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## Article

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## Research Article

# Determinant factors for the expansion of informal settlement in Gondar city, Northwest Ethiopia

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## ABSTRACT

This study examines determinant factors for the expansion of informal settlements in Gondar, a historical city in Ethiopia. In order to address this study objective, quantitative data were employed from 196 randomly selected households in four sites. The study indicated that a single factor is not determinant for the expansion of informal settlements in the city. The results of the study revealed that socio-economic, political and legislative, administrative, and demographic factors are statistically significant. These four dimensions together accounts 61.4 percent of all factors that facilitate the formation of informal settlement in Gondar city of Ethiopia. More specifically, socio-economic dimension is the first influential factor with 30.9%; political and legislative dimension is the second dominant factor with 15.7% followed by administrative dimension (10.2%); and demographic factors are contributed the least (4.6%) for the expansion of informal settlements. The study emphasized the need to implement appropriate urban planning, land and housing policy aimed at improving the efficient use of urban land. Improving the efficient use of urban land is imperative to address land prices and housing shortages, protecting farmland and ecosystems, and mainly to tackle land hoarding, urban sprawl and informal settlements.

## 1. Introduction

Urbanization is a societal process that has played significant role in determining the shape of urban built environment (UN-Habitat, 2020; United-Nations, 2019). In 2018, 55.2% of the global population lives in urban areas (UN-Habitat, 2020). In recent century, rapid urbanization has been experienced in most developing countries. In this sense, in developed countries, urbanization has been a result of industrialization associated with economic advancement. However, in the global south countries particularly in Africa and Latin America countries, urbanization has occurred as a result of frequent rural-urban migration and high natural population increase (Akirso, 2021).

Most cities in the global south are expanding horizontally than vertically, and the ever increasing population is moving to unplanned settlement on the peripheries at the expense of agricultural land and areas of natural beauty (Koroso, Lengoiboni, & Zevenbergen, 2021). Thus, such unplanned settlements have created in new peripheral spaces on the edges of urban territories is commonly known as informal settlement. Informal settlements are dense and unplanned settlements with irregular shape of settlement pattern comprising communities houses that are self-constructed and without formal land tenure (Akirso, 2021). In the last decade, informal settlements are common practices in developing countries and are typically considered as the product of an enforced need for shelter by the urban poor communities (Matamanda, 2019). Moreover, in some developing countries including Ethiopia, informal urban settlement is not only the result of lack of urban houses for the poor, but also it is emerged and expanded as a sort of business option for some group of people,

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especially for brokers or dealers and high income groups (Akirso, 2021; G/Silassie, 2019). In addition, in many countries, the practice of informal settlement increases its intensity when urban land administration and planning fail to address the housing demands of the community in the urban area (Okyere & Kita, 2015; Suditu & Vâlceanu, 2013).

According to UN-Habitat (2015), about one third of the urban population in developing countries is living in informal settlements. It is predicted by 2050, Africa's urban dwellers are projected to have increased from 400 million to 1.2 billion. Ethiopia is the second most populous (120 million) and the fifth least urbanized country (22%) in Africa (Matsumoto & Crook, 2021). Ethiopia's urban population is projected to grow between 3.8% and 5.4% per year (MUDHC, 2021). Ethiopia is currently facing the pressure of rapid urban expansion and growing urban housing demand (Koroso et al., 2021). Ethiopian cities generally have a large proportion of sub-standard housing stock and a deficient affordable formal rental market (Matsumoto & Crook, 2021). For this reason, in many urban centers of Ethiopia, including Gondar city, informal marketing of land plots and grabbing open public land from the periphery for the construction of residential houses are considered as a solution for the housing problem of the communities (Akirso, 2021).

Many African countries governments including Ethiopia have failed to meet the housing demand of the majority of urban residents (Matsumoto & Crook, 2021). The government of Ethiopia recently have taken different measures to satisfy the housing demand of urban dwellers in major urban centers including Gondar city. The major actions taken by the government include regulation of tenure, providing plots for housing cooperatives, and government housing development program. Despite these measures, tackling informal urban settlements still continues to be challenge due to a range of interrelated factors within the framework of socio-economic, political and legislative, demographic, and administrative issues.

A consistent and specific aspect study at urban center level is required to curb the challenges of urban growth, identify determinant factors of urban expansion of informal settlements and provide result oriented solution (Grant, Desta, Admassie, Hassan, et al., 2019; Grant, Desta, Admassie, & Stevens, 2019; Ochocho, Worku, & Yitna, 2018). To date, very limited studies have been conducted to assess the cause and consequences of informal settlements. Previous studies (Abebe, 2018; Admassie et al., 2019; Ambaye, 2011; Chaka, 2018; and; Gemechu, 2018) conducted provide neither consistent findings nor address dominant determinant factors for the expansion of informal settlements in regio-politan cities of the country such as Dessie, Bahir Dar, Mekele, Adama, Hawassa, and Gondar. To the best of the present researcher's knowledge, a few studies were conducted on factors contributing to the expansion of informal settlements in Ethiopia. A study by Anulo (2015) assessed the factors contributing to the expansion of informal settlements in Hossana town, Southern Ethiopia. This study focused only on deficits related to housing supply, high home rent and expensive land tender price as determinant factors to expand informal settlements using descriptive statistics. It doesn't include more of determinant variables for the expansion of informal settlements discussed in the literature section of this study. Besides, Ochocho et al. (2018) conducted a study focused on analyzing determinants for the expansion of squatter settlements in the same place using a mixed research approach and focused only on age, type of occupations, income, migration, and possession of legal construction permits as the outstanding factors which aggravated to the expansion of squatter settlements in the study area.

Apart from the Ethiopian context, many empirical studies have been conducted in different parts of the world to identify the driving forces for the expansion of informal settlements (Amao, 2012; Heshmati & Zarabadi, 2016; Matamanda, 2019; Mensah, Antwi, & Acheampong, 2013; Meshkini, Mansoor, & Esfaram, 2015; Okyere & Kita, 2015; Sakala, 2016; Suditu & Vâlceanu, 2013). However, evidences in developed and developing countries revealed inconclusive findings with regard to determinants. Although the impact and magnitude of variables on the expansion of informal settlements vary from country to country, city to city, and urban center to urban center, there are many common factors considered as growth determinants in literature of informal settlements. These include

**Table 1**  
Studies conducted on Informal settlement: Variable dimensions with their sources.

Variable Dimension		Sources
Demographic factors	Age	Ochocho et al. (2018), Anulo (2017), Friesen et al. (2018), Ochocho et al. (2018), Zweig (2016)
	Marital status	Baye et al. (2020), Anulo (2017), Friesen et al. (2018), Ochocho et al. (2018), Zweig (2016)
	Family size	Heshmati and Zarabadi (2016)
Socio-economic factors	Educational level	Baye et al. (2020)
	Land speculation	Meshkini et al. (2015), Wekesa et al. (2011), Meshkini et al. (2015), UN-Habitat (2015)
	Population growth	Heshmati and Zarabadi (2016), Matamanda (2019), Ochocho et al. (2018), UN-Habitat (2015), Niva et al. (2019), Msuya et al. (2017)
	High land price	Meshkini et al. (2015), Marutlulle (2017), Diab et al. (2020), Amao (2012), (Baye et al., 2020)
	High house rent	Meshkini et al. (2015), Amiri and Ghanbari (2016), Amiri and Ghanbari (2016)
	Income disparity	Meshkini et al. (2015), Marutlulle (2017), UN-Habitat (2015), Amiri and Ghanbari (2016), Amao (2012), Baye et al. (2020)
		UN-Habitat (2015), Wahab (2017), Avis (2016)
Political & Legislative factors	Inconsistency in land and plan legislation	Ochocho et al. (2018), Wahab (2017)
	High building regulation	Marutlulle (2017), UN-Habitat (2015), UN-Habitat (2003), Tsenkova (2010), Wondimu (2021)
	Inadequate house policy	Tsenkova (2010)
	Land substitution modality	Diab et al. (2020), Wondimu (2021)
Administrative factors	Current political situation	Marutlulle (2017), Avis (2016), Marutlulle (2017)
	Corruption	Marutlulle (2017), UN-Habitat (2015), Avis (2016)
	Inefficient public administration	Ambaye (2011), Anulo (2017), Minetos and Polyzos (2013), Sakala (2016), UNHabitat (2015), UNECE (2015), Wondimu (2021)
	Procedural problem of legal land provision	

Source: Developed by the Author (2020)

rural/urban migration, low income, high rent of housing, lack of education, population growth, housing policies, rapid urbanization, unemployment, war, natural disasters, lack of low-cost housing and serviced land, inefficient public administration, inappropriate planning, and inadequate land administration tools. The determinant variables (see Table 1) were distilled from previous empirical studies through systematic review. Consequently, the above backdrop suggests at least three reasons why additional research in the area of informal settlement is needed in the context of Ethiopia in general and Gondar city in particular.

Firstly, informal settlement in developing countries is not only seen as manifestation of poor standard housing but also a sign of administrative confusion and political uncertainties as well as existence of inequality and weak land governance (Mears, 2011; Weber & Mendelsohn, 2017). The phenomenon can be linked with series of factors interacting continuously within the system. With no doubt, the situations in Ethiopia and the city of Gondar are no exceptions. This suggests a need for understanding of determinants for the expansion of informal settlements in Gondar city. Secondly, despite the fact that previous empirical studies of different countries have identified common determinants associated with the expansion of informal settlements; however the influence, magnitude, and types of each determinant vary from one urban area to the other. As a result, they provide inconsistent findings that cannot be generalized, and that need further research. Moreover, the situation in Ethiopia is completely different from other developing countries and the practices, causes, and consequences of informal settlement are immense and vary from place to place overtime. Thirdly, in Ethiopian context, existing studies on the determinants of the expansion of informal settlements mainly focused only on the socio-economic factors without considering such important determinants as those given emphasis in this study, namely: administrative, political and legislative, and demographic factors. Moreover, like other cities in Ethiopia, Gondar city is home too much of informal settlers, but the determinants within the city context haven't yet received the attention of scholars. Therefore, with due consideration of the knowledge gap of the previous studies, identifying the major determinants for the expansion of informal settlements in the city of Gondar is the focus of this case study.

The novelty of this paper unlike the existing studies conducted by Anulo (2015) and Ochocho et al. (2018) is that it incorporates administrative, political and legislative, and demographic factors so as to fill the gap in the scant informal settlement literature in Ethiopia. Most importantly, using principal component analysis method, the paper has tried to provide answer for the question that which determinant dominantly puts influence on the expansion of informal settlements in Gondar city. The remaining sections of the paper are structured in such a way that section 2 discusses the concepts of informal settlements and related literatures, section 3 presents material and methods of the study, section 4 results and discussion, and finally, section 5 conclusion and practical implication of the study.

## 2. Literature review: concepts of informal settlement and its overview

Globally, informal urban settlement is becoming a predominant shelter setting for poor urban communities in the 20th century (Matamanda, 2019). Specifically, in the Global South (Africa, Asia, and Latin America), because of rapid growth of urbanization, formal urban sectors cannot meet the growing needs of house or shelter to urban poor communities (Zhang et al., 2020). This growing housing demand obviously leads to the formation and expansion of informal development patterns, such as informal settlements. Worldwide, there isn't still an agreement to define the term 'informal settlement'. It is context specific and has many synonym words in the literatures, such as squatter settlement, unplanned settlement, slum, spontaneous settlement, and illegal settlement, etc. Many literatures use the term informal and squatter settlement interchangeably. For example, Khalifa (2011) and Fouad and Abbas (2021) defined informal settlement as a residential area that consists of housing units constructed on vacant public and private land without legal recognition from urban planning authorities. Besides, it is characterized by lack of formal legal deeds and/or titles, unplanned urban development structure, insufficient basic infrastructures, and occupation on vacant land. Informal settlement and squatter settlement have similar concepts by sharing similar features (Abebe, Derebew, & Gemeda, 2019; Inostroza, 2017). Hence, these terms express about settlements of the urban poor (Friesen, Rausch, Pelz, & Fürnkranz, 2018). Many literatures proposed various definitions for informal settlement, however the UN-Habitat definition of informal settlement is probably the most widely acceptable one. Therefore, according to UN-Habitat (2015), "Informal settlements are residential areas where 1) inhabitants have no security of tenure vis-à-vis the land or dwellings they inhabit, with modalities ranging from squatting to informal rental housing, 2) the neighborhoods usually lack, or cut off from, basic services and city infrastructure and 3) the housing may not comply with current planning and building regulations, and is often found in geographically and environmentally hazardous areas. In addition, informal settlements can be real estate speculation for all income levels of urban residents, affluent and poor. Slums are the most deprived and excluded form of informal settlements characterized by poverty and large agglomerations of dilapidated housing, often in the most hazardous urban lands. Besides, tenure insecurity, slum dwellers lack formal supply of basic infrastructure and services, public space and green areas, and constantly exposed to eviction, disease and violence". This definition incorporates the concept, feature, and characteristics of informal settlements.

Locally, in Ethiopia, Ministry of Urban Development and Housing Construction (MUDHC) defined informal settlements as "unplanned housing proliferated as a result of high urbanization, limited housing supply, and the limited affordability of formal housing" (MUDHC, 2014), whereas Gondar city administration explained informal settlements in terms of its feature as by "illegal residential area and/or house which are built on government, community and private land against the urban planning and building regulations without the consent of authorized bodies (Zhang et al., 2020). Therefore, in this study, the above definitions in the local context, are adopted.

## 2.1. Determinant factors for the expansion of informal settlements

Urbanization is one of the key challenges of the 21st century with 68% of the world population likely to be living in urban areas by 2050 (Parikh, Bisaga, Loggia, Christina, & Ojo-aromokudu, 2020). Observers from a variety of disciplines agree that informal settlements account for the majority of housing in many cities of the global South (Zweig, 2016). Rapid urbanization and inadequate capacity to cope with the housing needs of people in urban areas of the developing world have contributed to the expansion of informal settlements (Akirso, 2021). This implies that rapid population growth, shortage of formal housing and unaffordable cost of formal housing for urban dwellers contributed to the expansion of informal settlements. As the urban population grows the housing need will be increasing; as a result, more agricultural land to be converted into human settlements (Berhane, 2015). Controlling and managing the expansion of informal settlements in the peri-urban area needs an integrated and comprehensive understanding of the informal settlements process, particularly its driving factors. Previous studies revealed that there are no single factors that accounting for the expansion of informal settlements globally (Abebe et al., 2019; Avis, 2016; Diab, El Shaarawy, & Yousry, 2020). Thus, factors responsible for the growth of informal settlement are unique in different geographical locations and spans of life. This is because each country has its own uncommon associated socio-cultural, economic, political, environmental, and demographic characteristics.

There are many types of informal settlements though they are best contextualized as hybrid considering that there are multiple factors which give rise to the informal settlements (Matamanda, 2019). Reports around the world revealed that, albeit these differences in their typologies, there are also many causes for the formation and expansion of these informal settlements (Dovey & King, 2011). For example, Amao (2012); Suditu and Vâlceanu (2013); and UNECE (2015) argued in developing countries, the formation of informal settlement critically associated with several interrelated driving forces, such as inefficient public administration, inappropriate planning and land administration, poverty, rapid urbanization and population growth, war, natural disasters, and ineffective housing policy. Multiple factors, such as insufficient planning laws and regulatory standards, population growth, high land price, and failure of government to provide service are some of the driving forces for the formation of informal settlements, especially in the cities of global south (Meshkini et al., 2015; Msuya, Moshia, & Mtili, 2017; Weber & Mendelsohn, 2017). Moreover, rising corruption, poverty, rapid urbanization, and strict government policies for housing development are also causes for the development of these kinds of settlements (Matamanda, 2019; Mears, 2011; Mensah et al., 2013; Wondimu, 2021). In some instances, income insecurity may also be a means to the expansion of informal settlements where the government fails to provide affordable house to the urban poor communities. This enforced to them to occupy illegal land in the peri-urban areas without the accessibility of basic infrastructures (Fouad & Abbas, 2021).

Furthermore, the most important reasons for the expansion of informal settlements, particularly in cities found in the global south,

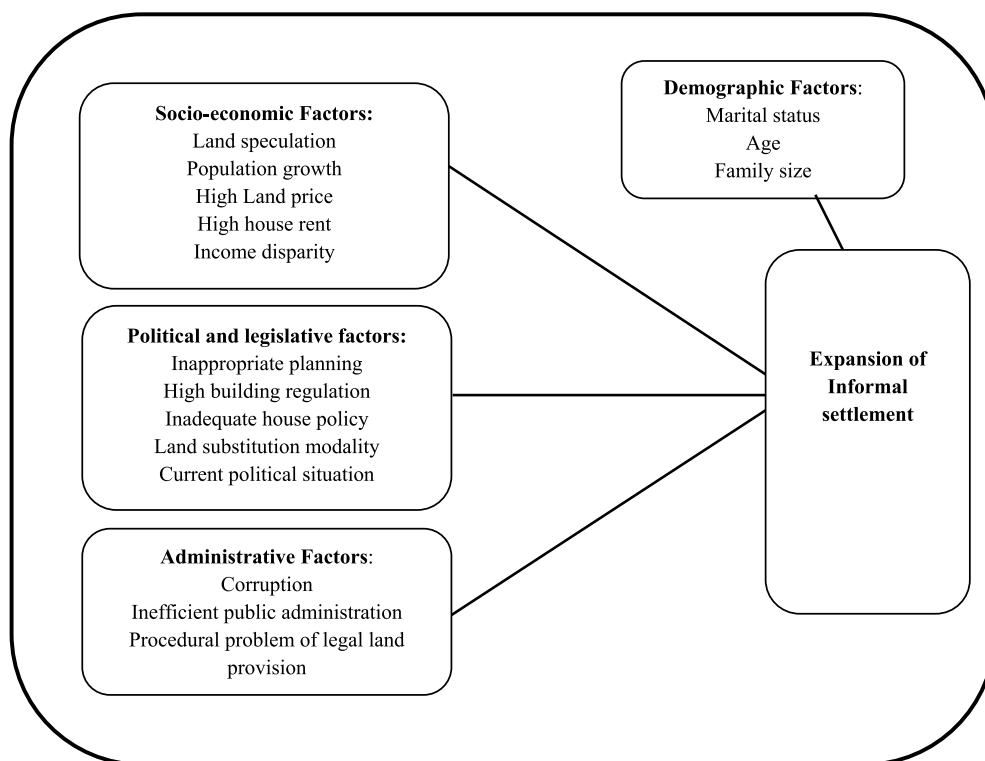


Fig. 1. Conceptual framework Developed by the author.

include expensive lands and shortage of housing, immigration and lack of a suitable employment which result in settlement in urban margins (Ghasempour, 2015). This indicates, different interrelated factors have influence on the expansion of informal settlements. Accordingly, through exploring previous empirical studies, seventeen variables from demographic, socio-economic, administrative, and political and legislative dimensions, such as age, marital status, family size, educational level, inconsistency of plan and land legislations, corruption, rigid building regulation of legal houses, procedural problems of legal land provision, inefficient public administration, inadequate housing policy, high land price in the formal land market, land speculation, high housing rent, income disparity, population growth, land substitution modality, and political situation have considered and contextualized in this study (see Table 1). In the previous studies, these factors have been identified and justified using descriptive statistics (Akirso, 2021; Ali & Sulaiman, 2006; Anulo, 2017; Asefa, 2020; Baye, Wegayehu, & Mulugeta, 2020; Dadi, 2018; G/Silassie, 2019; Hadush, 2019; Matamanda, 2019; Mensah et al., 2013; Msuya et al., 2017; Mwacharo, 2012; Sakala, 2016; Wondimu, 2021), binary logistic regression model (Ochocho et al., 2018; Minetos & Polyzos, 2013), and factors analysis or principal component analysis methods (Heshmati & Zarabadi, 2016; Meshkini et al., 2015).

A review of the linkage between demographic, socio-economic, administrative, and political and legislative factors with the expansion of informal settlements were discussed below to develop a clear conceptual framework (see Fig. 1).

### 2.1.1. Demographic factors

In this section of the study, academic research examining whether age, marital status, and family size which are considered as demographic factors, have an effect on the expansion of informal settlements are discussed. Within this scope, previous studies examining the influence of these factors listed above on the expansion of informal settlement are presented below.

Baye et al. (2020) reported age has influence on the expansion of informal settlements. That means as age of the households are increase, the need to acquire house also increases. Thus, age dynamics is correlate with the expansion of informal settlements. Anulo (2017); Friesen et al. (2018); Ochocho et al. (2018); and Zweig (2016) in their studies, argued that demographic indicators, such as age and marital status have contributed for the expansion of informal settlements. Also Heshmati and Zarabadi (2016); Meshkini et al. (2015); and Mwacharo (2012) demonstrated that family size has a significant effect on the expansion of informal settlements. Large family size has its own contributions for the people who choose to live in informal settlements. This indicates that those who are married and have large family are likely to fall under pressure of housing demand. This in turn enforces married households and their families to live in informal settlements.

### 2.1.2. Socio-economic factors

Expansion of informal settlements mainly in developing countries have been influenced by multiple factors (Akirso, 2021). Among others, socio-economic factors are dominant. More specifically, factors, such as population growth, rapid urbanization, poverty, shortage of formal housing, lack of employment, expensive land, industrialization, and rural to urban migration have played significant effect on the expansion of informal settlements (Mensah et al., 2013; Sakala, 2016). Taking this into account, the current case study tried to consider land speculation, population growth, high land price, high house rent, and income disparity as socio-economic determinants. The magnitude and types of these determinants as exhibited within a country, differs. Low level of income, high rent charges, social contacts, rural-urban migration and low level of education; for instance, are the dominant socio-economic factors that significantly put influence on the expansion of informal settlement in Kumasi, Ghana (Mensah et al., 2013). In Egypt; likewise, rural urban migration, poverty, and the price of land are the causes for the expansion of informal settlements (Diab et al., 2020). According to Abebe et al. (2019); Amao (2012); Matamanda (2019); Mensah et al. (2013); Msuya et al. (2017); Ochocho et al. (2018); and Sakala (2016), the expansion of informal settlements in sub-Saharan Africa cities are positively associated with urbanization, poverty, growth of informal sector, non-affordability of land, housing shortage, low level of income, low level of education, rural-urban migration, and high house rent charges. Currently, rapid urban population growth because of natural increase and rural to urban migration has led to frequent expansion of informal settlements particularly in cities of the global south and sub-Saharan Africa (Matamanda, 2019). Additionally, Niva, Taka, and Varis (2019) recognized informal settlements as retardant caused by people through migration, whereas Wahab (2017) sees governments as the architect of creating informal settlements in urban areas because of their inability to satisfy the housing needs of the residents. In most cities of the sub-Saharan Africa, failure of the government to provide a house for the urban poor has led to the proliferation of informal settlements (Amao, 2012; Mensah et al., 2013; and; Matamanda, 2019). They [the urban poor] simply undertake matters by their own hands without keeping the saying of local authorities; they buy small plot (out of local land sub-division standards) from peri-urban farmers. Meshkini et al. (2015) demonstrated in their study that factors, such as land price, house price, rent price, income, and unemployment, as economic factors of about 50%, are effective in creating informal settlements in Iran. Of these, house price with 19% had the highest impact. Thus, it can be stated that inability to afford a house, low income, and high land price are important factors of dwelling people in informal settlements. It is proven that informal housing has become the only option for the urban poor communities where the land price is high in the formal land market. A study conducted by Heshmati and Zarabadi (2016) and Ali and Sulaiman (2006) revealed preference to have large plot size and inadequate formal land provision system in developing countries are some of the driving forces for the expansion of informal settlements.

Formal urban land development activities in the cities of global south is subject to cumbersome procedures to access land for a legal residential use (Wekesa, Steyn, & Otieno, 2011). Hence, developers with the help of illegal local land brokers and individuals were engaged into the informal land markets. All these processes could cause the growth of informal settlement, especially when there is poor urban land management and governance system (Dadi, 2018; Fouad & Abbas, 2021).

### 2.1.3. Administrative factors

In most developing countries, institutional inefficiencies, such as delays in getting building documents, lack of enforcement of the building regulations, lack of sanctions against offenders, corruption involved in getting building documents, poor land administration system, and centralized bureaucratic procedures in land management have contributed to the expansion of informal settlements (Mensah et al., 2013; Sakala, 2016; and Minetos, 2013). Taking this in to account, the current study has considered inefficient public administration, corruption, and procedural problem of legal land provision are administrative or institutional factors that have influence on the expansion of informal settlements in the study area.

The nature and type of administrative factors that determine the expansion of informal settlements mainly in developing countries are mainly similar. UN-Habitat (2019) reported; for instance, that extensive bureaucratic procedures associated with land acquisition and building permits, corruption of public officials and experts are as institutional factors contributing for the growth of informal settlements. Moreover, Matamanda (2019), in his study, took corruption and inconsistent policies and plans as the main determinant factor for the existence of informal settlements in sub-Saharan Africa. The study proved that improper implementation and practice of urban planning could have influence on the expansion of informal settlements. Besides, Wahab (2017) identified imperfect land market, politics, corruption, high land and house price, uncoordinated urban development and inappropriate urban plan in peri-urban settlement as driving factors of informal settlements expansion in Nigeria. Corruption and poor land management practice have a positive relationship with the expansion of informal settlements where officials and experts have poor commitment to manage the urban land as a property (Matamanda, 2019). In such instances, individuals have tried to occupy private and government owned land illegally (Hadush, 2019).

Corruption and weakness in land policy enforcement have further aggravated problems related to land speculation and expansion of informal settlements. Similarly, Marutlulle (2017) in his study conducted in South Africa claimed that administrative issues, such as municipal inefficient administration, lack of control and corruption are some causes for the growth of informal settlements. Therefore, inefficient public administration, inappropriate planning and inadequate land administration tools have further aggravated the problem of informal settlements (United Nation, 2019).

It seems that expansion of informal settlement is uncontrolled in countries where inappropriate planning and bad practices of urban land management are exist. Ambaye (2011); Anulo (2017); Minetos and Polyzos (2013); Sakala (2016); UN-Habitat (2015); and UNECE (2015) in their studies argued that procedural problem of legal land provision has significantly affect the expansion of informal settlements. Also, according to some other studies by Akirso (2021); Asefa (2020); Msuya et al. (2017); and Wondimu (2021), the cumbersome process of land provision has caused to the expansion of informal settlements.

Consequently, weak governance in urban land administration in Ethiopia is one of the reasons behind the rise of informal settlements. This can be explained in terms of the high land price, land speculation, bureaucratic procedure of legal land provision, and urban sprawl (Koroso et al., 2021).

### 2.1.4. Political and legislative factors

In the cities of developing countries, inefficient legal frameworks in urban management, inappropriate building standards, poor implementation of rules and legislations, and rising political instability are conditions for the expansion of self-help informal houses. More specifically, in the cities of sub-Saharan Africa, these factors subsumed under political and legislative dimension have further aggravated the formation and expansion of informal settlements. There are various elements related to political and legislative factors that have impact on the expansion of informal settlements. Researchers such as Mensah et al. (2013) and Sakala (2016) used inadequate housing policies of governments and political instability as indicators of political and legislative factors for the expansion of informal settlements. Considering this, the following variables of political and legislative factors, such as inconsistency in land and plan legislation, rigid building regulation of legal houses, and inadequate housing policy are used as determinants for the expansion of informal settlement in the context of the current study area.

Studies reported that inappropriate and rigid planning laws, legislative and standards, political influence in planning, failure to control construction sectors as driving factors for the expansion of informal settlements, especially in the cities of global south (Matamanda, 2019; Suditu & Vâlceanu, 2013). This shows political reluctance to confront the situation that leads to the expansion of informal settlements (Matamanda, 2019).

A study by Hadush (2019) revealed that major political parties who require political support from the majority urban poor allow informal residents to develop, especially during the election period, to ensure their continued loyalties; leaders often supported and enhanced the activities of informal settlers, which are often known as political tribalism during the transitional period following election. In such instances, in the study area, informal activities of illegal developers and individuals seem to be more prevalent during the transition period (election periods). It proved that, during this period, illegal land allocation and development have practiced without the approval of political leaders and city authorities. Moreover, Mensah et al. (2013) claimed political instability and inadequate housing policy as the major influencing factors for the expansion of informal settlements in Kumasi, Ghana. Moreover, in South East Europe countries, informal settlements have been expanded because of outdated and rigid legislations and inefficient house policies (Tsenkova, 2010).

As UN-Habitat (2003) reported, population growth, demographic change and industrialization may not be the factors of slum formation; however, urban policies and legislations, ineffective housing policies and inadequate formal land provision systems are the

causes for the rise of informal settlements. Similarly, [Avis \(2016\)](#) argued that urban planning policies in the global south have failed to achieve the goal of sustainable development, especially provision of house to the urban poor. Due to high administration fee to get plan and building permits, developers and individuals have been forced to violate the building regulation where the ultimate outcome is the formation and expansion of informal settlement that are not manage and controlled by local authorities ([Wahab, 2017](#)).

### 3. Materials and methods

#### 3.1. Study area

This study about determinant factors for the expansion of informal settlements is quantitative in nature and adopted a case study design in Gondar city administration. The rationale for selecting this area is because it is ancient city and an emerging urban center in the country, just like most cities in the sub-Saharan Africa. In addition, the city is characterized by large informal settlements expansion regularly. Currently, all fringe areas of the city is characterized by rapid and unplanned informal settlement. The case study city is situated in Northwestern highlands of Ethiopia, 727 kms away from the capital city, Addis Ababa. The city is about a total area of 192.3 km with undulating topography and located at an average elevation of 2200 m above sea level. Like many cities in sub-Saharan Africa, Gondar has been encountering the rapid population growth associated with urbanization, which is one among the main impetuses for the proliferation of illegal settlements on the edge of the city. Based on the reports of Central Statistical Agency of the country, the city has 468, 750 projected population in 2019 ([CSA, 2019](#)) ([Fig. 2](#)).

#### 3.2. Data source and sample size determination

Primary data were collected using survey questionnaire. To administer the survey questionnaire, 4 data collectors (3 males and 1 female who are grade 12 students) were selected. Training was given to the data collectors regarding how to collect the data, and handle the challenges that may come across during the field work. Besides, a close supervision was done by the researcher.

In addition, given the unauthorized nature of informal settlements and the question of willingness of sample respondents, data collectors were purposely selected from informal settler households. This was because they had to gain trust from the participants. Moreover, an official support letter obtained from the office of the manager of Azezo-Teda sub-city was given to data collectors to make sure that the data collectors and the supervisor are legal.

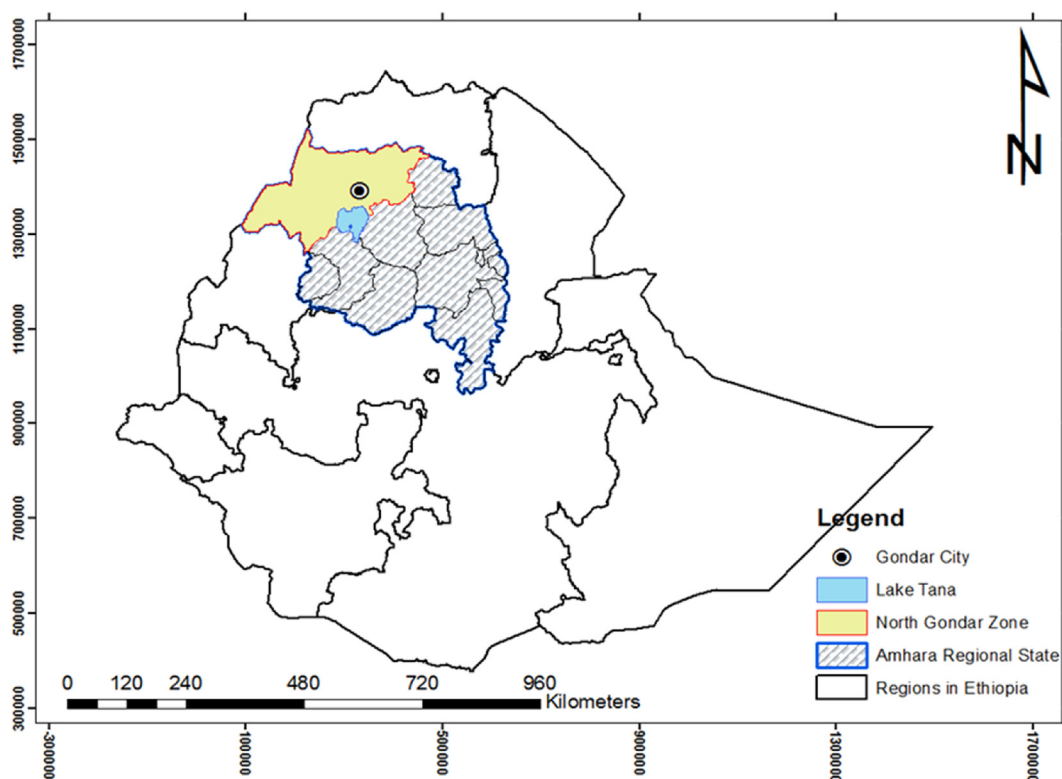


Fig. 2. Study area Map developed by the author.

The author was carried out field observation in 2020 to understand the features of the city and its informal settlements. The city comprises a total of 23 kebeles (lower administrative level) and 6 sub-cities namely: Azezo-Tseda, Fasil, Maraki, Zobil, Jantekel and Arada. Based on the field observation result, Azezo-Tseda sub-city was purposively selected due to its large representativeness of informal settlements of the city. Residents of the study were the informal settlers who have no legal title deeds in Azezo-Tseda sub-city.

There were a total of 2200 (informal settlers who have no title deed) which are registered by the land development and management office of the selected sub-city. There are four (4) kebeles in Azezo-Tseda sub-city. The sampling units for this research were randomly selected households in these kebeles of the sub-city. In this study, a two-stage random sampling technique was employed to select sample respondents in the sub-city. In the first stage, four kebeles were purposively selected, and these kebeles are peri-urban areas where rapid physical expansion of informal settlements have been high with many informal settlers living in them. Accordingly, Ayira (population size: 447), Azezo-Tekelehaymanot (population size: 782), Abasamueal (population size: 626), and Demaza (population size: 345) (Sub-city annual Report, 2020). The total sample size of this study was determined by using a formula in Equation (1) as a second stage. Along with the primary data, the study employed literature review as a secondary source of data.

$$n = \frac{Z^2 pq}{e^2} \quad (1)$$

Where n: the sample size; Z: the value found in statistical tables which contain the area under the normal curve that cuts off an area  $\alpha$  at the tails ( $1 - \alpha$  equals the desired confidence level, e.g., 95%) (1.96); p: the estimated proportion of an attribute that is present in the population (0.5); q:  $1 - p$ ; e: the desired level of precision (0.07).

In the second stage, this study includes sample size of 196 households based on the above equation. Furthermore, using the roster of the kebeles, sample respondents were randomly selected. The total sample size was distributed to the selected kebeles based on a proportion to size method to each kebele. To equally share the sample size with each selected kebeles, this study applied proportional sampling method. Therefore, equation (2) is used to calculate the proportional sample size of the study area (Equation (2)).

$$ni = \left[ \frac{Ni}{N} \right] * n \quad (2)$$

Where ni is a sample size for each kebele, Ni is the population of each kebele, N is the total population of the sub-city and n is total sample size.

### 3.3. Questionnaire design and data measurement determination

Questionnaires are important to address many issues and concerns efficiently, and they have maximum possibility of high response rate as compared with other data collection tools. Determinant factors of expansion of informant settlement variables have rated with 5-point Likert scale options (strongly agree, agree, undecided, disagree, strongly disagree) for the respondents to choose from. In this regard, Likert scale statements represent the knowledge, opinion, feelings, and practice components that are perceived by informal

**Table 2**  
Socio-Demographic characteristics of the Respondents (N = 184).

Variables	Specific indicators	Values
Sex	Male	83.7
	Female	16.3
Age	Average age	39 years
	Range of age	18–60 years
Educational Level	cannot read and write	1.5
	Read and write	5.6
	Primary school (1–4)	18.4
	Junior school (5–8)	14.3
	Secondary school (9–12)	26.5
	Certificate	5.6
	Diploma	16.8
Marital status	Degree and above	11.2
	Married	48.5
	Single	14.8
	Divorced	19.4
	Widowed	17.3
Occupational status	Government employee	24.3
	Self-employee	65.7
	Merchant	8.0
Family size	1–2	25.5
	3–4	44.9
	4–5	20.9
	Above 5	8.7

Source: Survey result, 2020

settlers in the study area. Therefore, the questions helped to identify major independent variables perceived by informal settlers. The dependent variable which was expansion of informal settlement was measured in categorical value with “yes or no” item. Hence, for the purpose of this study, the variable was defined as “illegal residential area and/or house which are built on government, community and private land against the urban planning and building regulations without the consent of authorized bodies”.

Furthermore, questions were designed to collect demographic information of the respondents in one hand, and on the other, the remaining parts of questions were designed to collect data regarding to socio-economic, administrative, and political and legal factors that influence the expansion of informal settlements in the study area.

### 3.4. Data analysis and statistical methods

Demographic profiles of the respondents were analyzed with descriptive statistics (percentage). While determinant variables were analyzed using Factor analysis or Principal Component Analysis (hereafter called, PCA) method. PCA is effective in reducing large quantity of factors to the main principal once to make data interpretation easy. Heshmati and Zarabadi (2016) and Mishra et al. (2017) strongly recommend the application of factor analysis/PCA as it can statistically reveal the underlying factors that influence social happening, phenomenon, or problem, and shows the contribution of each factor accordingly. According to Gniazdowski (2017), suitability of data to the method was assessed. During evaluation, the correlation matrix has been revealed the existence of many coefficients which have a value of 0.3 and above. As a result, in this study, the Kaiser-Meyer-Olkin value was 0.636 that has been exceeded the recommended value of the method, which is 0.60. Moreover, the study found that the Bartlett's test of sphericity was statistically significant, supporting the factorability of the data.

## 4. Results

### 4.1. Background characteristics of respondents

Out of 196 household survey respondents, 184 questionnaires were responded back, with a response rate of 94%. Majority (83.7%) of the participants were males. The respondents were with age range between 18 and 60 years old with an average of 39 years old (see Table 2). Regarding educational level of the sample participants, 26.5% of them had completed their secondary school (9–12), whereas the remaining 11.2% and 16.8% of the participants had completed their diploma and degree program, respectively. Nearly 50% of the participants were married, of these 19.7% of them were divorced. About 44.9% of respondents have three family members, whereas 20.9% of them have above four family members. It is expected that those participants who are married and have family are likely to fall under pressure of housing demand. This indicated that married households with their families were forced to live in informal settlements. The survey results also revealed that 65.7% of the participants are self-employed, while 24.3% of them are government employees (see Table 2).

### 4.2. Contextual profile of informal residents in the study area

Table 3 depicts, 86.6% of informal residents were migrants, either from the rural (63.4%) or from other urban areas (23.2%). This statistic asserts that population growth through migration to the city was identified as the major driving force for the expansion of informal settlements. This indicated that migrants who cannot afford formal housing dominantly formed informal settlements in Gondar city. Moreover, only 13.4% of the total of 161 migrants lived in rented house in the center of the city earlier and later. Later, they transferred to the informal neighborhoods while the rest (86.6%) migrants directly settled in the informal houses.

**Table 3**

Land and House ownership of respondents (N = 186).

Variables		Frequency	Percentage
Place of birth	Other rural area	118	63.4
	Other urban area	43	23.2
	Gondar	25	13.4
Place of former residence	Other rural area	63	33.9
	Other urban area	21	11.3
	Gondar	102	54.8
House ownership	Private	161	86.6
	Rented	25	13.4
Land holding	Bought from farmers	157	84.4
	Public/government	29	15.6

Source: Survey result, 2020

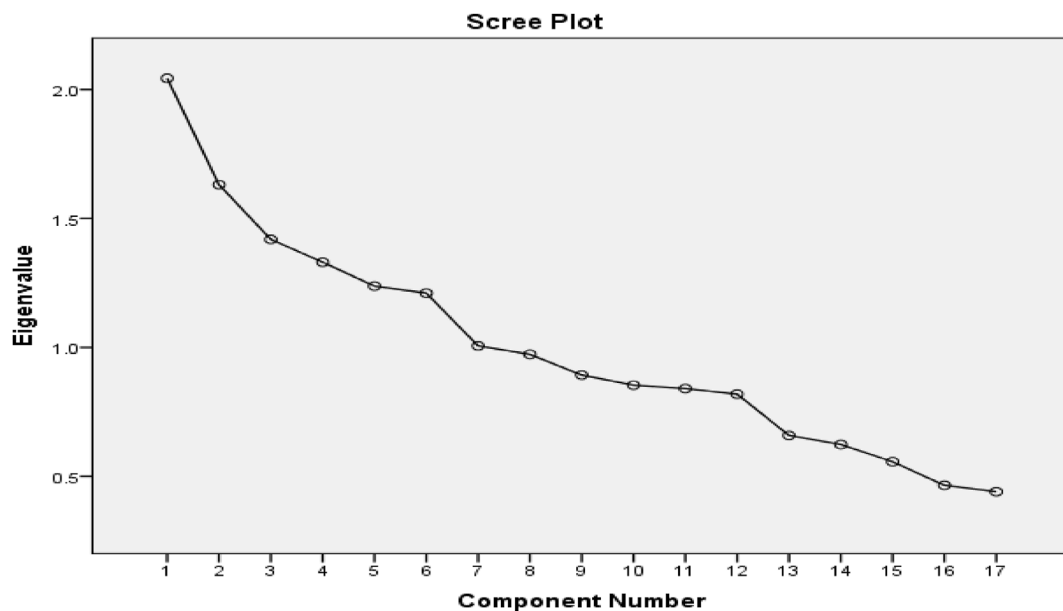


Fig. 3. Number of retained components depicted by Scree plot

Source: Survey result, 2020.

Table 4

Parallel analysis indicated the number of components retained for further analysis.

Variable (component) number	Actual eigenvalue from PCA	Criterion value from parallel analysis	Decision
1	2.700	1.7203	Accept
2	1.920	1.5943	Accept
3	1.628	1.5103	Accept
4	1.477	1.4346	Accept
5	1.091	1.3670	Reject
6	1.078	1.3080	Reject
7	1.045	1.2496	Reject
8	.992	1.2000	Reject
9	.976	1.1471	Reject
10	.968	1.1007	Reject
11	.959	1.0508	Reject
12	.898	1.0082	Reject
13	.868	0.9641	Reject
14	.841	0.9196	Reject
15	.791	0.8758	Reject
16	.747	0.8336	Reject
17	.693	0.7961	Reject

Source: Survey result, 2020

#### 4.3. Results and discussion on determinants for the expansion of informal settlements

As already described in the introduction section, the expansion of informal settlement is triggered by multidimensional factors. To identify these factors, factor analysis or principal component analysis method was applied. To this end, the PCA performed initially revealed that seven (7) components had eigenvalues greater than one (1). The total variance value of this study explained by the seven (7) components together was 65.3%. However, subsequent analysis of the data using scree plot (see Fig. 3) and parallel analysis shows that four components should rather be kept for further investigation (see Table 4).

The result from parallel analysis (Table 4), four dimensions have been selected using eigenvalues that exceeding the average values for a randomly generated data matrix (17 × 184). Besides, a varimax rotation was performed to further interpret the value of four components or factors. In this regard, the following variables such as location preference to live in an area, need to have large land size of plot, and delayed response of the municipality when individuals want to get land have been deleted from the original 17 variables due to their loading and insignificant value. However, the other variables have been successfully loaded a value greater than the required load of 0.3 and above (Mishra et al., 2017). Besides, the components can be chosen by using the scree plot (Fig. 3). A scree plot is a common diagram that plots the eigenvalues from the greatest to the smallest. It is common to disregard components that have less than one

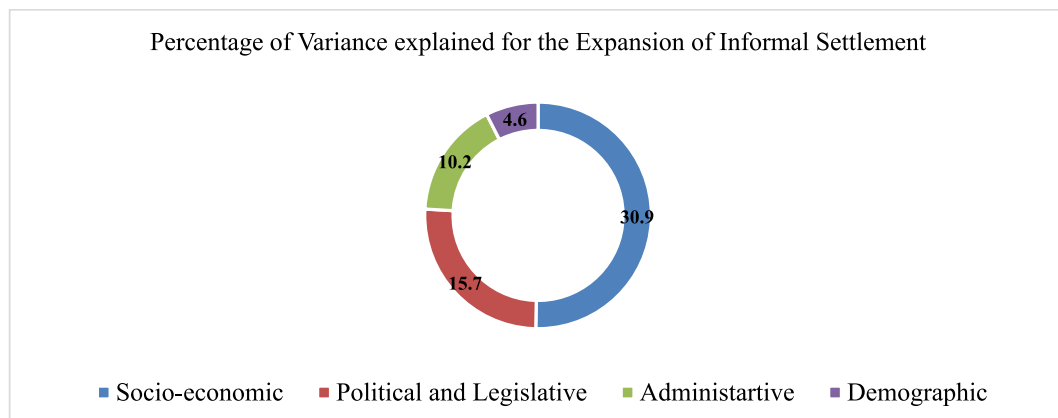
**Table 5**

Rotated component matrix showing factor loadings and amount of variance explained for the emergence and expansion of informal settlements.

Factor	Variable	Factor loading
Socio-economic	Inability to afford the price of land in the formal market	0.664
	High housing rent at the center	0.642
	Population growth due to natural increase and migration	0.620
	Income disparity	0.613
	Land speculation through brokers	0.578
	Insufficient compensation paid to peri-urban farmers during their land expropriation	0.552
	Educational level	0.440
	Inconsistency in land and plan legislation	0.509
Political and legislative	Land substitution modality for previous informal settler after eviction	0.501
	Rigid building regulation for legal houses	0.422
	Inadequate housing policy	0.410
	Current political situation of the country	0.356
Administrative	Corruption in relation to land provision by the leaders	0.455
	Inefficient public administration	0.395
	Procedural problem of legal land provision	0.334
Demographic	Marital status	0.362
	Age	0.300
	family size	0.328
Total percentage of variance explained by the four factors		61.4%

NB: From this variance table variables with loadings less than 0.3 have been omitted.

Source: Survey result, 2020

**Fig. 4.** Percentage amount of variance explained for the expansion of informal settlements.

eigenvalues. As a result, as seen in Fig. 3, components from 5 to 17 can be disregarded in one hand. On the other hand, components from 1 to 4 can be accepted that have greater than one eigenvalues.

In line with this, socio-economic factors as component 1, political and legislative factors as component 2, administrative factors as component 3, and demographic factors as component 4 were recommended by the varimax rotation as the main factors that statistically influence the expansion of informal settlements (see Table 5 and/or Fig. 4). The four dimensions together accounts 61.4 percent of the expansion of informal settlements in the city. This made the findings of this research accurate to have true picture of determinant factors for informal settlements in the city. As indicted in Table 5 and Fig. 4, socio-economic dimension determines the highest percentage (30.9%) of the expansion of informal settlements. This dimension includes eight items with their factor loadings. These are: inability to afford the price of land in the formal land market (0.664), high housing rent at the center (0.642), population growth because of natural increase and migration (0.620), income disparity (0.613), land speculation through brokers (0.578), insufficient compensation paid to peri-urban farmers during their land expropriation (0.552), and educational level (0.440). Hence, based on its factor loading, the dominant socio-economic factor that contributes to the expansion of informal settlement is inability to afford the price of land in the formal land market followed by high housing rent at the center and population growth.

Similarly, as indicated in Table 5 and Fig. 4, political and legislative dimension is the second dominant factor that contributes to the expansion of informal settlements with 15.7% of variance. This dimension includes five items, namely inconsistency in land and plan legislation, land substitution modality for previous informal settlers after their eviction, high building regulation of legal houses,

inadequate housing policy, and current political situation of the country. Therefore, based on the factor loading value, inconsistency in land and plan legislation (0.509) and land substitution modality for previous informal settlers after their eviction (0.501) are the two dominant political and legislative factors contributing to the expansion of informal settlements.

Furthermore, administrative factors with comprising three items explained 10.2% of the variance (Fig. 4). Table 5 shows corruption as the dominant administrative factor that contributing to the expansion of informal settlements with the highest factor loading (0.455). Factors that contributed less in explaining the expansion of informal settlements came from the demographic dimension (4.6%). Among the demographic factors, marital status (0.362) is the highest contributor for the expansion of informal settlements (Table 5). Therefore, as the results revealed four determinant dimensions namely: socio-economic, political and legislative, administrative, and demographic together influenced the expansion of informal settlements in Gondar city, Ethiopia.

For further illustration and clear understanding, determinant factors have been classified based on nature and level of indicators and how they affect the expansion of informal settlements in four major dimensions. Hence, based on the nature of variables, it was found that some determinant factors are more effective to indicate the social and economic nature of urban residents. These factors varied within different urban centers. Determining factors with such characteristics were classified in the dimension of the “socio-economic”. The second classification is on determinants that aggravated the expansion of informal settlements explained in terms of low political commitment of leaders, political instability, policy and legal gaps. Thus, these factors were included in the “political and legislative dimension”. The third classification is on factors that influence the expansion of informal settlements through weak institutional setup, inadequate service delivery and low management of resources. Factors with such characteristics were categorized in the “administrative dimension”. This dimension (administrative) is different from the political and legislative one, and mainly explained in terms of weak institutional set up of the organization and inefficient performance of activities. Lastly, other determinants are classified under “demographic dimension” that influence the expansion of informal settlements in line with the demographic changes of urban dwellers (see Table 5 and/or Fig. 4). Factor indicators that included in this dimension are age, marital status and family size.

#### 4.3.1. Socio-economic dimension

The socio-economic dimension includes inability to afford the price of land in the formal land market, high housing rent at the center, population growth because of natural increase and migration, income disparity, land speculation through brokers, insufficient compensation paid to peri-urban farmers during their land expropriation, and educational level. Taking this into account, findings of the survey revealed that inability to afford the price of land in the formal market and high housing rent were the two dominant factors that have influenced the expansion of informal settlements. Further probing revealed that population growth, low income, land speculation, low compensation and educational level were also influencing factors (see Table 5).

Previous findings, Msuya et al. (2017) argued that high land price in the formal market has caused for the proliferation of informal settlements in Arusha city, Tanzania. This indicated that shortage of supply planned land due to high price caused residents to purchase plots in the informal market from farmers at peri-urban area. The findings again support the assertion of Amao (2012) and Meshkini et al. (2015) on the causes that high land price and inadequate provision of land for housing have contributed for the rise of informal settlements. Also, according to some other studies, Akirso (2021); Anulo (2017); Asefa (2020); Diab et al. (2020); Marutlulle (2017); Mears (2011); and Weber and Mendelsohn (2017), high price of land and cumbersome land transaction determine the expansion of informal settlements. They proved that the cost of land in the form of the lease, auction and in informal land market are quite different regardless of plot size and other bureaucratic procedures for residential houses in the city. Consequently, unaffordable housing and land price forced people to move to the urban fringes where the price of land is very low.

In addition, there were other factors, namely high housing rent at the center, population growth due to natural increase and migration, and income disparity, found to determine the expansion of informal settlements. Studies in other areas suggest that the expansion of informal settlements have influenced by economic and social factors. Mensah et al. (2013) and Meshkini et al. (2015); for instance, presented in their studies that informal settlements have expanded due to low level of income, high rent charges, social contacts, rural-urban migration and low level of education. Similarly, studies in Zimbabwe (Matamanda, 2019); Nigeria (Amao, 2012); South Africa (Marutlulle, 2017); Zanzibar (Ali & Sulaiman, 2006); and Ethiopia (Abebe et al., 2019; Ochocho et al., 2018) revealed that population growth, high land price, low income and housing shortage have contributed to the expansion of informal settlements in their respective urban centers. In most cities of the global south, informal settlements could be used as a source of shelter for most of the urban poor communities. The findings of this study are again supported by the observations of Alzamil (2017); Amiri and Ghanbari (2016); Asefa (2020); Marutlulle (2017); Sakala (2016); and UNECE (2015) on the causes of informal settlement expansion.

#### 4.3.2. Political and legislative dimension

The “political and legislative dimension” which includes the political and legislative issues that cause the expansion of informal settlements. This dimension is subjected to political instability and political decision processes causing for the growth of informal settlements. On the other hand, under the influence of inappropriate policies, rules and regulation, poor urban management strategies at national, regional and city administration level cause changes in the spatial extent of informal settlements. In this regard, the findings of the survey revealed that inconsistency in land and plan legislation, land substitution modality for previous informal settlers after their eviction, rigid building regulation for legal houses, inadequate housing policy, and current political situation of the country are the most dominant political and legislative factors that have influence on the expansion of informal settlements (see Table 5).

Inconsistency in land and plan legislation is the major political and legislative factor that some previous studies consider it to be

effective in determining the expansion of informal settlements (Dadi, 2018; Marutlulle, 2017; Mears, 2011; Sakala, 2016; Tilaki, Mustafa, Marzbali, Adullah, & Ariffin, 2011; UNECE, 2015). Some other studies point out that inadequate housing policy and rigid building regulation have influence on the expansion of informal settlements (Akirso, 2021; Fadaei, 2015; Marutlulle, 2017; Mears, 2011; Msuya et al., 2017; Sakala, 2016; UNECE, 2015; Wondimu, 2021).

Moreover, consistent with these findings, UN-Habitat (2015) and Avis (2016) argued that the failure of urban planning and land management policies in cities of the global south resulted in the rise of informal settlements. Also, insufficient planning, inconsistent and complex regulation and poor urban management strategies in developing countries have influence on the rise of informal settlements. Besides, failure of social and urban planning policies (Okyere & Kita, 2015; Suditu & Vâlceanu, 2013), land substitution modality for evicted settlers (UNECE, 2012), poor legal enforcement and weakness of structural follow up (Dadi, 2018; G/Silassie, 2019), public policy failure (Wekesa et al., 2011), inconsistent policies and plans (Matamanda, 2019), and outdated and complex regulation (Tsenkova, 2010) are other crucial determining factors for the expansion of informal settlements.

Furthermore, rigid building regulation and long process to get construction permit have effects on the expansion of informal settlements. A study conducted by Wahab (2017) revealed that inadequate detailed regulatory plan, high building permit fee and too many procedures to get construction permit have contributed to expand informal settlements. Similarly, Matamanda (2019) and Ochocho et al. (2018) argued that strict government housing policies and building regulations have contributed to the expansion of informal settlements. Besides, according to Suditu and Vâlceanu (2013), inappropriate or absence of the legislative tools on urban planning, properties' restitution and management, and weak control of the construction sector are the dominant causes for the expansion of informal settlements in Romania.

#### 4.3.3. Administrative dimension

Administrative dimension refers to factors that contain the process and services of government institutions. These factors as organizational frameworks or institutional set ups, are integral parts of the urban administration and management systems of urban centers. Besides, factors are also formed and developed in the operation of governance structures which are responsible to manage urban development activities. Therefore, due to its ineffectiveness, this dimension is crucial for the expansion of informal settlements. In this sense, administrative dimension includes institutional factors, such as corruption in relation to land provision by local leaders, inefficient public administration, and procedural problem of legal land provision (see Table 5).

Corruption in relation to land provision (Marutlulle, 2017; Matamanda, 2019; Mears, 2011; UNECE, 2012) is one of the driving factors for the expansion of informal settlements. In Ethiopia, the responsible body that controls the informal settlement developments based on the regulation on control and prevention of informal activities in urban centers is the municipality. However, corrupted public officials provided land to urban residents against the regulation and allow informal house construction on private and government land (Dadi, 2018). It proved that despite the strict development control, it is not always adhered to due to corruption where the officials seem to cast a blind eye on some informal developments while this development control was also identified by many as their worst nightmare. Thus, particularly in the city, corruption has often put influence on the provision of affordable housing for the urban poor. It is one of the major indicators of poor urban governance in sub-Saharan Africa (Matamanda, 2019).

Inefficient public administration in relation to urban land administration and management (Akirso, 2021; Dadi, 2018; G/Silassie, 2019; Marutlulle, 2017; Mears, 2011; Mensah et al., 2013; Msuya et al., 2017; Suditu & Vâlceanu, 2013; Tsenkova, 2010; UNECE, 2012; Weber & Mendelsohn, 2017) and procedural problem of land provision (Ambaye, 2011; Anulo, 2017; Minetos & Polyzos, 2013; Sakala, 2016; UN-Habitat, 2015; UNECE, 2015) have significantly influenced the expansion of informal settlements. Also, according to studies conducted by Asefa (2020) and Msuya et al. (2017) cumbersome procedure to provide residential land has caused for the expansion of informal settlements. It is frequently observed in the city of Gondar that because of poor urban governance, the peri-urban land has been regularly occupied by illegal land developers and individual urban poor communities. Generally, many urban problems involving mushrooming of informal settlements are also related to the operation of administering and managing land which include inadequate land supply, inappropriate building codes and standards, weak governance, and poor capacity of institutions, among others.

#### 4.3.4. Demographic dimension

The “demographic dimension”, which includes factors, such as age, marital status, and family size, cause for the expansion of informal settlements. This dimension is subjected to influence the population dynamics and decisions of residents to live in informal settlements. In this regard, the findings of the survey revealed age, marital status, and family size as statistically significant to determine the growth of informal settlements (see Table 5).

Previous findings, Friesen et al. (2018) reported that demographic factors, such as age and marital status have significantly related to the development of informal settlements. That means high population dynamics and a large proportion of young people correlate with high development of informal settlements. Similarly, a study conducted in South Africa by Zweig (2016) shows that young men migrated into the urban center in search of a better life which resulted the formation and expansion of informal settlements. Migrants, particularly young men in Africa, are adapting very mobile forms of livelihood and live in inadequately serviced urban settlements. Hence, informal settlement becomes the only option for the young migrants to live in. This in turn result in the expansion of informal settlements. Additionally, marriage (Anulo, 2017; Baye et al., 2020), age (Baye et al., 2020; Ochocho et al., 2018), and family size (Heshmati & Zarabadi, 2016; Meshkini et al., 2015; Mwacharo, 2012) have significant effect on the expansion of informal settlements.

## 5. Conclusion and policy implications of the study

This study has explored the conceptual linkage between the determinants of informal settlement which are correlational within the socio-economic, political and legislative, administrative, and demographic frameworks. The study identified that unplanned and uncontrolled settlement which currently intensified in Gondar city has been brought by different determining factors. These factors include high housing rent and land price, inconsistency in land and plan legislation, land speculation by local brokers, increasing corruption, income disparity, and land substitution for informal settlers. The local municipality authorities have failed to control the expansion of informal settlements, which are rising because of unsustainable and political decision to substitute land for evicted informal settlers of Gondar city in 2015.

This finding is unique in the sense that it considers a multiplicity of factors from different dimensions which have a collective influence on the expansion of informal settlements. As we can understand from these results, the trend and situation of informal settlements in Ethiopia is influenced by a multiplicity of factors. A wider policy implication of the paper is that policymakers, city authorities and planning bodies should treat informal settlement as a multifaceted problem since its expansion is underpinned by a variety of factors. Considering the pervious discussion, this study suggested that the government of Ethiopia and Gondar city administration should intensively maximize the affordable housing scheme with greater emphasis on the low-level income societies. This scheme will help to supply housing to the less privileged and limit undue growth of informal settlements in Gondar city. Local municipality authorities should strictly manage and administered vacant and peri-urban land by applying modern land registration systems. They should also embark on routine inspection and monitoring exercises on illegal housing developments in the city to prevent the expansion of informal settlements. The activities should be fair and devoid of corrupt practices. For future prevention of the expansion of informal settlements, the city authorities must capture the existing illegal settlement through aircraft photo to identify the newly constructed illegal houses. The land in a given urban center is an engine of economic development and urbanization. In this sense, sustainable urban development cannot be achieved without efficient use of urban land.

Therefore, urban growth should focus on efficient urban land management and administration so as to tackle the problem of illegal settlements. In order to realize this, effective urban management approach should be intensified that should be explained in terms of appropriate urban planning, land and housing policy. This needs to be addressed for the country and city to improve practices of urban management. This is because ensuring efficient urban management not only improves sustainable urban development, but also helps to reduce illegal settlements, stabilize land prices and housing shortages.

### Authors' contributions

I have carried out all the whole works of the study. I designed the study research design, carried out the field work, document analysis, literature work, manuscript draft and editorial. The author, Endalew Terefe, personally undertook this study. The author also read and approved the final manuscript.

### Availability of the data and materials

The data is included in the manuscript.

### Ethics approval and consent to participate

Not applicable since this research did not involve human subject.

### Consent for publication

I have agreed to submit for Journal of Urban Management and approved the manuscript for submission.

### Funding

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### Declaration of competing interest

The author declare that there is no competing interests.

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## Appendix

### *Determinants that influence the expansion of Informal Settlement in Ethiopia: a case study of Gondar city* *Questionnaire for Sample Households*

#### *Part I: General profile*

1. Sex:
  - a. Male
  - b. Female
2. Age of the HHs: \_\_\_\_\_
3. Educational Level
  - a. Unable to read and write
  - b. Read and write
  - c. Primary school (1-4 grade)
  - d. Junior school (5-8 grade)
  - e. Secondary school (9-12)
  - f. Certificate
  - g. Diploma
  - h. Degree and above
4. Occupation
  - a. Government employee
  - b. Self-employed
  - c. Merchants
  - d. Others
5. Marital status
  - a. Married
  - b. Single
  - c. Divorced
  - d. Widowed
6. Family size of the HHs: \_\_\_\_\_
7. Place of birth
  - a. Rural area
  - b. Urban area (other than Gondar)
  - c. Gondar
8. Place of former residence
  - a. Rural area
  - b. Urban area (other than Gondar)
  - c. Gondar
9. House ownership
  - a. Private
  - b. Rent
10. Land holding
  - a. Bought from farmer
  - b. Public/government

#### *Part II: Determinants that influence the expansion of Informal Settlement*

1. Does Informal settlement is expanding in your sub-city?
  - a. Yes
  - b. No
2. The major determinant factors for the expansion of informal settlements are listed below. After you read each of the factors, evaluate them based on their level of influence and then put a tick mark (✓) under the choices below.

5=Strongly Agree 4= Agree 3= Undecided 2=Disagree 1=Strongly Disagree

No	Items	Agreement Scale				
		1	2	3	4	5
1	Inconsistency in land and plan legislation is a factor for expansion of informal settlements					
2	Procedural problems of legal land provision has influenced the expansion of informal settlements					
3	Inadequate housing policy is the cause for expansion of informal settlements					
4	Corruption has effect on the expansion of informal settlements					
5	Delayed responses of the municipality is a factor for the expansion of informal settlements					
6	High building regulation of legal houses has influenced the expansion of informal settlements					
7	Inefficient public administration is a factor for the expansion of informal settlements					
8	Inability to afford the price of land in formal land market has influenced the expansion of informal settlements					
9	High house rent at the center caused the expansion of informal settlements					
10	Housing shortage has caused the expansion of informal settlements					
11	Low income level and poverty are the cause for the expansion of informal settlements					
13	population growth due to natural increase and migration has affected the expansion of informal settlements					
14	Need to have large land size of plot is the cause for the expansion of informal settlements					
15	Location preference has influenced the expansion of informal settlements					
16	Unemployment is a factor for the expansion of informal settlements					
17	Land speculation has affect the expansion of informal settlements					
18	Land substitute modality for the informal settlers is a factor for the expansion of informal settlements					
19	Current political situation has influence on the expansion of informal settlements					

## References

- Abebe, A. D. (2018). *Causes and consequences of informal settlements: The case of woreda town, northwest, Ethiopia*. Ethiopia: MA thesis, University of Gondar.
- Abebe, M. S., Derebew, K. T., & Gemed, D. O. (2019). Exploiting temporal - spatial patterns of informal settlements using GIS and remote sensing technique : A case study of jimma city , southwestern Ethiopia. *Environmental Systems Research*, 8(6). <https://doi.org/10.1186/s40068-019-0133-5>
- Admassie, Y., Ayenew, M., Bekele, K., Desta, G., Grant, E., Hassan, F., et al. (2019). *Shelter provision in East african cities : Understanding politics for inclusive cities*. London, UK.
- Akisso, N. A. (2021). Exploring causes and consequences of squatter settlement in jimma town, oromia regional state, Ethiopia. *International Journal of Sociology and Anthropology*, 13(2), 58–63. <https://doi.org/10.5897/ijasa2019.0831>
- Ali, M. H., & Sulaiman, M. S. (2006). The causes and consequences of the informal settlements in zanzibar. *Shaping the Change XXIII FIG Congress Munich, Germany*, 2006, 1–15. October 8 – 13.
- Alzamil, W. (2017). Data in Brief the urban features of informal settlements in Jakarta, Indonesia. *Data in Brief*, 15, 993–999. <https://doi.org/10.1016/j.dib.2017.10.049>
- Amao, F. L. (2012). Housing quality in informal settlements and urban upgrading in ibadan , Nigeria [ A case study of apete in ibadan ]. *Developing Country Studies*, 2(10), 68–80.
- Ambaye, D. W. (2011). Informal settlement in Ethiopia , the case of two kebeles in Bahir dar city informal settlement in Ethiopia , the case of two kebeles in Bahir dar city. *TSO6D - Informal Settlement Issues, Spatial Development, Planning and Governance*, 1–27.
- Amiri, P., & Ghanbari, N. (2016). Investigating factors affecting the formation of informal settlements in Iran. *The Turkish Online Journal of Design, Art and Communication - TOJDAC*, 637–644. <https://doi.org/10.7456/1060JSE/031>
- Anulo, A. G. (2015). *The factors contributing for the expansion of informal settlements in Hossana town, southern Ethiopia*. MA thesis. Ethiopia: Addis Ababa University.
- Anulo, D. A. (2017). *Determinants of squatter settlement expansion in hosanna town , SNNPR : The case of gofer-meda sub-town*. MA thesis. Ethiopia: Jimma University.
- Asefa, B. (2020). Impacts of informal settlements on housing development : The case of debre berhan town , amhara regional state. *Landscape Architecture and Regional Planning*, 5(4), 67–73. <https://doi.org/10.11648/j.larp.20200504.12>
- Avis, W. R. (2016). *Urban governance (topic guide)*. Birmingham, UK: GSDRC. University of Birmingham.
- Baye, F., Wegayehu, F., & Mulugeta, S. (2020). Drivers of informal settlements at the peri-urban areas of Woldia: Assessment on the demographic and socio-economic trigger factors. *Land Use Policy*, 95, 104573. <https://doi.org/10.1016/j.landusepol.2020.104573>
- Berhane, D. (2015). *Squatter settlement and its impact on urban amenities of tilili town , awi zone, northwest Ethiopia* MA thesis. Ethiopia: Addis Ababa University.
- Chaka, S. (2018). *Impacts of informal settlement on development of sebeta city*. MA thesis. Ethiopia: Addis Ababa University.
- CSA (Central Statistics Agency). (2019). *Population projection Ethiopia, 2007-2037*. Central Statistics Agency, 2019.
- Dadi, T. T. (2018). *The influence of land management on the prevalence of informal settlement and its implication for environmental management in Bahir Dar city, Ethiopia*. Dissertation, University of South Africa.
- Diab, Y., El Shaarawy, B., & Yousry, S. (2020). *Informal Settlements in the arab region: Towards arab Cities without informal areas*". United Nations Human Settlements Programme.
- Dovey, K. I. M., & King, R. (2011). Forms of informality : Morphology and visibility of informal settlements. *Built Environment*, 37(1). <https://doi.org/10.2148/benv.37.1.11>
- Fadaei, A. (2015). *The contribution of planning to emergence of informal settlements: A discussion starting from the case of farahzad neighborhood*. Tehran (Iran). Italy: Dissertaion, Politecnico Di Milano University.
- Fouad, Z., & Abbas, S. S. (2021). The role of urban land management on the informal settlements the role of urban land management on the informal settlements. *IOP Conference Series: Earth and Environmental Science*, 754, Article 012014. <https://doi.org/10.1088/1755-1315/754/1/012014>. IOP, 2021.
- Friesen, J., Rausch, L., Pelz, P. F., & Fürnkranz, J. (2018). Determining factors for slum growth with predictive data mining methods. *Urban Science*, 2(81), 1–19. <https://doi.org/10.3390/urbansci2030081>
- G/Silassie, D. (2019). *The factors contributing for expansion of informal settlements: The case study of yeka sub-city , addis ababa, Ethiopia*. Ethiopia: MA Thesis, Addis Ababa University.
- Gemechu, S. (2018). *The trend and level of squatter settlement in burayu city*. Ethiopia: MA Thesis, Addis Ababa University.
- Ghasempour, A. (2015). Informal settlement; concept, challenges and intervention approaches. *Specialty Journal of Architecture and Construction*, 1(3), 10–16.
- Gniazdowski, Z. (2017). New interpretation of principal components analysis. *Zeszyty Naukowe WWSL*, 11(16). <https://doi.org/10.26348/znwwsl.16.43>
- Grant, E., Desta, G., Admassie, Y., Hassan, F., Stevens, S., & Ayenew, M. (2019). *Proposed solutions for inclusive shelter in Hawassa*. Retrieved from <http://pubs.iied.org/17727IIED>.
- Grant, E., Desta, G., Admassie, Y., & Stevens, S. (2019). *Shelter issues and solutions in Hawassa: Shelter provision in East african cities: Understanding transformative politics for inclusive cities*. London, UK: City Briefing.
- Hadush, A. T. (2019). An assessment of the challenges and prospects of good urban governance practice in land administration : The case of zalanbessa town administration, tigray region, Ethiopia. *IOSR Journal of Humanities and Social Science*, 24(11), 66–79. <https://doi.org/10.9790/0837-2411066679>
- Heshmati, S., & Zarabadi, Z. S. S. (2016). Evaluation of effective indicators on formation of informal settlements of shahr ghods. *Journal of Fundamental and Applied Sciences*, 8(3S), 1137–1163.
- Inostroza, L. (2017). Informal urban development in Latin American urban peripheries. Spatial assessment in Bogotá, Lima and Santiago de Chile. *Landscape and Urban Planning*, 165, 267–279. <https://doi.org/10.1016/j.landurbplan.2016.03.021>
- Khalifa, M. A. (2011). Redefining slums in Egypt: Unplanned versus unsafe areas. *Habitat International*, 35(1), 40–49. <https://doi.org/10.1016/j.habitatint.2010.03.004>
- Koroso, N. H., Lengoiboni, M., & Zevenbergen, J. A. (2021). Urbanization and urban land use efficiency: Evidence from regional and Addis Ababa satellite cities, Ethiopia. *Habitat International*, 117. <https://doi.org/10.1016/j.habitatint.2021.102437>
- Marutulle, N. (2017). Causes of informal settlements in ekurhuleni metropolitan municipality : An exploration. *Africa's Public Service Delivery and Performance Review*, 5(1), 1–11. <https://doi.org/10.4102/apsdpr.v5i1.131>
- Matamanda, A. R. (2019). Battling the informal settlement challenge through sustainable city framework : Experiences and lessons from harare , Zimbabwe. *Development Southern Africa*, 1–15. <https://doi.org/10.1080/0376835X.2019.1572495>, 0(0).
- Matsumoto, T., & Crook, J. (2021). *Sustainable and inclusive housing in Ethiopia: A policy assessment*. Coalition for urban transitions. <https://urbantransitions.global/publications>.
- Mears, R. (2011). Historical development of informal township settlements in Johannesburg since 1886. In *Paper Presented at the economic history Society of Southern Africa, conference, 10-12 september 2007, indaba hotel, fourways, Johannesburg and at ERSa research workshop*. Johannesburg: Kopanong, 2 – 4 November 2011.
- Mensah, C. A., Antwi, K. B., & Acheampong, P. K. (2013). Behavioural dimension of the growth of informal settlements in Kumasi city , Ghana. *Research on Humanities and Social Sciences*, 3(12), 1–11.
- Meshkini, A., Mansoor, E. S., & Esfaram, Y. (2015). Analyzing effective factors in establishing informal settlements in babol city using pathway analysis (PA) model. *Cumhuriyet University Faculty of Science, Science Journal (CSJ)*, 36(3).
- Minetos, D., & Polyzos, S. (2013). Informal housing in Greece : A multinomial logistic regression analysis at the regional level. *European Spatial Research and Policy*, 20(2), 57–84. <https://doi.org/10.2478/esrp-2013-0011>
- Mishra, S. P., Sarkar, U., Taraphder, S., Datta, S., Swain, D. P., Saikhom, R., et al. (2017). Principal component analysis. *International Journal of Livestock Research*, 7(5). <https://doi.org/10.5455/ijlr.20170415115235>
- Muya, S. M., Mosha, P. E., & Mtshali, R. A. (2017). The challenges of development control of informal settlements in Arusha city : A case of ngaranaro ward. *International Journal of Innovation and Scientific Research*, 32(1). <https://doi.org/10.13140/RG.2.2.25203.02084>
- MUDHC. (2014). *National Report on housing & sustainable urban development*. Addis ababa, Ethiopia: Federal democratic republic of Ethiopia. Ministry of Urban Development, Housing & Construction.

- MUDHC. (2021). *National Report on sustainable urban Development and urbanization*. Addis ababa, Ethiopia: Federal democratic republic of Ethiopia. Ministry of Urban Development, Housing & Construction.
- Mwacharo, R. E. (2012). *Factors influencing growth of informal settlements: A case of Bangladesh slum, changamwe constituency, mombasa county, Kenya*. Kenya: MA Thesis, University of Nairobi.
- Niva, V., Taka, M., & Varis, O. (2019). Rural-urban migration and the growth of informal settlements : A socio-ecological system conceptualization with insights through a “ water lens. *Sustainability*, 11, 7–10.
- Ochocho, A., Worku, K., & Yitna, E. (2018). Determinants of expansion of squatter settlements: The case of hosanna town, hadiya zone, southern Ethiopia. *Ethiopian Journal of Environmental Studies & Management*, 11(6), 677–696.
- Okyere, S. A., & Kita, M. (2015). Rethinking urban informality and informal settlements growth in urban Africa: A literature discussion. *Journal of Sustainable Development in Africa*, 17(6).
- Parikh, P., Bisaga, I., Loggia, C., Christina, M., & Ojo-aromokudu, J. (2020). Barriers and opportunities for participatory environmental upgrading : Case study of Havelock informal settlement. *City and Environment Interactions*, 5, 100041. <https://doi.org/10.1016/j.cacint.2020.100041>. Durban.
- Sakala, S. (2016). Causes and consequences of informal settlement planning in lusaka district : A case study of garden house. *International Journal of Management and Applied Science*, 2(11), 185–192.
- Sub-city Report. (2020). *Azezo-Tseda sub-city annual report in 2020*. Gondar, Ethiopia.
- Suditu, B., & Vâlceanu, D. (2013). Informal settlements and squatting in Romania : Socio-spatial patterns and typologies. *HUMAN GEOGRAPHIES – Journal of Studies and Research in Human Geography*, 7(2), 65–75. <https://doi.org/10.5719/hgeo.2013.72.65>
- Tilaki, M. J. M., Mustafa, R. A., Marzbali, M. H., Adullah, A., & Ariffin, J. (2011). Challenges of the informal settlements in developing countries: A case study of Iran. *World Applied Sciences Journal*, 12(2), 160–169.
- Tsenkova, S. (2010). Informal settlements in post-communist cities: Diversity factors and patterns. *Urbani Izziv*, 21(2), 73–84. <https://doi.org/10.5379/urbani-izziv-en-2010-21-02-001>
- UN-Habitat. (2003). *Challenges of slums: A global report on human settlement*. Nairobi, Kenya.
- UN-Habitat. (2015). Issue paper on informal settlements: [https://uploads.habitat3.org/hb3/Habitat-III-Issue Paper-22\\_Informal-Settlements-2.0.pdf](https://uploads.habitat3.org/hb3/Habitat-III-Issue-Paper-22_Informal-Settlements-2.0.pdf).
- UN-Habitat. (2019). *Addressing urban and human settlement issues in national adaptation plans: A supplement to the UNFCCC technical guidelines on the national adaptation plan process*. Nairobi, Kenya.
- UN-Habitat. (2020). The new urban agenda. UN-Habitat <https://doi.org/10.18356/4665f6fb-en>.
- UNECE. (2012). Informal settlements in countries with economies in transition in the UNECE Region. [https://www.unece.org/fileadmin/DAM/hlm/documents/Publications/Literature\\_Review\\_on\\_Informal\\_Settlements.pdf](https://www.unece.org/fileadmin/DAM/hlm/documents/Publications/Literature_Review_on_Informal_Settlements.pdf).
- UNECE. (2015). *Formalizing the informal : Challenges and opportunities of informal settlements in South-East Europe*. International Federation of Surveyors.
- United-Nations. (2019). World urbanization prospects: The 2018 revision. ST/ESA/SER.A/420 <https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf>.
- Wahab, B. (2017). *Transforming Nigerian informal settlements into liveable communities : Strategies and challenges*. Mandatory Continuing Professional Development Programme (MCPDP) of the Nigerian Institute of Town. <https://doi.org/10.13140/RG.2.2.16617.95849>. Planners, Held at Awka, Osogbo and Katsina, Nigeria.
- Weber, B., & Mendelsohn, J. (2017). *Informal settlements in Namibia: Their nature and growth exploring ways to make Namibian urban development more socially just and inclusive* (1st ed.). Development Workshop Namibia.
- Wekesa, B. W., Steyn, G. S., & Otieno, F. A. O. F. (2011). A review of physical and socio-economic characteristics and intervention approaches of informal settlements. *Habitat International*, 35, 238–245. <https://doi.org/10.1016/j.habitatint.2010.09.006>
- Wondimu, H. (2021). The subsequent challenges of the slum and squatter settlements : In the city of Addis ababa. *European Journal of Research Development and Sustainability (EJRDS)*, 2(1), 24–34. <https://doi.org/10.13140/RG.2.2.33523.96807>
- Zhang, J., Chen, S. S., Gao, Q., Shen, Q., Kimirei, I. A., & Mapunda, D. W. (2020). Morphological characteristics of informal settlements and strategic suggestions for urban sustainable development in Tanzania: Dar es salaam, mwanza, and kigoma. *Sustainability*, 12(4).
- Zweig, P. (2016). *Lost in space ? Considering young men as drivers of urban informal settlement risk*. Urban Forum. <https://doi.org/10.1007/s12132-016-9292-x>