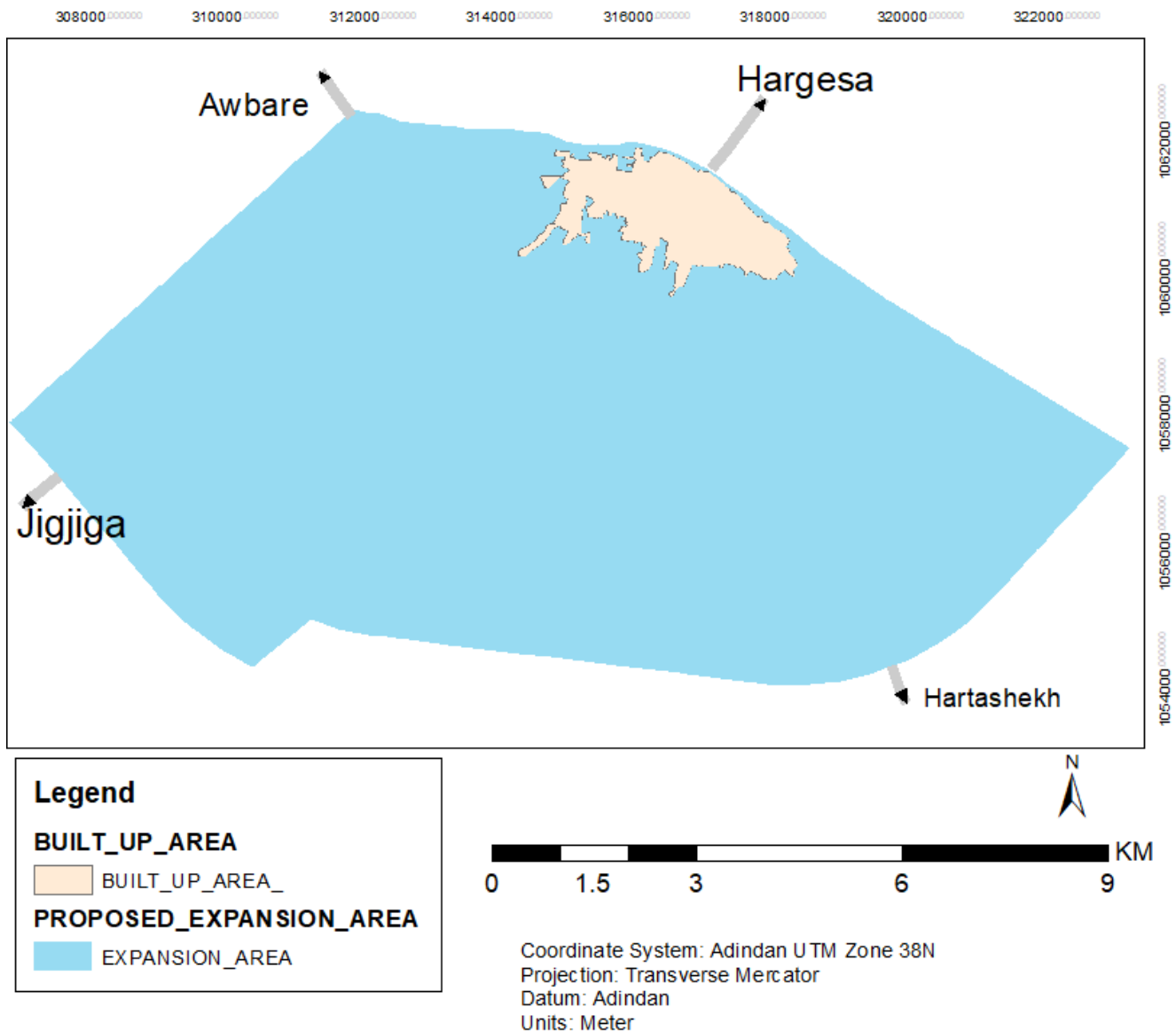


ETHIOPIAN URBAN EXPANSION INITIATIVE

SOMALI REGIONAL STATE

TOG-WAJAALE CITY URBAN EXPANSION PLAN

TOG-WAJAALE_CITY_
EXISTENCE_(BUILT-UP)_AND_EXPANSION_BOUNDARY



February 2025 G.C

TOG-WAJALE CITY ADMINISTRATION MUNICIPALITY OFFICE
URBAN EXPANSION TEAM



TOG-WAJAALE CITY URBAN EXPANSION PLAN REPORT

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TOG-WAJAALE CITY URBAN EXPANSION PLAN REPORT

1. Chapter One

1.1. Introduction

The Tog Wajaale City Urban Expansion Project (2025-2055) is a strategic initiative aimed at guiding sustainable development and growth over the next thirty years. In this context, urban expansion involves the extension and improvement of the city's physical, economic, and social infrastructures to accommodate population growth, enhance living conditions, and reinforce the city's position as a regional hub. This ambitious project seeks to transform Tog Wajaale into a modern, resilient urban center capable of meeting the needs of its growing population while promoting social, environmental, and economic sustainability.

Tog Wajaale is located in the Somali Region of Ethiopia and has experienced steady urban growth, particularly in recent decades. Originally a small trading Kebele, it has developed into an administrative and commercial hub, offering expanding opportunities for businesses and government services. However, rapid population growth and increasing demand for urban services have outstripped the city's capacity to meet these needs. Previous expansion efforts, while significant, were often reactive rather than proactive, resulting in overcrowded informal settlements, strained infrastructure, and insufficient public services. These challenges highlight the need for a comprehensive, forward-thinking urban expansion plan to sustainably manage Tog Wajaale's growth.

The Tog Wajaale Urban Expansion Project is designed to span thirty years, from 2025 to 2055, reflecting the long-term nature of the challenges and opportunities facing the city. Throughout this timeframe, significant transformations in infrastructure, housing, public services, and economic sectors are expected. The project aims to promote a well-balanced and planned urban expansion that considers future demographic changes, ensuring that Tog Wajaale can sustain its growth trajectory without compromising residents' quality of life.

The benefits of urban expansion are already evident in various cities around the world, where careful planning has led to enhanced economic opportunities, improved living standards, and more efficient urban management. Similarly, Tog Wajaale's urban expansion will provide advantages such as increased employment opportunities, improved transportation networks, greater access to healthcare and education, and the development of new industrial and commercial zones. Furthermore, by adopting modern planning principles such as sustainable development, climate resilience, and smart city technologies, this expansion will help ensure that Tog Wajaale remains a livable and competitive city for decades to come.



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This report outlines the vision, goals, and strategies for the Tog Wajaale Urban Expansion Project (2025-2055), detailing the steps necessary to address existing urban challenges while fostering long-term growth. The successful implementation of this project will establish a foundation for a thriving city that exists in harmony with its social, cultural, and environmental context, benefiting both current and future generations.

1.2. Background of the Project

Tog-Wajaale City Administration is one of the cities in the Somali Region, situated at the border of the Federal Republic of Somaliland. It stands out as one of Ethiopia's rapidly growing cities, particularly in its migration toward the regional capital, Jigjiga. This growth is propelled by neighborhood migration, national movement, regional dynamics, and the natural increase in population. Over recent decades, Tog-Wajaale has transformed significantly, evolving from a small kebele into an active urban administrative center.

The city's expansion is largely attributed to its strategic location on key trade routes close to the port of Barbara, along with its significant role as a political and administrative hub. This growth has inherently led to an increased demand for essential services, housing, and employment opportunities. However, alongside these positive changes, Tog-Wajaale faces pressing challenges, such as inadequate urban infrastructure, limited public services, and a housing sector that is burdened and stretched thin.

Historically, urban planning has struggled to keep pace with the swift growth of Tog-Wajaale. Many areas within the city suffer from underdeveloped infrastructure, including poor road networks, limited access to clean water, unreliable electricity supply, and insufficient sanitation systems. The imbalance between high demand for residential and commercial spaces and their limited availability has also contributed to overcrowded informal settlements and strained local resources.

As the population continues to surge, with projections indicating an area expansion more than twelve-fold by 2055, the current infrastructure and services may fail to meet future needs unless comprehensive urban planning is rigorously pursued. The government, in collaboration with local stakeholders, has acknowledged this urgency and is committed to a transformative vision for the city's future.

The Tog-Wajaale Urban Expansion Project is designed to meet these challenges by providing a comprehensive urban development framework that promotes sustainable growth. Its goal is to



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enhance the quality of life for residents while creating a resilient, efficient, and inclusive urban environment. Key focuses of the long-term project include upgrading infrastructure, improving public service delivery, developing affordable housing, and driving economic growth through industrial and commercial initiatives. The project also emphasizes modern urban planning principles, integrating aspects such as climate resilience, green spaces, and smart city technologies to ensure adaptability to the pressing challenges of climate change and urbanization.

This initiative not only addresses current deficiencies but also proactively works towards establishing Tog-Wajaale as a thriving city center capable of supporting its population for many years ahead. The planning process has been meticulous, involving an in-depth analysis of the city's growth patterns, demographic forecasts, socio-economic conditions, and environmental considerations, paving the way for a comprehensive approach to urban development.

1.3. Vision

The Tog Wajaale Urban Expansion Project (2025-2055) aims to transform the area into a regional center for commerce, education, and culture by 2055. The project will focus on developing a diversified economy that includes manufacturing, services, and sustainable industries. Additionally, it will integrate principles of green urbanism, emphasizing renewable energy and climate resilience.

1.4. General Objective:

To transform Tog Wajaale into a vibrant, sustainable, and inclusive city by providing affordable housing, expanding infrastructure, fostering economic growth, preserving cultural heritage, and promoting eco-friendly, climate-resilient urban development for an enhanced quality of life.

1.5. Specific Objectives:

Population Growth and Housing Development: To accommodate Tog Wajaale's growing population with affordable, inclusive, and safe housing solutions while ensuring access to essential infrastructure and services, such as water, sanitation, healthcare, education, and electricity.

Sustainable and Resilient Urban Planning: To integrate environmentally sustainable practices, such as green spaces, waste management, and energy efficiency, while designing urban spaces resilient to climate change and natural disasters.



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Economic Growth and Cultural Preservation: To stimulate economic development through job creation, industrial and commercial expansion and to preserve Tog Wajaale's cultural and historical heritage, balancing modern development with its unique identity.

Efficient Infrastructure and Mobility: To establish and expand efficient infrastructure and transportation networks that connect key city areas, reduce congestion, and promote eco-friendly alternatives like public transit and cycling.

1.6. Significance of the study.

The plan is significant as it highlights the shortcomings of the study areas, particularly due to the absence of a previous expansion plan. It will serve as a guide for structural plans that are developed every decade. Moreover, the implementation of these urban expansion plans aligns with various strategic goals of the Tog Wajaale city administration. These goals include fostering urbanization in smaller and mid-sized kebele centers in the surrounding areas, reducing or eliminating informal development, offering additional affordable housing, safeguarding environmentally sensitive areas from development, and establishing robust economic corridors in the city. Additionally, the plan will bolster ongoing donor-funded projects and initiatives, including recent efforts by the Cities Alliance's Cities and Migration Program aimed at enhancing the capacity of cities to support refugees and migrants.

1.7. Scope of the Project

The scope of this project centers on the urban expansion of Tog Wajaale, Ethiopia, with a strategic vision for the next thirty years (2025-2055). It encompasses several critical dimensions essential for effective urban planning, including demographic analysis, land use planning, infrastructure development, environmental sustainability, and economic growth. The key components of the study's scope are as follows:

Demographic Analysis: This component involves a thorough examination of Tog Wajaale's population growth trends through 2055, focusing on factors such as migration patterns and urbanization. Additionally, socio-economic factors will be assessed, including income levels, employment rates, education access, and housing needs, to effectively address the diverse requirements of the community.

Land Use Planning: An evaluation of current land use in Tog Wajaale will be conducted to identify underutilized areas that present opportunities for development. Future land needs will be



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estimated based on projected population growth and urban density goals, ensuring that land is allocated efficiently.

Infrastructure Development: This aspect investigates the existing transportation systems, including roads and public transit options, aiming to enhance mobility within the city. Plans will also be made to expand essential utilities such as water, sewage, and electricity infrastructure to accommodate the growing demand from residents and businesses.

Environmental Sustainability: Efforts will be made to mitigate environmental impacts associated with urban expansion by addressing issues like land degradation and biodiversity loss. The integration of green spaces, the promotion of renewable energy initiatives, and the establishment of efficient waste management systems will be core components of this focus area.

Economic Development: Key growth sectors within Tog Wajaale's economy will be identified, and mixed-use developments will be promoted to seamlessly integrate residential and commercial spaces, thereby enhancing urban vibrancy and fostering economic activity.

Governance and Engagement: A review of existing policies related to urban expansion will be conducted, alongside active engagement with stakeholders, including community members and the private sector. This collaborative approach aims to ensure inclusive planning processes that reflect the needs and aspirations of all residents.

Feasibility Studies Financial viability, cost assessments, and funding options will be thoroughly analyzed, with an emphasis on leveraging public-private partnerships. Potential risks will be identified, and mitigation strategies will be developed to ensure smooth implementation of the urban expansion plans.

Technological Integration Smart city technologies will be adopted to enhance traffic management and service delivery. Geographic Information Systems (GIS) will be utilized for comprehensive analysis of land use, infrastructure, and demographic data, supporting data-driven decision-making throughout the planning process.

1.8. Location and Area

Tog Wajaale City is located in the Somali Regional State, specifically within the Tog Wajaale Woreda of the Fafen Zone. It is situated approximately 90 km from Hargeisa and about 249 km from the port of Berbera, as well as 70 km from Jigjiga, the capital of the Somali Regional State. The



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city lies around 175 km east of Harar along the main highway that connects Tog Wajaale to Jigjiga, Harar, and Dire Dawa, positioning it roughly 70 km east of Jigjiga. Geographically, it is located at an approximate latitude of 38P 1061474.60m N and a 316716.77m E longitude.

Tog Wajaale was established as a city administrative center in 2009 E.C. It includes 20 kebele administrations, with 7 kebele situated in the built-up areas and 13 kebele in the surrounding peripheral regions.

The total built-up area of Tog Wajaale is around 711 hectares. Its urban area has a relatively compact shape, extending slightly to the south, west, and southeast, in line with the main routes leading to Jigjiga, Harti Shek, and Awbare.

With plans for urban expansion, Tog Wajaale's current area of 711 hectares is expected to grow significantly, potentially increasing by 12.6 times by 2055. This growth will be driven by factors such as migration patterns, local demographics, regional economic activities, and proximity to border areas like Somalia.



Cities Alliance
Cities Without Slums

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TOG-WAJAALE_CITY_LOCATION_ON_MAP

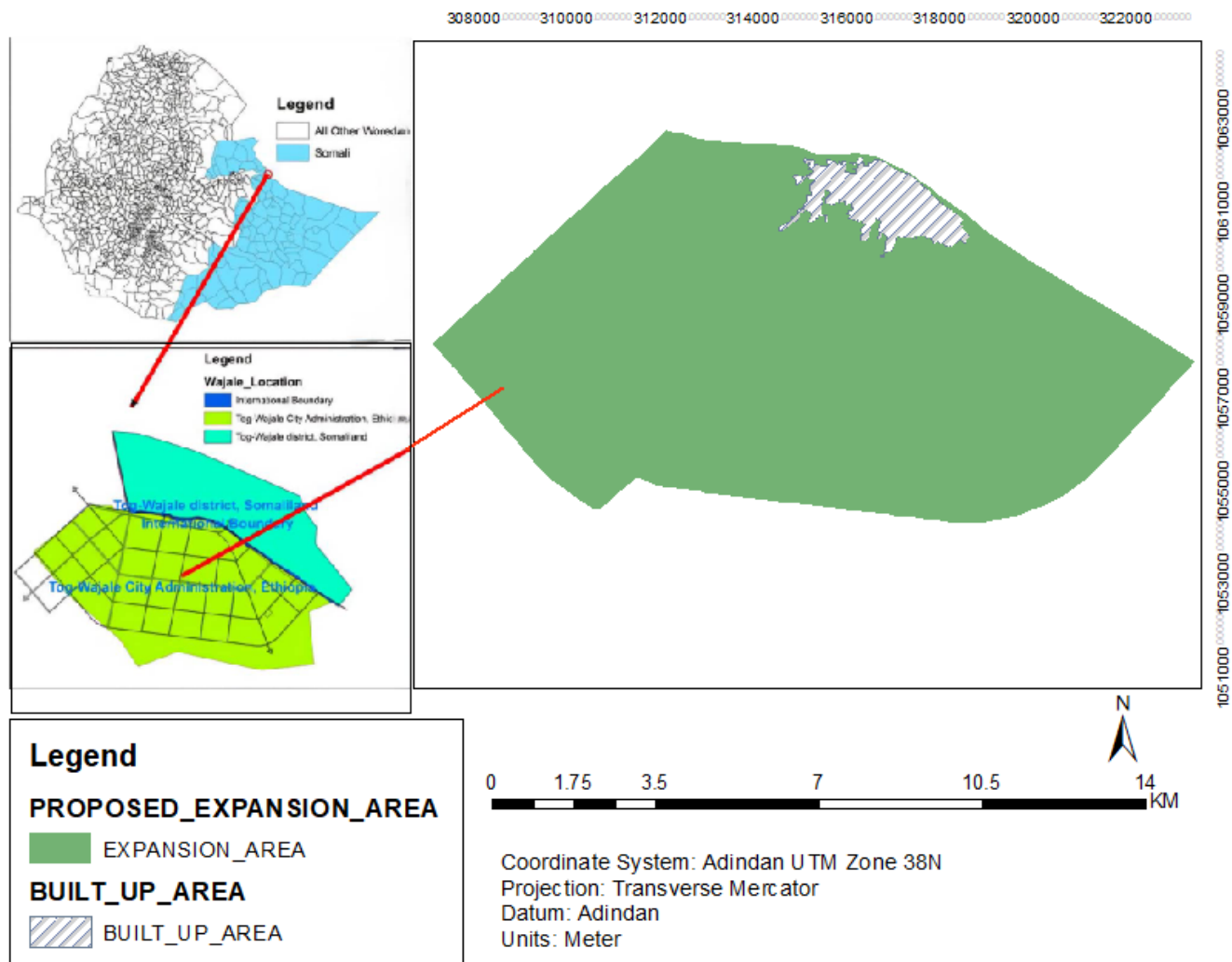


Figure 1 TOG-WAJAALE_CITY_LOCATION_ON_MAP

Source: Tog Wajaale City urban expansion team



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2. Chapter Two Literature Review Global Urbanization

Urban expansion is the word for the rapid growth and development of cities as a result of global urbanization to accommodate their growing populations (European Environment Agency, 2006; UN-Habitat, 2006). “Urban expansion is an inevitable reality; urban expansion planning prevents a disorderly development of congested in formal settlements with measurable benefits for climate change mitigation and adaptation” (Patric Lamson). Rural-urban migration is leading to rapid increases in the populations of secondary cities, causing massive urban expansion. Between 2000 and 2020, the total urban population in less-developed countries grew by 70%, or 1.39 billion people (United Nations 2018). This growth is driven both by natural increase and rural-urban migration (Keyfitz 2010). Rapid population growth during this period has led to a quadrupling of the built-up area of cities in less-developed countries (Pesaresi et al. 2016). In particular, secondary cities in Sub-Saharan Africa doubled their population and increased their extents by a factor of 2.5 during this period (Angel et al. 2016). Much of this urban expansion took place in areas without adequate infrastructure, often extending into environmentally sensitive areas (Friesen et al. 2019; Lamson-Hall et al. 2018).

Different authors developed various theories of urban expansion to explain more about the case of spatial expansion and land use changes of urban areas to peripheral farmland. The expansion of urban centers brings a political/administrative process that involves the reclassification of rural areas to urban areas. The exercise of reclassifying rural areas as urban is often thought to be a productive strategy for stimulating economic development. This is based expectation that adjustments to the overall structure of the system of cities within a country have the ability to influence a country’s socioeconomic composition, forwarding to supplementary growth and development (Asmera, 2018)

Reclassification of settlements contains three sub-components. These are the expansion (or contraction) of existing urban boundaries, the capture of adjacent settlements, and the addition or subtraction of new settlements that grow beyond a designated threshold (Farrell, 2014). From various theories discussed with main theories of expansion depending on purpose to expand, a few of them are microeconomic theory, urban economic benefits theory, and urban social production theory.

Urban expansion in Africa and other developing countries occurred and is happening by encroaching fertile agricultural land (Firman, 2009). ‘In several developing countries, this has been



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noted to increase ecological and social vulnerability and left people displaced, disempowered and destitute' (Aboda et al., 2019, p. 1).

Global urbanization is one of the most significant trends of the 21st century, with the United Nations (2018) predicting that by 2050, 68% of the world's population will live in urban areas, up from the current 56%. This rapid growth is particularly concentrated in Asia and Africa, where urbanization is reshaping demographics and spatial dynamics. Urbanization is both a driver and outcome of economic transformation, influenced by industrialization, population growth, and rural-to-urban migration.

2.1. Historical Evolution of Urban Expansion

Urban growth has evolved through several key stages including Pre-Industrial Cities, early urban areas, like those in Ancient Mesopotamia, Egypt, and Rome, were small and focused on religious, military, and trade functions. Growth was slow and constrained by defensive walls and technological limitations (Hall, 1996). While in Medieval Cities, urban expansion was limited by old boundaries, with cities growing around religious institutions and localized trade networks, though infrastructure was lacking (Knapp, 2011). When it comes to the Industrial Revolution (18th-19th Century) the rise of factories and mass migration from rural to urban areas led to rapid expansion. New infrastructure, such as railroads, spurred growth, but overcrowding and unsanitary conditions were common (Knapp, 2011). But Post-Industrial and Contemporary Cities The 20th century saw cities expanding both horizontally and vertically, with automobiles and skyscrapers shaping urban sprawl and the rise of megacities (Hall, 1996).

2.2. Theories of Urban Growth

Several theoretical models explain how cities expand:

As Burgess (1925) said, Cities grow in concentric circles, with zones for residential, industrial, and commercial areas. This model is seen in early 20th-century industrial cities like Chicago. There is also another theory saying that cities grow in a Sector Model, influenced by infrastructure like highways and railroads, as seen in cities like New York, (Hoyt, 1939), in contrast to that Harris & Ullman 1945, also mentioned Cities grow around multiple centers or "nuclei" such as industrial hubs and educational institutions, leading to more complex forms. but Modern cities often develop multiple cores (Polycentric) with business, residential, and commercial areas spread across regions, facilitated by globalization and technological advancements (Glaeser, 2011).



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2.3. Urban Expansion vs. Urbanization

Urban expansion and urbanization are related but distinct concepts. Urban Expansion refers to the physical growth of urban areas, either through outward sprawl or vertical development. It is primarily a spatial process influenced by population growth, infrastructure, and available land. Castells (2000) notes that this growth can occur without significant changes in social or economic structures.

Urbanization, on the other hand, involves broader social, economic, and demographic transformations as rural populations migrate to urban centers. It typically includes a shift from agrarian economies to industrial and service-based economies, accompanied by changes in labor, living conditions, and social structures (Glaeser, 2011). While urban expansion can occur without urbanization, the latter often leads to changes in the economy and society.

2.4. Global Patterns of Urban Expansion

Urban expansion manifests differently across regions, influenced by various geographical and social factors like Sprawl, which is Common in North America and parts of Australia. Urban sprawl involves low-density outward growth into rural areas, driven by car dependence and a preference for suburban living. It can lead to inefficient land use, environmental degradation, and higher transportation costs (Newman & Kenworthy, 1999). And many European and Asian cities seen infill development involve building within existing urban areas, maintaining higher population densities and reducing the need for outward expansion. This helps preserve green spaces and agricultural land (Hall, 1996). In Southeast Asia, see Vertical Expansion. In densely populated megacities is crucial to accommodate large populations within limited space. This approach integrates residential, commercial, and leisure spaces (Glaeser, 2011). But Urbanization in Developing Regions like sub-Saharan Africa and parts of Asia, rapid urbanization often leads to informal settlements and slums due to mass migration and inadequate infrastructure, resulting in poor living conditions (United Nations, 2014).

2.5. Drivers of Urban Expansion: Factors Influencing Urban Growth

Urban expansion is influenced by multiple factors, including demographic, economic, and migratory forces. These factors shape both the pace and scale of urban growth.



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2.5.1. Demographic Transition and Urban Growth

Urbanization and population growth are closely linked to the stage a society is in within the demographic transition model, like in the pre-industrial periods, societies were agrarian, with high birth and death rates, limiting urbanization. As Lee (1986) notes, urbanization was slow and mostly confined to cultural centers like Ancient Rome or Mesopotamia. On the other hand, due to Industrialization and Urbanization, birth and death rates decreased due to better healthcare, leading to rapid population growth in cities. Ginsburg (2007) highlights that industrial economies require large workforces, driving people to urban areas. Post-Industrial Societies In advanced economies, birth rates stabilize or decline. Despite this, urbanization persists due to migration and the growth of the service sector. Castells (2000) points out that migration, rather than natural population growth, often drives urbanization in developed countries.

Case Studies: In countries like China and India, rapid urbanization is driven by both migration and population growth, whereas in Europe, urbanization is slower due to aging populations and lower fertility rates (United Nations, 2014).

2.5.2. Economic Drivers of Urban Expansion

Economic factors are crucial in determining the scale and speed of urban growth, So The shift from agrarian to industrial economies catalyzes urban expansion. Sassen (2001) notes that industrialization centralizes labor around factories, drawing workers to cities. And Cities with access to global trade routes, like New York and Shanghai, see substantial economic growth, leading to urban expansion. Friedmann and Wolff (1982) emphasize that globalization boosts urban growth by enhancing trade infrastructure and increasing connectivity. Also, Government policies can significantly impact urban growth. Countries investing in infrastructure and economic development, such as South Korea and Singapore, experience rapid urbanization due to both public and foreign investment (Amin & Thrift, 2002).

2.5.3. Migration and Urbanization

Migration plays a key role in urban population growth, whether through rural-to-urban migration, internal displacement, or international migration. for example, Rural-to-Urban Migration Individuals often move to cities seeking better economic opportunities, education, or living conditions. According to Tacoli (1998), this migration is a primary cause of urban growth, particularly in developing nations like Brazil and Mexico. On the other hand, due to Political



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conflict, natural disasters, or economic hardship can displace people within countries, sending them to cities in search of safety and opportunities. In addition to that according to Zlotnik (2003). Migration across borders, particularly to cities that serve as economic hubs, accelerates urban growth.

2.5.4. Technological Advancements and Urban Growth

Technological advancements in transportation, construction and communication have significantly shaped urban growth, so due to the rise of automobiles and railroads has enabled horizontal city expansion. Cities like Los Angeles and Atlanta are built around car infrastructure, while places like Tokyo and Hong Kong have thrived with efficient public transit systems. Newman and Kenworthy (1999) highlight that efficient transportation is key to both the spread and density of cities. On the other hand, Construction Technologies also has allowed vertical growth in dense cities. As Glaeser (2011) suggests, skyscrapers are crucial for accommodating large populations in limited space, such as in New York or Shanghai.

Communication Technologies: Advancements in digital tools and remote working have enabled economic activity to spread across cities, enhancing global connectivity. Castells (2000) argues that communication technologies have integrated cities into global networks, facilitating urban growth.

2.5.5. Government Policies and Planning

Government policies, infrastructure development and proactive planning play a pivotal role in shaping urban growth for example Land-use regulations and zoning laws determine the spatial organization of cities. For example, Paris's dense, mixed-use zoning contrasts with Los Angeles' sprawling, segregated land use also Investments in infrastructure, such as roads and public transport, drive urban expansion. China's extensive investments in high-speed rail have accelerated the growth of cities like Shenzhen and Beijing. (Hall, 1996). Proactive urban planning that prioritizes sustainability, as seen in Copenhagen and Amsterdam, helps manage growth and mitigate sprawl; Create more livable, sustainable urban spaces. Barton et al. (2015)

2.6. Impacts of Urban Expansion

2.6.1. Economic Impact Urban expansion drives significant economic growth:

Cities like New York and Hong Kong attract diverse industries, creating numerous job opportunities (Glaeser, 2011). Also, Urban growth fosters new businesses and attracts investment,



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as seen in Shanghai's rise as a global financial hub. In addition to that Cities like London and Berlin created Diversification economic activities and become center of transition from manufacturing to finance, technology, and services, diversifying their economies.

2.6.2. Social Impact Urban expansion affects social dynamics:

In equality and segregation caused development of slum areas and wealthy areas that concentrate higher class groups so this causes exacerbating in equality and impoverished slums in cities like, Sao Paulo (Piketty, 2014). While urban areas can improve access to education and healthcare, rapid growth often outpaces the development of public services, particularly in cities like Lagos and Nairobi.

2.6.3. Environmental Impacts of Unplanned Urban Expansion

Unplanned urban expansion negatively affects the environment. For example, Urban Sprawl Expansion often encroaches on green spaces and agricultural land, as seen in Los Angeles (Newman & Kenworthy, 1999). Also, when cities grow demand more energy, contributing to higher emissions, as seen in most of the metropolitan cities. New York and London, and Delhi, cities expansion causes the loss of Biodiversity, like in São Paulo, contributing to the destruction of ecosystems such as the Amazon Rainforest. In addition to that Un planned Urban expansion causes housing shortages, leading to informal settlements and slums.

2.6.4. Health Implications Urban growth affects public health:

Unplanned urban expansion causes poor sanitation, which affects public health since low-income households are concentrated in un planed are in the urban periphery mental and other health problems can spread. In addition to that un planed urban expansion causes gridlock and inefficient transportation systems, resulting in long commute times.

2.7. Informal Economy and Urban Expansion

2.7.1. Urban Expansion in Developing Countries

Urban expansion in developing countries presents unique challenges shaped by factors such as economic growth, migration, and technological change. Below are key issues driving urban growth in these regions. In many developing cities, informal economies play a critical role in urban life. A large portion of the workforce is employed in sectors like street vending, construction, and



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domestic work (Santos, 2002). Informal economies are essential for urban survival in cities like Lagos and Mumbai, where many residents face barriers to formal employment (Portes & Roberts, 2005). Informal activities, though often hindering formal sector growth, stimulate local economies by providing affordable goods and services (World Bank, 2017).

2.7.2. Housing Shortages and Slums

Rapid urbanization leads to significant housing crises. Cities such as Cairo and Nairobi face unplanned growth, with insufficient affordable housing driving the development of informal settlements (UN-Habitat, 2016). These slums, characterized by overcrowding and lack of basic services, are often built on illegally occupied land (Karanja, 2011). Despite efforts like urban renewal projects, slums continue to grow, exacerbating social inequality and leading to public health issues (Huchzermeyer, 2004).

2.7.3. Urbanization and Environmental Degradation

Uncontrolled urban growth in developing countries leads to severe environmental degradation. Deforestation, as seen in Manila and São Paulo, reduces biodiversity (Seto et al., 2012), while the conversion of agricultural land for urban development threatens food security (Meier, 2015). Pollution, both air and water, becomes a major concern, particularly in cities like Lagos and New Delhi, where inadequate waste management contributes to health hazards (Davis, 2006).

2.7.4. Transportation Challenges

Rapid urban growth strains transportation systems, causing severe congestion. Cities like Mexico City and Jakarta struggle with traffic jams due to insufficient public transport (Litman, 2013). Many cities in the Global South lack adequate bus and train networks, resulting in long commute times and limited access to services (World Bank, 2017). However, cities like Bogotá have introduced innovative solutions like bus rapid transit to improve mobility.

2.8. Policy Challenges in Managing Growth

Governments in developing countries face significant challenges in managing urban expansion. Rapid urbanization often outpaces the provision of infrastructure and services, creating overcrowded informal settlements (Dixon, 2008). Fragmented urban governance and corruption complicate the implementation of effective urban planning (Harris, 2013). Although some policies aim to address housing shortages and slum upgrading, they often fail due to political and logistical



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barriers (Dube, 2015). Balancing growth with sustainability remains a key challenge for cities like Lagos and Manila (Baker, 2017). In conclusion, while urban expansion in developing countries offers economic opportunities, it also brings challenges related to informal economies, housing, environmental degradation, transportation, and governance. Addressing these issues requires effective urban planning and investment in infrastructure.

2.8.1. Sustainable Urban Expansion Models

Sustainable urban expansion focuses on developing cities that grow while maintaining environmental, social, and economic balance. The following are key models for achieving sustainable urban growth:

2.8.2. Green Urbanism

Green Urbanism promotes eco-friendly cities that integrate sustainable design and urban planning. Key elements include: Green Spaces, Parks, urban forests, and green roofs that improve air quality, regulate temperature, and offer recreational areas. Copenhagen is a model with extensive green corridors (Beatley, 2000), also Energy-Efficient Buildings, materials and renewable energy sources reduce energy consumption. Vancouver enforces green building codes to promote sustainability. In addition to that Sustainable Transport Prioritizing public transit, bike lanes, and electric vehicles reduces fossil fuel reliance. Bogotá's Ciclovía, a network of car-free streets, serves as an example of promoting sustainable mobility.

2.9. Urban Resilience and Climate Change

Building resilience to climate change is crucial for urban areas and New York City's One NYC plan focuses on green infrastructure and resilient construction to address climate vulnerabilities (Pelling, 2011); Cities like Mexico City invest in early warning systems and disaster-resilient infrastructure. Also, Singapore's ABC Waters Program is a prime example for Natural solutions, like rain gardens and permeable pavements, help manage stormwater and reduce flooding.

2.9.1. Socially Inclusive Urban Expansion

Sustainable urban growth should ensure social equity; Cities like Vienna have social housing policies to provide low-income housing and reduce inequality (Davis, 2006). In addition to that Participatory planning in cities ensures that marginalized communities have a voice in urban



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development, and integrated social services like transport and public spaces insure to benefit all residences.

2.9.2. Public-Private Partnerships (PPPs)

PPPs are key in driving sustainable growth by leveraging private investment and expertise because PPPs fund large-scale infrastructure projects like renewable energy or public transport. Dubai's Sustainability City integrates private innovation in urban development. Also, as seen in London's Olympic Park regeneration promotes sustainable and mixed-use developments apart from that Cities like New York and Singapore partner with the private sector to achieve goals like net-zero emissions and green building standards. (Sclar, 2000).

2.9.3. Urban Agriculture and Sustainability

Urban agriculture enhances sustainability and food security for example, Community Gardens Initiatives like New York's rooftop gardens provide fresh produce to urban areas, improving food access and security (McClintock, 2010). Also, Vertical Farming Cities like Singapore use vertical farming to grow food in high-rise buildings, reducing land use and environmental impact (Al-Hafedh, 2018). Some other cities are turning vacant lots into urban farms, contributing to local food production, economic development, and environmental sustainability.

2.9.4. Urban Poverty and Informality

In conclusion, sustainable urban expansion integrates green design, climate resilience, social inclusion, public-private collaboration, and urban agriculture to create cities that thrive environmentally, socially, and economically.

2.9.5. Urban Expansion Challenges in African Cities

Urban expansion in Africa is marked by rapid population growth, informal settlements, and infrastructure deficits. Despite the challenges, there are opportunities for economic growth and transformation. This section outlines key urban challenges and highlights case studies from African cities.

Urban poverty and informality are widespread in Africa. Informal settlements in cities like Nairobi (Kenya) and Lagos (Nigeria) lack basic services and secure land tenure. The informal economy,



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which includes street vending and petty trading, employs over 70% of urban populations (World Bank, 2020), contributing to economic inequality and vulnerability.

2.9.6. Infrastructure Deficits

Urban growth outpaces infrastructure development in many African cities: like Kinshasa (DR Congo) face severe water and sanitation issues, leading to health risks. While Cities such as Accra (Ghana) and Lagos (Nigeria) struggle with inconsistent electricity supply, hindering economic development (UNDP, 2019). And some other cities like Dar es Salaam (Tanzania) and Abidjan (Ivory Coast), are sphering Congestion, inadequate public transport and this reduce efficiency and access to opportunities.

2.9.7. Environmental Sustainability

The rapid growth of cities has led to environmental challenges and many cities like Nairobi, Accra, are sphering inadequate waste disposal that causes environmental pollution and health risks (African Development Bank, 2020). In addition to that High pollution levels from vehicles and industries contribute to respiratory diseases in cities like Lagos and Cairo (WHO, 2020). In the Ethiopian case due to Urban sprawl Addis Ababa and some other cities reduces fertile land and leads to deforestation and soil erosion.

2.9.8. Urban Governance and Planning

Weak governance and fragmented planning hinder effective urban development as stated Many cities, like Lagos and Cairo, lack the resources to manage rapid urbanization effectively this caused the need of Institutional Capacity, and due to Fragmented Planning Cities like Nairobi and Abuja (Nigeria) suffer from ad-hoc urban planning, making it difficult to provide services and ensure equitable access.

2.9.9. Urban Violence and Crime

Urban growth exacerbates poverty and inequality, leading to social unrest and crime for example Poverty, Inequality Economic disparities and youth Unemployment in cities like Johannesburg Lagos, Nairobi and Kinshasa, leads to increased involvement in criminal activities.



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2.9.10. Case Studies

Some studies done by different scholars in some African cities like Nairobi, shows Rapid urbanization has led to informal settlements like Kibera, with the government focusing on slum upgrading and infrastructure improvement; Kigali is undergoing an ambitious urban transformation, focusing on green spaces, affordable housing, and sustainable development. While Accra's rapid urban growth is met with challenges in housing and transport, but the city is investing in urban regeneration and public infrastructure. Same like other developed world Addis Ababa, master plan emphasizes sustainable development, with a focus on green buildings, waste management, and public transport also Cape Town, is addressing housing shortages and water scarcity through slum upgrading and social housing initiatives, while improving public transport.

2.10. Urban Expansion in Ethiopia

Ethiopia is experiencing rapid urbanization, driven by population growth, migration, and economic development. Cities like Addis Ababa, Hawassa, and Dire Dawa are at the forefront of this transformation, posing both challenges and opportunities for sustainable development.

Ethiopia is known for its minimal level of urbanization in Africa with an agriculture-based economy (Alacia, 2010). Surprisingly, now urban expansion in Ethiopia is booming. Annually, urban population is increasing at a rate of 5% (Ministry of Urban Development and Housing (MoUDH, 2016). agriculture has a lion's share in the economic growth of the people, urban expansion should be handled in ways that restore the economy and social well-being of the urban and peri-urban communities. Because urban expansion provides more room for the non-food producer, it also creates an extra burden on food demand (Satterthwaite et al.,2010).

2.10.1. Population Growth and Urbanization

Ethiopia's urban population is growing fast, projected to rise from 20% in 2010 to 30% by 2030. This is driven by high birth rates, rural-to-urban migration, and improved healthcare. Urbanization creates pressure on infrastructure, housing, and public services. And this is due to Migrants are searching better job opportunities and services is a key factor.

2.10.2. Urbanization and Economic Development

Urbanization has driven economic growth, particularly in Addis Ababa, a hub for industrialization and services. Addis Ababa leads Ethiopia's economic development through industrial parks and



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service sector growth. Urbanization has created jobs, particularly in manufacturing, construction, and services. However, Urbanization is not limited to Addis Ababa. Cities like Hawassa, Dire Dawa, and Mekelle are also growing rapidly due to localized economic development, while Addis Ababa is expanding rapidly with infrastructure projects like the Light Rail and new housing developments. Also, Hawassa and Dire Dawa are both growing due to industrial parks, improved transport, and strategic locations.

2.10.3. Urbanization and Employment Creation

Urbanization has opened new job opportunities in manufacturing, services, and construction, contributing to Ethiopia's economic diversification. Industrial parks, particularly in Hawassa, have created thousands of jobs. Also, Growth in sectors like finance, ICT, and healthcare is fueling urban economic expansion.

2.10.4. Urban Expansion and Land Use Planning

Effective land use and planning are crucial for managing Ethiopia's urban expansion and ensuring sustainability. Informal land tenure is a challenge in rapidly growing cities like Addis Ababa. Efforts are being made to formalize land rights and improve zoning. So, balancing residential, commercial, and green spaces is key to ensuring long-term growth without compromising the environment.



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3. Chapter Three Assessment Approaches and Methodology

This section outlines the assessment approaches and methodologies that will be employed in the study of the Tog Wajaale Urban Expansion Project, aimed at providing a comprehensive understanding of urban growth and development as it approaches 2055.

Planning Approach

The methodology of the planning task was mainly incorporated the deployment of various participatory mechanisms at every stage of the planning process and sector-based evaluation of the existing plan, and necessary input was generated. In addition, work procedures for reporting, participation of stakeholders, supervision, and approval were prepared. Moreover, the exploration of planning ideologies and principles, use of technological tools for data capture, analysis, and communication were essential to perform the project.

Deployment of detailed data collection on the characteristics of the city and its environs as well as the potential and constraints for future development, was identified in the process. Series meetings were also conducted to incorporate the views and interests of the key stakeholders to come up with a widely accepted development.

3.1. The study type:

The study type was descriptive, since the aims was to in light the future development process of the city. and both qualitative and quantitative was used, in the qualitative method was used to explain the non-numeric information while quantity type was use to explain in the numeric data analysis.

3.2. Sampling system.

The sampling system was direct and purposive selection due to the time and the financial limitations.

3.3. Data sources

Primary and secondary data were collected. Primary data mostly spatial data Was collected using surveying equipment. And land intensity was derived from Land satellite imagery for past 40years



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(approximately 1984-2024) while considering the availability of cloud-free photos and the scientific necessity Urban land expansion of the town during the past three decades was calculated using cloud-free multispectral scanner satellite pictures from 1985 and cloud-free thematic mapper. While secondary data collected from publish or unpublished documents, utilizing historical and recent census data to analyze demographic trends, population growth, and socio-economic indicators.

Government Reports and Studies: Review existing government publications, urban planning reports, and academic studies related to Tog Wajaale urban development.

GIS Data: Gather spatial data related to land use, infrastructure, and environmental features from Geographic Information Systems (GIS). also reviewed case studies of similar cities in Ethiopia or comparable contexts to draw lessons and best practices applicable to Tog Wajaale.

3.4. The data collection instruments

The team used multiple instrument types like participant observation, interviews, and snowball method of data searching. also, map and image analyzing tools were used. Surveys and Questionnaires were used to target residents, local administrations, Agro-pastorals, business owners, and stakeholders to gather insights on community needs, perceptions of urban expansion, and socio-economic conditions. Interviewers Performed structured and semi-structured interviews with key stakeholders, including government officials, urban planners, community leaders, and business owners, to gather qualitative data on urban planning perspectives. Organizing workshops and focus group discussions with community members, local leaders, and stakeholders to validate findings, gather feedback, and refine planning strategies.

3.5. Analytical Approaches

Both qualitative and quantitative approaches were used since using only one is insufficient. Quantitative Analysis Statistical techniques to analyze demographic data and project population growth patterns. Also, sophisticated software like SPSS and GIS was used to analyses spatial land use patterns, infrastructure distribution, and environmental features. GIS Software supported to visualize and assess urban growth areas. In contrast to that, Qualitative Analysis is used to analyze data from interviews and open-ended survey responses to identify common themes, perceptions, and concerns regarding urban expansion.



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3.6. Environmental Assessment

An Environmental Impact Assessment (EIA), was conducted to evaluate the potential environmental impacts associated with proposed urban expansion initiatives. This included assessments of land use changes, water resource management, and biodiversity impacts. environmental experts involved to ensure comprehensive evaluation and adherence to sustainability principles.

3.7. Economic Analysis

It performed cost-benefit analyses on the proposed urban development projects to assess their economic viability and impact on local communities and also analyzed potential funding sources, including government budgets, international aid, and private investments.

3.8. Reporting and Recommendations

Consolidate report produced on the findings from quantitative and qualitative analyses to provide a comprehensive overview of the urban expansion context in Tog Wajaale. And proposed implementable recommendations based on the study's findings, focusing on sustainable urban planning, infrastructure development, and community engagement strategies.



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4. Chapter Four Existing Situation Assessment

The following topics will cover aspects of the topographic and infrastructure situations in the Tog Wajaale expansion areas, such as location, elevation, slope, climate, environmental hazards, site morphology, road network, and infrastructure. These are critical to ensure sustainable and resilient development for the city.

4.1. Topographic Features

4.1.1. Elevation:

Tog Wajaale is primarily characterized by gently flat plains, accompanied by some rolling terrain and outcrops that reach elevations ranging from approximately 1,510 to 1615 meters above sea level. The landscape features moderate elevation changes, making it suitable for urban development.

The elevated areas, particularly those near the northern and northeastern borders, are ideal for urban development aimed at wealthier populations or public institutions. In contrast, the central, western, southwestern, and southern parts of the city are relatively flat, making these regions well-suited for large-scale residential, commercial, and industrial developments.

For expansion, the region surrounding Tog Wajaale consists of flat to gently rolling terrain, interspersed with ridges. Additionally, significant dry riverbeds and seasonal watercourses are present, which can impact land use for agriculture, housing, and infrastructure development.

Overall, the city's topography is favorable for urban expansion, with flat areas offering ample space for substantial infrastructure projects, including roads, utilities, and housing.

4.1.2. Slope Analysis

The slope of the land is a crucial factor in construction, road development, and drainage planning. Analyzing the slope helps identify areas that may be prone to erosion or flooding, as well as those capable of supporting dense urban development.

In Tog Wajaale, the general slope in most urban areas ranges from 1% to 5%, which is relatively gentle and conducive to development. However, steeper slopes can be found in the western region and along the riverbeds in the northwestern areas. While the city features gently sloping sections, the central, southern, southeastern, and southwestern parts—especially near seasonal riverbeds—



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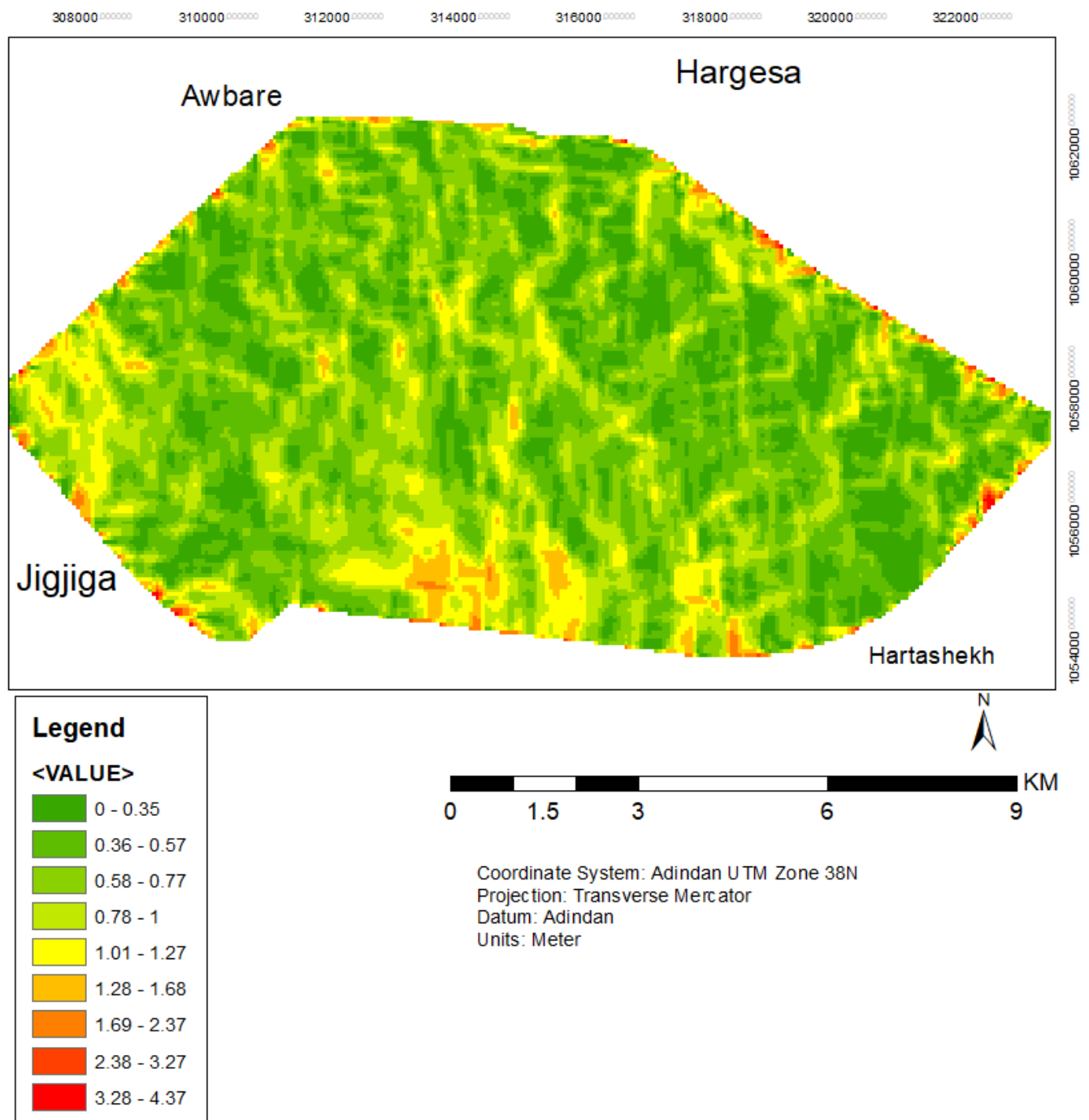
are more vulnerable to waterlogging or flash floods during the rainy season. Therefore, careful planning for drainage systems in these areas is essential.



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TOG-WAJAALE_CITY_SLOPE_ANALYSIS_MAP





TOG-WAJAALE CITY URBAN EXPANSION PLAN REPORT

Figure 2 TOG-WAJAALE_CITY_SLOPE_ANALYSIS_MAP

Source: Tog Wajaale City urban expansion team.



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4.1.3. Climate Condition

Tog Wajaale, located along the Somaliland-Ethiopia border at elevations of 1,550 to 1,635 meters, experiences a hot semi-arid climate with low rainfall levels (300 to 500 mm annually). Key aspects include:

- ✓ Temperature: Daytime ranges from 28°C to 35°C, with warmer nights expected due to climate change, increasing heat stress on health and livestock.
- ✓ Rainfall: Rainfall is concentrated in the Gu (April–June) and Deyr (October–November) seasons. Climate change may cause erratic rainfall patterns and an increased risk of flash flooding, threatening agriculture.
- ✓ Droughts: The region faces ongoing droughts, which may extend with climate change, exacerbating desertification and impacting local livelihoods
- ✓ Dust Storms: Increased wind speeds may lead to more frequent dust storms, negatively affecting air quality and agriculture.
- ✓ Water Resources: Agriculture is highly dependent on seasonal rainfall, and climate change could further stress water supplies, necessitating improved water management and adaptive strategies.
- ✓ Summary of Challenges and Adaptation Strategies
- ✓ To address these challenges, strategies should include enhancing water management, adopting drought-resistant crops, building community resilience, and fostering research collaborations. A comprehensive approach is essential to mitigate impacts and promote sustainable practices in Tog Wajaale.

4.1.4. Constrains and Environmental Hazards

The environmental hazards in Tog Wajaale can significantly impact urban expansion, especially considering the city's location in a semi-arid region. These risks must be taken into account when planning for growth, infrastructure, and public safety.

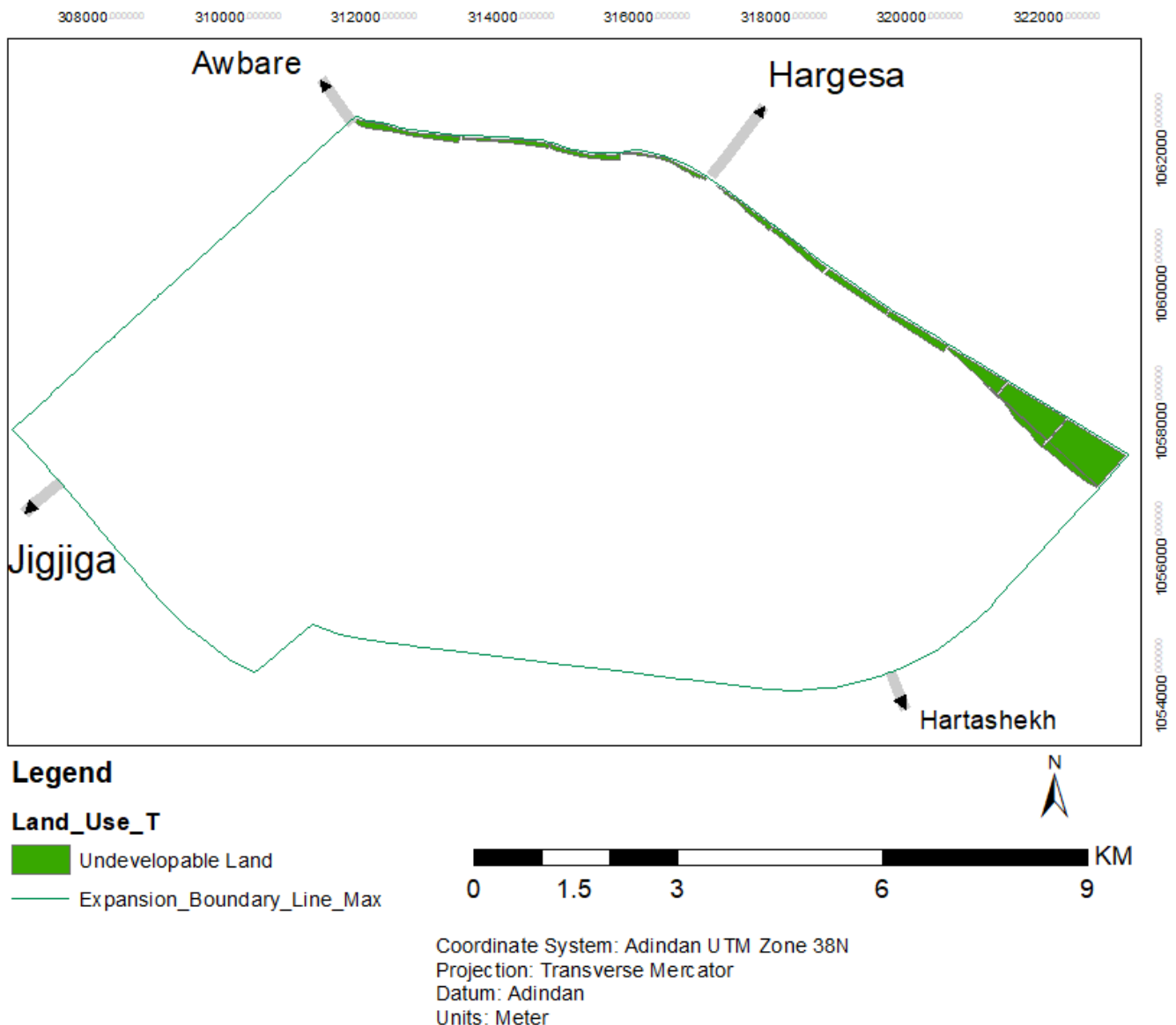
Tog Wajaale is susceptible to periodic droughts, which can affect water availability and agricultural productivity in the surrounding areas. Although the city is not situated near major rivers, seasonal rains can lead to flash flooding, particularly in low-lying areas near the riverbeds in the northwest and northeast. As a semi-arid region, Tog Wajaale is also at risk of desertification, which can result from deforestation, poor land management practices, and climate change. Therefore, careful land management and the promotion of sustainable land-use practices are essential in areas designated for expansion.



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Additionally, the sloped regions in the northern and eastern parts of the city are vulnerable to flooding due to the nearby river, especially during heavy rainfall. Therefore, erosion control methods will be necessary to mitigate these risks.

TOG-WAJAALE_CITY_PROPOSED_UNDEVELOPABLE_LAND_MAP





TOG-WAJAALE CITY URBAN EXPANSION PLAN REPORT

Figure 3 TOG-WAJAALE_CITY_PROPOSED_UNDEVELOPABLE_LAND_MAP

Source: Tog Wajaale City urban expansion team.

4.1.5. Site Morphology

Morphologically, Tog Wajaale is well-suited for expansion, featuring an overall flat landscape that can accommodate a growing urban population. The urban area is already experiencing a mix of residential, commercial, and industrial developments, with further growth planned in the surrounding regions.

The city center serves as the current economic and administrative hub, boasting well-established commercial activities. The surrounding areas, particularly to the south and west, are primed for new residential developments, primarily because they offer the greatest potential for development, given their relatively flat terrain and proximity to major roads and utilities. These locations are capable of supporting large-scale residential and industrial growth.

Planning for public parks, recreational areas, and green belts will be essential in balancing urbanization with environmental sustainability and providing residents with much-needed public spaces.

4.2. Road Network

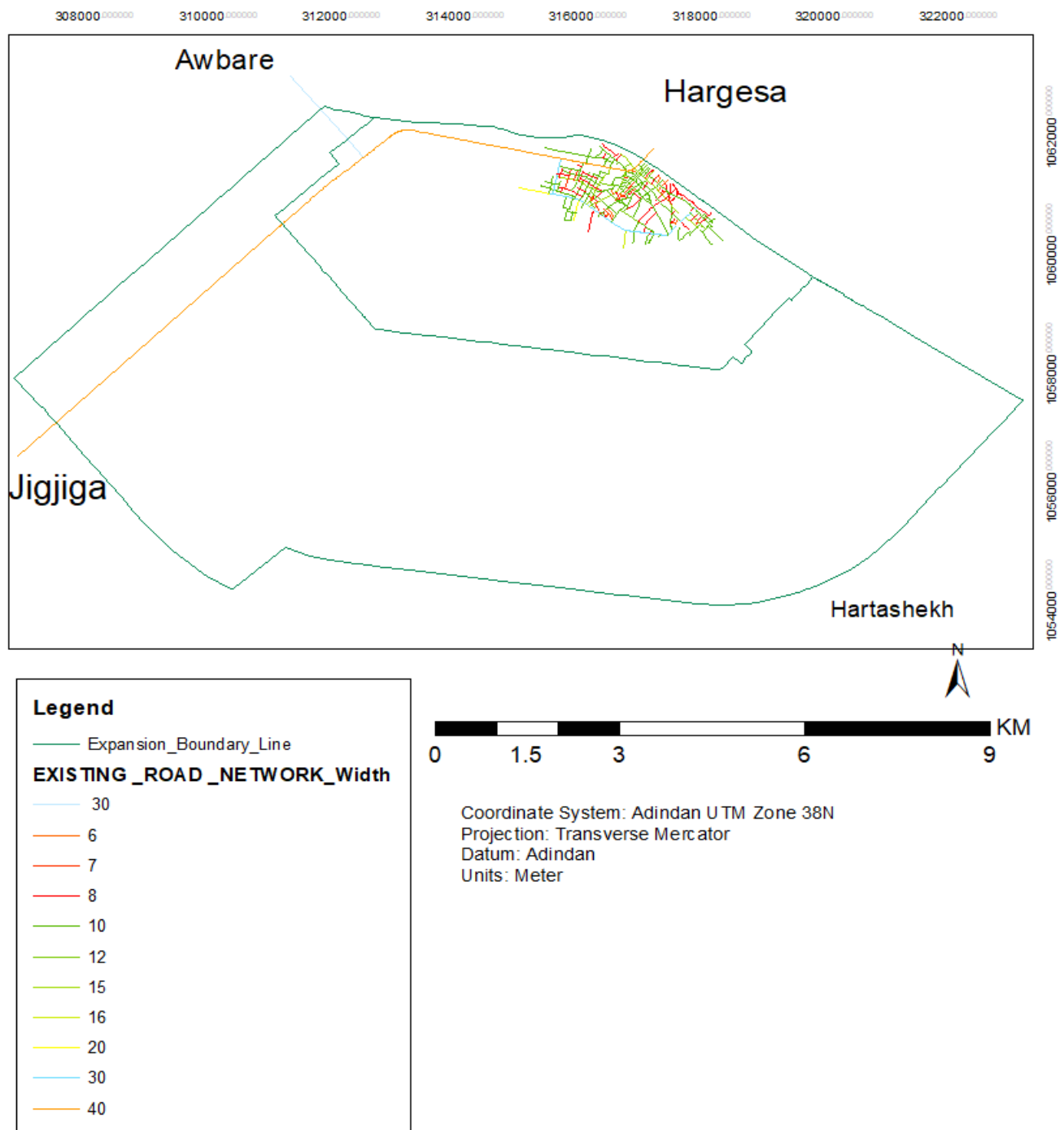
Tog Wajaale's road network is relatively well-developed in the city center, but much of the infrastructure is outdated or insufficient for the anticipated population growth. Expanding the road network is a key component of urban development. The city's current primary roads link to Jigjiga, Dire Dawa, Addis Ababa, and Somaliland border towns, but these roads require widening and upgrading to accommodate heavier traffic. Several feeder roads connect rural areas to the urban core, and these need to be improved, especially those in the southern and northern parts of the city, to ensure accessibility. However, most roads connecting the city to other areas are asphalt, except for the Awbare and Hartishekh roads. The maps below show the existing road networks, which provide a clearer picture of the situation.



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TOG-WAJAALE_CITY_EXISTING_ROAD_NETWORK_MAP





TOG-WAJAAL CITY URBAN EXPANSION PLAN REPORT

Figure 4 TOG-WAJAAL CITY_EXISTING_ROAD_NETWORK_MAP

Source: Tog Wajaale City urban expansion team



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There is a road network which are suitable for future expansion, and this road is composed of arterial and sub-arterial roads. Some of these roads are currently giving services while others are purposed for the future; the width of the existing and expansion roads are between 14m -50m and connected as shown in the below map



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TOG-WAJAALE_CITY_EXPANSION_ROAD_NETWORK_MAP

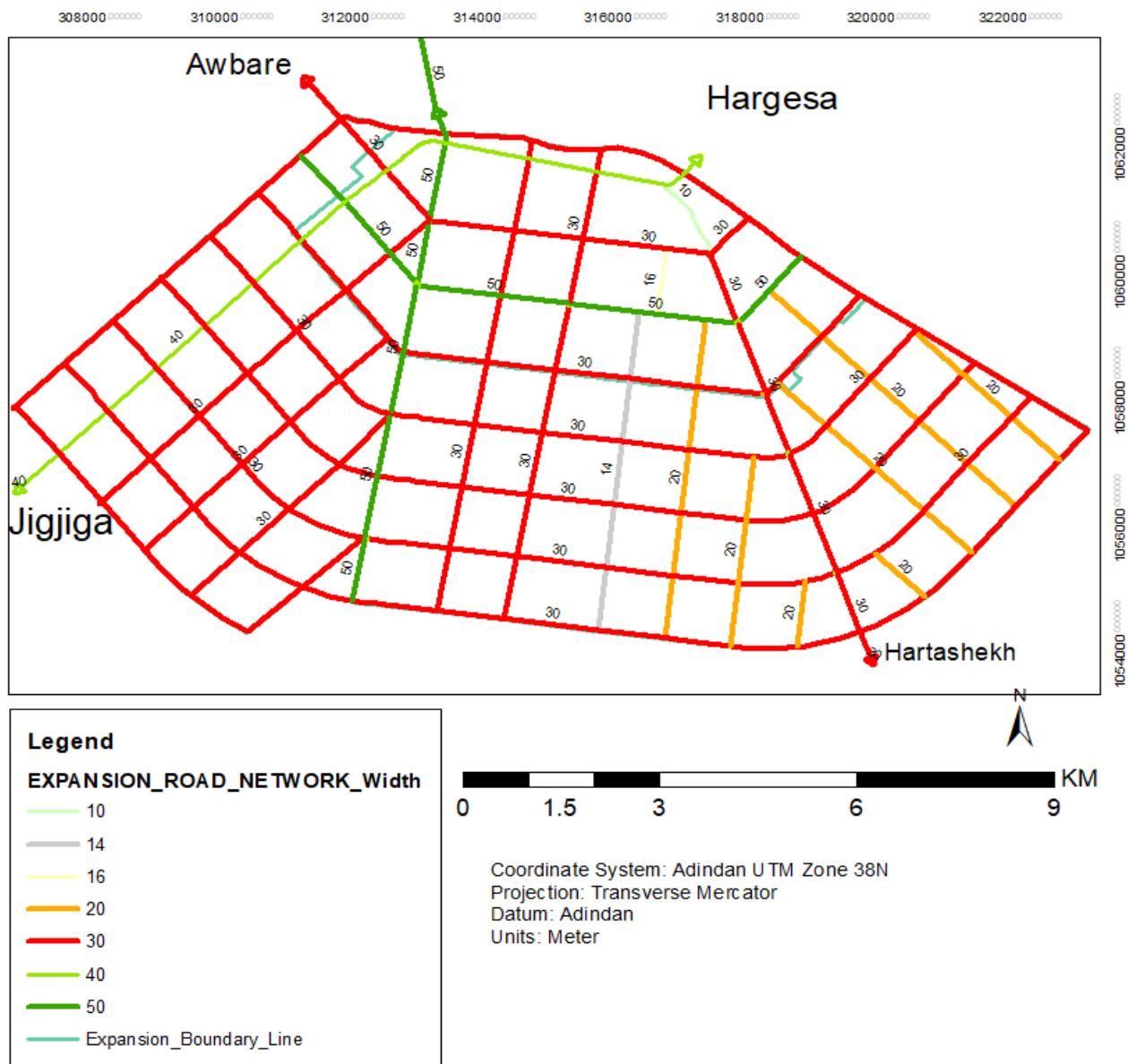


Figure 5 TOG-WAJAALE_CITY_EXPANSION_ROAD_NETWORK_MAP

Source: Tog Wajaale City urban expansion team



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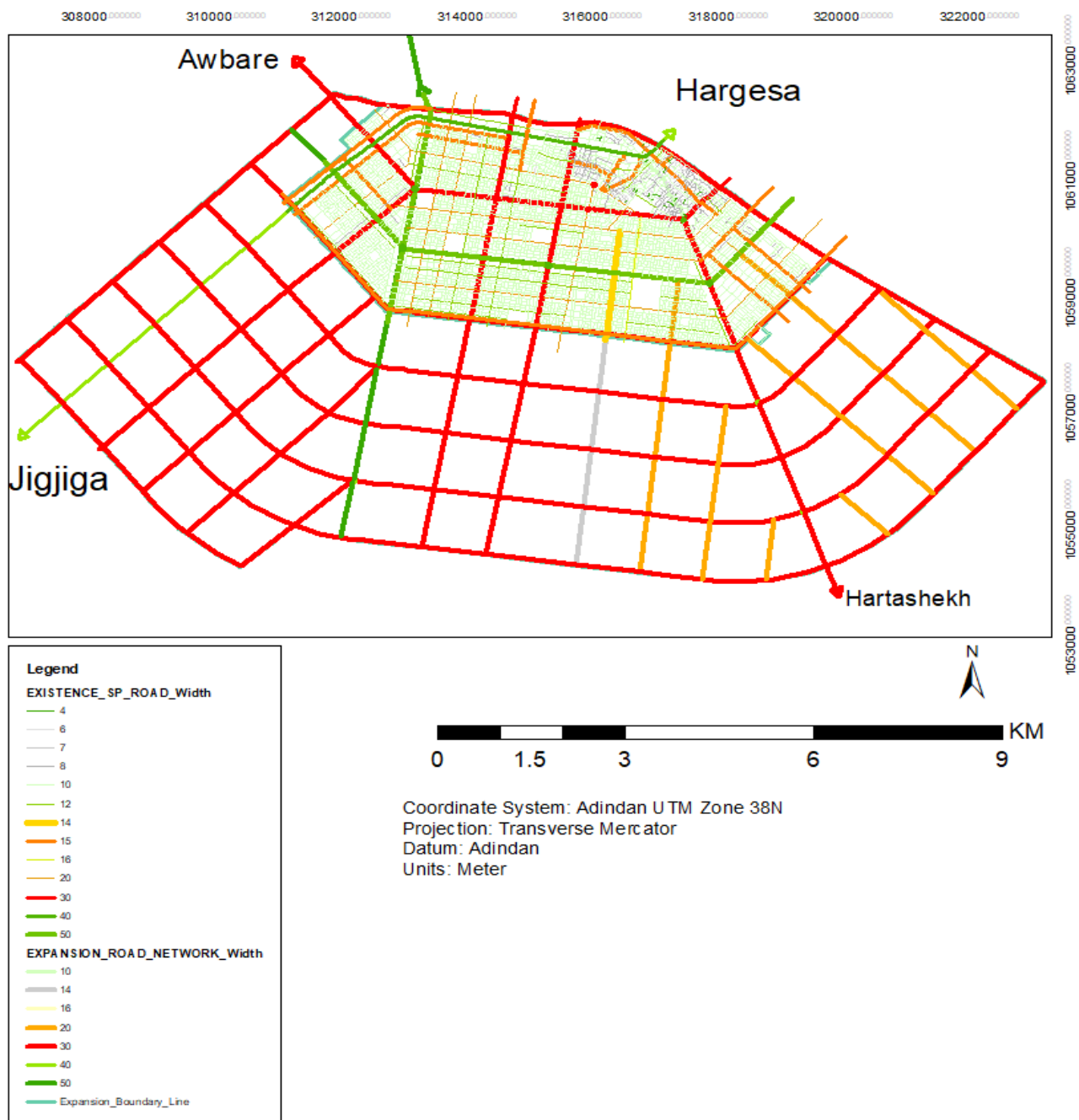
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TOG-WAJAALE_CITY_EXISTENCE_SP_ AND_EXPANSION_ROAD_NETWORK_MAP





TOG-WAJAALE CITY URBAN EXPANSION PLAN REPORT

Figure 6 TOG-WAJAALE_CITY_EXISTING_SP_AND_EXPANSION_ROAD_NETWORK_MAP

Source: Tog Wajaale City urban expansion team



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5. Chapter Five Population and Density Growth Trends

Tog Wajaale, located in the Somali Region of Ethiopia, has transitioned from being part of a small regional Kebele to evolving into a city administration in recent decades. This transformation is indicative of significant urban expansion, a trend seen in cities across the globe. Key factors contributing to this rapid growth include a rising population, migration trends, economic development initiatives, and various infrastructure projects designed to enhance the city's connectivity and services.

Understanding population dynamics and density is essential in analyzing urban expansion and provides critical insights into the growth patterns evident in Tog Wajaale. To explore these trends, our research team conducted an in-depth examination of demographic data collected from the Central Statistical Agency (CSA), local Kebeles, and the Elders Gosa leader Ugaas of Clan. Additionally, we carried out thorough analyses of built-up areas using satellite images taken over the past 30 years to assess changes in density over time. This extensive study highlights how the population has changed in correlation with land use and infrastructure developments, focusing on the significant implications of urbanization in Tog Wajaale. The results of this research are compiled in the following sections, providing a comprehensive overview of the city's development trajectory.

5.1. Historical Data and Growth Trends

The data provides a detailed overview of the changes in Tog-Wajaale's population, area, and density. We will break this down into key periods and explain what the statistics indicate about the city's transformation.

5.1.1. From 1994–2007: Early Urban Growth (T1 to T2)

Population Growth:

- 1994 Population: 8,000
- 2007 Population: 14,800
- Growth: 85% (an average annual growth rate of ~ 4.9%)
- Density Increase: +0.54% per year



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During this transformative period, Tog Wajaale experienced significant growth, with its population increasing by over 85%. This substantial rise can be attributed to several key drivers:

- Migration: Tog Wajaale developed into a dynamic regional sub-hub, attracting a diverse influx of rural migrants. These individuals sought better opportunities, contributing to a rich tapestry of culture and skills within the community.
- Infrastructure Developments: Significant improvements in essential infrastructure, including the construction of new roads, schools, and health services, greatly enhanced the overall livability of the area. These advancements resulted in increased accessibility and improved quality of life for residents.

Area Expansion:

- The geographical footprint of Tog Wajaale expanded by an impressive 72.5%, growing from 80 hectares to 138 hectares. This expansion reflects not only physical growth but also a burgeoning sense of community.

Additionally, the population density rose from 100 to 107.25 people per hectare. This increase indicates the beginning stages of urban sprawl as more people settled in the area, leading to a more vibrant and densely populated environment.

5.1.2. From 2007–2015: Rapid Transformation into an Urban Sub Hub (T2 to T3)

- ✓ Population Growth:
 - 2007 Population: 14,800
 - 2015 Population: 46,454
 - Growth: 213.9% (an average annual growth rate of ~15.4%)
 - Density Change: -0.97% per year
- ✓ Area Expansion: Increased by 239.9%, from 138 hectares to 469 hectares.
- ✓ Density: Reduced from 107.25 to 99.04 people per hectare, indicating rapid suburbanization.
- ✓ Key Observations:
 - Urbanization Plateau: Growth remained high but stabilized compared to earlier phases.
 - Land Expansion: Suburban development outpaced population growth.

5.1.3. From 2015–2024: Sustained Growth with Some Slowdown (T3 to T4)

- ✓ Population Growth:
 - 2015 Population: 46,454



TOG-WAJAALE CITY URBAN EXPANSION PLAN REPORT

- 2024 Population: 82,064
- Growth: 76.6% (an average annual growth rate of -6.4%)
- Density Change: +1.68% per year
- Key Drivers (2015–2024):
- Economic Growth: Expansion of trade, services, and industry.
- Better Living Conditions: Improved healthcare and education.
- Area Expansion
- Grew by 51.6%, from 469 hectares to 711 hectares.
- Density: Increased from 99.04 to 115.42 people per hectare, indicating improved land-use efficiency.
- ✓ Tog Wajaale's population is set to surge tenfold from 1994 to 2024, fueled by migration, economic opportunities, and robust infrastructure development.
- ✓ Population density has fluctuated significantly, driven by periods of urban sprawl from 2007 to 2015 and a shift toward more effective planning from 2015 to 2024.
- ✓ It is imperative that future planning prioritizes compact development and climate resilience to effectively manage this anticipated growth in a sustainable manner.

5.2. Population and Area Projections for the Future (2025–2055)

Tog Wajaale's population and land area are projected to continue growing, and this growth will have significant implications for urban planning, infrastructure, and sustainability.

5.2.1. Short-Term Growth (2024–2030)

- 2024 Population: 82,064
- 2025 Population: 87,300 (growth of 6.4%)
- 2030 Population: 119,000 (growth of 45% from 2024)
- Urban Area (2025–2030): 757–1,450 hectares
- ✓ Urban Area Increase: -6.5%–104% (from 711 hectares in 2024)
- ✓ Density: Expected to decrease slightly to 102–115 people/hectare (from 115.42 in 2024).

5.2.2. Mid-Term Growth (2031–2045)

- 2030 Population: 119,000
- 2040 Population: 221,200 (growth of 86% from 2030)
- 2045 Population: 301,600 (growth of 36% from 2040)



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- Urban Area (2031–2045): 1,917–4,200 hectares
- ✓ Density: Projected to decline to 71–92 people/hectare
- ✓ Density projections for this period suggest a decrease to between 71 and 92 people per hectare by 2045, driven by more land expansion as the population grows.

5.2.3. Long-Term Growth (2046–2055)

- 2045 Population: 301,600
- 2055 Population: 554,700 (growth of 84% from 2045)
- Urban Area (2046–2055): 4,806–8,990 hectares (depending on 0% – 2% annual density decline).
- ✓ By 2055, the population of Tog Wajaale is projected to exceed half a million, potentially reaching nearly 554,700 people. To accommodate this growth, the urban area may need to expand between 4,806 and 8,990 hectares, depending on how population density is managed.
- ✓ During this time, Tog Wajaale may encounter significant challenges related to urban sprawl. This will necessitate strong policies regarding land use, housing, transportation, and environmental conservation to ensure sustainable growth.

5.3. Key Factors Influencing Tog-Wajaale’s Future Growth

The Ethio-Berbera Corridor represents a pivotal opportunity for the future growth of Tog Wajaale, serving as a vital infrastructure project connecting landlocked Ethiopia to the Port of Berbera in Somaliland. This corridor can transform Tog Wajaale into a key trade and logistics hub, propelling urbanization, economic activity, and regional integration. Here’s a constructive analysis of its potential impact and the supporting factors:

i. Role of the Ethio-Berbera Corridor

Trade Connectivity:

- By decreasing Ethiopia’s reliance on Djibouti’s ports, the corridor can lower logistics costs by approximately 30% and improve access to global markets.
- Tog Wajaale, as a transit city, has the potential to attract logistics companies, warehouses, and cross-border businesses, facilitating accelerated industrial growth.

Economic Diversification:

- Job creation in transportation, customs, and various services will draw rural migrants and investors, fostering a robust economic landscape.



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- This environment will encourage private sector investments in several key areas, including agro-processing, manufacturing, and commercial real estate.
- ▣ Population Surge:
 - Improved access to economic opportunities is anticipated to boost rural-urban migration.
 - Projections suggest that the city's population could exceed 554,000 by 2055, a significant rise from around 82,064 in 2024.
- ii. Supporting Growth Drivers
 - ▣ Cross-Border Trade:
 - The Free Trade Zone in Tog Wajaale, established after 2015, is facilitating trade in livestock, textiles, and electronics, unlocking new economic prospects.
 - Informal trade networks, such as franco valuta, are thriving, showcasing resilience and adaptability in commerce.
 - ▣ Rural-Urban Migration:
 - Push factors include challenges like droughts and land degradation in the Ethiopian Somali Region, driving people to urban areas.
 - Pull factors comprise job opportunities, educational resources, healthcare, and infrastructure improvements in Tog Wajaale.
 - ▣ Infrastructure Development:
 - Strategic investments in roads, utilities, and public services, backed by Ethiopia-Somaliland border agreements, are enhancing the city's overall livability.
 - Government initiatives aimed at decentralizing growth are successfully alleviating pressure on Addis Ababa while fostering development in secondary cities.
 - ▣ Demographics: With a youthful population—60% under the age of 25—Ethiopia possesses a vibrant labor pool and an increasing demand for urban housing.
- iii. Opportunities for Addressing Risks and Challenges
 - ▣ Urban Sprawl:
 - Proactive urban planning can mitigate unplanned expansion, protecting agricultural land and ensuring sustainable resource management.
 - Implementing effective zoning will help manage growth and maintain the integrity of urban areas.
 - ▣ Environmental Resilience:
 - Addressing the risks associated with the semi-arid climate through climate-smart practices and infrastructure can enhance resilience to droughts and floods.
 - Investments in sustainable water management and waste disposal systems will support long-term sustainability.
 - ▣ Political Stability:



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- Strengthening Ethiopia-Somaliland relations is crucial; fostering dialogue and cooperation can fortify trade and growth momentum.
- iv. Strategic Recommendations for Sustainable Growth
 - a) Integrated Land-Use Planning:
 - Establish designated industrial zones and residential clusters along the corridor to manage growth effectively.
 - Create green belts to safeguard peri-urban farmland.
 - b) Density Management:
 - Encourage vertical mixed-use developments around transit hubs to optimize land use.
 - Set minimum density targets to ensure efficient urban development.
 - c) Infrastructure Resilience:
 - Invest in innovative water recycling, renewable energy systems, and robust flood prevention infrastructure to enhance resilience.
 - d) Social Equity:
 - Prioritize affordable housing initiatives for low-income migrants and focus on upgrading informal settlements.
 - Engage local communities, especially women and youth, in planning and decision-making processes.
 - e) Regional Collaboration:
 - Streamline customs procedures with Somaliland and form joint maintenance committees for the corridor to foster ongoing cooperation.

Conclusion

The Ethio-Berbera Corridor has the potential to act as a catalyst for Tog Wajaale's growth, positioning the city as a vital regional trade hub. Balancing economic opportunities with sustainable urban planning, climate resilience, and inclusive governance will be key to success. By implementing proactive strategies, we can harness the immense potential of Tog Wajaale while ensuring sustainable, equitable growth that benefits all residents. Investing thoughtfully in infrastructure and social equity will create a model for effective cross-border urbanization in the Horn of Africa.

5.4. Recommendations for Future Urban Planning

To address Tog Wajaale's rapid growth and ensure sustainable, equitable development, the following context-specific strategies are recommended, building on existing proposals and



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aligning with the city's unique challenges (e.g., climate vulnerability, cross-border dynamics, and projected population surge to 554,700 by 2055):

I. Integrated Master Planning with Climate Resilience

- Action: Develop a 20-year master plan integrating land-use zoning, infrastructure, and climate adaptation.
- Key Elements:
- Density Thresholds: Enforce a minimum density of 100 people/hectare in core areas to curb sprawl.
- Climate-Responsive Zoning: Designate flood-prone areas as green buffers and restrict high-density construction there.
- Participatory Governance: Involve local communities (e.g., women, youth, elders) in decision-making via town halls.
- Example: Medellín, Colombia's integrated urban projects model, which linked transport, housing, and social equity.

II. Sustainable Infrastructure Development

- Action: Prioritize green and resilient infrastructure to combat semi-arid climate risks.
- Key Projects:
- Decentralized Water Recycling: Build 3–5 plants by 2030 to reduce groundwater dependency.
- Solar Microgrids: Power streetlights and public buildings with solar energy, targeting 40% renewable energy use by 2040.
- Flood-Resistant Drainage: Construct permeable pavements and bioswales in flood-prone zones.
- Funding: Leverage partnerships with the African Development Bank or Green Climate Fund.

III. Affordable Housing and Slum Upgrading

- Action: Prevent slum proliferation through inclusionary zoning and community-led upgrades.
- Policies: Mandate 20% affordable units in all new housing developments.
- Upgrade informal settlements (e.g., Tog Wajaale's Kebele 05) with tenure security, water taps, and waste collection.
- Example: Rwanda's Green City Kigali, which combines affordable housing with eco-design.

IV. Transit-Oriented Development (TOD)

- Action: Align urban expansion with public transit corridors to reduce sprawl.
- Key Steps:



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- Develop Bus Rapid Transit (BRT) along the Ethio-Berbera Corridor by 2030.
- Zone mixed-use developments (residential + commercial) within 500m of transit hubs.
- Prioritize pedestrian/cycle lanes in high-density areas.
- Impact: Reduce private vehicle use by 30% by 2040.
- V. Smart City Technologies for Resource Efficiency
 - Action: Deploy IoT and data analytics to optimize resource use.
 - Initiatives:
 - Real-Time Traffic Management: Use sensors to ease congestion at border checkpoints.
 - Water Demand Forecasting: AI-driven systems to predict shortages and allocate resources.
 - Digital Land Registries: Blockchain-based systems to combat land speculation.
 - Example: Cape Town's digital water meters cut consumption by 50% during droughts.
- VI. Economic Diversification and Job Creation
 - Action: Transform Tog Wajaale into a regional trade and innovation hub.
 - Strategies:
 - Expand the Free Trade Zone to include agro-processing and renewable energy industries.
 - Establish a Vocational Training Center for skilled migrants in logistics, construction, and tech.
 - Partner with Somaliland to create cross-border special economic zones (SEZs).
- VII. Environmental Conservation and Green Spaces
 - Action: Preserve ecological zones and integrate nature into urban design.
 - Targets:
 - Allocate 15% of urban land to parks and green belts by 2040.
 - Restore degraded areas (e.g., riverbanks) with native drought-resistant vegetation.
 - Funding: Explore carbon credit programs for reforestation projects.
- VIII. Regional Collaboration
 - Action: Strengthen Ethiopia-Somaliland partnerships for shared growth.
 - Initiatives:
 - Harmonize customs procedures to reduce border delays.
 - Jointly develop the Berbera Corridor as a climate-resilient trade artery.
 - Establish a Cross-Border Water Management Authority to address scarcity.

Conclusion

Tog Wajaale's future hinges on proactive, inclusive, and climate-smart planning. By prioritizing density, equity, and regional collaboration, the city can avoid the pitfalls of unmanaged growth and emerge as a model for sustainable urbanization in the Horn of Africa. Failure to act risks



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irreversible sprawl, resource depletion, and social inequality. Let's build a Tog Wajaale that thrives for generations

5.5. Conceptual Development of Tog Wajaale Urban Project

5.5.1. Strategic Goals (2024-2055)

1) Infrastructure Development

- Objective: Build a resilient, interconnected infrastructure to support rapid urbanization and cross-border trade.
- Transportation Networks: Ethio-Berbera Corridor BRT System: Develop a Bus Rapid Transit (BRT) line along the corridor to reduce congestion and emissions.
- Pedestrian-Cycle Pathways: Create 50 km of shaded walkways and bike lanes in high-density zones by 2030.
- Utilities & Sanitation: Decentralized Water Recycling Plants: Construct 3 plants by 2030 to address water scarcity (target: 40% recycled water use by 2040).
- Solar Microgrids: Power 30% of public infrastructure with solar energy by 2035.
- Green Spaces: Urban Green Belt: Preserve 15% of peri-urban land as parks and agroforestry zones to combat sprawl.

2) Economic Growth and Diversification

- Objective: Position Tog-Wajaale as a regional trade and innovation hub.
- Special Economic Zones (SEZs): Establish cross-border SEZs near the Somaliland border for agro-processing, logistics, and renewable energy.
- Tax incentives for tech startups and SMEs in the Free Trade Zone.
- Vocational Training Center: Train 5,000 migrants/year in logistics, construction, and digital skills by 2030.
- Innovation Ecosystem: Launch a Tog Wajaale Tech Hub to foster digital entrepreneurship (e.g., e-commerce platforms for cross-border trade).

3) Housing and Social Services

- Objective: Ensure equitable access to quality housing and services.
- Affordable Housing: Inclusionary Zoning: Mandate 25% affordable units in new developments.
- Slum Upgrading: Formalize tenure for 10,000 informal households by 2030, with water, sanitation, and electricity.
- Healthcare & Education: Build 5 new clinics and 10 schools in underserved areas by 2035.
- Mobile health units and e-learning platforms for remote communities.
- Recreational Facilities: Develop 3 community centers and 2 sports complexes by 2030.



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4) Environmental Sustainability

- Objective: Integrate climate resilience into urban systems.
- Waste-to-Energy Plants: Convert 60% of municipal waste into energy by 2040, reducing landfill use.
- Climate-Resilient Infrastructure: Elevate critical roads in flood-prone areas and install permeable pavements.
- Green Building Standards: Enforce LEED-like certifications for new buildings (e.g., rainwater harvesting, solar panels).

5) Social Inclusivity

- Objective: Empower marginalized groups in urban governance and development.
- Participatory Planning: Establish a Community Advisory Council with 50% representation from women and youth.
- Equity Programs: Allocate 20% of city contracts to women-led businesses.
- Scholarships for 1,000 low-income students annually in STEM fields.
- Cultural Preservation: Protect heritage sites and support local artisans through a Cultural

6) Innovation Fund.

- Funding & Partnerships
- Public-Private Partnerships (PPPs): Attract investors for SEZs and solar projects.
- International Aid: Collaborate with UN-Habitat, AfDB, and EU for climate resilience grants.
- Community Co-Funding: Microfinance schemes for local entrepreneurs.

Conclusion

This conceptual framework transforms Tog Wajaale into a sustainable, inclusive, and economically vibrant cross-border hub. By aligning infrastructure, equity, and climate action, the city can avoid the pitfalls of unplanned growth and set a benchmark for urbanization in the Horn of Africa. Let's build a Tog Wajaale where people and the planet thrive together



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6. Chapter Six: Conceptual Development and Legal Framework

6.1. Introduction

This chapter outlines the strategic vision for the Tog Wajaale Urban Development Project (TWUDP), exploring its conceptual development alongside the legal framework that will guide its implementation from 2025 to 2055. The chapter presents an integrated view of how the urban development goals will align with legal policies, governance structures, and regulatory frameworks to ensure successful and sustainable growth in Tog Wajaale. This will serve as a roadmap for both the conceptualization and execution phases of the project, establishing clear Strategic goals while adhering to legal requirements.

The strategic Goal of Land Use and Zoning is to clear the allocation of land for residential, commercial, industrial, and recreational purposes. Mixed-use developments will be prioritized to create sustainable communities. Also, to design efficient public transport systems, roads, and pedestrians. Walkways and connectivity with regional and national transport networks; another goal is identifying and developing zones for industries and commerce to stimulate local job creation, innovation, and investment. Apart from that, developing affordable housing solutions for the growing population while fostering vibrant communities through urban planning strategies. Also, implementing green technologies, water conservation systems, energy-efficient buildings, and parks to enhance urban livability and reduce ecological impact.

6.2. Implementation Phases

- Short-Term (2025-2030): Initial planning, land acquisition, feasibility studies, and infrastructure groundwork.
- Medium-term (2031-2045): Large-scale construction of residential, commercial, and infrastructure projects.
- Long-Term (2046-2055): Consolidation of urban systems, refinement of services, and further expansion of economic sectors.

6.3. Stakeholder Engagement

- Local Government: The regional government will lead the planning, regulation, and monitoring of the project, ensuring it meets both local and national needs.
- Private Sector and Investors: Encouraging public-private partnerships to finance and deliver the project's components.



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- Community Participation: Involving local communities in the decision-making process, ensuring that their needs and aspirations are reflected in the project.

6.4. Legal Framework for the Tog Wajaale Urban Development Project

6.4.1. National Legal Context

- Constitution of Ethiopia: The project is anchored in the principles of Ethiopia's Constitution, particularly those relating to land ownership, urbanization, and the right to housing and development. The Ethiopian government's commitment to equitable development forms the foundation for the project.
- Urban and Land Use Policies: National urban planning laws will govern land-use zoning, urban expansion, and infrastructure development. These include regulations on housing density, building codes, and environmental protection. The Federal Government will provide the guidelines for urban planning while the regional government ensures compliance.
- Environmental Laws: The Ethiopian Environmental Protection Law and other related national regulations (such as those governing waste management, pollution, and natural resource conservation) will be adhered to throughout the project, including conducting thorough Environmental Impact Assessments (EIA) for major developments.

6.4.2. Regional Legal Considerations (Somali Region)

- Land Use and Ownership: In Ethiopia, land is state-owned, and regional laws govern the allocation and development of land. The regional government will oversee land tenure arrangements, including land redistribution or acquisition for urban development, ensuring fairness and transparency in land deals.
- Urban Planning Regulations: The Somali Regional State's urban planning policies will guide the zoning and development of the city, including infrastructure projects and building codes. Special attention will be paid to how urbanization impacts rural areas, migration trends, and local populations.

6.4.3. Local Legal Structures and Governance

- Municipal Laws: The Tog Wajaale Municipality will play a central role in the governance of the urban development project. Local laws and regulations will ensure that building permits, development guidelines, and infrastructure projects comply with the city's urban vision.



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- Building Codes and Safety Regulations: Local building codes will govern the construction of new structures to ensure they are safe, durable, and environmentally sound. These regulations will be strictly enforced to prevent poor construction standards.
- Taxation and Incentives: Tog Wajaale will implement a fiscal policy that promotes investment in infrastructure, housing, and businesses. Tax incentives for investors, construction companies, and developers will be crucial in attracting private-sector involvement.

6.4.4. International Legal Framework and Global Commitments

- Sustainable Development Goals (SDGs): The JUDP will align with the United Nations' SDGs, especially those related to urban development (SDG 11), climate action (SDG 13), and affordable and clean energy (SDG 7). The project will adopt principles of sustainable urbanization, including green buildings, energy efficiency, and reduced carbon emissions.
- International Investment Agreements: Ethiopia's international agreements, including trade and investment treaties, will facilitate foreign investment in the Tog Wajaale development project, promoting cross-border partnerships.

6.4.5. Legal Compliance and Risk Management

- Risk Management: Identifying and addressing legal risks, including issues related to land acquisition, displacement of communities, and environmental degradation. A comprehensive risk management framework will be established, with mitigation strategies for potential legal challenges.
- Dispute Resolution: Legal mechanisms for resolving disputes between stakeholders (e.g., landowners, developers, and the local community) will be put in place. This will include arbitration, mediation, and courts of law as necessary.

6.4.6. Monitoring, Enforcement, and Adaptation

- Monitoring and Evaluation: The legal framework will also include mechanisms for monitoring compliance with urban planning regulations, environmental standards, and social policies. This will involve regular audits and assessments of the project's progress.
- Adapting to Legal Changes: As urbanization trends evolve and national and international laws change, the legal framework will adapt to remain relevant. This includes revising urban



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zoning laws, incorporating emerging technologies into urban governance, and updating environmental regulations to respond to new challenges such as climate change.



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7. Chapter Seven Scenario Developments

The development of the Tog Wajaale Urban Expansion Project over the next 30 years has been evaluated through three distinct scenarios. Each scenario explores different pathways of urban growth, infrastructure development, and population management. After a detailed analysis, the medium-growth scenario has been selected as the most viable option for implementation.



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TOG-WAJAALE_CITY_SCENARIOS_DEVELOPMENTS_MAP

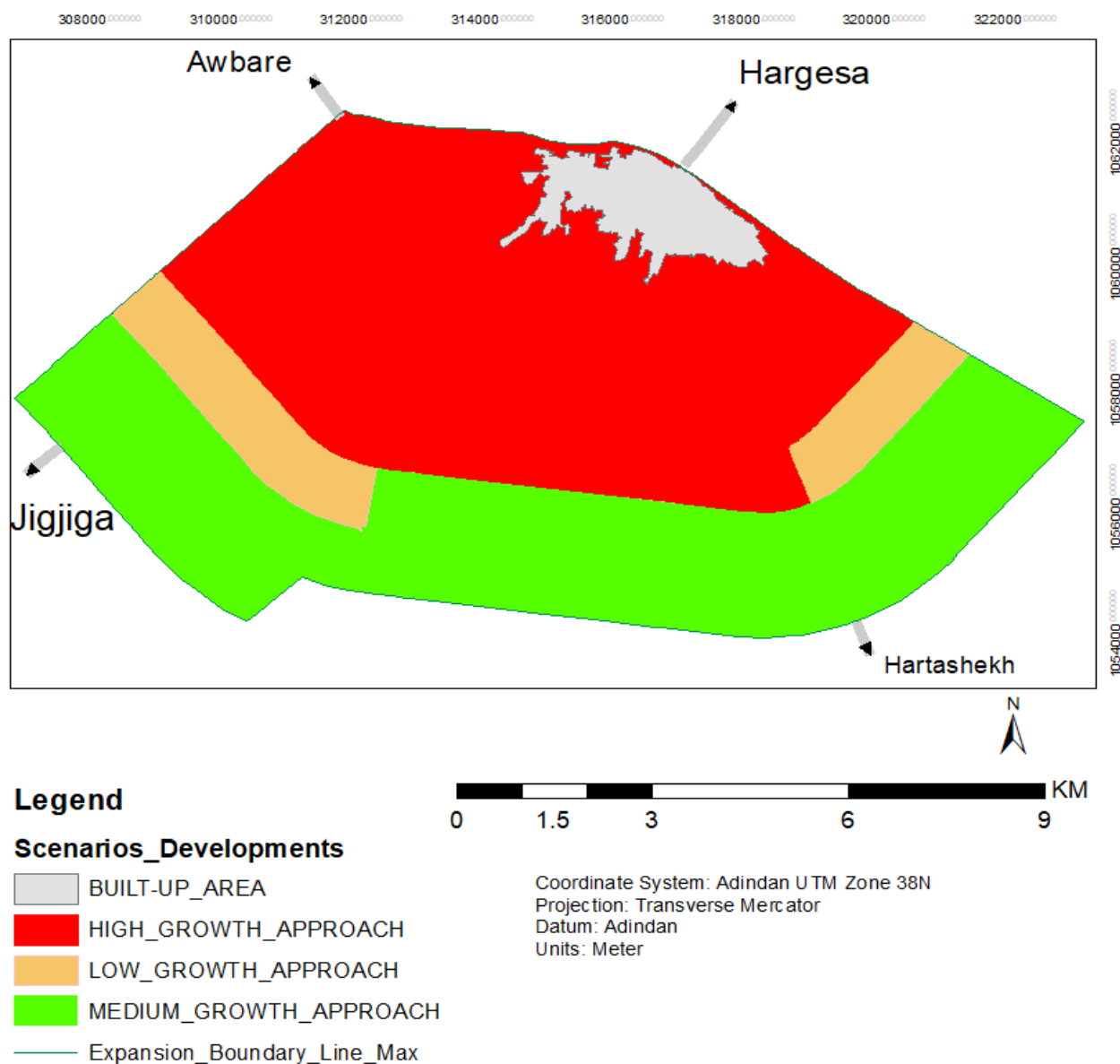


Figure 7 TOG-WAJAALE_CITY_SCENARIOS_DEVELOPMENTS_MAP

Source: Tog Wajaale City urban expansion team



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7.1. Scenario 1: Low-Growth Approach

- This scenario envisions a conservative trajectory of urban expansion driven by limited economic growth and a moderate population increase. This scenario ahead:
- Population Growth: Minimal annual growth rate, resulting in a projected population of approximately 283,000 by 2055.
- Population Density: 50 people per ha, focusing on the densification of existing urban areas.
- Urban Area Expansion: Expansion restricted to existing urban peripheries, minimizing new land development.
- Infrastructure Development: Basic improvements focused on maintaining current infrastructure levels with minimal upgrades.
- Economic Impact: Reduced investment in economic development and services.
- Advantages: Cost-effective and minimizes environmental impact.
- Challenges: Risk of overcrowding and inadequate facilities as population growth surpasses capacity.

7.2. Scenario 2: Medium-Growth Approach (Selected Scenario)

- This scenario represents a balanced strategy, combining sustainable population growth with moderate urban expansion. Key features include:
- Population Growth: A steady annual growth rate, leading to a projected population of approximately 554,700 by 2055.
- Population Density: 61.7 people per ha, ensuring efficient land use without overcrowding.
- Urban Area Expansion: Planned expansion to accommodate residential, commercial, and industrial needs, increasing the urban area by 12.6 times the 2024 built-up area compared to current levels.
- Infrastructure Development: Investment in modernizing existing infrastructure and developing new facilities, including transportation and utilities.
- Economic Impact: Encourages economic diversification and regional development.
- Advantages: It maintains a balance between growth and sustainability, ensuring adequate housing and services.
- Challenges: Requires effective governance and resource allocation to avoid inefficiencies.



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7.3. Scenario 3: High-Growth Approach

- This scenario outlines an aggressive growth strategy, anticipating rapid population increase and extensive urban expansion. Key features include:
- Population Growth: High annual growth rates, resulting in a projected population of approximately 554,700 by 2055.
- Population Density: 115.42 people per ha, with significant new land development to accommodate the growing population.
- Urban Area Expansion: Significant land acquisition and development, transforming rural areas into urban zones and increasing the urban footprint by 6.8 times the 2024 built-up area.
- Infrastructure Development: Large-scale projects, including advanced transportation networks and smart city initiatives.
- Economic Impact: High potential for economic growth and employment generation.
- Advantages: Positions Tog Wajaale as a regional hub with advanced infrastructure and services.
- Challenges: High financial costs, potential environmental degradation, and risk of unbalanced development.

Conclusion

- ✍ The medium-growth approach (Scenario 2) has been selected for the Tog Wajaale Urban Expansion Project. This scenario strikes an optimal balance between managing population growth, urban development, and sustainable resource use. The decision to choose Scenario 2 is based on the following reasons:
- ✍ Sustainability: Scenario 2 ensures that resources are utilized efficiently without overburdening the environment or local governance structures.
- ✍ Feasibility: The moderate growth rate and urban expansion plan align with the city's current capacities and potential for scaling up.
- ✍ Economic Opportunities: By encouraging economic diversification, Scenario 2 promotes steady economic development while avoiding the risks associated with over-reliance on rapid industrialization or urbanization.
- ✍ Infrastructure Development: Investments focus on both improving existing systems and strategically developing new infrastructure, ensuring equitable growth.



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- ✍ Population Management: Scenario 2 provides adequate housing, services, and urban space to accommodate the projected population, preventing overcrowding and slum development.
- 🏠 By focusing on planned expansion and infrastructure improvement, this approach ensures that Tog Wajaale can grow in a manner that is both sustainable and beneficial for its residents over the next three decades.



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8. Chapter Eight Scenario Developments for Tog Wajaale Urban Expansion Project (2025–2055)

8.1. Introduction

The Tog Wajaale Urban Expansion Project outlines strategic options for managing the city’s growth from 2025 to 2055. With a rapidly growing population and increasing urbanization, Tog Wajaale faces the challenge of developing a robust urban plan that considers territorial conflicts, economic growth, infrastructure capacity, environmental sustainability, social equity, and governance complexities. This chapter evaluates three different urban growth scenarios, each with distinct advantages and challenges, and explains the rationale for selecting the growth approach as the most appropriate for the city’s long-term development.

▣ Current Demographics and Urban Characteristics (2024):

- Current Population: 82,064 people
- Projected Population for 2055: 554,700 people (a growth of approximately 576%)
- Current Administration Area: 2,500 hectares
- Current Planned Urban Area: 2,500 hectares
- Current Built-up Area: 711 hectares

▣ Key Objectives:

- ▣ The primary goal is to accommodate the projected population increase by providing adequate land for housing, commerce, and industry while ensuring that infrastructure, environmental impact, and social stability are considered. Balancing these factors requires an integrated urban expansion plan that responds to both immediate needs and long-term growth.

8.2. Growth Scenarios for Urban Expansion

Three distinct growth scenarios were developed to assess potential urbanization strategies for Tog Wajaale. Each scenario reflects a different rate of growth and land use, with varying degrees of infrastructure demand, territorial impact, and sustainability considerations.

⊕ Scenario I: Low-Growth Approach

- Projected Area Required: 11,094 hectares
- Description: This scenario assumes a more cautious rate of urbanization, driven by moderate population growth and minimal industrialization. It emphasizes a slower pace of expansion, with a focus on preserving agricultural land and natural spaces.



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- Key Characteristics
 - Population Growth: 4–5% annual growth rate.
 - Urban Density: Low-density urbanization with widely spread residential areas.
 - Infrastructure Development: Focus on small-scale projects, with limited investment in large infrastructure.
 - Land Use: Primarily residential, with limited commercial or industrial development.
- ⊕ positive reflections
 - Environmental Preservation: The low-density development minimizes the consumption of natural resources, allowing for the preservation of agricultural land and green spaces.
 - Reduced Immediate Pressure on Resources: Fewer immediate demands on water, energy, and waste management systems compared to more rapid urbanization.
 - Sustainability: With a slower growth rate, this approach provides ample time for infrastructure and services to be developed in alignment with population increases, ensuring more sustainable urban development.
- ⊕ Special Challenges
 - Limited Economic Development: The low-growth scenario typically involves minimal industrial and commercial expansion. This could result in limited job creation, fewer economic opportunities for the population, and a reliance on agriculture, which might not be sufficient to meet the growing needs of a large urban population.
 - Risk of Economic Stagnation: By not promoting rapid growth in industries or commerce, the city may experience stagnation, where the local economy fails to diversify. This could lead to lower living standards and economic inequality over time.
 - Inefficient Land Use: The low-density nature of this approach may lead to inefficient land use. Expanding the city over a large area without concentrating urbanization may result in long travel distances, higher transportation costs, and challenges in providing efficient public services (e.g., healthcare, education, waste management).
 - Underutilized Land: Some areas may remain underdeveloped or underutilized, which could lead to inefficient use of land resources that could otherwise have been better optimized for housing, commerce, or infrastructure.
 - Underdevelopment of Infrastructure: Due to the slow pace of growth, there may be delays in providing essential infrastructure, such as roads, sewage systems, water supply, and electricity. This delay can create a backlog of unmet needs, which could harm the quality of life for residents and lead to social frustration.



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- Housing Shortages: Despite the slow pace of urbanization, a failure to accurately project population growth might still result in housing shortages, leading to informal settlements or overcrowded conditions
- Vulnerability to External Economic Shocks: A low-growth approach may keep Tog Wajaale more isolated from global economic trends, reducing its resilience to external economic shifts, such as market fluctuations or global investment trends. As the city remains less industrialized and commercialized, it might be more vulnerable to national economic downturns or shifts in regional trade patterns.
- ⊕ Scenario 2: Medium-Growth Approach (Selected Scenario)
 - Projected Area Required: 8,990 hectares
 - Description: The medium-growth approach is a balanced scenario that provides a sustainable pace of urbanization, meeting the projected population needs while ensuring well-planned infrastructure development. It offers a strategic expansion that is more likely to address the city's growth in a balanced and inclusive manner.
 - Key Characteristics
 - Population Growth: 6.4% annual growth rate.
 - Urban Density: Medium-density development, with well-distributed residential, commercial, and industrial zones.
 - Infrastructure Development: Significant but phased investment in roads, utilities, and public services.
 - Land Use: Balanced development, including residential, commercial, and light industrial zones.
 - ⊕ Positive Reflections:
 - Balanced Growth: This scenario offers a sustainable urban expansion that accommodates both population growth and economic development. It supports mixed-use zoning, which fosters vibrant neighborhoods and a strong local economy.
 - Minimized Boundary Conflicts: By ensuring a controlled and planned expansion, this approach reduces the likelihood of territorial disputes with neighboring Woreda areas. It strikes a balance between urban needs and the preservation of surrounding lands.
 - Economic Potential: The medium-growth approach supports a moderate expansion of the industrial and commercial sectors, leading to job creation and economic growth without overburdening the city's infrastructure.
 - Infrastructure Alignment: The phased approach to infrastructure ensures that as the city grows, the necessary services, such as transportation, water, and waste management, will be developed in tandem with urban needs, improving the quality of life for residents.



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- Environmental Considerations: This scenario ensures that land is used efficiently, reducing the risk of sprawling urbanization and environmental degradation.
- ⊕ Challenges:
 - Requires substantial initial investment in infrastructure, particularly in transportation and utilities.
 - While the risk of boundary conflicts is minimized, there could still be minor disagreements with surrounding areas as the city expands
- ✎ Why This Scenario Was Selected: The Medium-Growth Approach strikes the optimal balance between urban expansion and sustainability, addressing Tog Wajaale's growth needs while minimizing the risks of over-expansion, infrastructure overload, and boundary conflicts with neighboring Woreda areas. It is considered the most viable option because it supports economic development, environmental sustainability, and social equity in a way that can be efficiently managed over time.
- ⊕ Scenario 3: High-Growth Approach
 - Projected Area Required: 4,806 hectares
 - Description: The high-growth scenario envisions a rapid urbanization pace driven by higher population growth, industrialization, and urban expansion. It entails a dense and aggressive expansion of residential, commercial, and industrial areas.
 - Key Characteristics:
 - Population Growth: 6.4% annual growth rate.
 - Urban Density: High-density development with expansive residential, commercial, and industrial zones.
 - Infrastructure Development: Significant investment in large-scale infrastructure projects, including transportation and utilities.
 - Land Use: Rapid land conversion to urban uses, focusing on industrialization and residential housing.
 - ⊕ Positive Reflections:
 - Economic Growth: The high-growth scenario can potentially drive significant economic expansion, particularly through industrial and commercial development. It can lead to job creation, increased investment, and improved business opportunities.
 - Efficient Land Use in the Short Term: Rapid development allows for more intensive use of available land, potentially maximizing urban density and reducing the need for land acquisition over the long term.
 - Urban Vitality: A high-growth strategy can lead to dynamic urban spaces, fostering vibrant commercial, cultural, and industrial districts that attract investment and talent.
 - ⊕ Special Challenges:



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- Environmental Degradation: Rapid urbanization would require large amounts of land for residential, industrial, and commercial purposes. This could result in the loss of valuable agricultural land, which may reduce the city's ability to produce food locally and impact food security. It could also lead to the displacement of rural communities and farmers. Additionally, pollution, deforestation, and loss of biodiversity could increase.
- Pollution and Ecosystem Damage: High-density development often leads to increased pollution (air, water, and noise), deforestation, and destruction of natural habitats. The environmental impact of rapid urbanization may negatively affect the surrounding ecosystems, wildlife, and the overall climate of the region.
- Infrastructure Overload: Rapid population growth can overwhelm existing infrastructure systems, including transportation, sewage, waste management, water supply, and electricity. The city may struggle to provide sufficient public services for an expanding population, leading to inefficiencies, service shortages, and a decline in the quality of life for residents.
- Territorial and Land Use Conflicts: High-growth expansion can lead to significant territorial disputes with neighboring Woreda areas, especially if land acquisition from surrounding rural communities occurs at a fast pace. Boundary conflicts may emerge as urban development encroaches on agricultural or pastoral land, leading to tensions and legal challenges.
- ⊞ Challenges.
- Social Inequality and Housing Issues: High-growth strategies may lead to the development of informal settlements or slums where poorer populations are marginalized. This could exacerbate inequality if wealthy urban areas receive better infrastructure while poorer communities lack essential services. Overcrowding and inadequate housing may also become significant issues.
- Governance and Institutional Challenges: The administrative capacity of local authorities may be overwhelmed by the pace and scale of development, leading to inefficiencies, corruption, or poor coordination in urban management.

Conclusion:

☺ Why the Medium-Growth Scenario Was Selected

After evaluating the potential advantages and challenges of each scenario, the Medium-Growth Approach has been identified as the most feasible option for Tog Wajaale's urban expansion over the next three decades. This scenario offers a balanced, sustainable approach that allows for



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economic growth, controlled urbanization, and infrastructure development without overburdening the city's resources. It minimizes boundary conflicts, addresses social equity, and is adaptable to both local and regional planning frameworks. Therefore, the Medium-Growth Approach is recommended for implementation, ensuring a prosperous and resilient urban future for Tog Wajaale.



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9. Chapter Nine: Analysis of the Proposed Urban Expansion Plan

Urban expansion is a crucial aspect of the growth and development of cities. It involves a comprehensive analysis of land use, infrastructure planning, and future growth projections. This chapter will analyze the proposed urban expansion plan by categorizing different land types, assessing their potential for development, and evaluating the implications of each land category in urban planning. The analysis will delve into each aspect of the proposed urban expansion data, examining it from multiple perspectives, including land availability, suitability for development, infrastructure requirements, and potential challenges.



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TOG-WAJAALE_CITY_PROPOSED_SUPER_BLOCK_TYPES_MAP

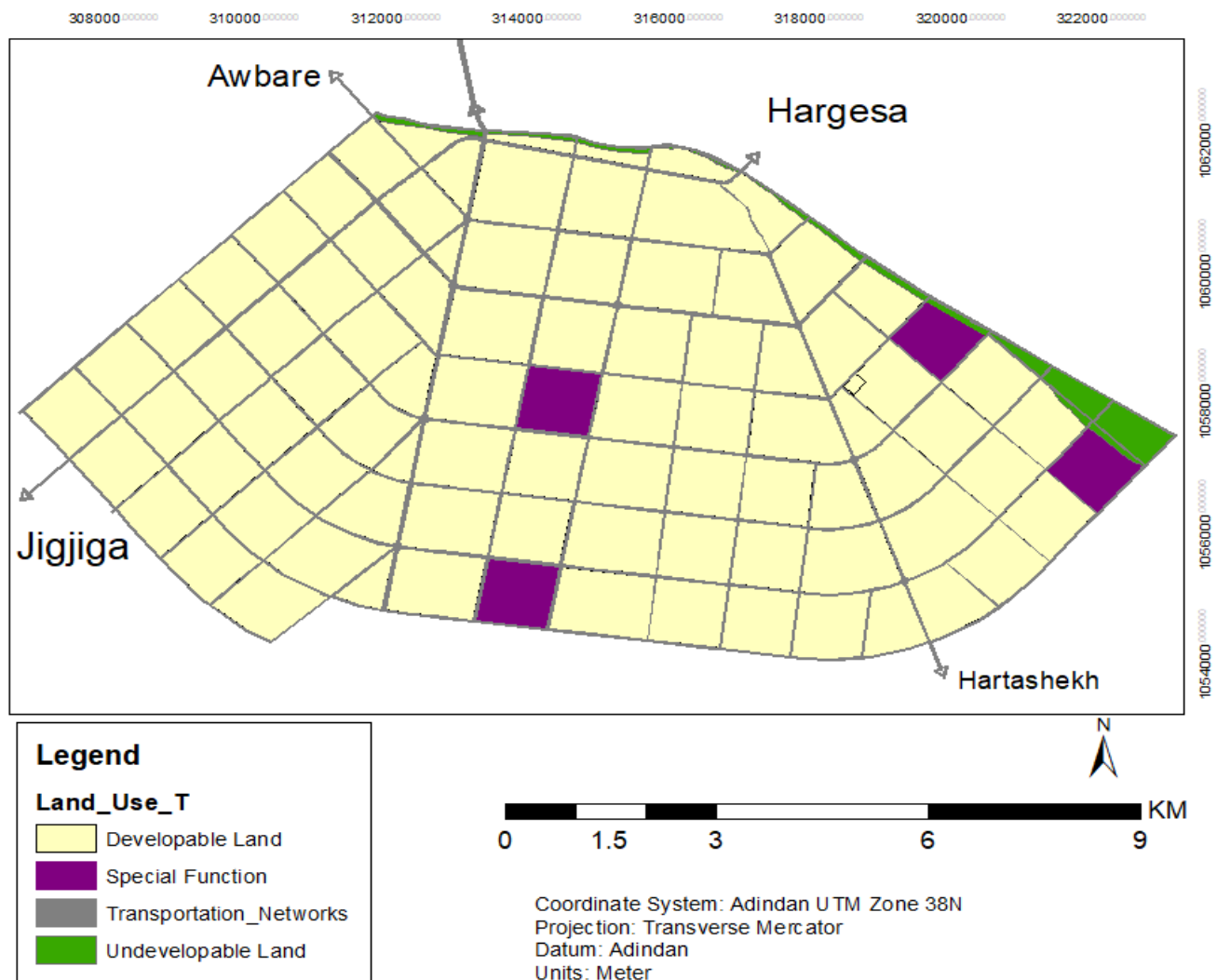


Figure 8 TOG-WAJAALE_CITY_PROPOSED_SUPER_BLOCK_TYPES_MAP

Source: Tog Wajaale City urban expansion team



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9.1. Proposed Expansion Area: Laying the Foundation for Future Growth

Total Area: 90,326,787.45 m² (9,032.68 hectares)

This Proposed Expansion Area outlines the land earmarked for potential urban growth, serving as a cornerstone for long-term city planning. This extensive area signals a commitment to accommodating robust growth and increasing population density through future residential, commercial, and industrial development.

Key Points for Consideration:

Strategic Importance: This vast area reflects a proactive approach by planners recognizing the need for additional urban space to support population increases, migration, and economic growth. It exemplifies forward-thinking urban policy emphasizing both expansion and sustainability.

Environmental Impact: Large-scale expansion inevitably raises concerns regarding environmental sustainability. It's crucial to assess the ecological impact of such an extensive area, focusing on the preservation of green spaces, wildlife habitats, and natural resources.

Infrastructure Pressure: Significant investments in infrastructure—such as water supply, waste management, and power grids—are essential. Planners must evaluate if existing infrastructure can accommodate this growth or if considerable upgrades are necessary.

Planned Area: The Blueprint for Development

Total Area: 25,211,120.10 m² (2,521.11 hectares)

The Planned Area comprises land already designated for specific development types, having been mapped out with clear intentions for future urbanization. This core outlines where development will unfold over the short and medium term.

Key Points for Consideration:

Zoning and Land Use: The planned area provides insight into the city's future layout, including residential, commercial, and industrial zones. Aligning zoning laws with sustainable land use practices is vital to avoid urban sprawl and promote efficiency.



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Economic Development: Likely to become an economic hub, the planned area must strategically accommodate commercial, retail, and industrial developments to maximize economic potential while minimizing environmental and social costs.

Transportation Integration: The planned development areas must connect seamlessly with existing and future transportation networks, ensuring efficient and sustainable mobility. Proximity to transit hubs and major roads is a key consideration.

Current Built-Up Areas: Evaluating Existing Urban Spaces

Total Area: 7,110,000.00 m² (711 hectares)

Current Built-Up Areas reflect the urban spaces developed to date, illustrating the existing state of infrastructure, housing, and economic activity. They represent the foundation where most of the population resides.

Key Points for Consideration:

Urban Density: These areas highlight current density levels, necessitating optimization to accommodate growing populations. High-density zones may call for vertical expansion or mixed-use developments to meet future demands.

Urban Renewal: As urban needs evolve, many cities undergo renewal or redevelopment. Planners should consider updates to existing infrastructure, retrofitting older buildings, and enhancing amenities to align with modern requirements.

Infrastructure Strain: Significant urban populations within built-up areas often lead to infrastructure pressure. Upgrades may be needed for transportation networks, utilities, and services to prevent congestion and degradation.

Developable Land: Potential for Urban Growth

Total Area: 81,610,542.33 m² (8,161.05 hectares)



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Developable Land comprises areas suitable for construction, urbanization, or expansion, crucial for meeting the growing demand for housing and commercial spaces.

Key Points for Consideration:

Land Suitability: Not all land within the developable area is equally suitable for construction; factors like topography and proximity to infrastructure significantly influence feasibility.

Sustainability Considerations: Development may lead to the loss of green spaces and habitats. Prioritizing sustainable practices is essential to minimize environmental impact.

Phased Development: The ample developable land allows for phased growth, distributing the pressures on resources and infrastructure. Strategic planning is vital for alignment with urban development goals.

Undevelopable Land: Identifying Constraints on Growth

Total Area: 1,606,245.12 m² (160.62 hectares)

Undevelopable Land includes areas that cannot be developed due to natural or regulatory restrictions, such as floodplains and protected zones. These spaces can also include parks and cultural sites.

Key Points for Consideration:

Ecological Sensitivity: Such areas provide essential ecological functions like flood regulation and biodiversity conservation. Effective management is necessary to preserve these critical functions.

Land Use Alternatives: While undevelopable for construction, these lands can serve as parks, forests, and recreation areas, acting as buffers between urban development and natural landscapes.

Strategic Protection: Urban expansion often pressures undevelopable lands. Policies protecting these areas are essential for maintaining a balanced urban ecosystem.

Urban Livability: Special function areas foster quality of life through parks and recreational spaces, while institutions like hospitals and universities strengthen community ties.



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Social and Cultural Impact: Designations for cultural functions enhance community identity. The accessibility of these spaces affects neighborhood cohesion.

Flexibility in Function: Designated areas may require flexibility over time to meet changing societal needs, allowing for the emergence of new cultural or research facilities.

Transportation Network: Facilitating Mobility and Connectivity

Total Area: 6,432,036.88 m² (643.20 hectares)

The Transportation Network reserves land for roads, highways, and transit infrastructures, essential for efficient movement within the city and beyond.

Key Points for Consideration:

Accessibility and Connectivity: A well-planned transportation network is vital for urban mobility, influencing traffic congestion and commuting experiences.

Sustainability: Transportation systems should mitigate environmental impacts by reducing emissions and incorporating sustainable transport modes, such as public transit and biking.

Long-Term Vision: Future transportation planning must anticipate growth and emerging technologies, ensuring that public transit expansion reduces car dependency.

Special Function Planned Area

Total Area: 3,655,315.25 m² (365.53 hectares)

The Special Function area is designated for unforeseen needs or services that may arise over time, ensuring flexibility in urban planning.

Key Points for Consideration:

Land Suitability: The reserve should be aptly located to accommodate future developments, maintaining adaptability as urban conditions evolve.



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Sustainability: Prioritizing sustainable practices within this area ensures that future developments align with environmental protection objectives.

Phased Development: A gradual approach to utilizing this reserve allows for careful assessment and responsiveness to emerging community needs. This strategy supports balanced urban growth while ensuring essential services are available when necessary.

Conclusion

A Comprehensive Approach to Urban Expansion

The analysis of the proposed urban expansion plan highlights the complexity and scale of planning required to accommodate future growth. By categorizing land into areas like planned, developable, and undevelopable, urban planners can make informed decisions that balance growth with sustainability, infrastructure development, and environmental preservation. Each land category plays a pivotal role in shaping the city of tomorrow, and careful consideration must be given to how these spaces are utilized to create a livable, efficient, and resilient urban environment.

As cities continue to grow, urban planners must embrace a holistic approach to expansion, ensuring that future developments align with broader economic, social, and environmental goals.



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10. Chapter Ten: Implementation Phases of Tog Wajaale's Urban Expansion Plan (2025–2055)

This chapter outlines the three key implementation phases for Tog Wajaale's Urban Expansion Plan. The aim is to effectively manage the city's population growth, urban sprawl, infrastructure needs, and sustainability challenges from 2025 to 2055. By the end of this period, Tog Wajaale is projected to have a population approaching 554,700, requiring robust urban management strategies.



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TOG-WAJAALE_CITY_IMPLEMENTATION_PHASES_MAP

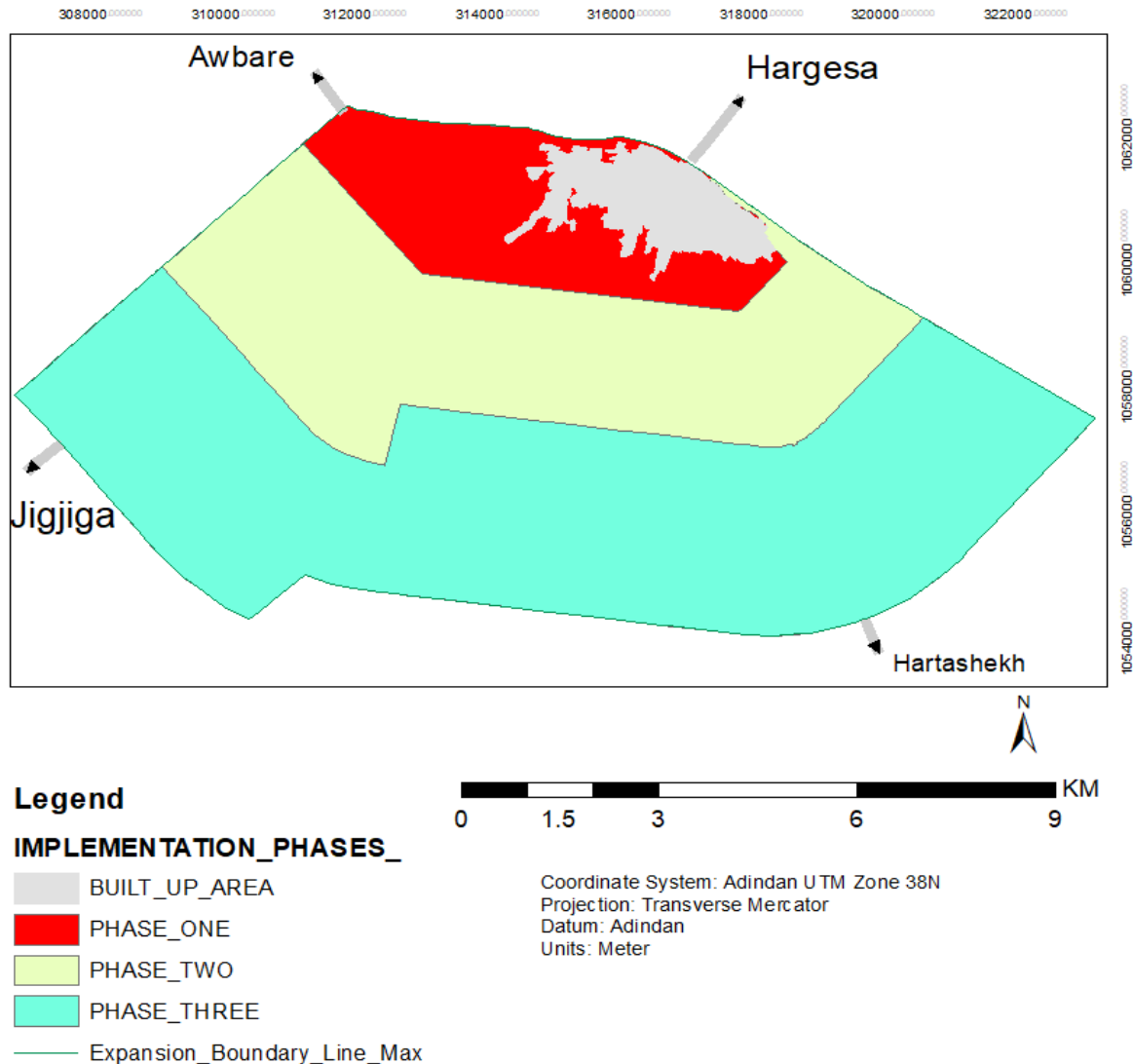


Figure 9 TOG-WAJAALE_CITY_IMPLEMENTATION_PHASES_MAP

Source: Tog Wajaale City urban expansion team



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10.1. Phase 1: Short-Term Growth and Infrastructure Development (2025–2030)

10.1.1. Population and Land Use Assessment

Objective: Establish a foundational understanding of the city's growth trends and prepare for the early stages of urban expansion.

Key Actions:

Validate Population Projections: Confirm the accuracy of the projected 2024 population of 82,064 and the annual growth rate of 6.4%. Prepare to scale up urban systems to handle the growth reaching 554,700 by 2025.

Land Use Capacity Assessment: Map current land uses and project future needs based on anticipated population growth. Assess land parcels suitable for residential, commercial, and recreational development.

Zoning and Regulations: Finalize and enforce zoning regulations to support sustainable growth. This will include special zones for green spaces, industrial areas, and mixed-use districts.

Challenges:

Gathering accurate demographic data in real time to adjust planning as migration patterns shift.

Securing land for infrastructure development amid increasing demand for urban housing.

Deliverables:

Updated Zoning Maps: Reflecting areas for high-density residential, commercial, and industrial use, as well as environmental conservation zones.

Infrastructure and Land Use Plan: A blueprint for the expected urban area of 757–1,450 hectares by 22030, focusing on key land parcels for future growth.

10.1.2. Infrastructure Expansion

Objective: Begin expanding critical infrastructure to meet the needs of the growing population.

Key Actions:

Water and Sanitation Systems: Install additional water treatment plants and sewage systems to meet growing demand, especially in underserved areas.

Road and Transportation Infrastructure: Develop arterial roads, key intersections, and public transportation hubs (e.g., bus stations, terminals) to improve mobility.

Affordable Housing Projects: Launch pilot affordable housing projects using sustainable building materials and energy-efficient designs to meet short-term housing needs.

Challenges:

Securing financing for large-scale infrastructure projects.

Balancing the rapid pace of expansion with the quality and sustainability of built infrastructure.



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Deliverables:

Completed Water and Sanitation Systems: Expansion of water networks and waste treatment facilities to accommodate the first wave of new residents.

Transportation Infrastructure: Key roads, bus routes, and pedestrian facilities designed to cope with population growth by 2030.

Housing Developments: At least 20% of the required affordable housing is completed in strategic urban areas.

10.1.3. Early-Stage Urban Growth Management

Objective: Ensure that the first decade of urban growth is manageable and sustainable.

Key Actions:

Density Control Measures: Implement strategies for reducing overcrowding, such as limiting the maximum number of people per hectare and introducing building height regulations.

Mixed-Use Zoning Guidelines: Create zoning regulations that allow for mixed-use developments (e.g., residential, commercial, and recreational spaces in one building or neighborhood).

Vertical Housing Solutions: Promote multi-story housing in dense urban centers to conserve land while increasing housing availability

Challenges:

Resistance from landowners or developers to increased density restrictions.

Balancing the need for urban expansion with environmental conservation.

Deliverables:

Density Management Policies: Regulations controlling overcrowding and promoting sustainable density through mixed-use zoning.

First-Phase Mixed-Use Developments: Projects that combine residential, commercial, and recreational spaces, especially in central areas.

Transport and Land Use Integration Plan: A framework that aligns transport systems with residential and commercial development.

10.2. Phase 2: Mid-Term Urban Expansion and Economic Development (2031–2045)

10.2.1. Growth Management and Zoning Optimization

Objective: Fine-tune zoning regulations and land-use policies to accommodate rapid population growth.

Key Actions:



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Review and Optimize Zoning Laws: Adjust zoning regulations to address the needs of a population of up to 301,600 by 2045, incorporating higher-density residential and commercial areas.

Mixed-Use Development Incentives: Introduce incentives for developers to create high-density, mixed-use buildings near transport hubs, which will reduce travel times and congestion.

Public-Private Partnerships (PPPs): Leverage PPPs to foster large-scale development projects such as malls, residential towers, and commercial districts.

Challenges:

Balancing private sector incentives with public needs.

Managing land speculation and price inflation as the demand for real estate increases.

Deliverables:

Updated Zoning and Land Use Plans: Expanding the city's development footprint in line with population projections.

Mixed-Use Development Projects: At least 30% of new residential areas to incorporate commercial and recreational facilities.

10.2.2. Infrastructure Scaling and Major Projects

Objective: Scale up infrastructure projects to meet the needs of a city of over 300,000 people by 2045.

Key Actions:

Large-Scale Transport Projects: Develop bus rapid transit (BRT) corridors and commuter rail lines and expand road networks to accommodate increased traffic volumes.

Upgrade Public Utilities: Implement solar and wind energy projects to supplement power generation, expand water supply networks, and improve waste management systems.

Education and Healthcare Expansion: Develop new educational institutions and healthcare facilities, including hospitals, clinics, and vocational training centers, to match the growing population's needs.

Challenges:

Securing funding for long-term infrastructure projects.

Integrating renewable energy and sustainable building practices in a rapidly expanding city.

Deliverables:

Expanded Public Transport Networks: Completion of new bus routes, BRT systems, and initial commuter rail lines.

Infrastructure Upgrades: Completed solar energy projects, water treatment facilities, and waste management systems.

Healthcare and Education Facilities: New hospitals, clinics, and schools built in high-density areas.



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10.2.3. Urban Sprawl Prevention and Environmental Conservation

Objective: Minimize urban sprawl and promote sustainable development patterns.

Key Actions:

Tighten Land Use Regulations: Implement tighter regulations to prevent the unchecked spread of urban sprawl. Focus on maintaining green spaces and limiting the expansion of low-density suburban developments.

Compact City Models: Continue to encourage higher-density housing projects, particularly in the urban core, and promote mixed-use neighborhoods that reduce the need for long commutes.

Environmental Conservation Areas: Establish protected parks, forest reserves, and wetlands surrounding Tog Wajaale to conserve natural ecosystems and biodiversity.

Challenges:

Resistance to high-density zoning from local residents and developers.

Balancing urbanization with environmental preservation.

Deliverables:

Green Space Development Plan: A comprehensive plan to create and maintain parks, nature reserves, and eco-friendly public spaces.

Compact Urban Developments: Completion of vertical housing units and sustainable urban districts that reduce the footprint of new developments

10.3. Phase 3: Long-Term Development and Sustainability (2046–2055)

10.3.1. Comprehensive Urban Growth Planning

Objective: Plan for the long-term growth of Tog Wajaale as it nears 554,700 people by 2055, ensuring sustainability and livability.

Key Actions:

Master Plan for Expansion: Develop a comprehensive urban master plan that focuses on sustainable growth, smart city technology, and eco-friendly infrastructure.

Land Acquisition for Future Growth: Secure land parcels for future urban expansion beyond 2045, prioritizing mixed-use zones and green spaces.

Smart City Technologies: Integration of smart city solutions like digital infrastructure, IoT-enabled systems, and data analytics to manage traffic, waste, and resource usage more effectively.

Challenges:

Long-term funding and financing for large infrastructure projects.

Anticipating future technologies and urban challenges that might emerge.

Deliverables:



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Long-Term Master Plan: Urban growth plan covering 4,806–8,990 hectares, focusing on smart and sustainable development.

Strategic Land Acquisitions: Land parcels secured for future urban development, including green zones and mixed-use areas.

10.3.2. Infrastructure Overall and Large-Scale Projects

Objective: Ensure the city has the infrastructure needed to support 554,700 residents by 2055.

Key Actions:

Public Transport Networks: Develop metro systems, dedicated bus lanes, and extensive cycling infrastructure to handle a high-density urban environment.

Renewable Energy Integration: Implement large-scale solar, wind, and geothermal energy projects to meet future energy demands.

Water and Waste Systems: Expand the city's water supply system and integrate wastewater recycling technologies to ensure sustainable water use.

Challenges:

Managing large infrastructure projects while maintaining public services.

Navigating complex environmental regulations related to large-scale energy projects.

Deliverables:

Metro Systems and Cycling Infrastructure: Fully developed metro networks, BRT corridors, and cycling infrastructure.

Renewable Energy Projects: Completed solar and wind farms.

Advanced Water Management: Completed water and waste management systems, including wastewater recycling plants.

10.3.3. Environmental Sustainability and Green Urbanization

Objective: Ensure Tog Wajaale grows in an environmentally sustainable manner.

Key Actions:

Green Building Standards: Mandate green building practices in all new developments, promoting energy-efficient designs and sustainable construction materials.

Expanded Green Spaces: Increase the number of parks, green roofs, and urban gardens throughout Tog Wajaale.

Eco-Friendly Waste Management: Develop an efficient recycling and composting system, reducing the need for landfills.

Challenges:



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- o Ensuring that developers adopt green building standards.
- o Securing funding for large-scale environmental sustainability projects.

Deliverables:

Green Urban Developments: New housing projects built with energy-efficient designs and sustainable infrastructure.

Urban Parks and Green Corridors: Expanded green spaces and community gardens integrated throughout the city.

Eco-Friendly Waste Management Systems: Comprehensive recycling and composting facilities.

Conclusion

The three-phase urban expansion plan from 2025 to 2055 ensures that Tog Wajaale's rapid growth is sustainable, infrastructure-efficient, and adaptable to future challenges. Each phase—Short-Term (2025–2030), Mid-Term (2031–2045), and Long-Term (2046–2055)—focuses on laying the groundwork, scaling infrastructure, and ensuring sustainable growth, setting the stage for Tog Wajaale to evolve into a thriving urban center that meets the needs of its expanding population while maintaining environmental and economic sustainability.



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11. Chapter Eleven Summary Analysis for Tog Wajaale Urban Expansion Project (2025–2055)

11.1. Introduction

The Tog Wajaale Urban Expansion Project (TWUDP) aims to transform Tog Wajaale into a vibrant, sustainable, and inclusive city over the next three decades. This chapter outlines strategic recommendations and detailed analyses to address urban growth challenges, optimize infrastructure, foster economic development, and ensure environmental sustainability. The focus is on actionable strategies to guide Tog Wajaal’s evolution into a resilient urban hub.

11.2. Strategic Vision and Objectives

General Objective

- To establish Tog Wajaale as a modern, sustainable, and inclusive urban center, providing affordable housing, robust infrastructure, and economic opportunities while preserving cultural heritage and addressing environmental challenges.

Specific Objectives

- Housing Development: Deliver affordable, safe, and inclusive housing for the growing population.
- Sustainable Urban Planning: Integrate green spaces, climate-resilient infrastructure, and renewable energy.
- Economic Growth: Develop industrial and commercial zones to create jobs and diversify the economy.
- Infrastructure and Connectivity: Expand and modernize transportation networks and utilities.

11.3. Projected Urban Growth

- ⊕ Population Projections:
 - 2025: 87,300
 - 2055: 554,700 (535% increase).
- ⊕ Urban Area Expansion:



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- Current urban area: ~711 hectares.
- Projected urban area by 2055: ~8,990 hectares
- ⊕ Land Use Plans:
 - Focus on mixed-use zoning to optimize land use and avoid urban sprawl.
 - Controlled expansion to minimize agricultural land conversion.

11.4. Infrastructure Development Plans

- ⊕ Roads and Transportation
 - Highways: Upgrade major highways connecting Tog Wajaale to Dire Dawa, Addis Ababa, and Somaliland border towns.
 - Public Transit: Develop formalized systems, such as buses and light rail, for improved urban mobility.
 - Pedestrian and Cycling Infrastructure: Create safe, accessible pathways to reduce reliance on cars and promote sustainability.
- ⊕ Utilities and Public Services
 - Expand water, electricity, and sanitation networks to meet increasing demand.
 - Introduce renewable energy solutions, including solar and wind power.
 - Strengthen waste management systems with a focus on recycling and composting.
- ⊕ Housing Development
 - Construct affordable housing projects targeting low- and middle-income families.
 - Encourage vertical development in high-density urban zones to optimize land use.

11.5. Environmental and Climate Resilience

- ⊕ Key Environmental Challenges
 - Flash floods during rainy seasons.
 - Periodic droughts and water scarcity.
 - Risks of desertification and soil erosion.
- ⊕ Mitigation Strategies
 - Establish urban green belts and parks to mitigate urban heat island effects.



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- Implement rainwater harvesting and drought-resistant landscaping.
- Use soil stabilization techniques to prevent erosion in vulnerable areas.

⊕ Renewable Energy and Efficiency

- Mandate green building standards for new constructions.
- Invest in solar farms and other renewable energy projects.
- Implement energy-efficient public lighting and appliances.

11.6. Economic Growth and Opportunities

⊕ Industrial Zones

- Develop manufacturing hubs for textiles, food processing, and construction materials.

⊕ Commercial Development

- Promote business districts and regional trade hubs to boost commerce.
- Job Creation
- Encourage public-private partnerships (PPPs) to generate employment opportunities in the infrastructure, housing, and technology sectors.

11.7. Legal Framework and Governance

⊕ National Legal Context

- Align with Ethiopia's urban development policies and land use regulations.
- Ensure compliance with environmental protection laws and urban planning standards.

⊕ Regional Governance

- The Somali Regional Government will oversee land allocation, zoning, and infrastructure development.
- Strengthen Tog Wajaale Municipality's capacity to enforce building codes and manage urban growth.

⊕ International Alignment



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- Integrate Sustainable Development Goals (SDGs), particularly SDG 11 (Sustainable Cities) and SDG 13 (Climate Action).
- Leverage international investment treaties for funding support.

11.8. Selected Scenario for Growth

⊕ Medium-Growth Scenario (Chosen Approach)

- Balances population growth, economic expansion, and environmental sustainability.
- Urban density: ~61.7 people per ha.
- Land use: Planned expansion of ~50% in urban areas with strategic allocation for residential, commercial, and green spaces.

⊕ Advantages

- Controls urban sprawl.
- Ensures efficient delivery of services and infrastructure.
- Promotes economic diversification while preserving cultural and environmental assets.

11.9. Challenges and Mitigation Measures

Table 1 Challenges and Mitigation Measures

Challenges	Mitigation Strategies
Inadequate Infrastructure	Significant investment in roads, utilities, and housing via PPPs.
Informal Settlements	Formalize tenure and integrate informal areas into planned urban frameworks.
Environmental Degradation	Conduct rigorous Environmental Impact Assessments (EIAs) for all major projects.
Governance and Coordination	Enhance institutional capacity and foster multi-stakeholder coordination.
Financing	Diversify funding sources, including international loans, grants, and private investment.



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11.10. Recommendations and Conclusion

- Develop a dynamic plan updated every five years to address demographic, economic, and environmental changes.
- Community Participation
- Engage communities through workshops and public consultations to ensure inclusivity and ownership.
- Address the needs of marginalized groups, including women and youth.
- Smart City Integration
- Used Geographic Information Systems (GIS) for land-use optimization and resource management.
- Introduce digital tools for traffic management and utility monitoring.
- Capacity Building
- Train local planners and municipal staff in advanced urban management techniques.
- Establish monitoring and evaluation units for project oversight.

Conclusion

The Tog Wajaale Urban Expansion Project offers an ambitious yet feasible roadmap for transforming Tog Wajaale into a resilient urban hub. By adopting the medium-growth scenario, investing in sustainable infrastructure, fostering economic diversification, and engaging communities, Tog Wajaale can address its challenges while laying a foundation for equitable and sustainable development over the next three decades.



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