and those who bought which ignores registering them at first and called illegal. Second, the buyers who are relocated into another area and remained on the house where they were first, the relocated one got a smaller area which is 100 Sq. meter while those who their house is not demolished remained with what they have (register on the base map it could be 100 - 400). The third one is those who have *Metesha* house relocated and those who not, the relocated householders get a land plot with an area of 250 and relocated far from their early house which is mainly asked by the people who displaced from the main arterial, they think the government should give them land adjacent to its instead. The fourth one is on the implementation of the development plan who told to demolish their house, some people demolished their house as soon as they informed and others still said no to demolish without compensation. After six years the people who did not demolish their house get compensation, but the settlers who demolish (accept the municipality order) did not.

After the researcher collects, some data from the settlers’ interviews with the stakeholders held. One of the questions the researcher asked one of the engineers (see index I) working in Hawelti Sub-city municipality, is that right early settlers who demolish their house did not get compensation while the settlers who did demolish their house are getting compensation? He said yes “the early settler’s house can get a minimum of 69612 birrs compensation and it is because the new proclamation, the proclamation by 2016, but the proclamation of 2010 did not consider.” But the proclamation No. 455 of 2005 part three make it clear about compensation in cases of expropriation and said (Representatives 2005):

"1. A landholder whose holding has been expropriated shall be entitled to payment of compensation for his property situated on the land and for permanent improvements he made to such land. 2. The amount of compensation for property situated on the expropriated land shall be determined on the basis of replacement cost of the property."

Thus, the implementation shows the existence of a gap between what is stated in the laws and the actual practice on the ground on valuation and compensation of house demolition compensation. As a result of this, early setters dislocated without compensation, lacks fairness and conflicts.

The other socially negative impacts are there are settlers who said the implementation of the plan could create is gentrification and marginalization. According to one interviewed householder if the proposed building height of the development plan is implemented they are going to build their house illegally or sell it and live in another area because of the building height regulation said G+3 – G+8. Thus, the implementation of the regulation plan of the building height will create gentrification of the early settlers who cannot build accordingly she said.

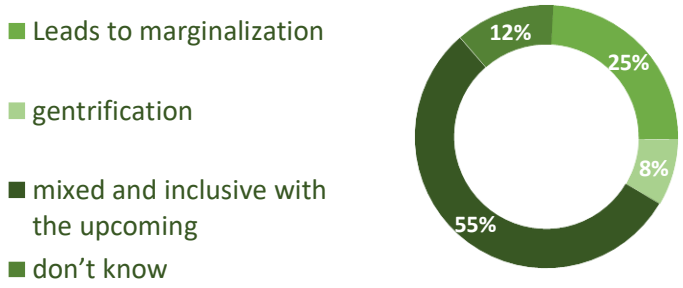


Chart 5. 7 Opinion of early settlers on peri-urban development in terms of social inclusiveness

The early settlers who bought Metesha house and relocated far from the area are segregated from previous settlement and relocated 1 km far from their previous living area. The settlers claimed the implementation of the development plan did exclude and marginalized them and relocated from the society in which they were living for a long period did not participate in the planning and design of the local development plan.

The implemented plan has also good side related to the creating of connection to the existed settlements of the peri-urban areas and the city that connects with arterial and sub arterial streets. This response of the settles covers more than 44 % as shown in the chart (chart 5.7).

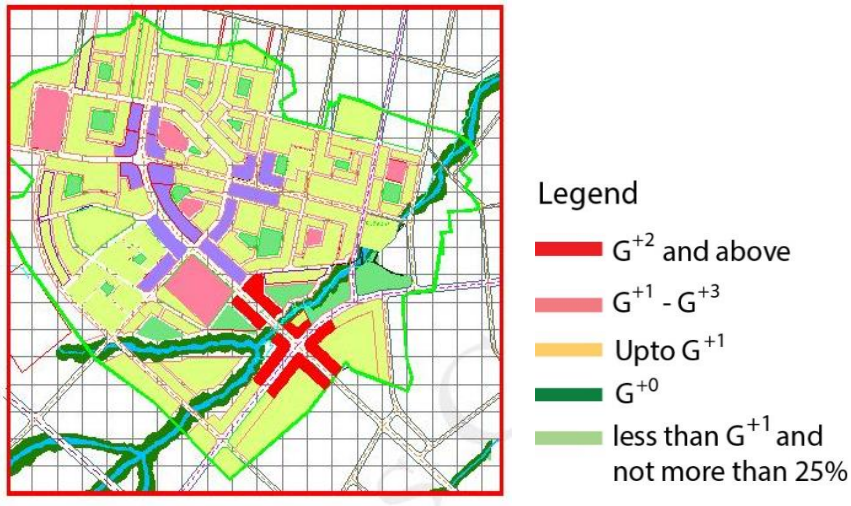


Figure 5. 20 building height of the implemented development plan – source – LDP report

According to the selected focus group discussion and communal police, said the study area's settlers are facing safety problems because of lack of infrastructure, clear and standardized streets, and street amenities, undeveloped areas, incompletion of the implementation of the study area and house without settlers or owners that are used as a hiding area.

The area has many open parcels, incomplete streets without electric city and mixing of the existed and new implementing plan development of buildings and other infrastructures, narrow streets in some part of the area and undeveloped riverside area which is filled by forest and dust which the criminals or thief's hides.

5.4.2. Spatial impacts of early settlers housing transformation

Spatially transformation of the settlement affects the early settlers in its land-use change, road network and typology, morphology and its delay on implementation has its own impact on the early

Figure 5. 21 Early settler's house character and demolishing while implementation – taken by the author

settlers' housing. The land-use change of transformation at first hurts the early settlers that minimize the agricultural and plot area of their compound, which led them to live in a relatively small area and lose some homemade activities like vegetables, playing area, and other spaces.

Second, the transformation of land use has also minimized the open space they had before which they had been using as a festivity and planning area. Besides, the land use transformation has also a negative impact on the conserving natural features of the area. The settlers claim that the development intervention did not conserve and consider and even some of the settlers said they ought to be paid as compensation for the trees. The transformation has a positive impact as well as the provision of different activities and services that helps the settlers to get access to health, education and transport services.

As shown in the chart (chart 5.8) the implementation of the development, plan demolishes 51 % of the settlers and 40 % are partially demolished. The only house which has not physically affected by the implementation of the area, 22 % or 12 householders' houses.

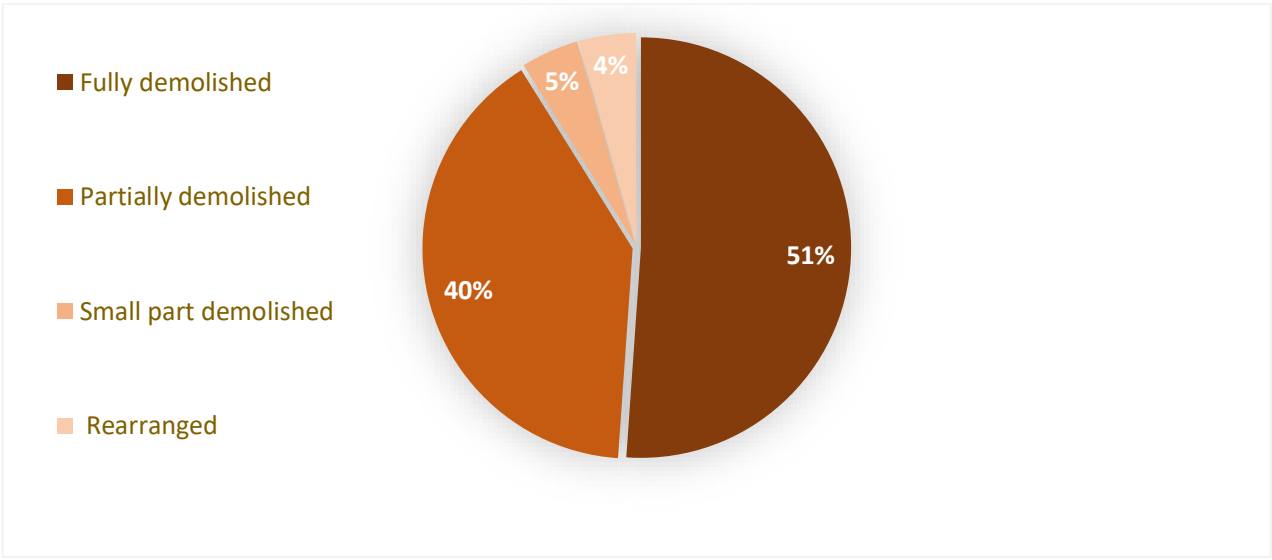


Chart 5. 8 how did the development plan of the neighborhood affect your house physically

The other negative impacts of the implementation are the lack of consideration of the existed settlers. The socio-economic study was weak which did not know who and how many were living there and had no documented detail ownership data. This led them to give land for some people who claim, as he/she was early settlers. Even while the researcher was collecting data, from the municipality, the municipality leader (see index IV) was signing for 10 householders those who

Figure 5. 22 demolishing of the house by the municipality – source – taken by the author

claim, as they were early settlers of the study area and accepted by the committee. The committee, who organized to check, study the ownership and final approval to settlers who have ownership issues and claim, as they were settlers of the study area before the development intervention.

The street pattern transformation that was more of irregular pattern and narrow sized street transformation had its one negative impact related to the demolishing of the house for street expansion and change of pattern, and for rearrangement of the buildings towards the implemented street indirectly. The implemented street was wider than that of what was existed before, so this also had its own negative impacts on taking of bigger space that demolishes many settlers and natural features and positive impacts of getting access to the wide street.

Mrs. Demekech, one of the interviewees' early settlers said also, "the street did not take the natural and manmade existed features. One of the impacts that the implementation of the street brings was, in addition to the demolishing of the house and destroying my plants, my house changes its previous orientation to another area which was topographically incompatible or sloppy which asks me much money to rebuild."

The relocation of the buyer's area was far from their early settlement was one negative impact that led them to live far away from the city, services, early settlement's community, and working area. Besides, these settlers have affected by the transformation also related to the adequacy of space, which they think is not enough to live in 100 sq. Meter Area.

The life story of dislocated householders

Case one - Mr. G/tsaddik G/yohannes

Household head: - G/tsadik Belay
Land acquisition of the previous plot – Metesha
Family size – 7

Household profile: -

He was living in mayalem, which is located towards the wester of Adi Daiero until the age of 25. Later the land was given since 1993 traditionally, which was measured by *metsean* and by foot, called it 20*20 m by the *kebele* land administration. The land provision was in a group in which they, the administrators, gave them a plot of land for ten or twelve and later divide the group on their own. Since1993 he came to the Adi Daiero and built 5m*5* house and add one later, and later after three years, he built an extra one house for rent that was 3m*3m area. 2011 the municipality of the city, after their land, demarked as part of the Mekelle city, inform the early settlers whom their house was on the street and another area which will be demolished can give them the land of 250 sq.m each and within the neighborhood without compensation. Mr. g/tsdik rejected it.

Socioeconomic and spatial transformation: - Socioeconomic and spatial transformation: - Currently the main source of income of this household is daily (labor) work the wife at home and the husband within the neighborhood which the total amount of is “unknown” and different while at the same time their monthly expenditure is 4000 Br. The householder was working in agriculture before the development intervention and relocation of their neighborhood. But if the settlers say no for this one the municipality said: “they will give them only 100 sm.” the householder says no and start accuses the municipality with help of an attorney which was by paying 10% of later get compensation of four houses which was 70,000 and the attorney took 10% of it.

Since 2007 sq. m the householder got a plot of land which is 250 sq.m and within the neighborhood but he claimed that the municipality at first promised as they will give them land adjacent to 20 m wide street but the household got land adjacent to 15m wide street. Still asking to get the extra land of 150 sqm. In addition, later built their houses where they are living now with 500,000 Br costs with 110,000 Br borrowed from friends and Microfinance.

Socioeconomic and spatial impacts of the transformation

According to the interviewee, the impacts of the transformation are losing agricultural land and products, unaffordability of the newly built house on the dislocated area and location of the plot adjacent to 15 m wider street that he thick might help them economically. Besides the transformation leads them to extra expenses for an attorney and other related processes. The positive impacts of the study area were the provision of infrastructure, transportation which is proximate which is only 10- 15 minutes’ walk to get the taxi stop and accessible street, provision of the electric city since 2003, water and other health and municipality services.

Case two - Mr. Tadesse Alemayoh

Household head: - Tadesse Alemayehu
Land acquisition of the previous plot – bought
Family size – 6

Household profile: -

Mr. Tadesse was born and grown up in geralta (zaena) which out of Mekelle city, rural area of the Tigray region. He has come to this neighborhood since 2007 after the family displaced from Eritrea because of the conflict or war and bought land of 20*20 sq.m wide by 3,000 Br with one house and chooses to Adi Dairo because of affordability of houses/land and nearness to the city. In addition, he later added two extra houses that built on his own. Since 2003, the municipality informed as the area demarcated as the part of the Mekelle city. By 2009, the name of the householders released in a newspaper that shows ownership of the land. In May 2012, the municipality told them to pay tax and paid later after one year in December 2013 the municipality, with help of “federal police”,

forced to leave their house to the new location site. Accordingly, the householder starts living in the new relocated area, which is one-kilometer far from the previous house, building two new houses.

Socioeconomic and spatial transformation: -

Currently, the income source of this household is help from their child and bank security that is 1500Br.In addition to this, the main source of the householder is from their child who was aboard and helped them to build their new house in the relocated area. The primary job the householder was construction, the building of the house when he was an adult. The householder stops his primary work because he gets older and sick. After the displacement to the "100 care" neighborhood without compensation, the family moved to the new house, which built by a loan from their child who was living aboard. "Without her, we wouldn't have such this kind, costs 470, 000birr, of the house," he said. He said the land is adequate for living and he claimed that it is not fair that they displace us without compensation, far from the area while there was enough space to arrange, and call us illegal even though we have a legal document and transferred the property legally. Besides, the location of the job was another reason for an extra expense that is 2 taxi and 6 Br per single travel 3 Br each.

Socioeconomic and spatial impacts of the transformation

According to the interviewee the impacts of the transformation demolishing of their house without compensation and dislocation far from their previous house that was proximate to the city and far from the main "economic active or 30 m wide street". Besides inadequate space of the house, unaffordability that was built by the help of their children, lack of accessibility to public service, transport and market are also the negative impacts of the transformation or development.

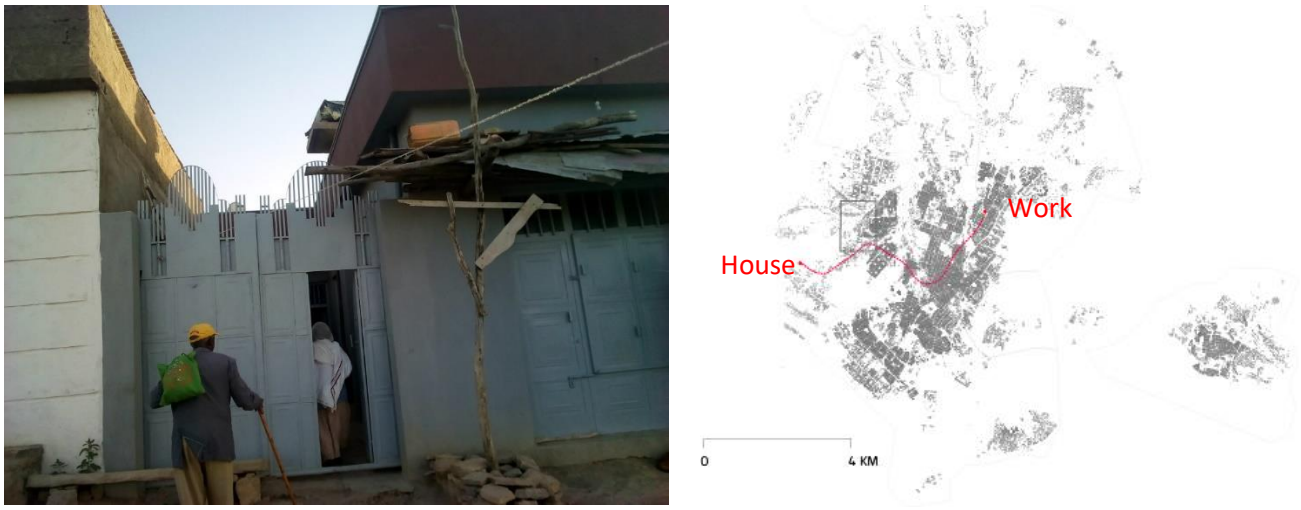


Figure 5. 23 Mr. Tadesse's in front of his house leaving for work, left and location of his house and working area

5.5. Inclusiveness of the early settlers on the development plan

In this analysis, as the researcher described in the methodology part, use triangulation on the implementation of the development plan and its impacts with the parameters of sustainable peri-urban development plan to analysis the extent of inclusiveness on the development plan

preparation, implementation, other planning, and design activities and the implemented plan and design by itself as follows. The response for the parameters is that 5- very good implies very well delivered at all on the implementation of the plan and 4- good – well delivered, 3- neutral - neutral, 2- bad – not well delivered and 1- very bad – not well delivered at all respectively.

5.5.1. Inclusiveness in participation -

The interviewee's early settlers' house holder's response to the question as they heard was 64%, which means more than half of the early settlers have not heard about the development. From the early settlers who respond yes for this question the place they heard was mainly municipality, meeting and governmental office and only one settler respond as have heard in church. Which makes the information about the development plan was limited and not accessible for the settlers. For those who can go to church and the government, the office would not have heard. According to the data, the people who participate and express their opinion respond that only two out of nine respond that as if the suggestion that they rise implemented. One of the interviewees said, "I did not know what was happing even till they come to my house and measure something in the neighborhood using instruments."

Besides, Kinfe (see index VII) said on TV that the municipality former officials told the dislocated (owners of the demolished houses) settlers in St. Micheal church as 'the settlers have two choices one, signing to take the land of 250 sq. meter within the neighborhood. Secondly, if they said no for the first offer, the municipality will give them the land of 140 sq. meter which its location is unknown' which was with a time limit to accept and sign for the first choice. Thus the development plan did not identify the area of land for the dislocated early settlers and did not implement even according to the proclamation that recommended providing a land area of '300 – 500 sq.m' for agrarians.

One of the city planning officers who was one of the stakeholder's interviewees said the participation of the settlers on the local development plan was weak the consulting office just inform them in church and few people came. As shown in the chart (chart 5.9) 64 % of the early settlers did even heard about the peri-urban development plan.

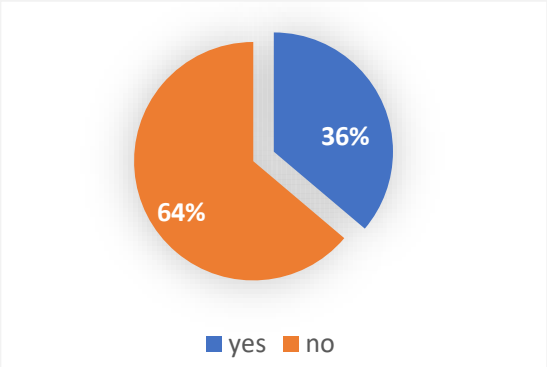
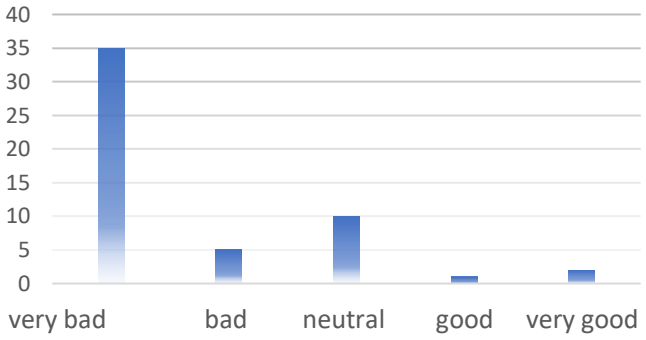


Chart 5. 9 Response for the question, have you heard about the peri-urban development plan



Graph 5. 4 participation the residents in planning & design

The participation of residents in the development planning and design response as shown in the graph (graph 5.4) responds very badly or not very well delivered. This response as shown in more than half of the interviewed settlers and the requirement of the principle said that "Invite representatives of residents to participate in the settlement planning and design process." This implies most of the resident's representatives did not participate or did not represent any residents to participate in the planning and design.

One of the early settlers said, "We want to borrow money from financial institutions and build a house for rental and other commercial activities but we don't know what would happen after we plan and start the construction. Some information that we heard informally is as the street width increases its width to 20 m which is now 15 m wide and demolishes it… we don't know what is going on in the municipality related to the implementation of the regulations of the street. " This also tells us how much are the settlers far from the information about the planning and design of their local area. Thus, the implementation of the development plan did not have a lack of inclusiveness in terms of participation in the planning and design of the study area.

Another parameter in this theme is the provision of access for residents to the knowledge of sustainability, which was weak in this settlement As shown in the chart (Chart 5.10) 71% of the settlers responded, as it is not well delivered. Only 8% of the respondent said that they get access to the knowledge of sustainability.

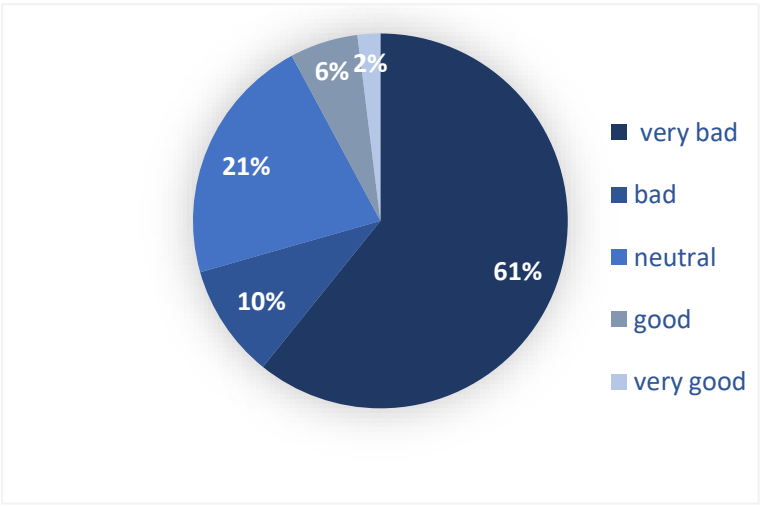


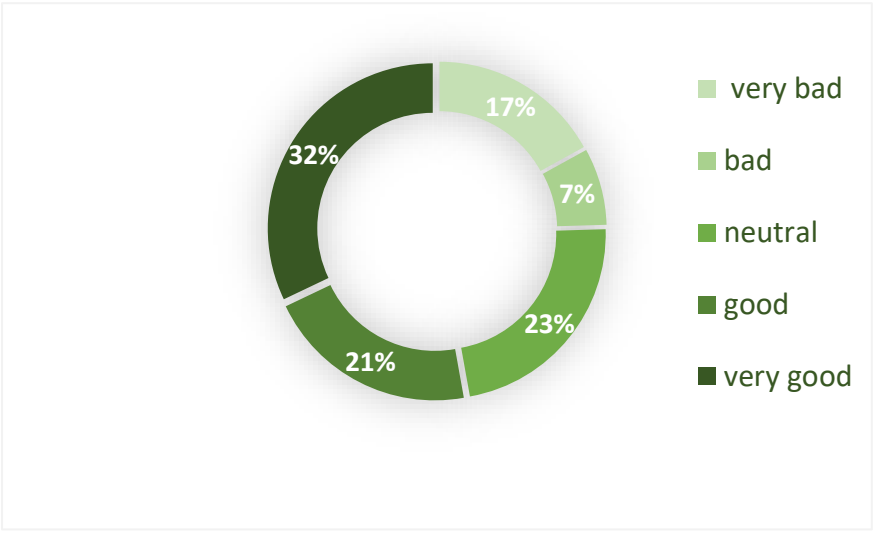
Chart 5. 10 Access for residents to the knowledge of sustainability

According to the in-depth interview, the settlers lack how to develop and transform their life from rural life to urban sustainably. Besides settlers said as they leering and training institutions and technologies that help them develop sustainably and learn to get access to the knowledge of sustainably.

5.5.2. Inclusiveness on the implemented plan and design

5.5.2.1. Accessibility and proximity to public transport

The proximity of public transport mainly dominated by delivered respond and neutral who is better for the settlers. However, there are also those who respond is bad and very bad 24 % of respondents. These settlers are from the area which locally calls '100 care' or relocated from the study area because of the implementation of the plan and who are living on the far area from the city to the western part of the study area.



The public transport is proximate for 53 % of the settlers and neutral for 23% householders. Thus, we can say that the proximity of public transport is inclusive especially to those are not dislocated.

Graph 5. 5 Proximity of public transport

5.5.2.2. Affordability and Quality of life

In terms of the adequate space, the area given by the government which was for the residence of the settlers is good most of the settlers got 250-500 sq. meter that is more than the standard parcel unit for living, which is 140 sq. meter. Nevertheless, the settlers who got 140 and 100 sq. meter claimed that this area is not enough and adequate for a family to live within.

As shown on the chart (see chart 5.11) the settler's response for the adequate space is in some part delivered but for the 30% of the settlers did not deliver. Besides 24% of the settlers responded as it is neutrally delivered. Affordability of the house of the early settlers, many settlers say affordability of the old house which was built long years ago is better affordable than that of the new one.

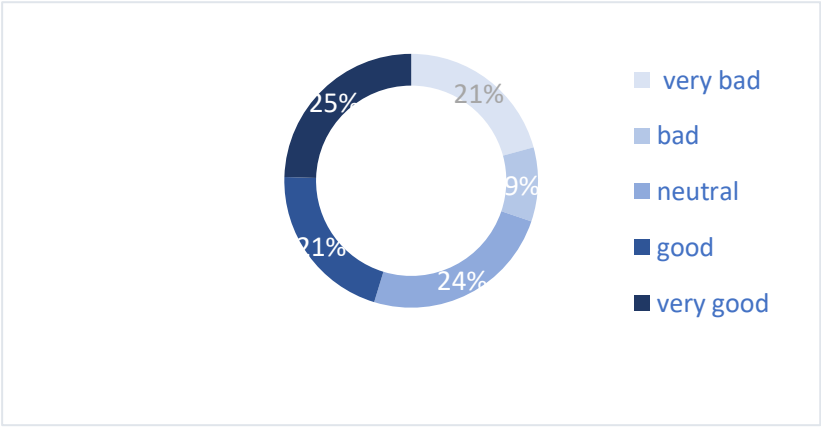
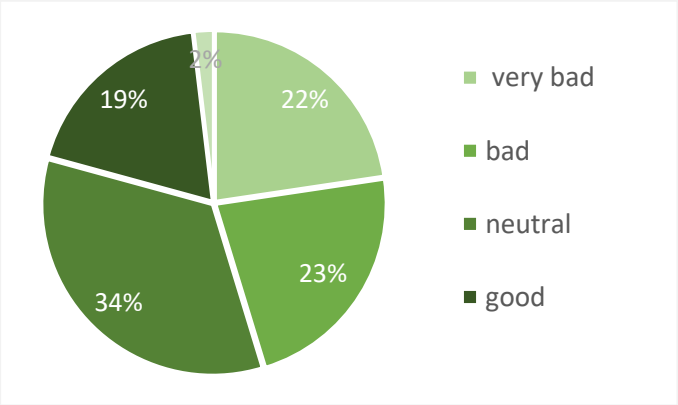


Chart 5. 11 provisions of adequate space

The graph (graph 5.6) tells us as only 21 % of the householders respond, as it is affordable. Related to the affordability of the houses the old house built before the development or what was existed

was better affordable than the new one because of the construction material, construction method and most of them built by the local people.



Graph 5. 6 Affordability of the house

Mrs. Mihret one of the interviewed settlers said the “the house I had before was relatively affordable but the new house which I built 2 years ago is not though even the government gave me 400 sq. Meter area for the change of the expropriated land and demolished house.

Thus, I sold half of the plot area with 600,000 Brr and built it the house using this money and I have not even a cent after I complete the house, which includes one living room, two-bedroom, one toilet and two rented house with 500 birrs per moth”. Currently, she has no other source of income out of the renting of the house with her two children, after she stopped working as daily labor and *tela* brewery because of aging.

The other parameter in the affordability and quality of life is the access to the public green space in this regard the site has no implemented standardized open space that the settlers can use it. Many settlers claim that the open area and they think it is an open space for the future but now it is full of dust discussed below in detail.

5.5.2.1. Access to green space

The settlers’ response for access to the public green space in which its requirement says that ‘Design community gardens to allow easy access for most of the residents’ respond is not well delivered which is 75 % of the early settlers (see chart 5.12). The study area has not only lack of open space but also the settlers used as dumpsite and toilets which makes unusably and leads to environmental pollution and diseases caused by poor sanitation these diseases are namely; acute upper respiratory infection, Cholera, Skin infection and asthma said the health office serewat (Adi-Dairo) health officer (see index). The health officer added that the reason for the lack of sanitation was the lack of infrastructures like water and others. Besides, socially the children and women, economically the poor and spatially more of the settlers those who are located far from the city and near to the dumpsite of the city are more vulnerable.

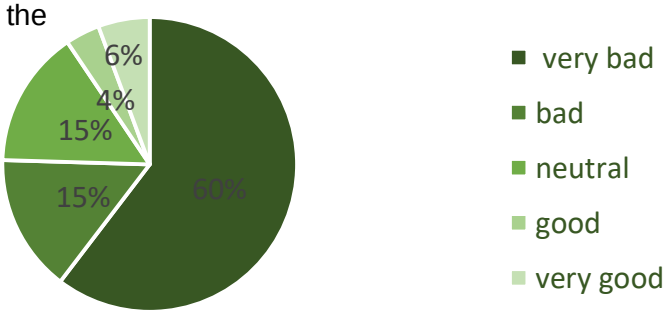


Chart 5. 12 access to public green space –source field survey

5.5.2.2. Access to education and other public service facilities

The access to education parameter requirement is 'plan and design the site that at least 50% of the dwellers of the settlement are within walking and cycling distance to schools (daycare and other)'. The area has also good access to the educational facilities and other public services such as health center and police station there are health centers, education facilities and police stations within walking and cycling distance to dwelling units of the settlers. However, there is also a lack of high school within the study area; the existed high school is far from the site. According to the implemented development plan, the settlers get access to the elementary school within walking and cycling but the high school, the governmental school is far from most of the settlers, which is more than one kilometer (see fig 5.24

The number of schools' is also limited and traveled to other neighbor schools for highs cools and preparatory schools. The requirements for the other public service facilities is planning and designing the site that at least 50% of the dwellers of the settlement are within walking and cycling distance to public service facilities.

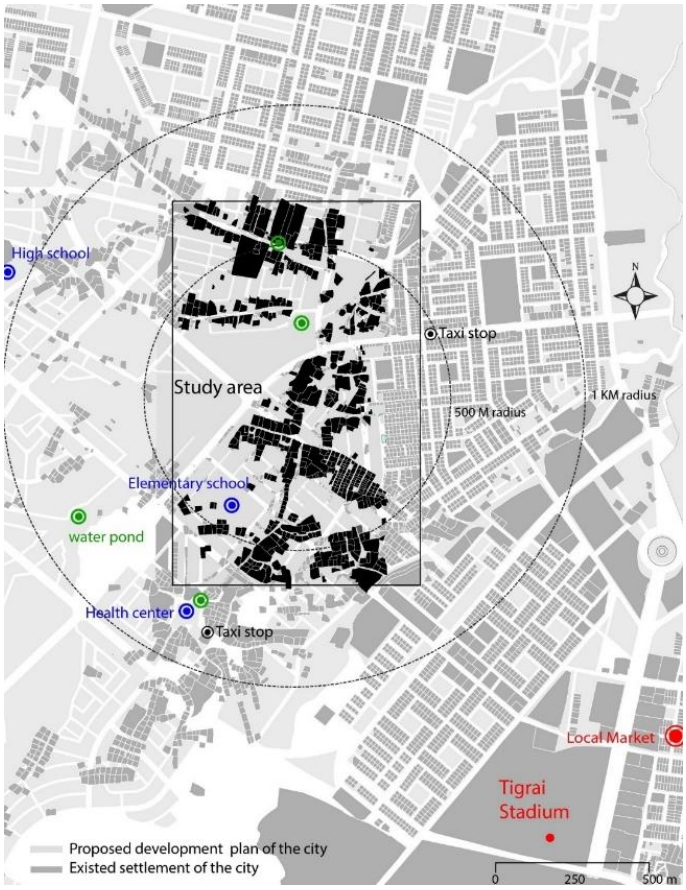


Figure 5. 24 Service distribution map of Adi Dairo with 500m and 1000m radius

The settler's response to this question was 58% good and very good and 6 % of them said it is bad and very bad access. Thus, generally, the site has good access to public access to the public facilities but when the researcher checks it on map and synchronic analysis of the study area shows that though there is good access to the police station, health center, and other administrative facilities the site access to the education and water supply is weak. Especially the water facility is very weak the settlers have no private access they only have three communal water and one of these water is a water pump located far from the settlement on the riverside as shown in the picture (fig. 5.24).

The settlers are now paying more than 3100 Br for distributing water within the settlement. In addition to this, the settlers use Adi-haki, which located in the center of the city, as a local market which is one taxi travel for most of them and some of them also have long walking distance to get transport access. Especially the displaced settlers took 30-60 minutes' travel time to the local market.

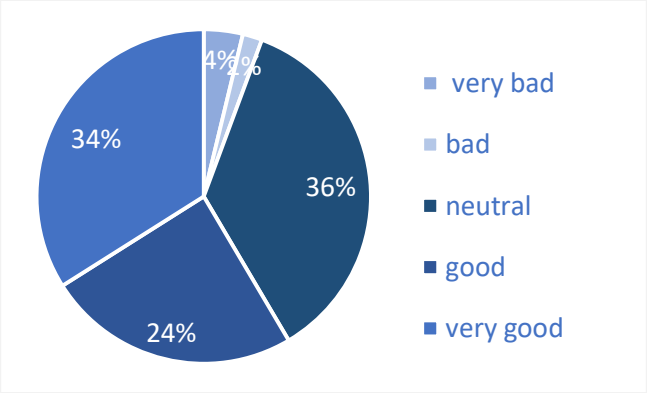


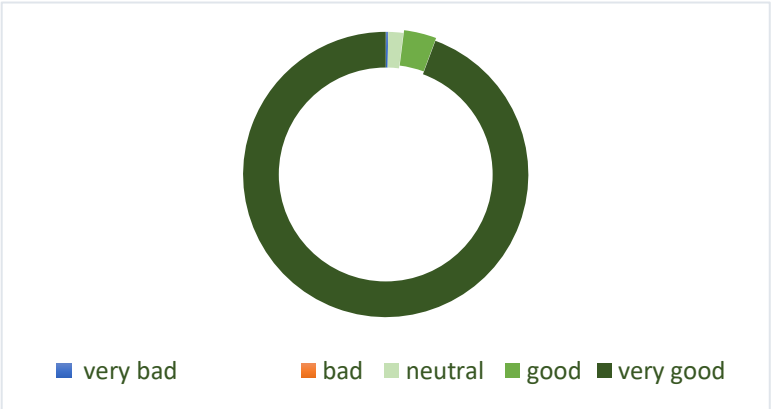
Chart 5. 13 response of early settlers of Adi Dairo on the access to the public service

5.5.2.3. Social cohesion and sense of community

In this principle of diversity of household types in the community, the requirements area plan includes a sufficient variety of housing sizes and types in the settlement or projet to enable citizens from a wide range of economic levels and age groups to live within a community. Though the implemented plan has no variety of housing typology and different projects the settlers who are buying, leasing within the parcel implemented are mixed and create an opportunity to live different people with different economic and social groups.

5.5.2.4. Integration with existing surrounding communities:

The requirement of this principle is also promoting communities that are physically connected and foster connectedness beyond the development intervention boundary.



As the chart (chart 5.13) shows the integration with the existing surrounding community of the implemented development plan is well delivered which covers more than 90% (94% respond as it is well delivered or very good and 4% good delivered) of the early settlers respond.

Chart 5. 13 early settler's response to Integration with existing surrounding communities

5.5.2.5. Provision of opportunities to perform agricultural activities

One of the parameters, under the Minimized land consumption and compact urban form theme, of the development of sustainable peri-urban development is the provision of opportunities to perform agricultural activities within or near development: which requires making provisions for and encourage agricultural activities within or near the development. However, in this implementation, the agricultural activities are ignored even though there were many early settlers with the experience and economically dependent on agriculture. As the chart (chart 5.15) reveals the agricultural performing area ignored and only a few people practices it and those people are living

in the area where the implementation of the development plan is not completed and the urban expansion of the city is slow.

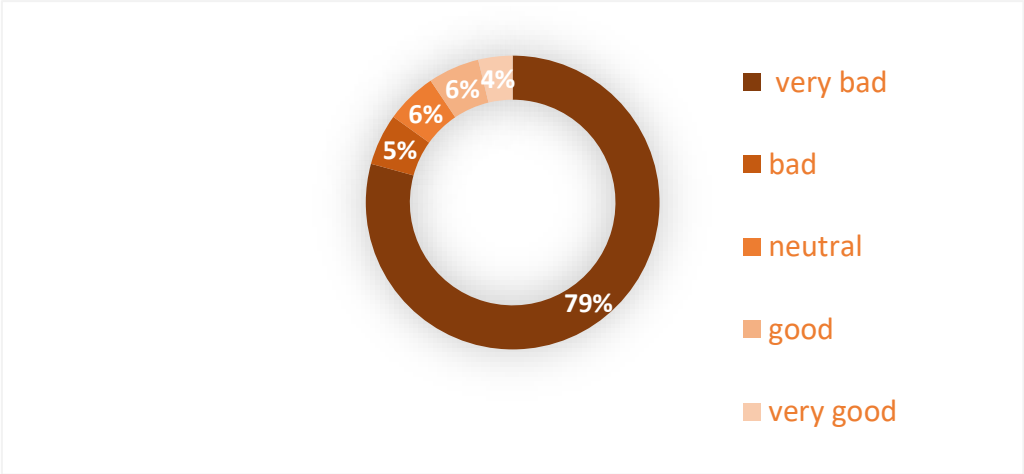


Chart 5. 14 response by the settlers on the opportunity the plan create to perform agricultural activities

Chapter six - Findings

1.1. Urbanization

The demographic definition of urbanization is defined by factors such as population size and density while at the same time economic function as the territorial concentration of productive activities of industries and service rather than population. The growth of the Mekelle city towards the peri-urban, in terms of economic function, lacks the concentration of productive activities especially near to the study area rather concentrated by the residential land use and functions. Besides, Mekelle city expansion proposed on the agricultural land of the peri-urban settlers are mainly for residence purpose.

In recent times, the urban natural population increase has been the dominant delivery of urban growth in developing countries that helps to explain the misconception between rapid urbanization and rapid urban growth. The effect of rural to urban migration is to establish the level of urbanization, whereas urban natural population increase is to increase the rate of urban growth. Although urban natural population increase has replaced migration/reclassification as the dominant contributor to urban population growth, this has not been adequately reflected in the policy arenas in developing countries.

1.2. Peri-urban development

Regarding as a place, the peri-urban presents a context that exhibits a heterogeneous state that both rural and urban features juxtapose and present challenges to environmental integrity, social justice and economic viability that require tailored mitigations from a new perspective. The process-based conceptualization fails to address the issue of sustainability in that it does not reveal how the specificities of place and location shape the relationships between environmental specificities, economic practices, and social institutions.

In Mekelle, the Italian intervention brought about a new town planning model, which transformed radically the urban system related to both urban morphology and lifestyle of the inhabitants. Though the Italian “colonial regime” lasted for only a few years, the system laid by them was reinterpreted by its successors to create new developing planning within the framework of this rectangular system which demolished existed indigenous settlements.

In the case of Mekelle, the peri-urban areas developed because of natural population increase, migration and reclassification of the rural settlements to an urban area. Particularly, Adi-Dairo settlement development developed because of first: natural population increase or high fertility rate, which transforms the bare and agricultural land to residence or *metesha* of youth. Second, the migration of settlers who bought house and land from the early settlers “informally” mainly from the *metesha* and old agrarians. Third, the reclassification of the settlement to the urban area of Mekelle city.

Particularly, the Adi Dairo settlement, both the pre-planning development and intervention did not consider the existed situation. The development plan had no detail and complete analysis. Thus, the intervention lacks solving the existed problems of the area and affects the early settlers economically, socially and spatially.

1.3. Characteristics of Adi Dairo settlement

Adi Dairo settlement had, socially, different kinds of settlers before the implementation of the development plan mainly categorized into four: first, the *old agrarians* who had their own farming land got through the traditional way from their family (which was not given as *Metesha*) and live for a long time within the site. Second, those who get land as *Metesha* from Derg and the current regime and their family and the others are those who bought land from the early settlers.

Economically the main source of income of the early settlers was agriculture, 58 percent of the early settlers, spatially the old agrarians and those who get land from their family and government as *Metesha* were dependent on their families and other labor works. The buyers were involved in different works.

The Spatial characteristics of the area were different as well: some were dispersed with wide farming area encircled it, some part also organic with denser and vernacular *hidmo* houses and farming area at the back. The other one is the area, which was relatively the latest, before the development plan implantation and *Metesha* has given since 1990 were very dense houses with narrow streets and relatively linear patterns. Generally, the settlement was unplanned with spontaneous alley and mainly rural settlement character though its character was changing through time.

1.4. Transformation of Adi Dairo settlement

The settlement spatially transforms into the denser, relatively grid pattern, nonagricultural land use which is dominated by residential land use. The intervention brings some social services like schools, clinics, and other administrative services within and near to the settlement. Economically, the settler's sources of income changed from agriculture to the renting of houses, shop, governmental and continued farming by "buying" and renting land. Besides, the social character of the site is now changed and transformed, which is more diverse and diverse.

6.5. Impacts of Peri-urban intervention

6.5.1. Socio-economic impacts

Economically, the agrarians lose their farming, primary job, and lead them to economic difficulties. Building a new building, for the demolished house without compensation, it was expensive for them. In addition to this, the urban life brought them an extra expense for transportation, service, and infrastructures. The other economic impact was, the cost for getting what they intended to get; land according to the legislation because of technical error of the implementation and weak intervention plan.

The early settlers, those who relocated far from their previous living area and the city and lacks basic infrastructure and services, transport access and with smaller plot area, than the 'standard' they had to get. This relocation has also affordability issue that was difficult building new houses without compensation for what the development demolishes first. Besides, the development implementation also mislocated some settlers in which the municipality told them to relocate to another area while the plan does not touch or demolish it.

Socially the transformation of the settlement had a negative and positive impact on the early settlers. The negative impacts were separating from the relative social life, segregation on the planning proposal implementation, conflict, and unfairness. Segregation among buyers and other early settlers, especially those who are relocated, the agrarians (old and *metehsa* owners) relocated near to the area where they were before while the buyers got smaller (100 sq. meter) and far from their original area. Besides, the registering and documentation of the early setters held by the municipality ignored the buyers at first because they were "illegal".

The implementation of the plan had fairness issues between the old agrarian and buyers, buyers and other settlers whom their house is demolished vs. those not. The conflict was also other social negative impacts that happened because of overlapping of a plot of land, weak detailed plan of the settlement some plot had "two up to seven" owners, shifting and taking of one early settler's house to the other one.

The positive socio-economic impacts of the intervention are the creation of access to extra sources of income and integration of the settlement with the city and other neighbor settlements. Besides, some of the early settlers sell half of their plot and rebuild their house after they get their tittle.

6.5.2. Spatial impacts

Spatially because of the change of morphology the existed houses start changing its orientation, demolishing, 51% full and 40% partially demolished, of houses that lead the early settlers for extra expenses. Besides, the proposed parcel/detail plan did not consider the existed topography, settlement form, and location, which demolished and relocated parcels or householders even within the same block.

The settlers who had a house on the proposed street and public use were relocated in different and far from their previous area. Besides, these settlers get a different and smaller plot of land especially those who get a small area were the buyers, bought a house from the early settlers, and their house demolished using excavator by the municipality with our compensation. The relocated buyers had an issue with the adequacy of the space of the plot given. The area lacks infrastructure (electric city, water supply, and sanitation) and social services, though there was not enough access to potable water, school, and transportation service of the study area. Besides, the early settlers are facing drainage problems because of the street lacks considering the topography of the settlement.

Environmentally the settlement is vulnerable to the pollution caused by a lack of water infrastructure to have better sanitation and its location that is near to the landfill site of Mekelle city. The pollution that is caused by the poor sanitation leads to the early settlers to sickness.

6.6. Inclusiveness of the early settlers

6.6.1. On the development process

The settlers had a lack of information on the development plan of the settlement in general. Inviting the representative of residents to participate in the project planning and design process was weak. Because of these problems, the implementation faces difficulties and lagged longer than the time that was intended to complete. Still, there are people who are asking about adding plot of area, getting land for their children and their own (who claim, as they were the early settlers) which was happened because of lack of information of the early settlers about the intervention and its process.

The selected group also said there was a committee as first who had a responsibility to identify, register and document the householder's ownership and area of land they had but had not stayed long. After that, there was a newcomer and get land as early settlers registered in the rural area and given land by the Sub City Municipality office.

6.6.2. Implemented development of the settlement

The inclusiveness on the implementation of the plan and design of the area was also well delivered in different parameters of sustainable peri-urban development while at the same time lacks or fails to deliver some requirements. The inclusiveness on the diversity of householder types in the community, access to education and social services and integration of the settlement with the surrounding communities are well delivered. However, access to education and social services is limited in number and scale level and their distance is longer than the standards.

The implemented development plan delivered the proximity to the public transport of the settlement but is not well delivered or excludes the relocated early settlers. Provision of affordable house affordability of house is not well delivered especially early settlers who demolish their house and relocated far from their previous area. Besides, the development was not inclusive for the dislocate settlers on the provision of adequate space who get land less than 140 sq. meter.

The provision of opportunities to perform agricultural activities within or near the development area ignored, which makes also not inclusive for those whose source of income was agriculture. Besides, the implementation of the development plan has weak performance for early settlers' inclusiveness on access to the public meeting, public green space, and residents to the knowledge of sustainability.

Chapter seven – Recommendation

To solve the problems identified in the findings of the study, it is possible to suggest the following, policy and planning level, recommendations.

7.1. Policy level:

Since urban land is a key yet scarce resource, policy and decision-makers have to shift the provision of housing to apartment housing that minimized land consumption and create compact urban form instead of giving land to settlers' piece by piece. However, if the land, farmland, is to be seized and expropriated for the "public purpose", a market value compensation has to be provided instead of only the agricultural product.

Besides, there should be a policy that when land is required or proposed for housing or other "public purpose", to propose in a barren land instead of on fertile farmland and there should be regulation and specification on the "public purposes" uses.

To control illegal invasion and speculation of peri-urban land there should be a frequent inventory of developments in the city and rural area land administrations. Moreover, land buyers or "Informal Settlers" should not be marginalized on the development intervention process and design by its self and need the protection of incremental housing. To minimize these, informality, sustainably the peri-urban rural settlement should have platforms and technologies such as Shannon's entropy and GIS to register the early settlers with their detail spatial information and measure the degree of spatial the built-up area over time, and professionals that can help to document and identify the existed socio-economic and spatial conditions.

In terms of population concentration and urbanization, there should be a policy to spread services and other productive activities all over the region, which is vital to minimize land consumption for the housing of the city. Besides, there should be a density limit of cities that prevents the excessive planned rapid urban growth or expansion.

Vernacular houses and indigenous settlements mainly characterize the Peri-urban early settlement. Thus, there should be a policy that promotes the intervention and design with a different type of developing model within its indigenousness and a counter-proposal against the status-quo should be formulated through a thorough analysis.

7.2. Planning and design level

The socioeconomic and spatial impact of peri-urban intervention or urban expansion has to be thoroughly examined, and agriculture-focused per-urban development has to be given priority and due attention for the inclusive urban transition of the agrarians and other early settlers and

sustaining of the city. Nonetheless, when the agricultural land is expropriated the compensation should pay on time and with the training of the agrarian how to use it.

Basic infrastructure provision should give priority and due attention which helps the settlers to protect from pollution and disease caused by poor sanitation and improve the living conditions of the settlers.

The LDP intervention proposal should be after an open design competition among professionals and in a way that minimized negative socio-economic and spatial impacts on the early settlers. Besides, the design of the peri-urban development plan or design by itself evaluates by the sustainable development parameters. Besides, in the peri-urban area, the development of urban centers should not be only for residence but also for the concentration of productive activities or land uses (manufacturing, industries, and services).

There should be a guiding principle and management of affordable housing and more regulated development and management of economical and comfortable housing. Moreover, social mixing in community development should increase social cohesion and sense of community.

The planning process and its implementation of peri-urban development should participate in all the early settlers and increasing institutional measures catering to public participation in urban planning decision-making is needed. Besides, the implemented development plan by itself should be inclusive for all settlers by design.

Most of the expropriated land is mainly fertile farmland that has been a primary source of income. Thus, peri-urban development should invest and design in the riverside for irrigation purposes for urban agriculture thereby increase productivity and empower the agrarians. Besides, train farmers to improve their farming method and transform their life from rural to urban sustainably.

Since there is a professional and capacity gap on implementation, the planning department of urban areas needs to appoint appropriate urban planner professionals in the appropriate position and develop professional is capacity through training.

Settlers who are dislocated should get compensation for the property they had according to the proclamation and relocate not far from the city. Parcel development or parcellation should consider early settlers' parcel area and location. Besides, the proposed one should be compatible with the existing one and identify which and how many plots are for the early settlers stayed on the early house and relocated one in detail. Besides shifting, overlapping of ownership and other detailed plan’s technical correction should be taken first before informing the settlers what to do.

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Index

Questionnaire for Early settlers

Introduction:

The interviewer should describe the objective of this questionnaire for the interviewee

Use code "999" for the question that the interviewee does not want to answer

Use code "222" for a question which shouldn't be answered by the interviewee

Name of Interviewer: _____Names of interviewee:

_____

Date of interview (date/month/year) _____

1. Profile

1.1. Interviewee profile

1. House number: _____
2. Number of the parcel from the map of the questionnaire: _____
3. Name of the kebele (ketena):_____
4. House ownership: 1. self-owned □ 2. Rental □
5. local name of the area: _____
6. Family size: ____ Male _____ Female _____
7. Your gender: 1. Female □ 2. Male □
8. Your age: 1. 17-24 □ 2. 25-35 □ 3. 36-50 □ 4. 51-65 □ 5. > 65 □
9. When did you start living in this neighborhood? _____ month _____year
10. When did you start living in this house? _____ month _____year
11. Before you start living in this house where were your living area? 1.In this the neighborhood □ 2. Mekelle city center □ 3. other Peri-urban area of Mekelle city □ 4. another city □ 5. rural area □ 6. another region □ 7. Eritrea □ 8. Other □_____
12. If your family come from area what was the reason? 1. Family /relatives □ 2. Work □ 3. lack of affordable house □ 4. School □ 5. Health □ 6. marginalization famine □ 7. social conflict □ 8. other □ _____
13. How long have you lived in this community: 1. <6 months □ 2. 6-12 months □ 3. 12-24 months □ 4. One -five year □ 5. More than five years □
14. Mode of land acquisition 1. Family □ 2. Government □ 3. Inheritance □ 4. Squatting □ 5. Traditional □ 6. Landlord □

1.2. personal profile

No.	15.**Name**	16. **Relationship in the HH** **1.** wife of HH **2.**husband of HH **3.** child **4.**sister/brother of HH **5.**father/Mother of HH **6.**no relationship **7.**Other	17. **Gender** **1.**male **2.**female	18. **Year of birth** **1.** <3, **2.** 3-7 **3.** 7-15**,** **4.** 15-19 **5.** 19-30**,** **6.** 30-60, **7.** >60	19. **Marital status** **1.**married **2.**unmarried **3.** divorced **4.** widowed	20. **religion** **0.** none **1.**Orthodox **2.**protestant **3.**catholic **4.**Muslim **5.**other	21. **disability** 1. none 2.mental 3.visual 4.hearing 5.nerve 6.physical 7.speaking	22. **Income/month in birr** Write in number salary
1								
2								
3								
4								
5								
6								
7								

No.	23. **Employment** **1**.agriculture **2**.Governmental **2'.**self-owned **3.**private **4.**trade **5.**unemployed **6.**other	24. **reason for unemployment** **1.** lack of employer **2.**lack of skill **3.**disablity **4.**distance **5.**exprience **6.**education level **7.**health **8.**other	25. **Job location** **1.**at home **2.**around the neighborhood **3**.out of your neighborhood **4.**out of the city	26.**Mode of Transportation for work** **1.**Bus**,** **2.**Minibus **3.**Taxi**,** **4**.car **5.**bicycle **6.** Walk	27. **Time of travel to work** **1.** >5 Minute **2.** 5-10 Minute **3.** 10-30 minute **4.** 30-60 minute **5.** >one o'clock	28. **primary occupation** **1.** Agriculture **2.** governmental **3.** trade **4.**self-owned **5.** other	29. **location of primary work** **1.**at home **2.**with in the neighborhood **3**.out of your neighborhood **4.**out of the city
1							
2							
3							
4							
5							
6							
7							

30. Family monthly expenditure _____ : Food _____ House rent _____ Electric city _____telephone_____water _____ School fee _____ Transport _____Health _____recreation _____other_____Total Family income_____
31. Family monthly expenditure before the development_____ Family monthly expenditure _____ Food _____ House rent _____ Electric city _____telephone_____water _____ School fee _____ Transport _____Health _____recreation _____other_____ :Total Family income_____
32. What changes happen on your family monthly expenditure before and after development of the plan
    1.lower infrastructure cost □ 2. increase house rent □ 3. lower transportation cost □ 4. Higher infrastructure cost □ 5. decrease house rent □ 6. increase transportation cost □ 7. get extra source of income □ 8. lose some source income □ 9. other □ _____

a. Life story

33. Where were you born and grow up?
    _____
34. Tell me your life story starting from the beginning of living in this area?
    _____
    _____
    _____
35. Where was your first house located? And what do you remember about your house (the way you got it, location, planning, construction, space activities and change through time)? (try to take photo, plan or sketch)
    _____
    _____
    _____
    _____
36. What was your favorite work in your house and neighborhood?
    _____
37. Where were the favorite area you spend more in your neighborhood?
    _____
    _____
38. What was the special skill you had as an adult?
    _____
39. How was your family grow up and change your compound though time?
    _____

Existing situation

2.1. The physical condition of the house

Criteria 1. Structural condition 2. Wall condition 3. Roof condition 4. Floor condition is to be considered
Good – strong structure, good construction, well maintained and house without any demolished or cracked part
Fair – well-structured and constructed, not maintained and house with some part demolished and cracked
Bad – chancy [structure] and needs immediate maintenance

41. Housing condition: 1. good □, 2. fair □, 3. poor □
42. Construction material: fill the number 1. Stone 2. Brick 3. Mud (chicka) 5. Wood 6. soil 7. iron sheet 8.cement
Wall,_____ floor,_____ roof, _____ceiling, _____fence,_____ pavement,_____

a. House hold space usage graphic/ sketch/ mapping

- Activity (plan, section & Elevation if it is required) including the compound and identifying building uses.
- Writing and sketching of all houses and identifying their ownership including the detail plans of every house with its furniture other materials.
- Identifying the interviewee's house and floor area from the compound.
- Every plan and section should include dimensions.
- Take photo of the house and compound which describes its physical situation

43. Did the development plan of the neighborhood affect your house specific 1. Yes □ 2. No □
44. If is yes, how?

1. Fully demolished □ 2. Partially demolished □, 3. Small part demolished □, 4. Rearranged □

45. If your answer is fully demolished did you get enough compensation? 1. Yes □2. No □
46. If your answer is yes do you think it is enough? 1. Yes □ 2. No □
47. Was there any problem related to the compensation 1.Yes □ 2. No □
48. If yes what was that 1. Time: Being late for the payment □ 2. Amount of the payment □ 3. Other □
_____
49. If your answer is fully demolished how is the relocation area?

1. Very good □ 2. good □ 3. Not enough □ 4. Very small □

50. If your answer for number 44 is partially demolished what challenges happen?

1. Loss of plot area □ 2. demolition of house □ 3. get access to street □ 4. help to get open space □ 5. bring economic opportunity □ 6. loss source of income □ 7. other □ _____

51. If your answer for question number 43 is "1" how do you describe the new house to the older one in terms of space usage

1. Get better space 2. The same as the older one 3. Smaller space 4. Very small

52. Sketch and describe how your house and compound was and its change after development below.

_____
_____

2.3. Physical Infrastructure

Source of energy:

53. Cooking: 1. hydro Electric □ 2. generator □ 3. charcoal □ 4. fire wood □ 5. animal dung□ 6. other□
54. Light: hydro: 1.Electric □ 2. generator □ 3.candle □ 4.fire wood □ 5.biogas □ 6. Other

_____

What was your source of energy before development or on the old house?

55. Cooking: 1.hydro Electric □ 2.generator □ 3.charcoal □ 4.fire wood □ 5.animal dung □ 6. other□
56. Light: 1.hydro Electric □ 2.generator □ 3.charcoal □ 4.fire wood □ 5.gas □ 6. other□
57. Drinking Water supply: 1. Private □ 2. communal/compound □ 3. public □ 4. Spring water □ 5. river □
58. Other water supply: 1. Private □ 2. communal/compound □ 3. public □ 4. spring water □ 5.river □ 6. Other □_____
59. Solid waste disposal system: 1.Door to door collection □ 2.private □ 3.on the near area□ 4. other□

_____

60. Gray water disposal system: 1. on the road □ 2.storm water ditch □ 3.cesspool □ 4. septic tank □ 5. other□

_____

61. Black water disposal: 1. on the road □ 2.storm water ditch □ 3.cesspool □ 4. septic tank □ 5. other□ _____

62. What are the changes on physical infrastructure of the neighborhood and you house after the Peri-urban development?

_____

_____

2.4. Services used by the household: (KG, primary school, secondary school, Market, Local market, Kiosk, Church, Mosque, Sport field, Youth, women center, others)

no.	**Service**	**63. Name of the service**	**64.provider of the service** **1.**governmental **2.**private **3.**NGO **4.**religiouse orga. **5.**other	**644.Location** **1.**with in the neighborhood **2**.out of your neighborhood **3.**out of the city	**65. Means of transport** **1.** Bus**,** **2.**Minibus **3.**Taxi**, 4**.car **5.**bicycle **6.** Walk	**66. Travel time** **1.** >5 Minute **2.** 5-10 Minute **3.** 10-30 minute **4.** 30-60 minute **5.** >one o'clock	**67.Frequency of visit** **1**. daily **2.** once a week **3.** per month **4.** per year
1	KG						
2	primary school						
3	secondary school						
4	Health						
5	Market						
6	Local market						
7	Kiosk						
8	Religious						
9	Sport field						
10	Youth center						

68. Do you have a say on development activities of the government that occur in your neighborhood? 1. Yes □ 2. No □ how?

_____

Socio Economic situation

3.1. Economic situation

69. What other source of income do you have?

_____

Description

_____

70. Did you have any source of income you lose because of the development plan? 1. Yes □ 2. No □
71. If your answer is yes describe it

_____

72. If your answer for the question number 70 is 'yes'. Do you think another way that can be minimize it? 1. Yes □ 2. No□
73. If your answer is yes did you try to communicate with the planning and local administration on the planning phase to do so? 1. Yes □ 2. No □
74. If your answer is yes what was their reaction?

_____

75. If your answer for the question number 73 is "no" why?

_____

76. What different activities, that increase your income, exist in your neighborhood?

_____

77. Describe comparing with the old neighborhood

_____

Affordability

78. If the house is your own how did you build it? 1. Loan □ 2. without loan □
If the house is your own fill the family's expenditure for housing in table below/

79.types of expenditure	80. yourself (birr)	81.**loan type** 1. Bank 2. Micro finance 3. Social 4. institution 5. Family or friend	82. amount of loan	83. date you took the loan	84.time to repay loan
Land					
Building main house					
Building extra house					
Building 3 house					

3.2. Social interaction

85. With which social interaction are you more familiar with 1. Idir □ 2. Ekub□ 3. Mahiber □ other _____.
86. What is the basis for your social interaction? How does the social tie happen?
_____
87. Did the development plan help you to develop your social interaction? 1. Yes □ 2. No □
88. If is yes, how _____
89. If no, why _____
90. Do you have a communal space that you use for holidays and other ceremonies; 1. Yes □ 2.No □
If yes, what are they and where do you celebrate them?
1. _____
2. _____
91. Did you have a communal space that you use for holidays and ceremonies before the development plan? 1. Yes □ 2. No □
92. what changes did the development plan bring on this communal spaces

1. Increase in area □ 2. Located near to house □ 3. Decrease its area □ 4. Located far from the house □ 5. Totally demolished □

93. What benefits do you get from your social interactions?

1. Money loan □ 2. financial assistance □ 3. social support □ 4. material and goods exchange □ 5. emotional support □ 6. information exchange □ 7. resource sharing 8. others□

94.. Did you lose these benefits because of the development plan or developed 1. Lose □ 2. Developed □ 3.nuetral □

---

94. How do you resolve your social conflicts? (Household, Neighbors) Who are involved
1. elders □ 2. Kebele □ 3 . police □ 4 .others □
_____
95. Is this different from what you have before the development? 1. Yes □ 2. No □
96. If yes how? _____
97. Does your family have a role in the neighborhood? 1.Yes □ 2. No□
98. If yes how?
_____
99. Do you have a say on development activities of the government that occur in your neighborhood? Yes □ No □ how? _____

100. In your opinion how do you describe the Peri-urban development in terms of social inclusiveness for the early settlers of the area?
1.Leads to marginalization □ 2. Gentrification □ 3. mixed and inclusive with the upcoming □ 4. I don't know □

Environment and Green space

101. Do you have green space in your neighborhood? 1. Yes □ 2. No □
102. If No, Why?

_____

103. Do you have a habit of growing plants? 1. Yes □ 2. No □. If No, Why?

_____

104. If your answer is yes where?

1. within your compound □ 2. In the neighborhood□ 3. River side near to the neighborhood□ 4.other □ _____

105. If the environment is convenient would you like to grow plants? 1. Yes □ 2. No □. If No, Why

_____

_____

106. Do you think you contribute to the environmental protection? Yes □ No □, how? (State if there is existing practice)

_____

Peri-urban development plan

5.1. **Perception towards the Peri-urban development**

107. How do you understand Peri-urban development?

_____

_____

108. How do you inter relate Peri-urban development with your current income level?
1. Increase □ 2. Continue as I had before □ 3. Losing source of income □ 4. I don't know □

109. Which neighborhood in Mekelle is a good example of Peri-urban development to you and why?

_____

_____

110. What is your idea of urban area? What do you think it includes? Compared to rural areas.

_____

5. 2. Participation

111. Have you heard about the Peri-urban development plan? 1. Yes □ 2. No , If yes, how did you receive the information? How many times where you informed? _____ Who informed you? _____ When were you informed? _____
112. Where were you informed? _____

_____

113. Describe the information you have about the Peri-urban neighborhood development plan?

_____

114. Did you participate in the development of your neighborhood? 1. Yes □ 2. No □
115. If yes, how do you describe your contribution?

_____

116. Did you get a chance to express your opinion on the development? 1. Yes □ 2. No □ If yes, how?

_____

117. If your answer is yes. Did they implement your suggestion? 1.Yes □ 2. No □
118. If your answer is no, what measures did you take?

_____

119. If your answer for question number 117 is "no" why do you think is the reason?

_____

120. In your opinion what are the negative and positive effects of the development plan to your old neighborhood?

1. helps me to get extra source of income □ 2. i lose my job □ 3. help me to get good infrastructure □ 4. lack access to the school □ 5. Get good access to the school □ 6. i lose my social interaction □ 7. helps me to get good new people □ 8. lose my agricultural land □ 9. other describe below

Positive

_____

Negative_____

_____

121. What do you think should be done to minimize the negative effects as a Peri-urban
122. neighborhood plan?

_____

123. In your opinion what are the effects of the development plan to your old access to potable water?
1. More accessible □ 2. As it was before □ 3. Lack access □
124. In your opinion what are the negative and positive effects of the development plan to your old access to electric city?
1. More accessible □ 2. As it was before □ 3. Lack access □
125. If you want to describe more

_____

_____

6. Evaluating the intervention sustainablity or inclusiveness of the early settlers performance

If the answer for "To what extent do you think this indicator is affrdablity deliver in the implemented development plan?" is answer is 5 or well delivered, indicate as fellows

1 – very bad 2 – bad 3 – neutral 4 – good (5) very good

a. **Accessibility and proximity**

No.	parameters	Evaluate performance importance
125	**Proximity to public transport:** Requirements: provision of accessible transport rides daily and/or make arrangements for public transit lines to cover the development site.	1 2 3 4 5
126	**Access to educational facilities:** Requirements: plan and design the site that at least 50% dwellers of the settlement are within walking and cycling distance to school.	1 2 3 4 5
127	**Access to public service facilities:** Requirements: plan and design the site that at least 50% of the dwellers of the settlement are within walking and cycling distance to public service facilities.	1 2 3 4 5

a. Affordability and Quality of life

128	**Adequate space:** Requirements: The design and provision of buildings and land that satisfy the national and local building design guidelines for minimum dwelling space.	1 2 3 4 5
129	**Access to public green space:** Requirements: Design community gardens to allow easy access for most of the residents.	1 2 3 4 5
130	**Affordable Housing:** Requirements: Provision of housing options that are more affordable than commercial housing products	1 2 3 4 5

b. **Minimized land consumption and compact urban form**

131	**Provision of opportunities to perform agricultural activities within or near development:** Requirements: Make provisions for and encourage agricultural activities within or near the development.	1 2 3 4 5
	c. **Social cohesion and sense of community**	
132	**Diversity of household types in the community:** Requirements: Include a sufficient variety of housing sizes and types in the design to enable citizens from a different range of economic levels and age groups to live within a community.	1 2 3 4 5
133	**Integration with existing surrounding communities:** Requirements: Promote communities that are physically connected and foster connectedness beyond the development.	1 2 3 4 5
	d. **Public participation in the intervention**	
134	**Access to public meeting space:** Requirements: Provide space in the community for indoor and outdoor gatherings and meetings.	1 2 3 4 5
135	**Participation by residents in community management:** Requirements: Establish residents' community to help in making decisions on the management of the community.	1 2 3 4 5
136	**Participation by residents in the planning and design process:** Requirements: Invite representatives of residents to participate in the settlement planning and design process.	1 2 3 4 5
137	**Access for residents to the knowledge of sustainability:** Requirements: Provision of knowledge of sustainability to residents by the community administrative body	1 2 3 4 5

Table 7.1. – developed using parameter for sustainable peri-urban development (Sun 2012) and SDG thems as source

Questionnaire for the stakeholders

Introduction:

Use code "999" for question which you don't want to answer

If you cannot answer the question write the name of the person who can

General questions

1. When was the local development plan of Adi Dairo prepared? _____after the structure plan _____ by whom? _____when was the structure plan prepared _____
2. Did you implement the whole plan? 1,Yes □ 2, partially changed □
3. If your answer is partially changed why?_____Who prepared the new one?___ _____
4. When was the development plan implemented?_____and how the process _____
5. was there any challenge when you implement the plan? 1,Yes □ 2. No □ , if yes Describe_____
6. Who participated on the plan preparation_____How many people participated on the development plan preparation?_____How did they inform thme?_____when was the time?_____
7. How many early settlers were within the of the development plan area? _____How many of them were farmers_____, buyers _____and adult who are aged >18 by then?_____

8. What was the size of the plot area proposed (given) to the early settlers_____what is the reason for the proposing this area why do the dwellers got different size_____
9. How many of them are displaced from their old house?_____How many of them are partially demolished because of the development plan?_____ and rearrange their plat(house) because of the LDP?_____
10. Was there any problem related to displacement of the dwellers? 1, Yes □ 2. No □, if yes describe_____

    _____
11. Why are the dwellers relocated in different areas (some of them out of the LDP area and far from where they were before) _____why did they get different plot of area_____
12. When did you analyze the amount of the compensation for dwellers agricultural land and what basically does it consider? _____
13. How was the analysis (what did you consider) and what was the amount per care (m2) _____

    _____When did the dwellers take their compensation? _____
14. Did you gave the displaced dwellers compensation for the demolished house or other built up area_____ _____if you did what did you consider (how is that work) _____if not why _____
15. How much is true that there are farmer dwellers come who come from other far area like serawat and adi kolomy and got plot of area adjust to the 30 m wide street_____
16. If it is true do you think it is fair comparing to the dwellers who lived there but relocated to other area? _____

    _____

List of early settlers on newspaper which includes the buyers too

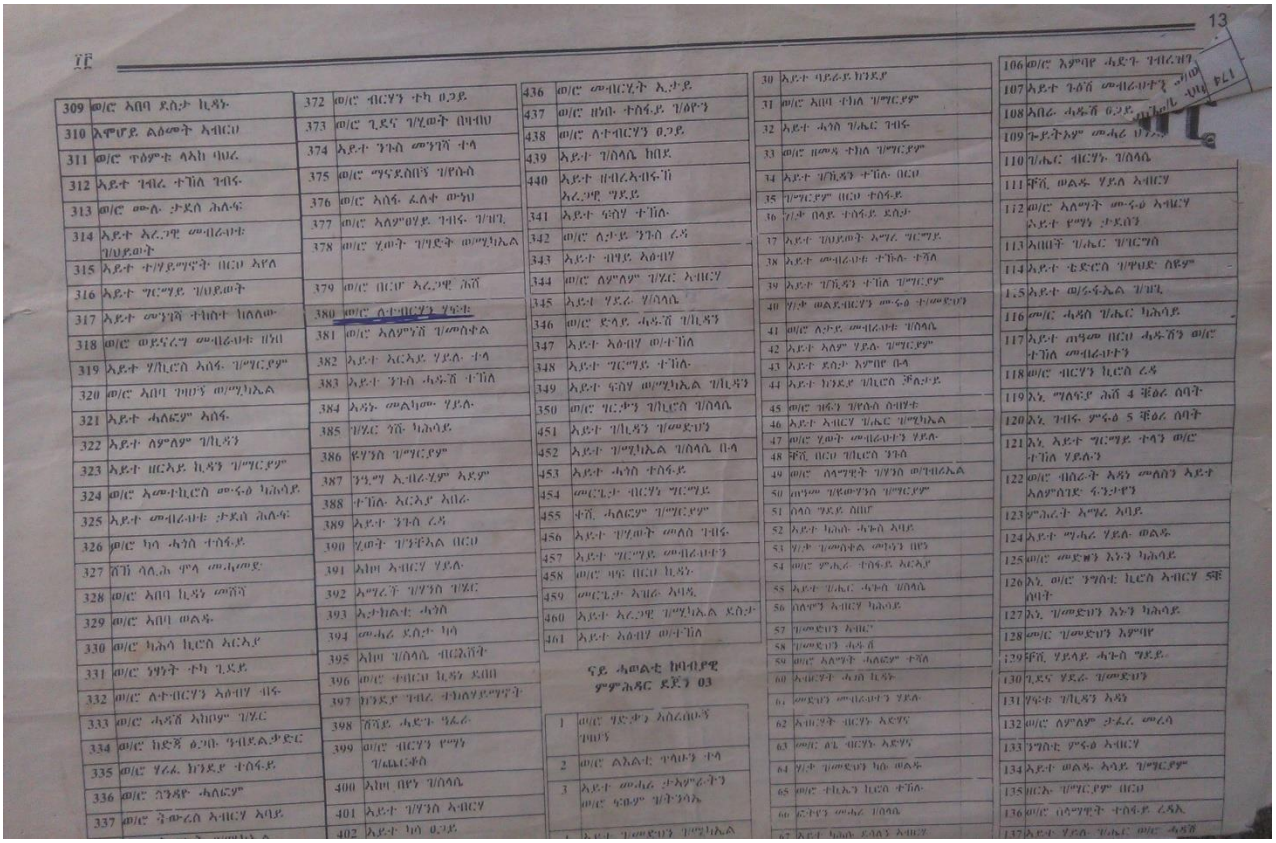


Figure 7. 1 List of early settlers on newspaper -source from in-depth interviewed early settler

Momona police station identified areas with high crime

Figure 7. 2 Momona police criminal areas location

Rural area land holding tittle of the early settlers

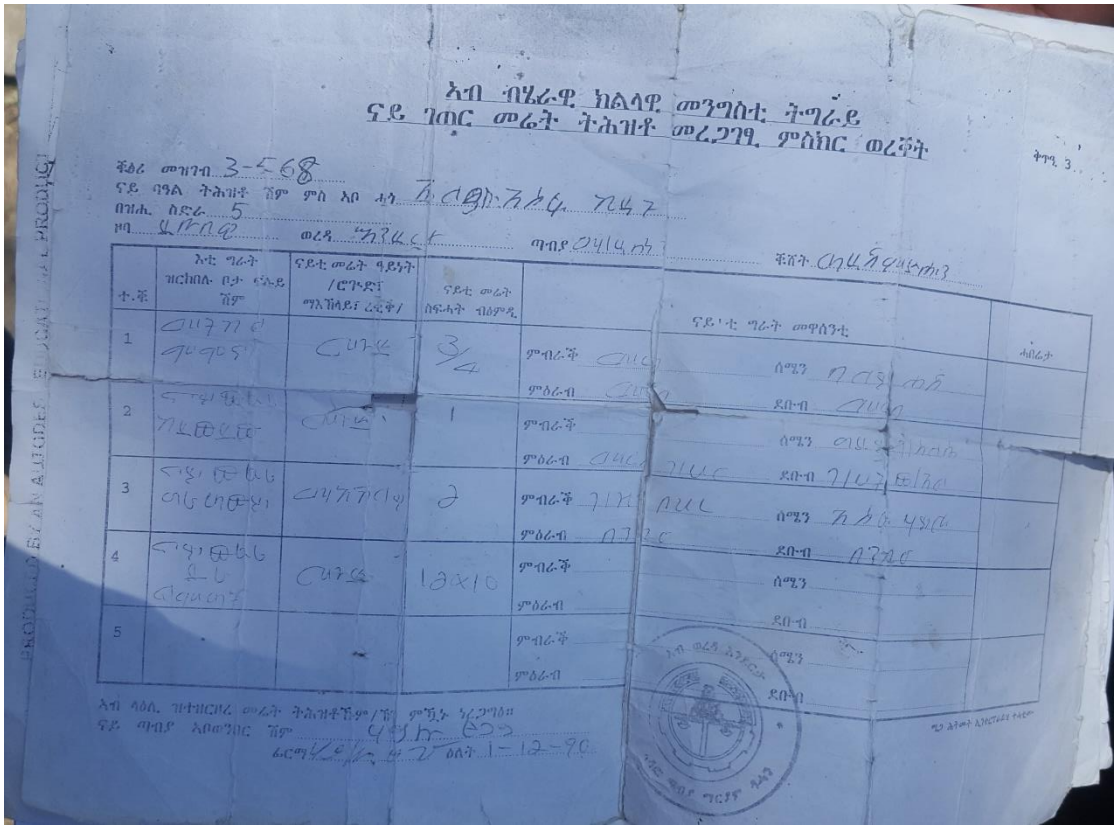


Figure 7. 3 Rural area land holding tittle

List of interviewed officially

I. Engineer Birhane – compensation issue leader in Hawelti sub-city
II. Planner Seyoum – planner expert in Hawelti sub-city
III. Former city development office leader – currently working in Mekelle city administration office land management department
IV. Hawelti sub-city municipality leader
V. Asegid nega - health official in Serewat (Adi daiero) health center
VI. Edris - GIS expert former Mekelle city administration office participated in the implementation of the development plan – now working in Mekelle University as a lecturer
VII. Teklay – land administration department in Tigray region city development office
VIII. Kinfe (lecturer in Mekelle University) – foreign language department – December 30, DW television: after 8:30

Letter of agreement between sellers and buyers approval

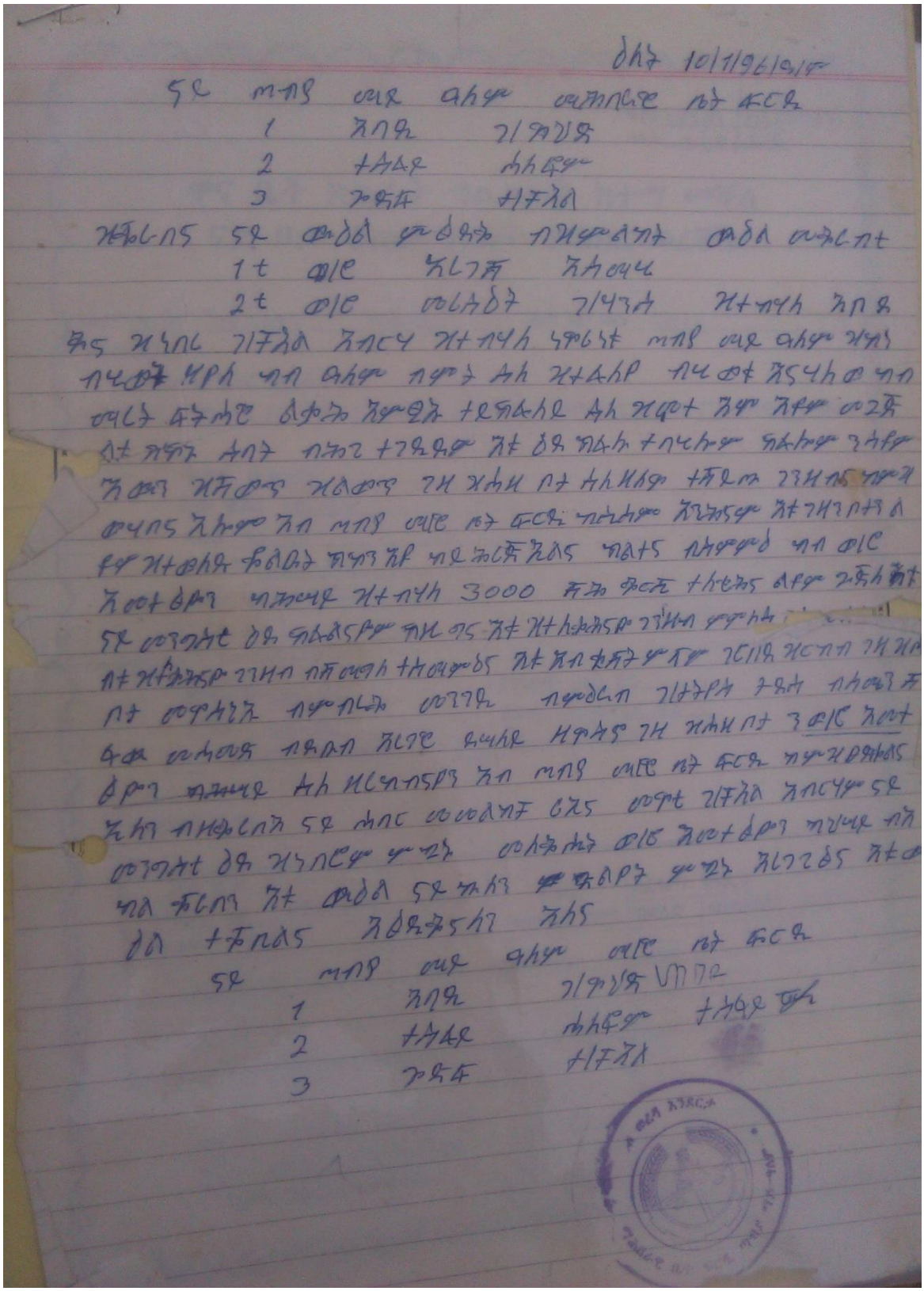


Figure 7. 4 Letter of Agreement between sellers and buyers approval

Letter of Agreement between sellers and buyers approval (site plan)

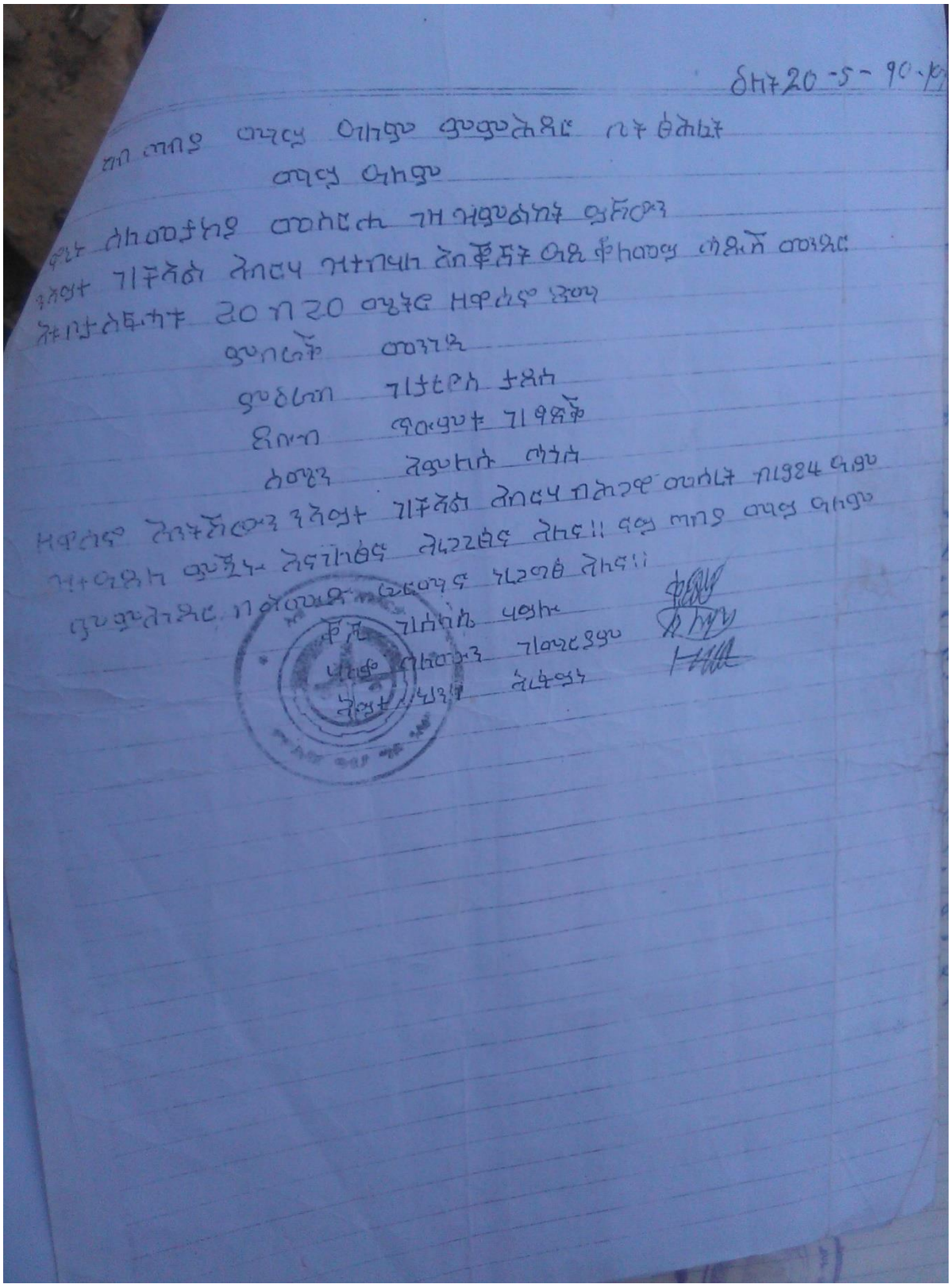
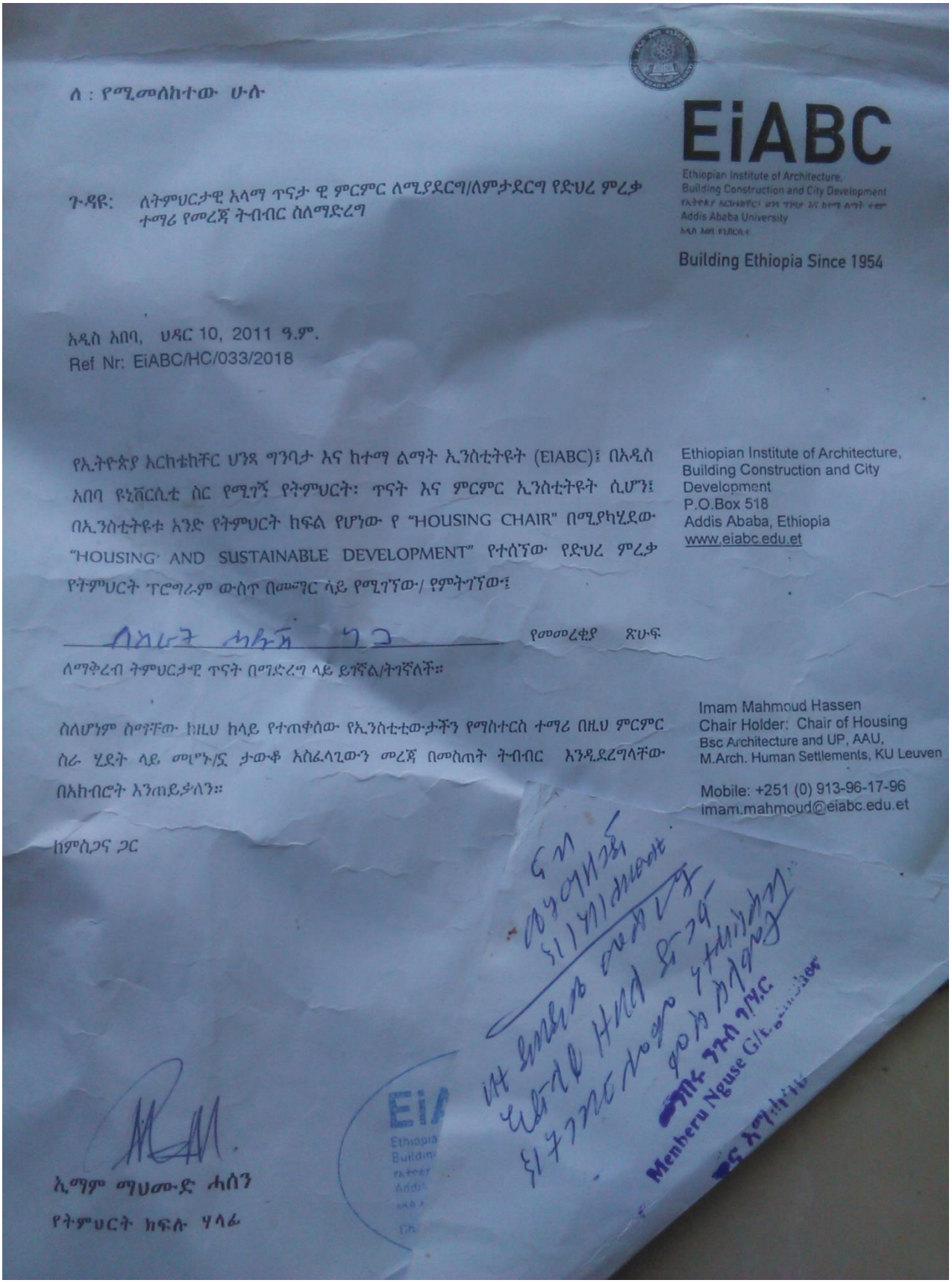


Figure 7. 5 Site plan given for the buyers (one of the agreement letter)

A letter has given from Graduate program Director, EiABC and signature of Hawelti sub-city leader



ለ : የሚመለከተው ሁሉ

EiABC
Ethiopian Institute of Architecture, Building Construction and City Development
Addis Ababa University
Building Ethiopia Since 1954

ጉዳዩ: ለትምህርታዊ አላማ ጥናታ ዊ ምርምር ለሚያደርግ/ለምታደርግ የድህረ ምረቃ ተማሪ የመረጃ ትብብር ስለማድረግ

አዲስ አበባ, ህዳር 10, 2011 ዓ.ም.
Ref Nr: EiABC/HC/033/2018

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የኢትዮጵያ አርክቴክቸር ህንጻ ግንባታ እና ከተማ ልማት ኢንስቲትዩት (EIABC)፤ በአዲስ አበባ ዩኒቨርሲቲ ስር የሚገኝ የትምህርት፡ ጥናት እና ምርምር ኢንስቲትዩት ሲሆን፤ በኢንስቲትዩቱ አንድ የትምህርት ከፍል የሆነው የ "HOUSING CHAIR" በሚያካሂደው "HOUSING AND SUSTAINABLE DEVELOPMENT" የተሰኘው የድህረ ምረቃ የትምህርት ፕሮግራም ውስጥ በመማር ላይ የሚገኘው/ የምትገኘው፤

ለአሰፋት ሓዱሽ ካ ጋ የመመረቂያ ጽሁፍ

ለማቅረብ ትምህርታዊ ጥናት በማድረግ ላይ ይገኛል/ትገኛለች።

ስለሆነም ስማቸው ከዚህ ከላይ የተጠቀሰው የኢንስቲቲውታችን የማስተርስ ተማሪ በዚህ ምርምር ስራ ሂደት ላይ መሆኑ/ኗ ታውቆ አስፈላጊውን መረጃ በመስጠት ትብብር እንዲደረግላቸው በአክብሮት እንጠይቃለን።

ከምስጋና ጋር

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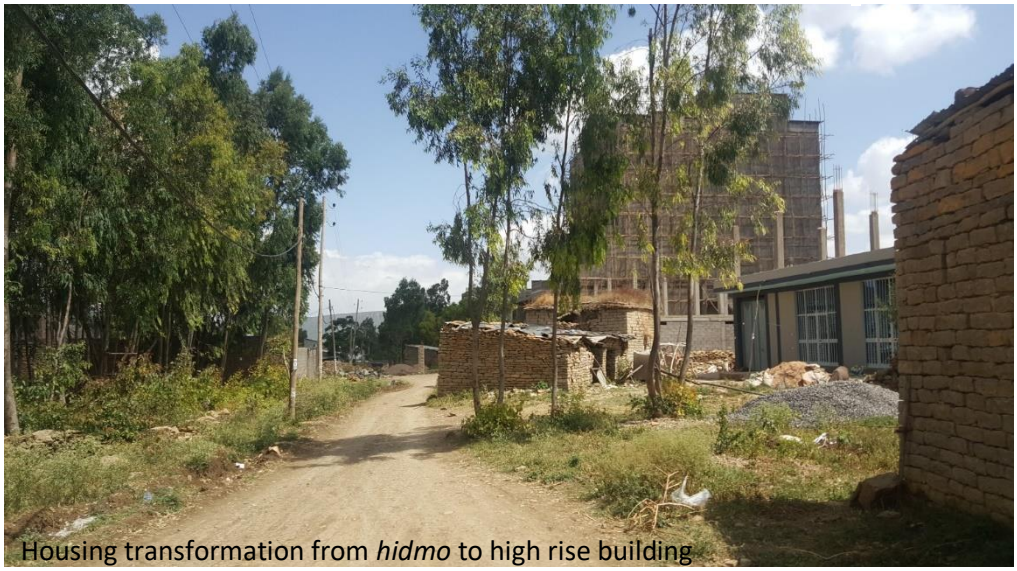
ኢማም ማህሙድ ሐሰን
የትምህርት ክፍሉ ሃላፊ

Menheru Nguse G/E...

Figure 7. 6 Letter given from Graduate program Director, EiABC and signature of Hawelti sub-city leader

Study area photos



Housing transformation from *hidmo* to high rise building

140 area house for dislocated

POST SCRIPT

During defense, some important comments were forwarded from the board of examiners and they were seriously taken in to account for the final submission. The comments include editing issues like to edit tittle and abstract, adding some contents literature and contextual review, findings and editing of caption of figure and table. Besides, there were also comments on data type and recommendation to make it detail.

For the comment on the abstract, the alphabetical order of the keywords was edited. On the literature, part the peri-urban is contextually defined see page 8 and literatures related to inclusiveness on page 22 and 23 and Mekelle city contextual literatures on page 49 were added according to the comment given. Related to the editing of caption see page 59 and 68 of figure 5.3.2 and table 4.1 were edited. On the finding part, page 95, fifth paragraph was edited according the comment. The data type on page 26 were edited. On the recommendation part putting detail recommendation on the technologies and tools were added and edited according to the comment.

Finally, I would like to use this opportunity to thank my board of examiners for their valuable comments and encouragements. I thank you all.