



Urban land policy and urban land use efficiency: An analysis based on remote sensing and institutional credibility thesis

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ABSTRACT

Ethiopia has an urban land lease policy in place to facilitate the transfer of land for residential, commercial and industrial purposes. Because of the lease policy, many cities have experienced significant expansion through massive conversion of agricultural land. Although the lease policy has been in place for nearly three decades, little is known about its effectiveness in promoting sustainable urban land use. This paper examines the effects of the lease policies on urban land use efficiency (ULUE). Building on the institutional credibility thesis, this paper investigated the performance of land institutions using the urban land use efficiency approach. Remote sensing data was used to investigate urban land use efficiency through spatiotemporal analysis of land use change. Analysis of satellite imagery was performed using ArcGIS. Moreover, quantitative and qualitative data from secondary sources were studied. The study findings show that in almost all study areas, urban land use efficiency is low, which is mainly reflected in the forms of land hoarding, land banking, illegal land grabbing, informal settlement, land use fragmentation and urban sprawl. A significant portion of the land transferred for various urban uses has remained vacant or underutilised for years, in direct violation of the provisions of the lease policy. This means that the lease policy has hardly been enforced to ensure efficient urban land utilization. This demonstrates the ineffectiveness (dysfunctionality) of the existing land institutions. It is concluded that some elements of the lease policy have evolved into an empty institution, i.e., a symbolic institutional arrangement that is largely ignored by socioeconomic and political actors.

1. Introduction

Ethiopia has had an urban land lease policy since 1993 to facilitate the transfer of urban land for various uses. The lease policy has played a central role in facilitating the process of transferring urban land, which has contributed to rapid urbanisation and economic development. Nonetheless, it has created or failed to address a number of challenges. One of the areas where the policy faced a serious challenge was in ensuring efficient urban land utilization. The policy did not provide a robust mechanism to ensure proper use of urban land. For instance, the 1993 and 2002 proclamations did not unambiguously stipulate when urban land use rights holders should initiate and complete land development projects. Instead, they left the responsibility to “the appropriate national or regional council” (FDRE, 1993) and to the “Region or City Government” (FDRE, 2002). This created policy loopholes that were

susceptible to manipulation and abuse. To fill this gap, the Urban Lands Lease Holding Proclamation nr.721/11 was re-enacted in 2011 (FDRE, 2011), in part to fill gaps pertinent to land use efficiency. The lease policy that came into effect in 2011 specifies when lessees must start and conclude land development projects. According to this proclamation, the transferred land must be fully developed within a maximum of 5 years (FDRE, 2011). It is conceivable that this was an attempt to address land speculation and land use inefficiencies, but also to admit that the previous two proclamations had gaps in these areas. In practice, however, the 2011 Urban Land Lease Proclamation appears to do little to improve urban land utilization and halt speculation (Kassa, 2015). Some sections of the new policy have been largely ignored by actors (Gemedet al., 2020). Moreover, the level of commitment from the government to enforce appears weak or symbolic (ENA, 2018). As a result, the policy did little to address existing practices of land use inefficiencies (Gemedet al., 2020).

Abbreviations: FDRE, Federal Democratic Republic of Ethiopia; LCR, Land consumption rate; LCRPGR, the ration of land consumption rate to population growth rate; OBN, Oromia Broadcasting Network; PGR, Population growth rate; SNNPR, South nations, nationalities and people's region; ULUE, Urban land use efficiency.

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et al., 2020; Koroso et al., 2020). Inefficient urban land use is one of the reasons behind land supply shortages, inflated land prices, informal settlement and urban sprawl (Gemeda et al., 2020; Koroso et al., 2020; World Bank, 2015; Yusuf et al., 2009).

The analysis of institutional credibility has attracted the attention of scholars and it has been analysed from different perspectives, including institutions governing grazing land tenure security (Ho, 2016; Nor-Hisham and Ho, 2016), mining institutions (Yang and Ho, 2020), forest reform (Krul and Ho, 2020) and international negotiations and agreements (Dimitrov, 2020). The aim of this paper is to explore how urban land use efficiency (ULUE) can be affected by the existing institutional arrangement and its implementation. This will be done within the institutional framework. This paper discusses institutional credibility within the context of institutions governing urban land. ULUE is used as a measure to analyse institutional credibility.

The first section of this paper highlights the theoretical underpinnings of institutional credibility and related issues: empty institutions, institutional function vs forms, etc. The second section provides a policy overview with a focus on urban land lease policy in Ethiopia. Materials and methods (study area, data sources and data analysis) are discussed in Section 3. Results and discussion are presented in Sections 4 and 5, respectively. Finally, the conclusion summarizes the findings and highlights policy implications.

2. Theoretical overview

2.1. Land use efficiency

Urban land use efficiency is defined in several ways. It refers to a function, which includes both the land use effect (a result) and the consumed resources to achieve this effect (Auzins et al., 2013). According to Huang et al. (2016), it refers to how optimally a piece of urban land is used after conversion and/or after transfer to a third party. ULUE can be expressed in terms of a degree of interaction between human economic activities and natural subsystems, according to Liu et al. (2019). Other scholars defined it as a measure of an input-output ratio measured in terms of factors such as land, capital and labour (Chen et al., 2016). Urban land use efficiency can also be defined as the ratio of urban area growth to population growth (Corbane et al., 2017; Zhang et al., 2020; Zitti et al., 2015). In general, land use efficiency analysis is done to evaluate the optimum use of land for various use types (Auzins et al., 2013). That means that low-density¹ development, largely due to land hoarding/fencing, land banking, urban sprawl, land use fragmentation and land oversupply can adversely affect the optimum use of urban land.

Land hoarding or fencing refers to vacant land or land unused for years (Németh and Langhorst, 2014). This includes plots held by individuals or companies for speculation or future expansion, or by municipalities for future sale or development (land banking). Urban vacant land, according to Németh and Langhorst (2014), is a common occurrence in most cities. Moreover, urban sprawl happens when a city, usually with a low built-up density, expands rapidly into peri-urban areas (Rafferty, n.d.). Informal settlements, according to the UNSD (1997), have two key characteristics. It represents “areas where groups of housing units have been constructed on land that the occupants have no legal claim to, or occupy illegally; and unplanned settlements and areas where housing is not in compliance with current planning and building regulations (unauthorized housing)”. Informal settlements can be identified using physical (irregular shapes, lack of infrastructure, lack of public spaces, etc.) socio-economic (low income, poor-quality living and housing conditions) and legal criteria (illegal land occupation, informal subdivision, informal farmlands conversion, violating urban

and building regulations criteria, etc.) (Fernandes, 2011).

The degree of ULUE exhibited within a given country differs. Studies revealed that ULUE varies across regions and cities (Jiao et al., 2020; Wang et al., 2015). Land use efficiency of urban expansion areas and areas at the peripheries are relatively low, Huang and Xue (2019) wrote. Similarly, ULUE is associated with different stages of economic development, according to Chen et al. (2016). Economically developed regions tend to achieve better ULUE scores. ULUE in “old urban areas and mature built-up areas” is relatively high (Huang and Xue, 2019). Furthermore, as Zhao et al. (2018) suggested, ULUE is positively associated with the agglomeration of industries, labour, capital and technology. There are other factors that determine ULUE. These include population density, investment, fiscal expenditure, transportation infrastructure, land marketization, type of land, etc. (Wang et al., 2015). Additionally, land policy effectiveness, particularly in areas of lease policy enforcement (Koroso et al., 2020), land management (Zitti et al., 2015) and zoning plan implementation are other ULUE determinants.

ULUE has been studied by different scholars focusing on issues such as agricultural productivity, farmland protection, land management, land use intensity, etc. (Auzins et al., 2013; Storch and Schmidt, 2008; Wei et al., 2018; Yang et al., 2017). For instance, Zitti et al. (2015) investigated the ULUE of Southern Europe, mainly that of Greece. Unsustainable urban growth, which creates land use inefficiencies, they argued, is a function of market forces related to weaknesses in policies and practices. Policies for sustainable land management should take local and regional factors into account, they advised. There are also studies on ULUE focused on urban and rural China (Wei et al., 2018; Yang et al., 2017). For instance, Ding (2001) studied Chinese ULUE from an economic, mainly land market perspective.

2.2. Institutional credibility

Institutional credibility is “the perceived social support [that institutions enjoy] at a given time and space” (Ho, 2014). Institutional credibility emanates from its functions. Institutional function is mainly about how institutions serve people than the form it takes (Ho, 2018). Compliance and enforcement are indispensable for the proper functioning of institutions (North, 1990; Prakash and Potoski, 2016). Sometimes institutions are hardly enforced and therefore do not perform according to established rules. This happens for several reasons. According to Prakash and Potoski, institutions do not function properly when they are captured by interest groups. Likewise, institutions fail to deliver, Ho (2016) argued, if they are empty institutions designed from the onset for symbolic purposes.

Institutional function is usually expressed in terms of institutional effectiveness or credibility at a given time and space (Ho, 2014). Traditionally, much emphasis has been placed on the forms² of institutions rather than their functions (effectiveness) (Ho, 2020). That is why many countries formulated various (formal) institutions, which have usually been copied from other countries. However, it has become apparent that institutional forms do not guarantee proper institutional performance and credibility (Ho, 2018, 2014). There is a growing call from scholars to focus more on institutional function than mere form (Chen, 2020; Dimitrov, 2020; Ho, 2018, 2014; Krul and Ho, 2020; Zheng and Ho, 2020).

Weaknesses in institutional performance or effectiveness often result in missed goals and objectives (Acemoglu and Robinson, 2008). This further undermines the credibility of institutions (Ho, 2018, 2014, 2006). Formal institutions that fail to fulfil their missions become non-credible institutions. When formal institutions are no longer credible, actors often resort to informal institutions (Ho, 2018). On the other hand, institutional credibility is a continuum. That is an institution can

¹ In this paper, density refers to the ratio of developed land (built-up) compared to open spaces and vegetation cover within the built-up environment.

² Institutional forms, mainly in relation to land institutions, refer to formal, private, titled (secure) property rights.

be fully credible, partially credible, or non-credible (Ho, 2014). Besides, the degree of institutional credibility can be impacted by time and space. Additionally, it is not wise to assume that all empty institutions have the same characteristics in terms of formulation and implementation.

Empty institutions are “compromises over sensitive political issues. The interests opposed to them ensure that they are established in such a way that they cannot achieve their aims, whereas the interests supporting them win a pyrrhic victory as their rules, as represented by the new institution, have no practical impact on social actors’ behaviour” (Ho, 2005b, p. 73). They are ‘symbolic set of rules’ and often “ineffective and ignored” (Ho, 2016), with literally no consequences if disregarded (Krul and Ho, 2020). An empty institution, according to Krul and Ho (2020), is “a symbolic token that remains inconsistent with its stated objectives”. Empty institutions, Dimitrov (2020) argued, are designed in such a way that policies cannot have functional effects.

According to Ho, weakness in enforcement could be the reason for the existence of empty institutions. It emerges when the role of institutions is relegated to mere symbolism and ignored by actors. He wrote: “the newly desired institution becomes detached from actors’ daily practices and evolves into an “empty institution.” Its disassociated status allows those governed to generally continue with what they were doing, while those governing can “enforce without enforcing” (Ho, 2017, p. 204).” This illustrates that empty institutions result from political bargains or noncompliance by actors. This is to pretend that a government is serious about some issues that the public is interested in. Occasionally, however, attempts to create empty institutions fail, Dimitrov (2020) wrote.

Empty institutions do not have meaningful impacts on actors’ conduct. This may be because most rules exist only on paper or they are ‘an empty shell’ that has very little impact on actors’ behaviour (Ho, 2005). In this sense, the gap between what is formally stated and what is actually implemented is an indicator of empty institutions (Krul and Ho, 2020). Although empty institutions are usually ineffective, we may not find fully contested or fully ineffective empty institutions, Ho (2014) argued.

Empty institutions can be credible for some actors and non-credible for others (Krul and Ho, 2020). It is credible for those who directly benefit from empty institutions. For instance, a lack of proper lease policy enforcement, particularly in areas related to land utilization, can be beneficial for speculators and corrupt officials (Eticha, 2017; Mengistu and van Dijk, 2018). According to Ho (2017), non-credible institutions can help prevent or delay potential conflicts with interest groups. On the other hand, it can be non-credible to those who do not benefit or are affected by a lack of enforcement. In some severe cases, it can be a source of anger, conflict and contestation.

Empty institutions can be described on a continuum: fully and partially empty (symbolic) and fully functional. This can also be time and space bound. Furthermore, along the institutional credibility continuum, there is usually an empty institution somewhere in the middle. If enforced under political or public pressure, empty institutions can evolve into credible (for actors who resisted their existence) or non-credible (for actors who took advantage of their existence) institutions (Ho, 2016). Fig. 1.

3. Urban land policy in Ethiopia

In this section, this paper provides an overview of urban land policy in Ethiopia. The following sub-sections highlight urban land lease policy, urban land utilization, policy implementation challenges and urban land use efficiency.

3.1. Urban land lease policy

In Ethiopia, urban land is under state ownership. To transfer land to individuals, companies and public/private entities, the country has adopted a land lease policy. Ensuring that urban land is used in a way

that meets the needs of the population (FDRE, 1993), removing obstacles and speeding up the land transfer process (FDRE, 2002) and efficiently and responsively meeting the increasing demand for urban land are some of the objectives of the land lease policy (FDRE, 2011). Under the lease policy, land can be acquired for industrial, residential and commercial purposes. The lease duration, except in Addis Ababa,³ is 99, 80, 70 and 70 years for education and health, industrial, commercial and other purposes, correspondingly (FDRE, 2011).

Under subsequent lease policies, the transfer of urban land has taken various forms: tendering, negotiation and administrative allocation (FDRE, 2011, 2002, 1993). The revised lease proclamation of 2011, nevertheless, removed negotiation as a mode of land transfer (FDRE, 2011). This is ostensibly to address the challenges posed by this mode of land transfer.

Ethiopia’s urban land lease policy aims to promote economic development and attract investment (FDRE, 2011, 2002). To achieve these goals, land has been used as a policy instrument to attract domestic and foreign direct investment (Lavers, 2012). To incentivize investment, a sizable urban and peri-urban land has been transferred to individuals, companies and public enterprises. In Ethiopia, urban land has additionally been used to generate municipal revenue to finance urban infrastructure building (Peterson, 2006; World Bank, 2015). Using land to attract investment and generate income is a widely used policy tool in countries like China (Du and Peiser, 2014; Nolte, 2014; Vongpraseuth and Choi, 2015; Zoomers, 2010). These policy objectives, however, might not be realized without efficient urban land utilization.

3.2. Urban land utilization

According to the lease proclamations, land development should be started and completed within the stipulated period (FDRE, 2011, 2002, 1993). Nonetheless, the 1993 and 2002 proclamations did not specify when land development should be started and when it should be completed. The responsibility to determine this was left to regional and urban governments. This created policy ambiguity, which opened doors for manipulation. The revised land lease proclamation of the city of Addis Ababa, for example, recognized gaps in the previous lease proclamations, specifically in the areas of land utilization and enforcement. It also acknowledged the prevailing practices of illegal land subdivision,⁴ land fencing, corruption and land mismanagement due to lease policy loopholes (Addis Ababa City Government, 2011).

To fill the existing gaps, the 2011 lease policy proclamation included provisions setting the start and completion time for land development. According to this proclamation, leaseholders for small and large projects must start land development projects within 6–18 months from the date of issuance of construction permits⁵ (Addis Ababa City Government, 2011). Once construction has started, it should be completed within 2–4 years, depending on the scale of development projects (FDRE, 2011).

In theory, noncompliance results in fines and/or termination of the lease contract. In reality, however, there are no proper monitoring and sanction mechanisms in case developers fail to develop plots. Developers often produce various excuses, such as a lack of infrastructure to commence construction projects. However, according to the 2011 Urban Land Lease Proclamation, urban lands must have access to a basic infrastructure prior to transfer. Excuses such as lack of infrastructure might be true in some situations. Nevertheless, it should be noted that there is a significant size of land sitting idle in the inner city section, where infrastructure-related excuses cannot be a good justification for

³ In Addis Ababa, the lease terms for industrial and commercial use are 70 and 60 years, respectively.

⁴ Land transferred through the lease contract should be used for intended purposes.

⁵ A building permit must be issued within 3, 6 and 9 months for small, medium and large projects, respectively.

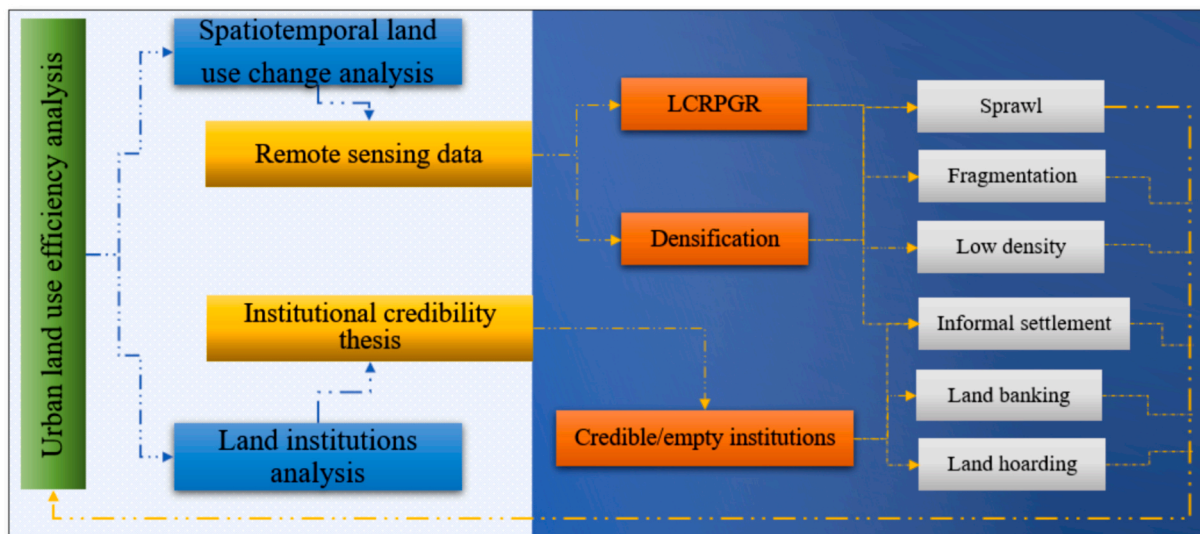


Fig. 1. ULUE & institutional credibility analysis framework.

the lack of development or land underutilization (Kassa, 2015; Koroso et al., 2020; World Bank, 2015).

There are several factors affecting urban land utilization in Ethiopia. Land hoarding, land stockpiling, illegal occupation and corruption remind some of the most pressing issues in the country (Eticha, 2017). Although the government envisions a compact city (World Bank, 2015), its realization so far remained elusive due to a lack of proper planning and implementation. Poor land management practices continued to undermine a compact and efficient urban form (World Bank, 2015). Contrary to the vision, municipalities have until recently focused on the supply of land than on the efficient use of already disposed land. As a result, the country has so far achieved neither effective land supply nor efficient land utilization. Lack of land policy enforcement, corruption, nepotism and political interference, capacity limitations and land transfer below market value are some of the reasons for the prevailing challenges (Eticha, 2017; Gemedu et al., 2020; Legesse, 2014; World Bank, 2015). These are discussed in more detail in the next section.

Ethiopia's land lease policy lacks clarity because of some ambiguous provisions and easily changing directives (Plummer, 2012; Wubneh, 2018). Therefore, it is vulnerable to manipulations, which has created opportunities for speculation, corruption and nepotism (Adamu, 2014; Eticha, 2017; Gebremariam and Mailimo, 2016). For instance, the lease policy lacks strong legal provisions to deal with speculation (Adamu, 2014). Besides, there is also a lack of commitment (ENA, 2018) and capacity to address it. This created a conducive environment mostly for powerful people and organizations to engage in speculation (Adamu, 2014; Gebremariam and Mailimo, 2016). The active involvement of the powerful and the political elite in speculation and land transactions (Plummer, 2012) could explain the government's reluctance or inability to control speculation, either through strong enforcement or by changing the land transfer model. Furthermore, there are also manifestations of state capture: a significant size of the land is being held by the rich, the powerful and by those who are politically affiliated with the ruling party (Gebremariam and Mailimo, 2016; Lindner, 2014; Plummer, 2012). Weaknesses in policy formulation and legal framework and failure to meaningfully enforce policies are the main reasons behind elite capture (Plummer, 2012).

Low ULUE in a given area, Shen et al. (2019) wrote, is largely attributed to the inability to implement policies or conform to existing policies or plans. It can also be an indicator of bad policy formulation, which does not encourage efficient urban land use.

3.3. Lease policy implementation challenges

In Ethiopia, at the municipal level, the Urban Land Development and Management Bureau is the main body responsible for implementing urban land tenure policy. Local officials have considerable power when it comes to implementing land lease policies (Wubneh, 2018). That means municipalities play a vital role, both in ensuring proper land utilization and in failing to do so. However, as mentioned, there are gaps in the enforcement of land lease policy. Although the lease policy has had gaps for years, measures taken to address the problems have not been satisfactory (Gemedu et al., 2020).

There are several plausible reasons for the lack of proper enforcement. First, Ethiopia's land lease policy is complex both in terms of formulation and implementation (World Bank, 2015). Besides, there is rigidity and reluctance to reform the policy meaningfully (Adamu, 2014). Furthermore, there are interventions and influences from the federal government on regional and municipal governments (Kassa, 2015; Wubneh, 2018).

Second, local governments have capacity limitations in several areas. They are understaffed and lack qualified personnel (Eticha, 2017; World Bank, 2015). Particularly, they have institutional capacity constraints in areas such as land rights and obligations enforcement and lease policy implementation, Wubneh (2018) argued. In addition, there is a need for technical capacity development, especially in areas related to land management (MoUDH, 2013). Besides capacity constraints, a lack of commitment to enforcing existing policies has also encouraged land hoarding (Gemedu et al., 2020; Shen et al., 2019).

Third, according to the World Bank (2015), most cities do not keep proper land inventories. This includes the extent and location of fenced land and land in land banks. This complicates lease contract enforcement, particularly to address issues of land underutilization, speculation and illegal activities (MoUDH, 2013). To ensure efficient land use, the Ministry recommends that a comprehensive inventory of vacant and underutilized land be compiled.

There are other issues that undermine land use efficiency. One is the transfer of urban land below market value. This practice seems to encourage land hoarding. Under the guise of land for investment, individuals and companies usually acquire urban land far below market value (World Bank, 2015). Nevertheless, instead of developing the land, some of them engage in speculative practices. If the land is priced at the market value, land utilization enforcement (tackling speculation) might not require a robust institutional capacity, as keeping land idle is costly for landholders (World Bank, 2015).

Besides, there is a pattern of excessive land allocation for government agencies and investment companies. In Dire Dawa, for instance, 18 government agencies hold 57 ha (World Bank, 2015). Usually, companies or agencies keep all or a significant part of the plot idle for years (Gemedo et al., 2019; Koroso et al., 2020). To tackle this problem and improve land use efficiency, moderate land consumption standards, by both public and private entities, should be an integral part of the urban planning process (World Bank, 2015). In general, introduced land policies affect urban land use efficiency (Frenkel, 2004; Huang et al., 2017; Lichtenberg and Ding, 2016; Yang et al., 2017). Therefore, land policy design should consider the effect of policies on ULUE (Wei et al., 2018).

4. Materials and methods

This section covers the methods, study area, data sets and data analysis techniques.

4.1. Study area

This paper investigated urban land use efficiency in Adama (Oromia), Hawassa (Sidama), Bahir Dar (Amhara), Mekele (Tigray), Jijiga (Somali Region), Legetafo (Oromia) and Gelan (Oromia). Adama, Hawassa, Bahir Dar, Mekele and Jijiga are regional cities. Gelan and Legetafo are Addis Ababa satellite cities.

These urban areas were purposively selected for the following reasons: rapid urban expansion; investment flows; the existence of informal land market and informal settlements and also because of their regional and geographical representation. The purpose of this paper is to examine how urban land use efficiency can be influenced by existing institutional arrangements and their implementation. Thus, the cities included in this study are suitable for this research both in terms of number and regional diversity (Fig. 2).

4.2. Methods

To measure ULUE, scholars employed various techniques. Data Envelopment Analysis (DEA), scale-adjusted metropolitan indicators, exploratory spatial data analysis, stochastic frontier analysis and slacks-based measures are some of the techniques used to study ULUE (Danni, 2019; Huang and Xue, 2019; Jiao et al., 2020; Liu et al., 2019; Lu et al., 2020; X. Wang et al., 2020; Xing and Sun, 2013; Zhu et al., 2019). Another technique to measure ULUE is to measure the ratio of urban expansion (land consumption) to population growth (Cai et al., 2020; Jiang et al., 2021; Koroso et al., 2020; Melchiorri et al., 2019; Mudau et al., 2020; Nicolau et al., 2019; Schiavina et al., 2019; Y. Wang et al., 2020). This technique measures how much land cities consume in relation to their population growth. In addition, densification (urban infill) is another method for assessing urban land use efficiency (UN-Habitat, 2018).

Realizing a compact city is one of the urban land use policy goals to improve urban density and tackle urban sprawl and fragmentation. Although in most cases city planners try to achieve a compact city, there is no consensus on what the optimum density⁶ of a given city should look like. Because the desired density differs from country to country. It differs even within a city: central business district, residential and sun-urban density. Regarding the ratio of land consumption to population growth, however, Lall et al. (2021) proposed the ULUE benchmark for countries at different stages of development: low-income countries (0.47), lower-middle-income countries (0.86), upper-middle-income countries (1.05) and high-income countries (0.88). According to this benchmark, a ULUE value > 0.47 is considered inefficient in Ethiopia.

⁶ According to Lehmann (2016), urban density refers to the number of people inhabiting a given urbanized area, and/or the amount of floor area built on a defined site.

However, in the Ethiopian context, in the absence of census data, this study only identifies the ULUE value > 1 as an indicator of inefficient land use, to be on the safe side.

For most African cities, according to Goldblatt et al. (2018), it is difficult to find city-level panel data on variables useful to measure urban land use efficiency. Therefore, because of their relevance and data availability, this study used the ratio of land consumption rate to the population growth rate and densification to assess ULUE in the study areas.

4.3. Data sets

The study of urban land use efficiency in the study area was mainly based on remote sensing and population data. Remote sensing data is ideal for spatiotemporal analysis of land use and land cover change (LULC) (Hepinstall-Cymerman et al., 2013). To investigate urban boundary expansion, land hoarding and informal settlements in the study areas, this paper used Landsat 7 and 8 imageries from 2007 to 2019 for the regional cities. For Gelan and Legetafo, however, imageries from 2010 to 2019 were used. This is mainly because of the lack of reliable population data for the two cities for the period before 2010. Landsat 7 and 8 imageries (30 m * 30 m) were downloaded from the US Geological Survey Earth Explorer database.⁷ The imageries were taken in 2007, 2010 and 2019 and most of them were taken between June and September.⁸ Landsat 7 scan line error was corrected using the Landsat Toolbox. In order to calculate changes in the built-up area, composite imageries were created and supervised classification was conducted using ArcGIS (Li et al., 2013; Tian et al., 2017).

The emphasis of this study was to identify the proportion of built-up areas as compared to open spaces (mostly bare land) and vegetation cover (farmlands, grassland, trees and forest) within the study areas. The footprint of built-up areas and the calculation of total area for the years 2007, 2010 and 2019 were done using Google Earth Pro. The total area of various land covers (built-up area, vegetation cover, open spaces and water) were computed after classifying raster images and converting them to a polygon (vector) using ArcGIS. Land cover was then classified into built-up, open spaces, vegetation and water (Gong et al., 2018). This was mainly for the sake of simplicity.

It is difficult to find recent official population data in Ethiopia. Because the country has not conducted a national census since 2007. Moreover, there is no population projection from the Central Statistical Agency (CSA) for most of the cities for the years after 2017 (Central Statistical Agency, 2013).⁹ Therefore, population data for the year 2019 was computed using a population projection formula ($N_t = Per * t$) based on the population growth rate from 2014 to 2017. Population projection based on another projection might undermine data quality and reliability. However, since there is no census data or official figures for the year 2019, this is the only plausible approach to fill the existing data gap. Nevertheless, the proximity in time between the two projections could limit the differences in data quality and reliability.

The extent of land hoarding and fencing within cities was assessed based on a proxy, such as the ratio of built-up areas to open space and vegetation cover within built-up areas. In this study, most of the plots sitting idle for over 5 years within built-up areas, both open space and vegetation cover, were considered vacant or underutilized land. There are two main reasons for this. First, in most Ethiopian cities, there is no sizable land dedicated to urban agriculture and public parks within

⁷ Downloaded from USGS Earth Explorer (<https://earthexplorer.usgs.gov/>).

⁸ In most of the study areas, June to September is a rainy season. Cloud free imageries taken during this time enable more accurate classification result by easily differentiating built-up area, for instance, from barren land.

⁹ There is a population data based on CSA projection for major urban centers in the country for the year 2014–2017. Population data for 2007 and earlier were taken from the national census (UNFPA, 2008).

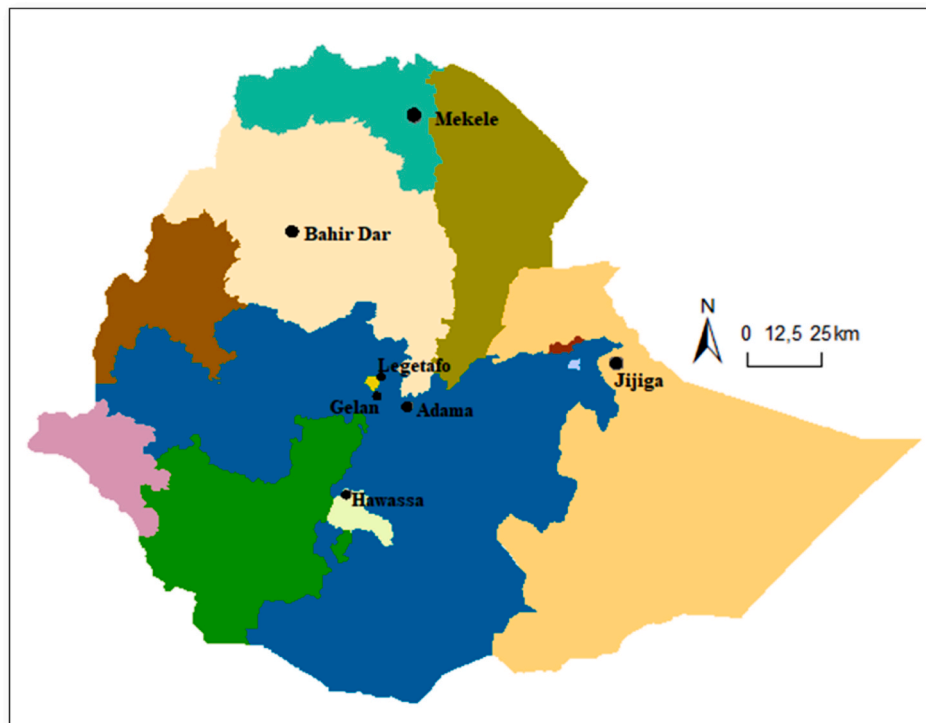


Fig. 2. Study areas (black dots).

built-up areas (Abebe and Megento, 2016; Azagew and Worku, 2020; Girma et al., 2019). Moreover, in Ethiopia's urban areas, street coverage and land allocated for associated infrastructure are low compared to cities in other parts of the world (World Bank, 2015). Second, land converted and transferred for urban use (industrial or residential) must be fully developed within a maximum of 5 years (FDRE, 2011). This means that a substantial number of open spaces sitting idle for over 5 years confirm the existence of land hoarding or land underutilization.

Google Earth imagery are ideal for time series spatiotemporal change analysis (Gong et al., 2018; Malarvizhi et al., 2016; Samper et al., 2020; UN-Habitat, 2018; Wang et al., 2012; Wibowo et al., 2016). Its resolution is high for supervised classification.¹⁰ It is also useful to virtually identify (validation) open spaces (fenced plots) and informal settlements. Based on common features that define informal settlements, such as structure, infrastructure, density, a visual analysis of informal settlements was conducted using Google Earth Pro.

Moreover, cloud-free satellite images taken during the rainy season were selected, primarily for classification accuracy. Several training sites were selected to perform maximum likelihood classification. With this process, an overall classification accuracy¹¹ of 89 %, 96 %, 87 %, 92 % and 97 % was achieved for Legetafo, Gelan, Bahir Dar, Adama and Hawassa, respectively. Furthermore, classification accuracy was also visually checked using high-resolution images from Google Earth Pro.

As mentioned above, measuring urbanization is challenging, especially in developing countries, mainly because of a lack of reliable data. To complement remote sensing data with qualitative and quantitative data, secondary data was used in this paper (Baxter and Jack, 2008). Also, to have first-hand information on spatiotemporal changes, a field observation was conducted in February 2019. The field observation covered Adama, Hawassa and Addis Ababa satellite cities. During field observation, instances of land grabbing, plot size, urban density, urban sprawl and informal settlements were observed. Due to time constraints,

it was not possible to travel to all study areas for the field observation.

4.4. Data analysis

According to the Ethiopian urban land lease policy, all land transferred for urban uses under a lease must be fully developed within 2–4 years (depending on the size of the projects) (FDRE, 2011). Development projects must be commenced within 18 months. Therefore, strictly defined, any piece of land that remains idle for over 2 years can be categorized as fenced (hoarded) land, which is a case of inefficient land use. According to the lease policy, land development projects that have been started must be completed within four years. However, in this paper, where samples of vacant plots were collected, only plots that had been fenced for more than 5 years were considered for analysis.

For the ULUE analysis, the focus of this paper was on vacant spaces (the combination of both open spaces and vegetation cover) within built-up areas, i.e., density analysis. Purposively selected land allocated for investment was analysed to investigate land use patterns. Since most Ethiopian cities have insufficient public spaces (Girma et al., 2019) and coverage of streets and land allocated for roads is low (World Bank, 2015), this paper considered most open spaces within built-up areas, either fenced or built-up, as plots allocated for urban land use but not used optimally.

As mentioned above, the ratio of land consumption rate to population growth rate was a method used to measure the ULUE in this study. This technique measures, according to UN-Habitat (2018), how much land cities consume compared to their population growth. In this study, the extent of urban boundaries includes all footprints built-up areas¹² where urban land use (urban settlement, infrastructure, etc.) is exhibited.¹³

¹² Built-up area footprint in this case is land used for houses, buildings, industrial structures, roads, parks, etc.

¹³ Urban boundaries extent is not limited to administrative boundaries (UN-Habitat, 2018).

¹⁰ Google Earth spatial resolution (1–30 m) is ideal for urban analysis.

¹¹ For an overall classification accuracy formula see Section 4.4.

$$LCR = \frac{LN\left(\frac{Urb(t2)}{Urb(t1)}\right)}{Y} \quad (1)$$

$$PGR = \frac{LN\left(\frac{Pop(t2)}{Pop(t1)}\right)}{Y} \quad (2)$$

$$LCRPGR = \frac{LCR(annual \ land \ consumption \ rate)}{PGR(annual \ population \ growth \ rate)} \quad (3)$$

Where:

LCR = the land consumption rate (LCR).

PGR = the population growth rate (PGR).

Urb = the total urban built-up area.

Pop = the total population.

t1 = the initial year.

t2 = the final year.

Ln = the natural logarithm.

Y = the number of years between two measurement periods.

LCRPGR = land consumption rate and population growth rate.

Under normal circumstances, the land consumption rate (LCR) should go hand in hand with the population growth rate (PGR). A rate of urban boundary expansion (land consumption) that is faster than the growth of the urban population means inefficient urban land use. There are three common values of LCRPGR¹⁴: $0 \leq LCRPGR \leq 1$, $1 < LCRPGR \leq 2$ and $LCRPGR > 2$. In the $0 \leq LCRPGR \leq 1$ case, PGR is greater than LCR. This indicates a substantial density in a given area, which is an indicator of efficient land use. On the other hand, the value $1 < LCRPGR \leq 2$ demonstrates that the LCR is greater than the PGR. This is a case of low density and indicates inefficient land use. If the LCRPGR value is > 2 , the LCR is at least twice the PGR value (Melchiorri et al., 2019; Y. Wang et al., 2020), indicating a high degree of land use inefficiency.

Moreover, densification of built-up areas (urban infill) was used to analyse ULUE. Densification measures the proportion of vacant land (fenced plots) within existing urban boundaries that are developed within a given time.

$$Densification = \frac{\text{builtup area } t2 - \text{builtup area } t1}{\text{builtup area } t1} \times 100 \quad (4)$$

Where:

t1 = the initial year.

t2 = the final year.

When measuring densification, urban boundary t2 should be the same as urban boundary t1.

The regional cities and Addis Ababa satellite cities were separately assessed. This is primarily due to reasons such as demography, geography (proximity to the capital) and factors such as population data reliability. The LCRPGR was used to analyse the land use efficiency of the regional cities. Whereas densification analysis was conducted for Gelan and Legetafo. The combination of LCRPGR (regional cities) and densification analysis (Gelan and Legetafo), however, would help us understand how urban land utilization and lease policies are implemented in the study areas.

Classification accuracy was conducted based on an Overall Accuracy assessment technique indicated below.

$$\text{Overall Accuracy(OA)} = (\Sigma x_{ii})/x \quad (5)$$

Here x_{ii} represents the diagonal elements in the error matrix, x is the total number of samples in error matrix.

5. Results

This section presents the study results. The first sub-section presents the urban boundary expansion of the study areas from 2007 to 2019. It also deals with the LCR, PGR and LCRPGR of the study areas. The remaining sub-sections deal with urban densification (Gelan and Legetafo), land hoarding and informal settlements.

5.1. Urban boundary expansion and cities LCRPGR index

Over the past twelve years, all the cities in this study have witnessed remarkable urban expansion, both in terms of population and area. For instance, from 2007 to 2019, five cities registered a growth of over 100 %. Legetafo was the one with the highest growth among the cities studied, while Jijiga was the fastest among regional cities with a growth of 277 %. Although not as fast compared to other cities, the growth of Adama and Mekele was also remarkable (Fig. 3).

During the study period, urban expansion happened primarily in a fragmented way. As a result, urban sprawl has become one of the defining features of most cities. However, Hawassa and Adama expanded in a relatively consolidated manner, although it is far from optimal (Fig. 4). The degree of densification in these two cities is also relatively better than what was observed in other cities.

Between 2007 and 2019, the expansion of the built-up area (LCR) of regional cities averaged 6.9 %. Likewise, the average urban population growth (PGR) of regional cities is 5 %. During this period, Jijiga and Mekele were respectively the highest and lowest in terms of LCR. On the other hand, Hawassa and Jijiga had the highest and the lowest PGR, respectively (Fig. 5).

The LCRPGR index of regional cities showed that from 2007 to 2019, three cities (out of five) had an LCRPGR value of > 1 , indicating inefficient land use. Two cities achieved efficient land use. In terms of urban land use, Mekele and Jijiga were successively the most and the least efficient (Fig. 6). Because of the high LCR and PGR gap, Jijiga's LCRPGR index was remarkably high compared to other cities.

5.2. Urban densification in Gelan and Legetafo

In 2010, the built-up area constituted about 9 % and 22 % of the total area of Gelan and Legetafo cities, respectively. The proportion of the built-up area in 2019 increased to 28 % and 51 % in Gelan and Legetafo, subsequently. From 2010 to 2019, the urban densification of Gelan and Legetafo increased by 211 % and 132 %, correspondingly (Fig. 7). In 2019, nonetheless, about 72 % of Gelan and 49 % of Legetafo were still a mixture of vegetation cover and open spaces (Figs. 7–9). Nevertheless, the boundaries of the cities have expanded and footprints of built-up areas have penetrated deeply into peri-urban areas, mainly agricultural areas.

5.3. Land hoarding

A few of fenced plots from the study areas were purposively selected to highlight the extent of land hoarding. The analysis of Google Earth Pro images shows that in almost all the cities, tracts of land have been fenced for years, much longer than the period stipulated in the land lease proclamation (Table 1). Most industrial plots in Bahir Dar, Hawassa, Mekele and Adama have been fenced for over 7 years. In central Gelan and Legetafo, some plots had been fenced for over 15 and 10 years, respectively.

Table 1 shows pervasive practices of land hoarding across the study areas. In each city, a significant proportion of urban land remained vacant for years. This study identified, from purposively selected areas, about 315 ha of land fenced for years in the study areas (Table 1). This count did not include all fenced plots, especially the smaller ones. Furthermore, plots are often underutilized, i.e., a significant part of them are fenced. For example, a public corporation in Adama developed

¹⁴ LCRPGR is the ratio of the land consumption rate (LCR) to the population growth rate (PGR).

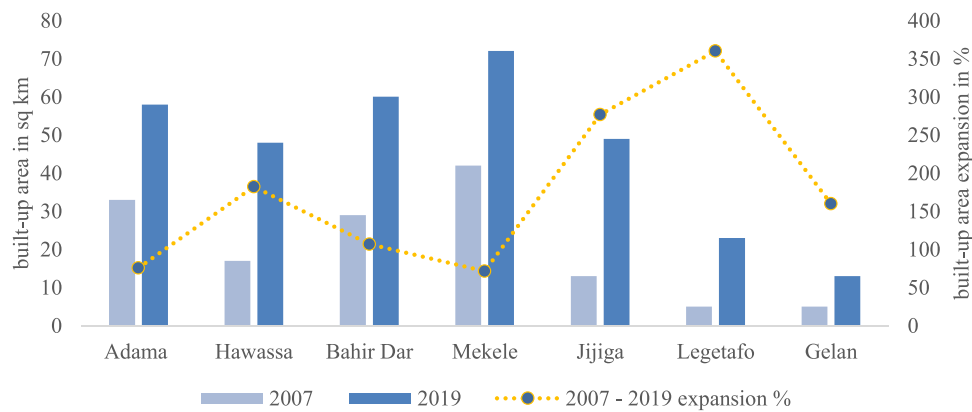


Fig. 3. Major regional cities built-up area expansion (2007–2019).

only 25 % of the land out of the 16 ha it had acquired 15 years ago. Moreover, in the same city, an investment company used around 50 % of the 20 ha it had received 10 years ago. Though the extent varies, full and/or partial land fencing are common across all the cities studied.

5.4. Informal settlement

As Fig. 8 shows, informal settlements are ubiquitous in almost all cities. In this paper, several cases of informal settlements in the study areas have been identified using Google Earth Pro images.¹⁵ For example, informal settlements in a one area (neighbourhood) alone cover about 350, 270, 160 and 17 ha in Legetafo, Hawassa, Bahir Dar and Adama respectively (Fig. 10). In Hawassa, this study furthermore identified six key sites for informal settlements (neighbourhoods), occupying a total of over 900 ha of land. This is about 20 % of the total built-up area footprint of the city. Informal settlements are prevalent in the study areas. The only exception is Mekele, where the incidence is relatively low.

The data show that most informal settlements exist on the urban fringe. It is usually in all directions and is also expanding rapidly. It often happens on land bought informally from farmers in peri-urban areas. It also happens on public land, mostly on land in land banks and in ecologically sensitive areas.

6. Discussion

6.1. Urban boundary expansion and LCRPGR index

In the last 12 years, according to the research results, there has been a huge expansion of the built-up area in all the cities included in this study. Although the population has increased in all cities, the expansion of the built-up area of cities has been remarkable. During this period, the cities have experienced a built-up area expansion ranging from 71 % to 360 % (Fig. 3). Legetafo and Jijiga were at the forefront of expansion. Legetafo's geographic proximity to Addis Ababa is probably the main reason for the explosive expansion. The reason for Jijiga's rapid expansion is largely due to uncontrolled urban expansion, which took the form of informal settlements.

In most cities, the land consumption rate outpaced the population growth rate (Fig. 5). This resulted in a high LCRPGR index for regional cities, indicating low land use efficiency. For example, the LCRPGR index for Hawassa, Bahir Dar and Jijiga was > 1 . In contrast, Mekele and Adama had better land use efficiency. However, since the LCRPGR index is close to one, their ULUE value is not satisfactory. In Jijiga, the ULUE

was the lowest with an LCRPGR index of 3.6 (Fig. 6). Most cities have an LCRPGR index of > 1 , showing high land use inefficiency (low density), such that the built-up area is growing faster than the population. This could indicate that factors such as land hoarding, land banking, urban sprawl, informal settlements, land use fragmentation, large plot sizes, etc. are prevalent. In general, a high LCRPGR index in most cities indicates that urban land in the study areas is being used inefficiently. Other studies also pointed to cases of low land use efficiency in Ethiopia (Dadi et al., 2016; Koroso et al., 2020; Larsen et al., 2019; Terfa et al., 2020; World Bank, 2015).

6.2. Urban densification

From 2010–2019, urban densification of Gelan and Legetafo was about 211 % and 132 %, respectively. This shows a rapid densification (urban infill) of built-up areas. However, in 2019, about 72 % of Gelan's built-up area and 49 % of Legetafo's built-up area within the 2010 built-up area boundaries were still either covered by vegetation or open. Nevertheless, the built-up area of Gelan and Legetafo increased by 45 % and 68 %, respectively, from 2010 to 2019. The built-up area footprint encroached on farmlands on many fronts, resulting in urban sprawl, loss of agricultural land and fragmentation of land use.

In most Ethiopian cities, there are no public spaces or they are getting smaller (Girma et al., 2019). This means that almost all open spaces and vegetated areas identified in this study can be categorized as land allocated for urban use, but which have been unused for years.

6.3. Land hoarding

The results of the study show that land hoarding is widespread in the study areas (Table 1). It is common for land to have been fenced for years, even in prime locations. The size of fenced land ranges from small residential lots to lots as large as fifty acres (real estate or industrial plots). The OBN television documentary revealed that companies in Gelan and Legetafo had fenced about 221 ha of land they had acquired for investment purposes for more than 15 years (OBN, 2017a, 2017b). The report was not exhaustive. However, it highlights the severity of the challenges associated with urban land hoarding. Even after the television reports, analysis of satellite imagery showed that little had been done to put these lands to use. For example, the land in Gelan (54 ha), which had been fenced for over 20 years, still remained undeveloped.

Although many real estate developers and investment companies are usually involved in land acquisition, few develop the land in a timely manner (Adamu, 2014; Plummer, 2012). Most of them hoard land or

¹⁵ The combination of physical and legal characteristics was used to identify informal settlements. See Fernandes (2011) and Samper et al. (2020).

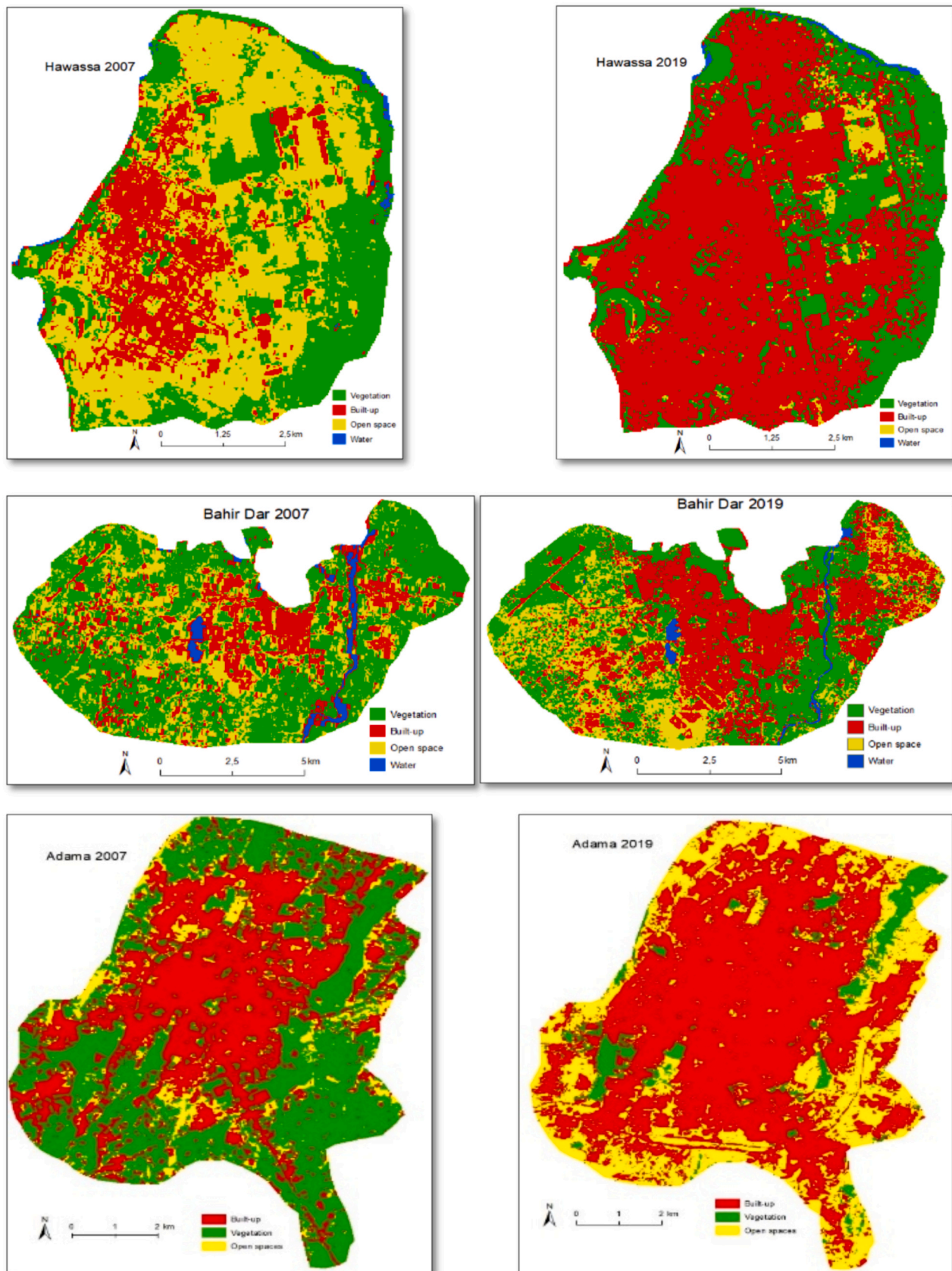


Fig. 4. Built-up footprint expansion of Hawassa, Bahir Dar & Adama (2007–2019).

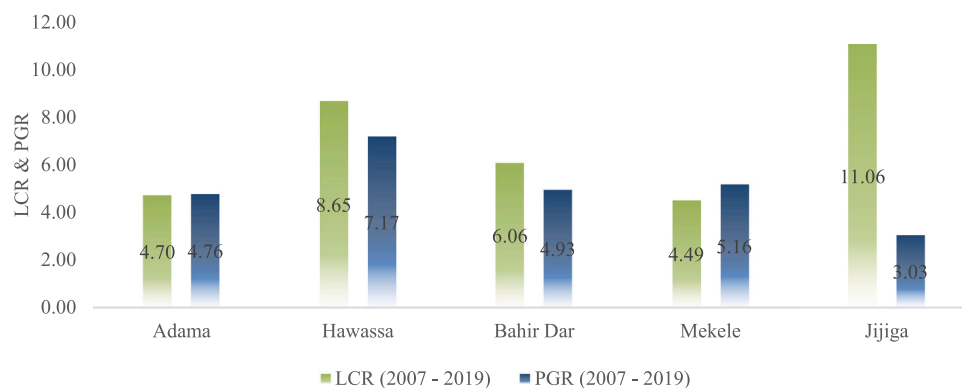


Fig. 5. Land Consumption & Population Growth rate 2007 – 2019

Source: computed from Google Earth and population data.

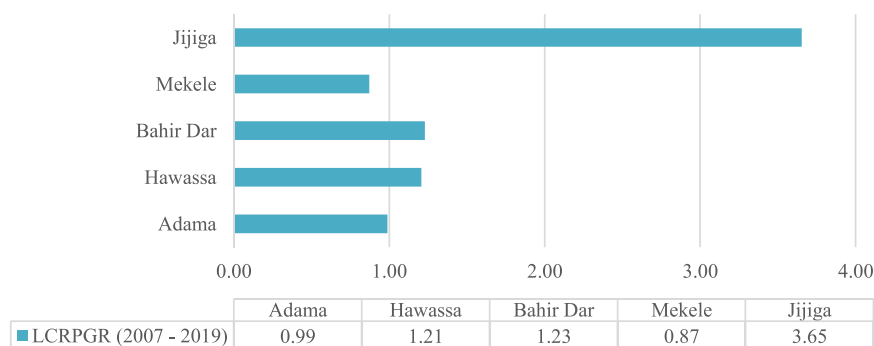


Fig. 6. LCRPGR index of five regional cities (2007 – 2019).

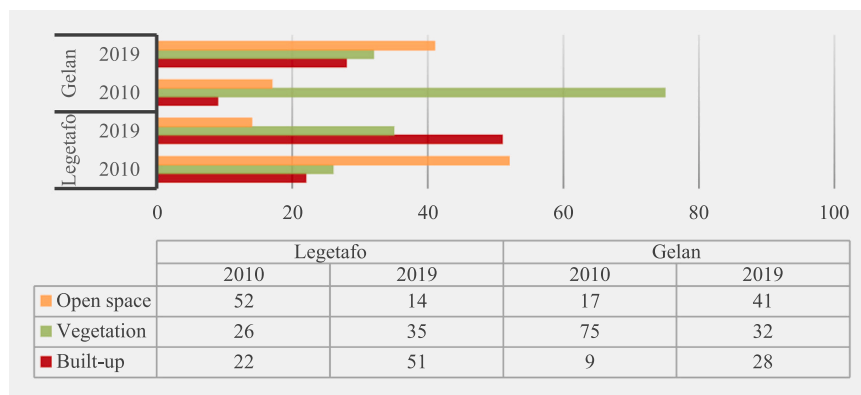


Fig. 7. Proportion of built-up area of Gelan and Legetafo (2010 & 2019).

underutilize it.¹⁶ The study conducted by Yusuf et al. (2009) found that in Addis Ababa and its satellite cities, of the land allocated for real estate projects between 1992 and 2006, only 11 % was fully developed and 3.3 % was under development. According to Mengistu and van Dijk (2018), hundreds of hectares have been fenced off by real estate developers for years. Often, all or a significant portion of the land remains unused, mainly for speculative purposes (Adamu, 2014; Eticha, 2017; Gebremariam and Mailimo, 2016; Wubneh, 2018). Often, concrete is seen on

construction sites (giving the impression that construction is underway or about to begin), although it takes years for the actual development of the land to begin. In addition, some lessees transfer or subdivide the land to third parties in violation of the lease policy without developing the land in a meaningful way (Adamu, 2014). Speculation continues to be a serious problem for most cities across the country (Eticha, 2017; Gemeda et al., 2020) and has led to an artificial shortage of land (World Bank, 2015). This is one of the reasons for the surge in land prices¹⁷

¹⁶ Ethio ICT village, out of about 190 ha of land it acquired around 2009 in Addis Ababa, so far it develop about 10 %. The land acquired for Bole Lemi Industrial Park expansion sits idle. Eastern Industrial Park acquired 375 ha in 2008. Nonetheless, until mid-2016, only around 16 % of the land was developed.

¹⁷ In 2015, a plot in the central district of Addis Ababa was sold for 35,3965 birr/m² (~15,390 \$/m²). From 2013–2017, the average plot price was 143,362 birr/m² (6233 \$/m²) and 33,190 birr/m² (1443 \$/m²) in Addis Ketema and Arada sub-cities, respectively. In 2017, the GDP per capita of Ethiopia was around \$768.

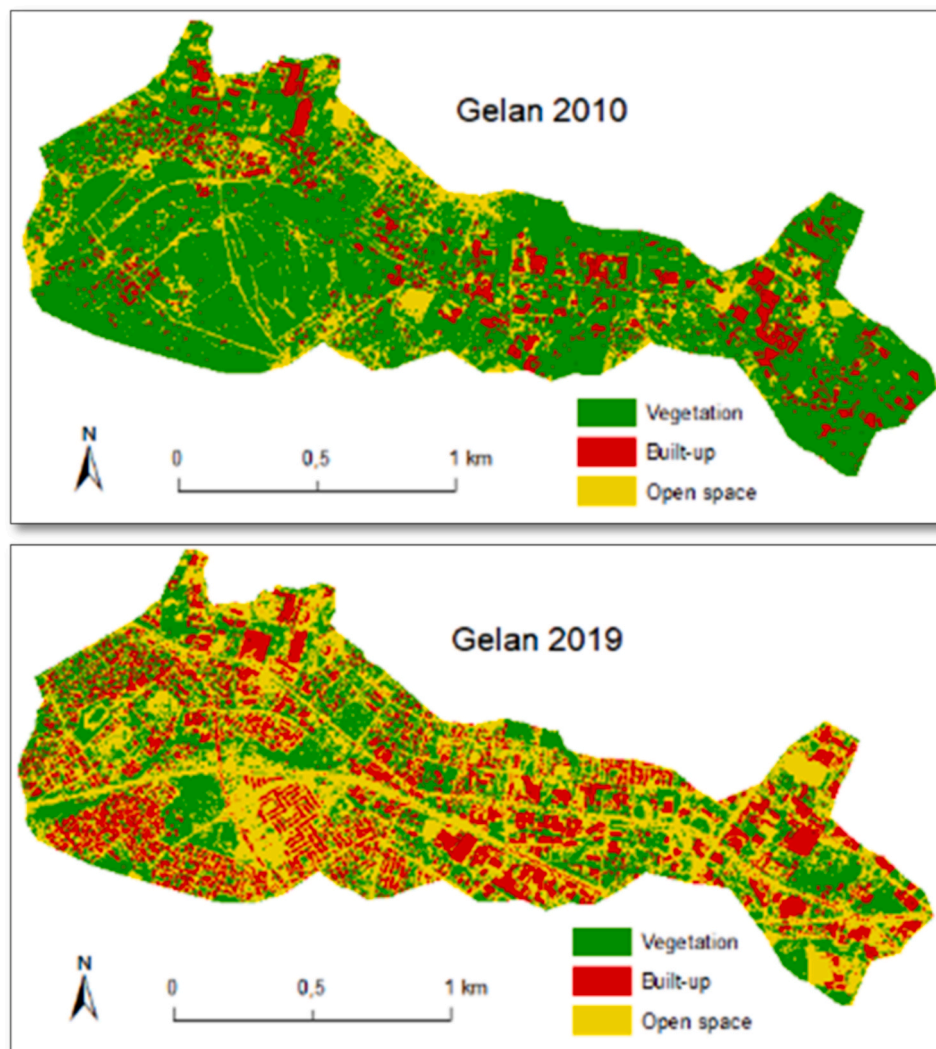


Fig. 8. Gelan densification (2010–2019).

across the country (Endeshaw, 2016).

Although land banking varies in scale, it contributes to the land use inefficiencies highlighted. After converting rural land, municipalities often store much of the land in land banks instead of using it directly or quickly for urban purposes. The land in land banks sits vacant for years. This happens in a country where urban land is expensive, demand for residential and commercial land is very high and the supply of housing is scarce (Gebremariam and Mailimo, 2016; World Bank Group, 2019). A combination of land hoarding and land banking has contributed to inefficient land use. A significant amount of vacant land in developed areas, if used intelligently, could have helped to significantly reduce the housing shortage and lower skyrocketing land prices.

The study shows that cities have done little to make efficient use of urban land within existing built-up areas. The focus appears to be on expanding boundaries. In doing so, citizens are routinely displaced for investment projects that typically take years to get underway after land acquisition (Kassa, 2015) and agricultural land is lost only to end up in land banks. It is useful to ensure that land that has already been converted or transferred is used efficiently before more agricultural land is converted.

6.4. Informal settlement

The results show that, as a result of rapid urbanization, informal

settlements are mushrooming, especially on the outskirts of cities. Informal settlements have become one of the defining features of the cities (Fig. 10). In Hawassa, for example, informal settlements account for about 20 % of the built-up area. Except in Mekele, informal settlements are widespread and rapidly increasing. Informal settlements have persistently pushed the built-up area footprints outward, mainly in fragmented ways. This is the main reason for urban sprawl. Urban sprawl has negative consequences not only for land use efficiency but also for agricultural and ecological land.

Informal settlements have become a major urbanization challenge in the country (Adam, 2014). In 2014, for instance, there were about 10,000 informally built houses in Dire Dawa, although the city had legalized about 7000 houses three years earlier (World Bank, 2015). There is a high demand for urban land in the country's major cities (Gebremariam and Mailimo, 2016; World Bank, 2015). The municipalities, nevertheless, failed to effectively respond to the increasing demand. Little has been done to provide buildable land in inner city areas by releasing hoarded land and land in land banks. The shortage of urban land and housing, coupled with high land prices, forced people to resort to informal settlements. In peri-urban areas, it is common to buy land

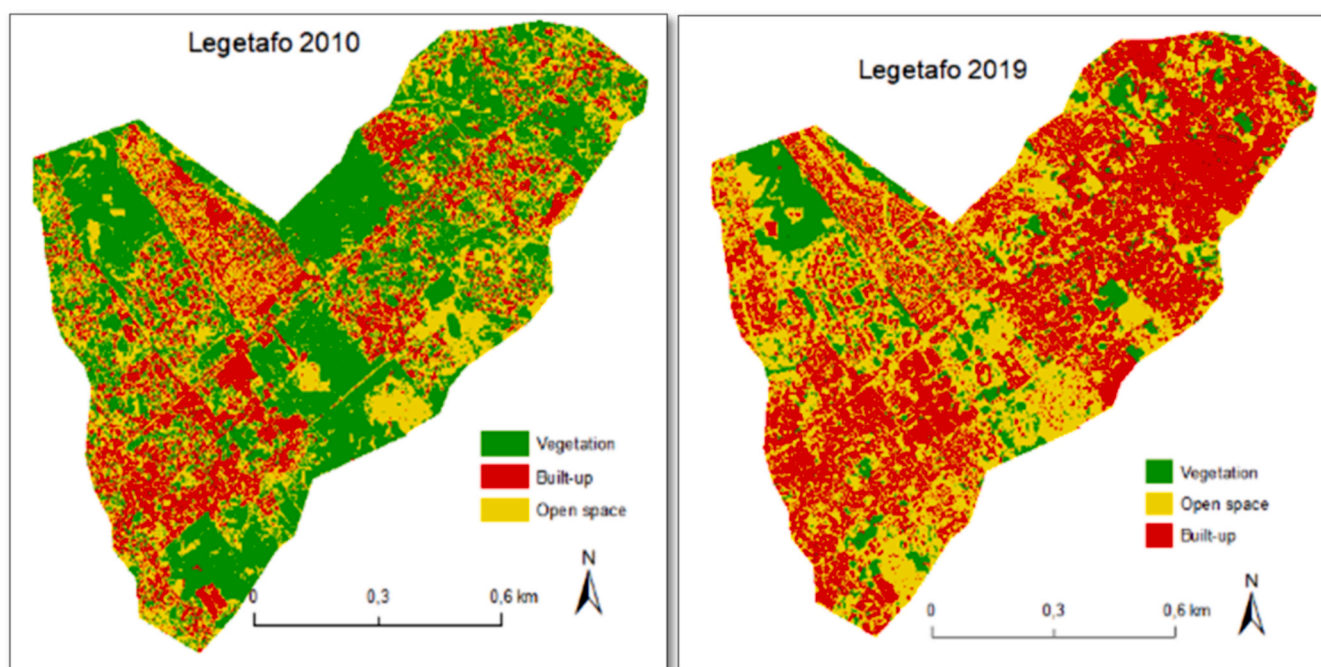


Fig. 9. Legetafo densification (2010–2019).

Table 1

A sample of fenced plots (source: computed from Google Earth Pro).

Cities	Vacant plots (in ha)
Bahir Dar	47
Hawassa	44
Mekele	30
Adama	27
Jijiga	64
Legetafo	63
Gelan	76

from farmers, often through plot sub-division. Besides, land rights insecurity, abuse of land for ‘public purpose’¹⁸ and low compensation forced land use rightsholders in peri-urban areas to prematurely convert agricultural land in informal land markets (World Bank, 2015; Wubneh, 2018).

Moreover, there are pervasive practices of illegal land capture. For instance, according to the OBN television documentary, five companies, most of which are real estate developers, have illegally captured 16.3 ha in Gelan, Holeta and Burayu, in addition to the land they are legally entitled to. Illegal land capture routinely takes place on public lands. Recently, the Addis Ababa city administration announced that it had recovered 1300 ha that had been illegally captured (APANews, 2021). This is about 2.5 % of the total area of the city. This action came seven years after the government announced it would take back all illegally captured land (Endeshaw, 2015). In addition to illegal subdivision and land capture, the use of land for purposes other than those specified in the lease is also common (Mengistu and van Dijk, 2018; Wubneh, 2018).

6.5. Institutional credibility and land use efficiency

The results of the study show that urban land is being used inefficiently. There could be multiple reasons for this. First, while the 2011

Urban Land Lease Proclamation brought some changes, it did not adequately address the problems of inefficient land use. Although land hoarding for speculative purposes has been a problem since 1993, the new lease policy has done little to combat it. Due to a lack of enforcement, Eticha (2017) wrote, speculation has increasingly become the biggest challenge. In some instances, illegal land capture and informal settlements have intensified (Fig. 8). The country also lacks sustainable policies for efficient urban land use. In countries such as Ethiopia, where urban land is owned by the state, a sustainable urban land use policy is one way to address issues of land use inefficiency (Lu and Ke, 2018).

Second, the urban lease policy has showed inadequacies, particularly in terms of enforcing what has already been stipulated in the policy. With respect to the 2011 Urban Land Lease Proclamation, under no circumstances may a plot of land be fenced for more than 18 months without starting development projects after a building permit has been issued. Projects that are started must be completed within a maximum of 4 years. Failure to start and complete land development projects in a timely manner could result in fines and even termination of the lease contract (FDRE, 2011). Nonetheless, the revised proclamation has been poorly enforced (Kassa, 2015) allowing land fencing and/or underutilization to continue unchecked. According to Gemedu et al. (2019), many lessees keep their land idle for years without or with little consequences for failing to comply with the terms of the lease policy provisions. There are cases of municipal officials working with speculators (Plummer, 2012). This highlights the symbolic nature of the lease policy provisions (articles 21, 22 and 23 of Proclamation 721/2011). The symbolic nature of the policy might have emboldened speculators to keep tracts of land idle for years.

There are capacity constraints in land policy enforcement (MoUDH, 2013; World Bank, 2015; Wubneh, 2018). However, the gaps that exist may be due to a lack of commitment to enforcement rather than mere capacity constraints. For example, Addis Ababa sub-city managers and officials admitted that while land hoarding practices are widespread in the city, lease enforcement is generally slow and inefficient (Eticha, 2017). This demonstrates a lack of commitment to tackling land hoarding. One could argue that a state that effectively monitors its citizens (Fick, 2019) and expropriates land cannot fail so miserably in controlling rampant land hoarding and illegal land capture if there is a

¹⁸ In the current situation, it is easy to expropriate land for private purposes, according to the World Bank (2012).



Fig. 10. Informal settlements (left to right: Legetafo, Hawassa, Bahir Dar, Adama, Hawassa & Mekele).

genuine commitment to address it. Lack of commitment to enforcement underscores the existence of symbolic or empty institutions.

In this particular case, it is difficult to say whether the existing empty institutions are the result of a political compromise or not. However, one thing is noticeably clear. The willingness or commitment to enforce land lease policies to address prevailing practices of land hoarding and similar illegal activities is non-existent or insufficient (ENA, 2018). The study conducted by Gemedu et al. (2019) found that in Shashemenne about 73 % of those who have hoarded land for years have never encountered an enforcement agency for failing to develop plots. In several cities, the prevalence of land hoarding is not hidden from authorities. The lack of legal action against lease violators indicates either a lack of interest in enforcement or a tacit agreement that allows speculators to do as they please (Plummer, 2012). In either case, there is clearly an empty institution. This needs to be explored further.

Even under the new government, land hoarding, illegal land grabbing and informal settlements have increased, contrary to promises to address land management malpractices (Ezega, 2020). Despite persistent pressure and complaints, the government has remained hesitant to take serious actions against speculators. Occasionally, municipalities' actions against land hoarding are hampered by political intervention from the central government. MIDROC, which fenced about 54 ha of land in the heart of Addis Ababa for over 20 years, can be a case in point (Getnet, 2018).

Two things might explain why the commitment to address the problem is low. First, the land has been routinely used for political gains, such as buying political loyalty (Addis Fortune, 2016; Legesse, 2014; Plummer, 2012). According to Addis Fortune, "for political expediencies, [the elite] has been rewarding illegality with complicit tolerance." Moreover, the government may have decided to avoid confrontation with elites, cadres and loyal supporters who not only run the cities but also have a vested interest in land hoarding and illegal land capture. Fear of conflict and contestation is also one of the reasons countries put empty institutions in place (Ho, 2016; Zeuthen, 2018). According to Dimitrov (2020), empty institutions can be political tools, although they are useless for addressing public policy challenges. These arguments might explain why the authorities in Ethiopia have not taken a strong stance and measures to address, for instance, rampant land hoarding, illegal land capture and informal settlements. Second, corruption in the land sector is widespread in Ethiopia (Ezega, 2019; Mohamed et al., 2020; Plummer, 2012). Some of those who hoard land are officials or individuals/companies with close ties to those in power (Addis Fortune, 2016; Eticha, 2017; GAN Integrity, 2017; Hailemariam, 2018; Wubneh, 2018).¹⁹ Corrupt officials undermine enforcement efforts and 'the level of corruption is influenced strongly by the way policy and legislation are formulated and enforced' (Plummer, 2012, p. 286).

In theory, the expropriation of land is intended to clear land for the public interest (FDRE, 2011, 2002). The law does not allow the expropriation of land for purposes such as stockpiling (land banking).²⁰ Expropriated land must be transferred to third parties or used by municipalities for development purposes. In practice, however, municipalities engage in land banking, which means that a sizeable portion of land is often vacant for years. It is difficult to justify why farmlands and land acquired after demolishing entire neighbourhoods (for inner-city redevelopment) are kept in land banks for years after conversion using the eminent domain clause. It appears that two core factors have

exacerbated land banking: the excessive peri-urban land expropriation and the failure of lessees (municipalities) to develop land in a timely manner.²¹ In each case, land banking and land hoarding undermine efficient land use.

Land banking is a policy instrument in various countries to deal with vacant land and abandoned properties (Alexander, 2008). In Ethiopia, nonetheless, land banking has been serving opposite purposes by turning farmlands into idle or vacant land. The widespread practice of land banking demonstrates the symbolic nature of some policy provisions, mainly articles 6 and 26 of Proclamation 721/2011. It also casts doubt on the government's commitment to efficient use of urban land. Moreover, urban land can only be acquired through a lease contract. Nevertheless, illegal occupation and abuses of land lease contract are common in the country (Mengistu and van Dijk, 2018; Wubneh, 2018). Rampant illegal land capture may be a manifestation of a failed lease policy, which also demonstrates the presence of empty institutions.²²

In countries where the land market determines the demand and supply of land, land hoarding is not as widespread. In Ethiopia, according to the World Bank (2015), land is transferred below market value. The government justifies this by saying that it wants to encourage investment. However, this may have encouraged individuals and businesses to acquire land with little or no investment plans. Once land is acquired below market value, many may see no urgency to develop it, especially when enforcement is weak. They often keep the land idle until the price appreciates to sell it. Transferring land at market value could have helped the government both to capture land value and tackle land speculation (World Bank, 2015). Market-led urban land allocation mechanism, according to Lin and Ho (2005), improves land use efficiency.

Another issue that exacerbates illegal land capture, corruption and land underutilization is state urban land ownership. Public land, usually in land banks, is prone to illegal land capture; especially in a country like Ethiopia, where land administration is very weak and exposed to corruption and state capture (Lindner, 2014). Therefore, keeping a considerable size of urban land in land banks demands strong enforcement capacity and commitment. Without ensuring the capacity and commitment to properly manage urban land, pursuing policies that encourage land banking can lead to several undesirable consequences. Land policies introduced by governments should take into account the capacity and commitment to enforce them. That means that the government that cannot properly audit and manage urban land should either limit expropriation or transfer expropriated land to third-parties as soon as possible. Currently, this does not seem to be the case in Ethiopia, indicating the symbolic nature of these institutions (empty institutions).

Corruption in the land sector seems to be extensive in countries where land is under state ownership. In these countries, land transfer models prone to corruption, such as administrative allocation, tender and negotiation, can be ignored or manipulated by corrupt officials (Addis Fortune, 2016; Ho, 2005; Lin and Ho, 2005). Likewise, where corruption is rampant, public land can be used for individual benefits or political gain (Plummer, 2012). Such challenges could be mitigated by allowing individual land use right holders to transfer land in formal land markets. This could also help limit land expropriation. In Ethiopia, state urban land ownership, monopoly of urban land supply (in formal land markets) and land banking practices have created a favourable environment for the existence of empty land institutions. It has also undermined the efficiency of urban land use.

¹⁹ Officials and individuals/companies with well-established connections are the major actors in land related corruption, illegal land capture and land hoarding.

²⁰ Nowhere in the lease proclamation does it say that land can be expropriated and kept in land banks until developers show up or municipalities find a plan and budget to use it for public purposes (housing, infrastructure, etc.). Usually, expropriation under eminent domain use is meant for clearly defined economic and societal development purposes.

²¹ On November 09, 2020, the mayor of Addis Ababa admitted the city identified over 1000 ha of land fenced for years and the owners are not yet known. This land ended up in land banks.

²² Addis Ababa city officials said coordinated efforts had been made over the past two years to illegally seize land in land banks in various parts of the city. It happened on a large scale, mainly with religious and ethnic motives.

In Ethiopia, land is a political tool. State ownership of land seems to exacerbate this. For example, after the 2005 elections, the ruling party used urban land to attract new supporters and reward party loyalists (Addis Fortune, 2016; Legesse, 2014; Plummer, 2012). Politics facilitated elite/state capture in Addis Ababa, leading to massive built-up area expansion and encroachments on peri-urban areas (Legesse, 2014; Plummer, 2012). Institutional entrepreneurs,²³ with a vested interest in uncontrolled urban expansion, coupled with weak lease contract enforcement (Tellman et al., 2021) took advantage of the political environment. State capture by the elite, according to the World Bank (2012), takes place through the formulation of policies that favour the elite. In Ethiopia, those who have hoarded a significant amount of land in most of the urban centres and in the urban fringes are companies, public enterprises and people with political influence or connections (Gebremariam and Mailimo, 2016; Koroso et al., 2020; Plummer, 2012). This points to the existence of state capture.²⁴ State capture often benefits the powerful at the expense of vulnerable groups (Yang and Cai, 2020).

As discussed above, there is strong evidence that empty (land) institutions exists in Ethiopia, primarily due to a lack of enforcement. These empty institutions might serve the interests of those who have been involved in speculation, illegal land capture and corruption (Lindner, 2014; Plummer, 2012). The empty land institutions have been largely responsible for creating artificial land supply shortages, which has also affected land prices (World Bank, 2015). Shortages in land supply and high land prices forced people to seek affordable land in peri-urban areas, often through informal land markets.²⁵ That is, informal land markets fuelled informal settlements (Adam, 2014; World Bank, 2015). On the other hand, some actions taken to deal with informal settlements have led to evictions, aggravated hostilities and land-related conflicts (Adam, 2014; Amnesty International, 2020). The continued existence of empty land institutions in the Ethiopian context could confirm the argument that the land lease policy, especially the provisions pertinent to land utilization, is hijacked by interest groups with power and influence.

In general, urban land is 'not put to good use' in Ethiopia (Lindner, 2014), mainly because of existing gaps in urban lease policies. First, it is difficult for low- and middle-income people to acquire urban land for residential purposes because auctioning is the only (main) way.²⁶ In addition, it is extremely difficult for small and medium-sized enterprises (SMEs) to acquire land for business purposes because of the high bid prices and capital requirements associated with the bidding process. Exclusion of these groups literally means excluding the vast majority of citizens from accessing urban land through the formal channel. In recent years, the lease policy primarily served the wealthy and various domestic and foreign companies. Second, the policy had serious gaps in the enforcement of lease contracts. Those who acquired significant amounts of urban land often failed to develop all or part of the land (Adamu, 2014; Eticha, 2017; Gebremariam and Mailimo, 2016; OBN, 2017a, 2017b; Wubneh, 2018; Yusuf et al., 2009). Third, the policy has exacerbated rural land conversion without ensuring efficient utilization of significant land already within the built-up areas (World Bank, 2015). By relaxing how rural land can be expropriated, the 2011 Urban Lease Policy Proclamation did little to protect the rights of peri-urban land

rights holders. Furthermore, the policy paid little attention to the protection of agricultural land and ecosystems. These factors make the credibility of some elements of the existing land lease policy questionable. A lack of credibility not only undermines sustainable urbanization but also leads to undesirable social, economic, political and environmental consequences.

This study examined the effect of land lease policy implementation on urban land use efficiency. Lease policy was assessed using the institutional credibility thesis and land use efficiency was assessed using remote sensing data. By combining remote sensing data and the institutional credibility thesis, this study makes an important contribution to the understanding of urban land use efficiency. It also makes a significant contribution to the advancement of the credibility thesis.

This paper has attempted to answer questions regarding urban land use efficiency and related institutional credibility in Ethiopia. However, the study has gaps. First, the focus was on the assessment of a part of the land policy that is responsible for the proper use of urban land. Second, the analysis of the institutional credibility thesis was not supported by field research. To further explore empty institutions associated with urban land policies and their implications for urban land use efficiency, a field study may be needed. The reasons for the existence of low land use efficiency and empty institutions also need further investigation.

7. Conclusion

In the areas studied, urban expansion was in most cases much greater than population growth. Moreover, most of the expansion occurred in a fragmented manner. This resulted in a high LCRPGR index for many cities, demonstrating the prevalence of urban land use inefficiencies. In addition, the density of the built-up areas is low. Land hoarding and informal settlement are rampant, indicating poor urban land utilization practices.

Past and present lease policies have failed to tackle uncontrolled urban expansion, extensive land hoarding and informal settlements, which are responsible for low land use efficiency across the cities. The existence of widespread land use inefficiencies in the study areas demonstrates that the land lease policy, particularly the sub-section that deals with urban land utilization, is only symbolic (nominal) in nature. The lease policy, nonetheless, does not seem to have become an empty institution by design, but has become one due to inadequate enforcement, i.e., municipalities do not enforce vigorously and lessees do not fully comply with the policy. Despite periodic amendments to the lease proclamations, problems pertinent to weak urban land use efficiency persist. This may be due to a lack of attention in policies to efficient and sustainable land use. The Urban Land Lease Proclamation of 2011, for instance, focused on facilitating land transfer to meet the growing demand for urban land, mostly real estate, rather than addressing the critical problems of urban land underutilization. Furthermore, corruption, political interference and lack of institutional capacity appear to play an important role.

Although urbanization in Ethiopia is low, the current rate of urbanization is high. Therefore, efficient use of urban land in the country is of utmost importance. Policymakers should focus on ensuring proper urban land utilization to address problems related to land and housing shortages, high land prices, eviction, loss of agricultural land, informal settlements and urban sprawl. To that end, it must first be ensured that land lease policies are implemented in a way that improves ULUE. Gaps responsible for empty institutions should be closed. Political and public pressure, Ho (2017) argued, can lead to the enforcement of empty institutions. With proper enforcement, existing empty institutions can gain credibility. Proper enforcement can also lead to efficient urban land use, which is essential for sustainable urbanisation.

Ensuring ULUE requires functional institutions, i.e., not only good policy prescriptions but also vigorous enforcement. First and foremost, compliance with the lease policy must be closely monitored, especially with respect to the commencement and conclusion of land development

²³ Institutional entrepreneurs refer to speculators, intermediaries, developers, city officers, politicians, etc.

²⁴ State capture refers to the situation when politically, economically, or socially powerful people or business influence policy making decisions and its implementation for their benefit.

²⁵ Empty institutions limit people's access to land and harm the interests of those who desperately need land for various urban purposes.

²⁶ In 2016, average land price for four rounds of auction was 16,666 birr (~\$764) per m² for residential plots in Addis Ababa. In the same year, GDP per capita in Ethiopia was \$717.

projects. Second, illegal land capture should not be tolerated. Third, strict monitoring and evaluation mechanisms should be put in place to curb excessive land expropriation. Under current circumstances, land expropriation for stockpiling or land banking should not be allowed. Since the current land tenure policy hardly serves the interests of low- and middle-income urban Ethiopians, effective enforcement may not necessarily eliminate all the shortcomings of the policy. Making the policy equitable may require policy prescriptions, such as pro-poor and fit-for-purpose, which go beyond effective enforcement.

In general, the country should focus more on improving the performance of land institutions. Best practices can be adopted from abroad. But they cannot guarantee policy success, i.e., achievement of desired goals and objectives. Functional institutions, not empty institutions, ensure land use efficiency and productivity. This means that improving institutional effectiveness (institutional credibility) can lead to the desired outcome. Therefore, the country should take measures to improve the credibility of land institutions to ensure efficient urban land use for sustainable urbanization.

CRedit authorship contribution statement

Nesru H. Koroso: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

Data will be made available on request.

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