PRODUCTIVE ADDIS

INCREASING ACCESSIBILITY TO LOCAL INCOME GENERATION BY DESIGNING A PRODUCTIVE OPEN SPACE SYSTEM

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Chris Bartman

P5 report

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ACKNOWLEDGEMENTS

I started the last year of the Urbanism master asking myself why we, as urban planners and designers, cannot prevent the formation of slums. We know that cities need to accommodate more inhabitants every day, mainly low-income households from the rural areas. But we tend to focus on accommodating them in the form of shelter and not in employment and mobility. This thesis therefore tries to investigate whether it is possible to accommodate the rising urban population by integrating their shelter, income generation and mobility. In order to try to come to an answer the scope turns to Sub-Saharan Africa and Ethiopia specifically. The national Integrated Housing Development Program (IHDP) introduced in Ethiopia in 2005 formed the motivation for this thesis.

My thanks go out to everybody who supported me during this long year. First of all my mentors, Roberto and Stefan. Your help and feedback have been of vital importance to my project. I like to thank you both for the opportunity that you gave me.

Next I like to thank the TU Delft itself, specifically the faculty of Architecture and the Urbanism department as well as the University Fonds who all made it possible for me to travel to Ethiopia.

My stay in Addis Ababa was made unforgetable by the help of Bizuayehu. You have been incredible, it was amazing to meet you and your family as well. I also like to thank the EiABC, Helawi Sewnet, Bisrat Kifle, Zegeye Chernet, Fasil Giorgis and Darik Zebenigus for their precious time and insights. I also like to thank Tamrat Eshetu from the Addis Ababa planning commission for his time and insights. All the residents of Addis Ababa, especially those of the Weyira sefer for their amazing hospitality and their time to talk with me. Your input was the most valuable for my project and design. Finally my stay in Addis Ababa was made complete thanks to Dagmawi. The many dinners of amazing Ethiopian food, great talks about Ethiopian history and culture and how games are going to change the world.

Many thanks go out to my friends, and family, especially for all the support and distracting me during the year.

Finally my thanks go out to Milou for her endless support, patience and love during the whole year (and beyond). I could not have done it without you.

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figure 1. sattelite image of the Ayat neighbourhood, LSE, 2015

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PROLOGUE

Haile woke up by the sound of birds, he looked outside, still dark. He needs to leave his home at 5.30 in order to arrive at 9 at his work in Piazza. First he finds a minibus taxi to take him outside his 'sefer', his neighbourhood. On a busy transit place he takes another minibus, fully packed. Even at this hour, he is not alone. The city of Addis Ababa oficially has 5 million inhabitants. The last minibus takes even longer because of the increasing traffic. Two hours later and 10 Birr (around 0,30 €) lighter, he arrives at Piazza the 'old' heart of the bustling city of Addis Ababa. Like many other residents of the capital of Ethiopia, he migrated from the countryside some 10 years ago to find employment. He started selling stuff on the streets and after years of hard work and saving money, he managed to buy a small kiosk to sell daily products.

Many migrants from the Ethiopian countryside share the same story. And they all live in substandard housing, either all the way on the fringes of the city or on dangerous sites along steep river banks or steep hills. In any case, the accessibility to employment is limited.

Haile's case is no exception for this, he lives in the west of Addis Ababa in the Kolfe Keranyo sub-city. This part of Addis is the least accessible part, mainly caused by the topopraphy, steep hills and many rivers that need to be crossed. But a closer look also shows that the west of Addis lacks employment opportunities itself. Many residents of this part of the city depend on work in the central areas of Addis, the main concentration of jobs. However, getting to the center and back has high travel costs, in terms of money ánd in time. Resources low-income households simply do not have in abundance. Especially if they ever want to improve their life as well as that of their children. The need becomes higher every day to create better access to income generation. Both in the living areas, the sefers themselves, as in creating better transportation options. The open space can become the most important tool for achieving this goal. The open spaces have the potential to accommodate income generation acitivities themselves, as well as connecting the whole sefer. Turning current unused space into a productive open space system.

This thesis will follow the daily struggle that many inhabitants of Addis Ababa experience. Their everyday journey to generate income, to survive in an ever expanding and growing city.

Figure 2. View of Kebele neighbourhood (The Guardian, 2015)

Figure 3. Daily transport in Addis Ababa (AddisFortune.com,2018)

PROLOGUE: THE MAIN CHARACTERS

(People of Addis, 2018)

Haile Kassahun, 40 years old, came from rural Oromya and migrated to the city to support his family. He started working as a streetvendor in the central areas of Addis. After some years he was able to rent a Kebele house in the Kolfe Keranyo sub city. He lives there now with his wife and five kids in a compound that he shares with three other households.

(People of Addis, 2018)

Bethlehem (Betty) Bekele, 30 years old, was born and raised in the central area of Addis. But when the governmente decided to redevelop their are, Betty and her family were evicted. As a compensation they were offered to move to a recently finished condominium complex in the Kolfe Keranyo sub city. They were lucky to be able to pay the down payment in order to get the condominium.

The stories of Haile and Betty will structure this thesis from the current situation to the design and beyond. The first chapter focuses on the daily life and the use of space. The second chapter will introduce the main hypothesis of the project, how a productive open space system can increase the access to local income generation. The third chapter will focus on the access to income generation on the scale of the city region. Resulting, in chapter 4, the chosen site for further research and the implementation: the Weyira sefer. The fifth chapter will show the design strategy and the implementation of this. Followed by the final chapter that will summarise and discuss the hypothesis and strategy.

Figure 4. Haile's home: a Kebele house (by author)

Figure 5. Betty's home: a condominium unit (by author)

CHAPTER 1:
FROM RURAL ETHIOPIA TO THE POTENTIAL OF OPEN SPACE

1.1 RAPID URBANISATION IN AFRICA

1.2 ADDIS TODAY

1.3 THE IHDP AS SOLUTION?

1.4POORACCESSTOLOCALINCOMEGENERATION

1.1 RAPID URBANISATION IN AFRICA

Haile used to live in the east of the Oromya province. This area is characterised by many conflicts with the Somali ethnic groups and Somalia. Besides that the area suffers many droughts and thus shortages of food and water. Haile, aged 16, is sent by his parents to the city of Addis Ababa to work. He arrived at the oustkirts of this massive metropolis and was impressed by the size and the shear number of inhabitants. Together with many other migrants from all over the country he became a streetvendor in the central parts of Addis...

One of the most urgent matters in the Global South is the rapid urbanisation of cities. Urbanisation itself is caused by natural population growth and rural-urban migration. This paragraph will give a short background about urbanisation and the different factors contributing to urban growth. Another major issue regarding urbanisation is that it is concerning mainly poor people. It can be viewed as a rapid urbanisation of poverty. But first, the relation between economic growth and urbanisation will be discussed.

Urbanisation as a process has a high association with economic growth. Howerver, the situation in Africa, especially sub-Saharan Africa, is different. Although there is a relation between economic development in urban centers and city growth, not all of the growth can be directly explained by economic aspects. Data that comes from the 80's and 90's shows that there was even 'urbanisation without growth' (Fay and Opal, 2000; Fox, 2012). But what does explain the urban growth of cities in Sub-Saharan Africa? According to Fox (2012) urbanisation needs to be understood as a global and historical process. Changes in demographic trends are related to technological and institutional innovations. Mainly technological progress related to food production and disease control. As well as institutional changes. (Fox, 2012: p. 285).

Motives are related to social aspects, such as youth escaping traditional culture, women escaping gender discrimination, family reunion and the city as a market to meet potential partners (Fox, 2012: p. 288). Studies focussing on recent times focus more on the push factors that drive migration, like climate events (droughts, floods) and political factors (war, ethnic conflict) (Fay and Opal, 2000; Barrios, Bertinelli & Strobl, 2006; Fox, 2012).

In many traditional studies the focus lay only on economic development, neglecting the role of population dynamics on urbanisation. Natural population increase in cities themselves is characterised by first a decline in mortality rate. Later this is followed by a decline in fertility rates in cities, slowing down the urban population growth. However, urban population growth is also influenced by rural-urban migration. The same

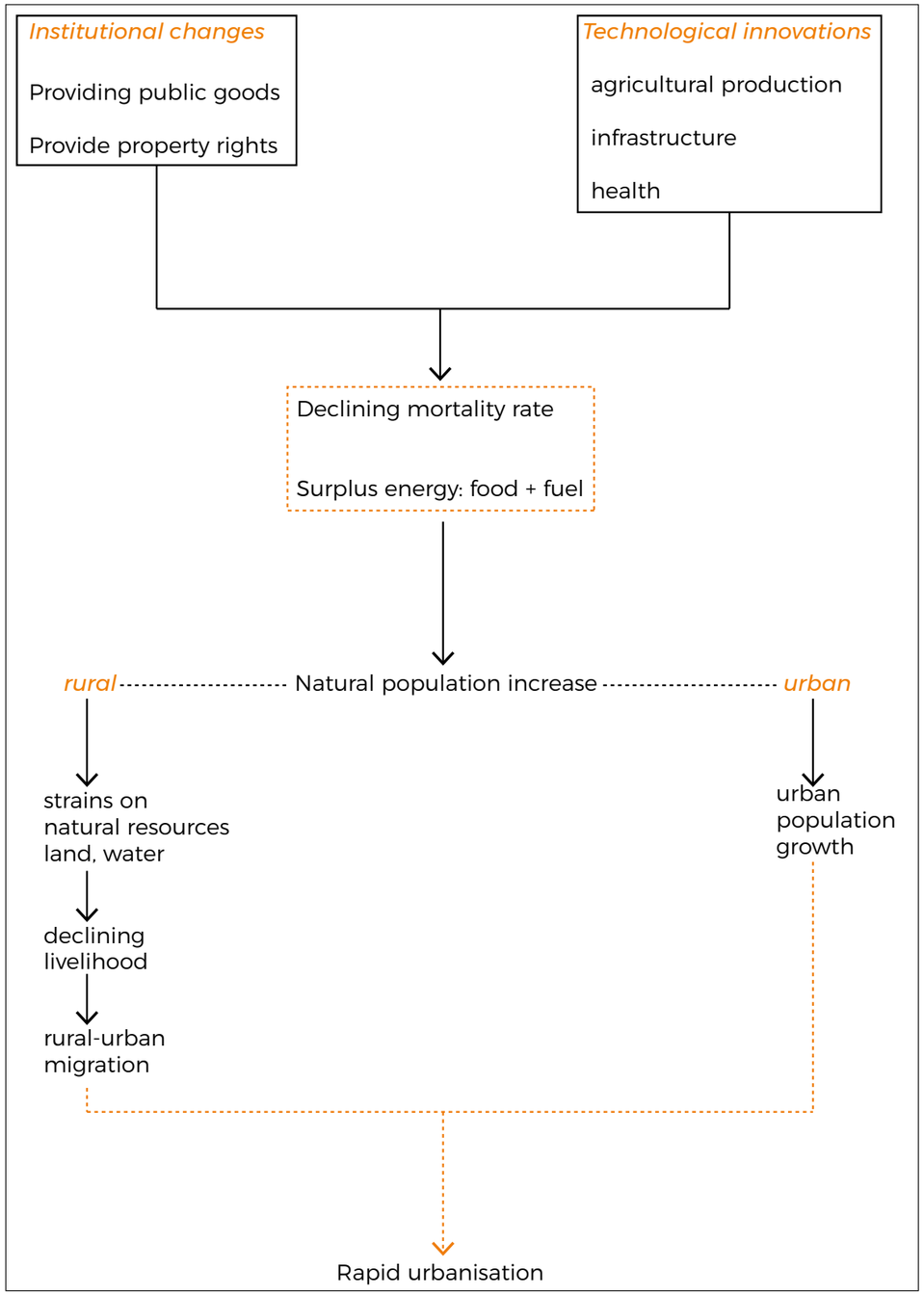


figure 6. Diagram explaining rapid urbanisation (image by author)

demographic changes occur in rural areas, thus creating more pressure on scarce livelihood opportunities in rural settings. As a response people migrate to urban areas and combined with a natural population growth, contribute to a rapid urbanisation of sub-Saharan African cities (Fox, 2012: p. 289).

Recent trends from 2010 have seen an increase in the urbanisation of poverty, contributing to the many problems observed in large urban areas in sub-Saharan Africa. Access to education and health care and employment are better and more diverse in cities than rural areas. People can increase their income in urban areas, even when costs of living in cities are higher. So a net gain in income might be the case and thus an improved financial situation compared to their former status as ruralite, this does not mean that their social status has been improved: they are still low-income. A city should again function as a social upward moving escalator, providing employment opportunities, culture, social, education, health care and affordable living (Fielding, 1992).

Rural-urban migration; causing rapid urbanisation

Fertility rates in rural areas remain high, resulting in more pressure on available resources such as land and thus deteriorating living conditions in rural areas. The consequence of this is the increase in rural-urban migration, resulting in a higher rate of urbanisation (Cobbinah et al, 2015a).

Causes for migration can be distinguished in two parts, pull and push factors. Especially the case for Ethiopia stands out, since it is a country that has never been fully colonised by an European country. Except for a short period of Italian occupation, from 1935 to 1941. However, Ethiopia has been influenced by other countries, notably because it is the diplomatic capital of the whole of Africa. Urbanisation processes have been slightly different, the country is still highly rural (around 80%) and only the capital Addis Ababa has a population above one million inhabitants (UN Habitat, 2014).

Pull factors are related to the perceived better living conditions and economic opportunities, as well as better access to social services (like education and health care). Other pull factors are related to uneven spatial development, where urban areas receive more investments both from national as international stakeholders. In the case of Ethiopia this pull factor does not apply, multiple policies have been focussing on rural areas as well. This is also apparent in the fact that agriculture has the highest proportion in the country's GDP (World Bank, 2015). The role of Addis Ababa is unique since it is the uncontested primate city of the country. In terms of politics, economy, culture (Z. Cherenet, personal interview 23-2-2018) This has a huge attraction to rural migrants. Though their journey often goes via

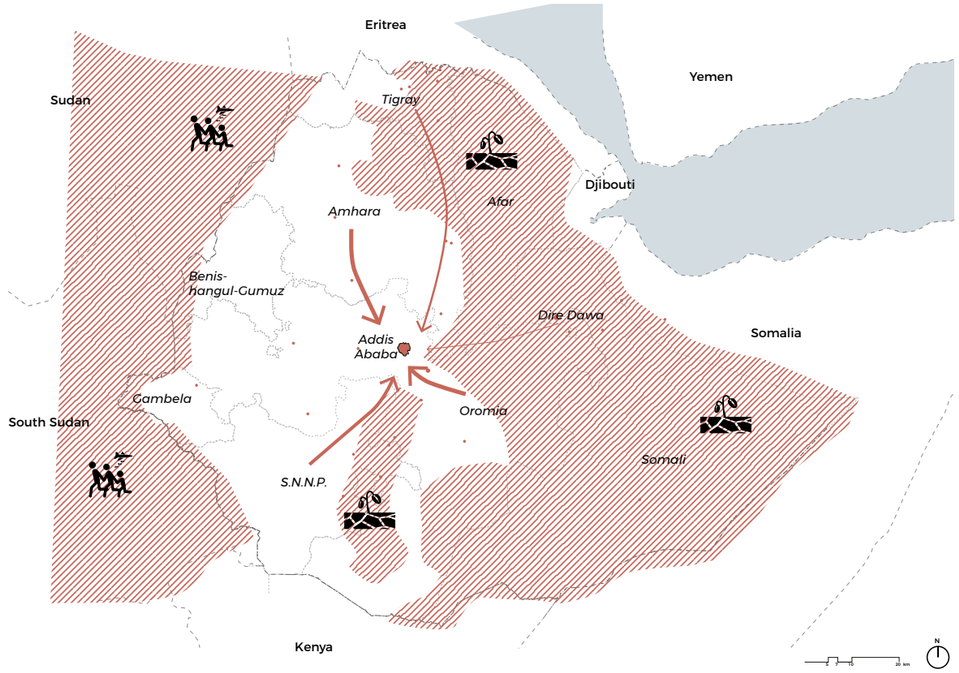


figure 7. Rural-urban migration: push factors (image by author)

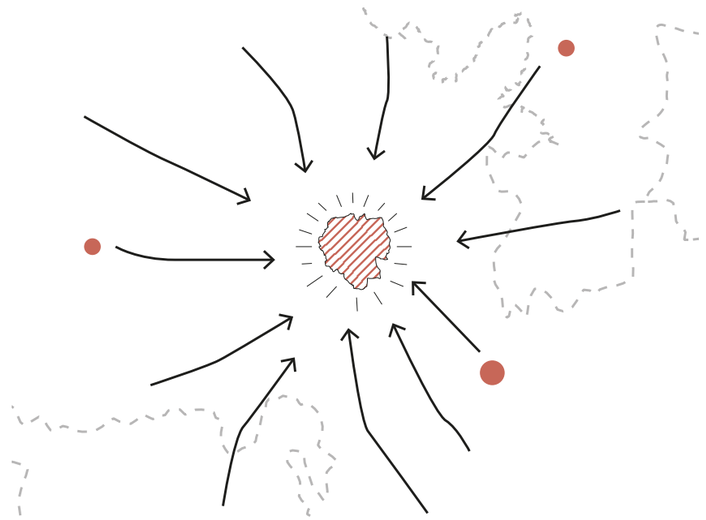


figure 8. Rural-urban migration: pull factors (image by author)

secondary cities and from there they migrate to Addis Ababa.

Push factors are related to deteriorating living conditions in rural areas like limited livelihood options, poor infrastructure conditions and social services. As well as insecurity and conflict due to climate change (droughts and floods) and political factors as wars and ethnic tensions. Finally and espacially valid in Ethiopia are the socio-cultural factors mainly related to the bad condition for women: mutilation, child marriages and so on. This is a growing factor explaining rural outflux of mainly young women (Erulkar et al., 2006).

Informal development caused by rapid urbanisation

The main effect of rapid urbanisation on development of cities, first and foremost, is the pressure caused by need for employment and housing. Many of the problems that are associated with urbanisation, such as health and environmental problems, are directly related with migrants looking for survival, for some form of income. They start living close to a job, mainly in the central areas of cities, in either self-constructed shacks or subletting a small space from others. When space is running out in the centers, or when governments are keen on developing it, migrants and current inhabitants are pushed towards the periphery. Farmers illegaly subdivide their plots to sell them individually to people who want to build their houses there. The structures themselves do not meet the building regulations and are in that extent informal as well. This informal urbanisation has many negative effects, first already mentioned the environment. Second accessibility, these informal settlements are located far away from any form of public transport. People depend on (high polluting) car transport or have to walk many hours every day. Service provision is lacking and is highly expensive to apply. There are hardly any functions related to health or education (Fekade, 2000).

Since the majority of the new city dwellers is poor, they are not able to 'survive' on the real estate market. And in many African countries the real estate sector is of small significance. The low-income city dwellers depend on public housing, provided by governments who posses little financial tools as well. The amount of public housing that can be provided by governments is by far insufficient to meet the demands of the growing urban poor population (Fekade, 2000). So long as there is no alternative provided by public parties and / or private parties this informal sprawl will continue. That all results in an increasingly expanding city, threatening natural areas or farmland. The accessibility to a stable form of income decreases drastically, making life in the city harder and harder.

figure 9. Rural meets urban, an average street in Addis (by author)

1.2 ADDIS TODAY

Haile's morning is the same as always, awoken before the sun is up he first checks the latest damage to the Kebele house. There was no rain tonight, so at least no leaking water this time. He is getting worried about the crumbling chika wall, it seems like the crack is getting bigger everyday. He needs to go to the Woreda office to get a permit to maintain his own dwelling. That means another day of waiting and not making any money. He walks across the small open courtyard that will soon be used by the women of the compound for washing, drying spices and preparing food. Haile exits the compound through the corrugated iron sheet that serves as a fence. Through the small street with uneven pavement he walks down towards the taxi terminal.

In the evening he arrives back at the terminal, bustling with activity. The tough climb up the hill towards his house is as demanding as ever, but he is encouraged by the fragrance of fresh shiro and injera. At the compound he founds his family eagerly waiting for him. "Salaam baba, how was your day? Any luck?" Mariam, his wife, asks. As a response Haile holds a note of 20 Birr in the air, that was all for today. It is barely enough for Haile to pay for transportation back to his work the next day, but the family manages to get by with help of the strong community around them. The family sits together around the table and finishes the delicious injera and shiro in no time. The air is filled with rich Ethiojazz tunes and laughter, lighting up the spirits of the Kassahun family. Tomorrow is a new day...

Rapid urbanisation in Addis Ababa

The population of Ethiopia currently is around 100 million inhabitants (UN-Habitat, 2017). Almost 20 % of this population lives in urban areas, of which Addis Ababa is by far the largest city. The other cities in the country do hardly reach 500.000 inhabitants while the population of Addis Ababa is estimated at 4.000.000 inhabitants. In the coming decades however this might change, since other urban areas, such as Mekelle (6.2%), Hawassa (6.1%), Adama (4.2%) and Dire Dawa (4.3%) show an high urbanisation rate, compared to the 2.1 % of Addis Ababa (UN-Habitat, 2017). Some experts claim actually that the figure is way higher for Addis Ababa, most of the urbanisation happens informally and is not registered by the officials. Estimations are an extreme urbanistation rate of 10 % (Z. Chernet, personal interview, 23-2-2018).

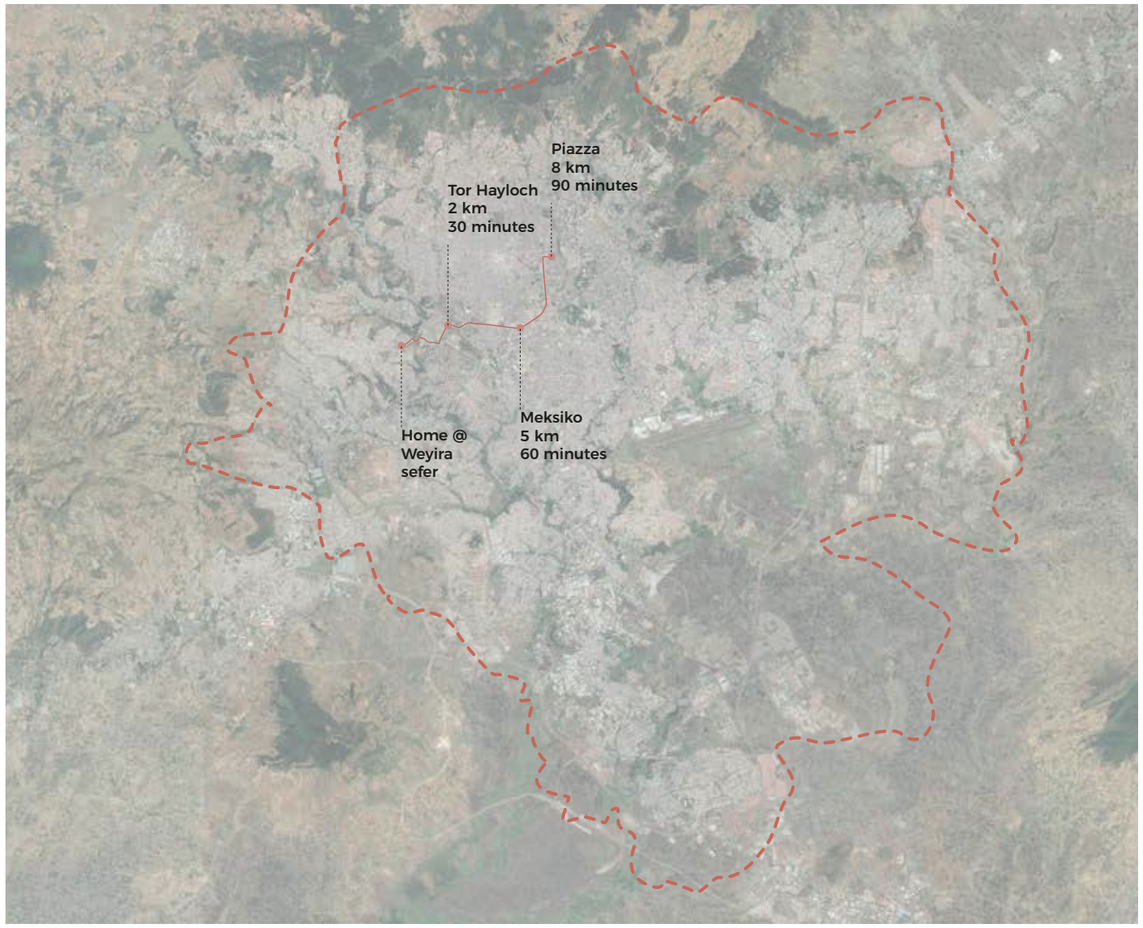


figure 10. Daily travel pattern in Addis Ababa (by author)

The population growth of Addis Ababa is characterised by a lot of uncertainties. Reliable data prior to 1961, when the first census was held, lacks. Based on estimations given by multiple scholars (Mahiteme, 2007; UN-Habitat, 2017). The graph shows that the population of Addis Ababa started as a small settlement in 1890 and gradually started to increase. Only after 1960 did the population exceed 500.000 inhabitants. But then it took less than 20 years to double in size to 1 million. And another 20 years to reach the amount of 2 million inhabitants. The latest census data that is available, 2007, estimates that approximately 2.7 million people live in Addis Ababa. More recent estimations indicate that around 4 million inhabitants live in Addis Ababa in 2017 (The Guardian, 2017).

This paragraph furthermore will discuss how the inhabitants of Addis Ababa live, work, use open space and move around the city.

Ethiopian daily life

The increased population also increases current problems in the city of Addis Ababa. Especially related to income generation, infrastructure, public facilities and housing. Starting with the way income is generated in developing countries differs much from Western ways. To start, there are different types of income generation: is formal employment, informal employment, income from others (family members).
Open space in Addis Ababa is important and frequently used due to the moderate climate, which enables the use of open space through the day, each day of the year.

Addis Ababa is by origin the commercial hub of the country, because of its location and importance for the region. Increasingly towards industry and manufacturing as well as service related jobs. Addis Ababa is the political heart of the country and the Oromya region, harbouring many ministries and other governmental insitutions in the city. So most of the inhabitants of Addis Ababa either are a civil servant, work in cafés, restaurants and shops or for private companies.
Formal employment includes a large range of jobs ranging from shopowners, government employees, private employees.
In the range of formal employment, special attention for daily labourers, and small and micro enterprises (SME's) Examples for the latter are solid waste collection companies and contruction material production, mainly the hollow concrete bricks.

Informal employment includes a lot of small jobs that can be found anywhere in the city where there are many other people. For instance streetvendors, shoeshiners, touts, car cleaners.

From third parties: by subletting rooms or dwellings in the own

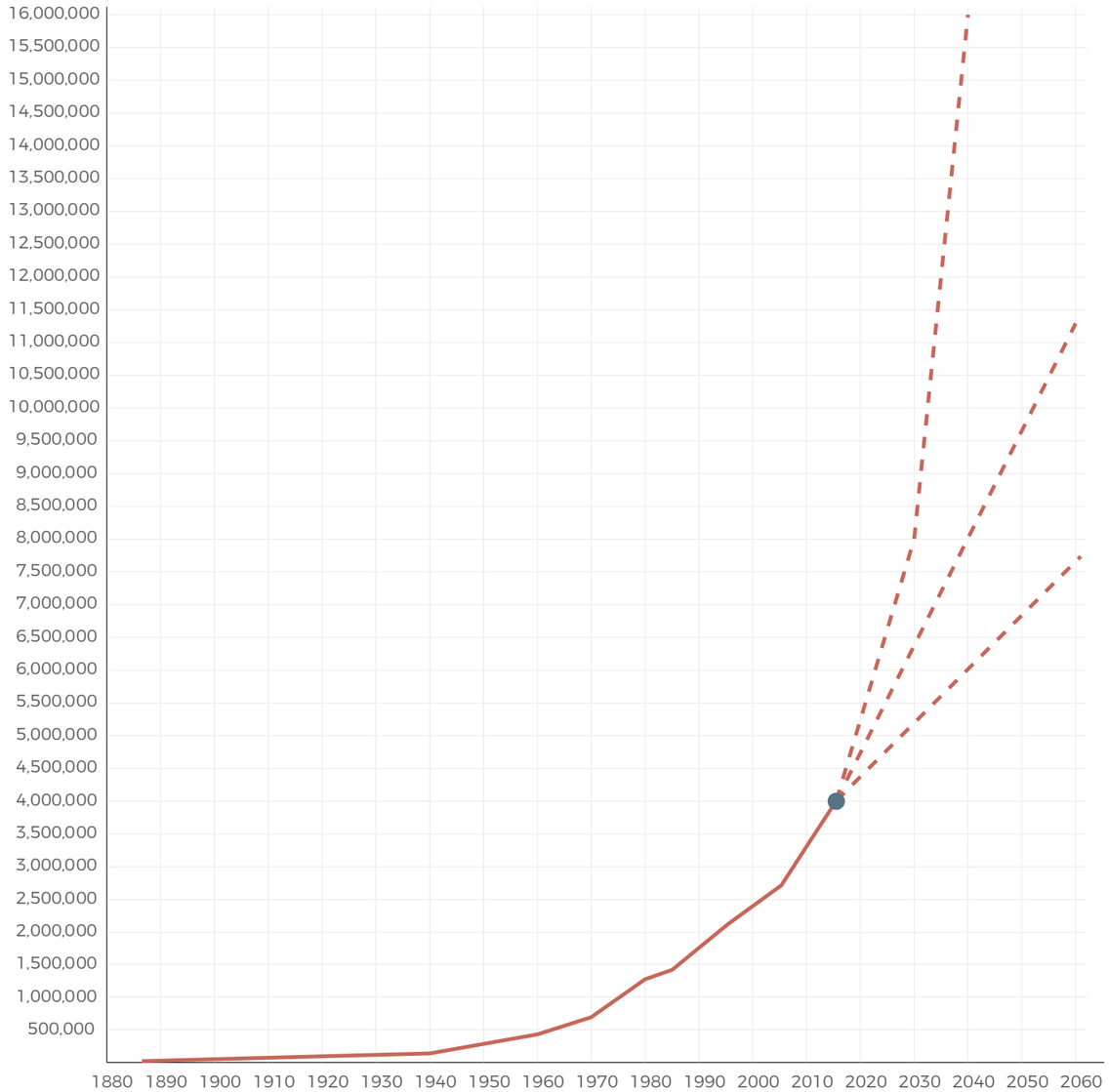


figure 11. Development of population and expected growth (by author)

CATEGORIES		INCOME GENERATING PRACTICES	SPATIAL
Formal	**Commercial**	Coffee shop owner/employee Shop owner/employee Restaurant owner/employee Market	*Building*
	Manufacturing	Construction material Recycling	*Building*
	Service	Civil servant (e.g. teacher) Private employee (e.g. banker)	*Building*
		Minibus owner/operator	*Minibus/taxi*
	Agriculture	Farmer Pastoralist	*Private compound/ open field*
Informal		Streetvendor Car cleaner Shoe shiner	*Sidewalk* *Large open space (e.g. Meskel sq.)*
From others		Pension	
		From family members	
		Subletting	*Private compound*

figure 12. Categorisation of income generation (by author)

figure 13. SME's in Addis: solid waste collection and HCB production (by author)

figure 14. Formal market near Bethel (by author)

figure 15. Informal shoe shiners in Addis Ababa (bkpk.me, 2018)

compound. If you are able to achieve a permit, this is allowed. Most of the times households illegaly extend their houses to accommodate newcomers to the city, thus creating the lastic betochs as mentioned before. As well as from family members, multiple generations in the same compound. The children earn income also to take care of their parents / grandparents. Finally pensions, only from civil servants.

Spatial make-up of income generation practices in Addis Ababa can be categorised according to privateness.

Starting with the most private space, the courtyard of kebele compounds. The courtyard within private compounds is used as an extension of the dwelling, it is used for daily activities like doing laundry and cooking. The space is also used by some households for small scale agriculture. In most compounds, mainly the Kebele houses, the courtyard is shared by multiple households, ranging from 4 to 10. Most of the times the households in the same compound are relatives of eachother, added with subtenants and friends.

Then the use of the streets of the sefer differs whether the street is higher in hierarchy. The more important the street, the more activity can be found. This accounts for the functions, in the form of kiosks, mini markets barbershops and the like. The space of the street itself is used for traffic, both motorised as non-motorised and for commerce. Whereas the less important streets are only used for traffic. The functions are more residential with an occasional workshop or kiosk attached to a dwelling.

figure 16. Kebele courtyard (by author)

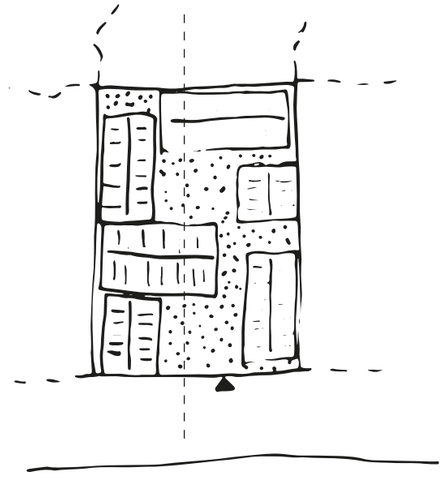


figure 17. Diagram of a Kebele compound (by author)

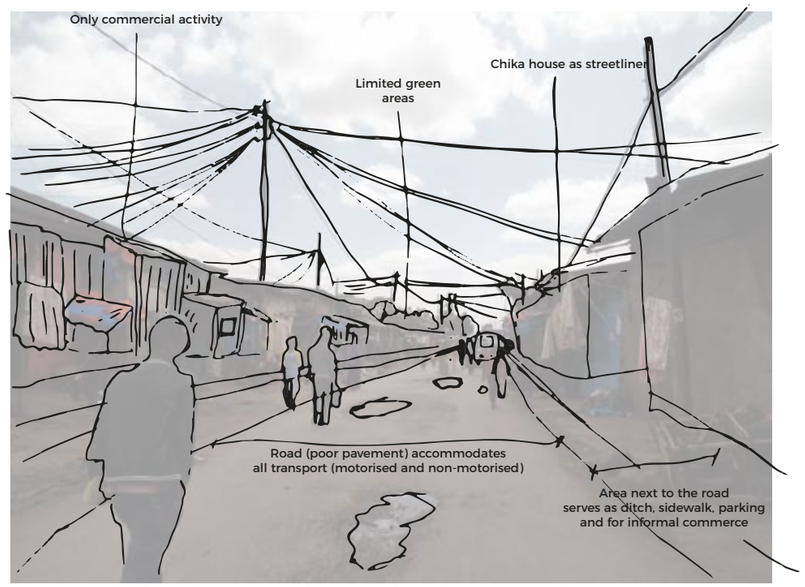


figure 18. Analysis of a street in a sefer (by author)

The main streets of Addis Ababa are characterised by a lot of movement on the streets themselves as the pavement. The roads are congested at every time of the day and the sidewalk is bustling with commercial activity. Either by informal salesmen on the sidewalk, or by mobile informal trade on the road. The pedestrian flow on these sidewalks and roads mixes with the commerce and the transport creating one big chaos. But since the flows of transport are so high, it keeps on attracting commercial activity. They can be especially found in the central areas of the city close to transport hubs, large offices and around the wealthy streets in Bole area.

The most public space in Addis Ababa is the Meskel Square, located in the heart of the metropolis. The size of the square is enormous, so mainly used for big parades, celebrations or protests. Today the square is mainly used by inhabitants to exercise, in the morning you see many Ethiopians running up and down the square and the stand. A large amount of the square is used as a long-distance bus station. At night it is a popular spot for couples to meet eachother outside their parents homes.

Travel time (= negative income generation)

Important as well is to note that time spent on other necessary activities for instance to travel to work or visiting the administration for permits is time that cannot be spent on income generation. So in a sense spendings on travel, both in time and money, are subtracted from the income generation potential. Or, travel costs for visiting public facilities are negative income generation. Therefore these costs need to be limited in order to create higher income. High travel costs in the city of Addis Ababa due to a inefficient transport network

Housing in Addis Ababa

Since the origin of the new city rich and poor have been living next to each other, contributing to a high mix of typologies (Mota, 2015). The city of Addis Ababa originated in 1887 as a conglomeration of informal settlements, situated around formal structures belonging to the emperor and his subordinates. The land was owned by a few landlords, who were building illegally for the increasing urban population (Mahiteme, 2007).

The Marxist Junta government that came to power in 1974, issued an influential act to nationalise all urban land and rental dwellings. The law, proclamation No. 47, divided the rental buildings into two groups. The first group consisted of dwellings with a rent higher than 100 ETB per month, these dwellings were placed under the Agency for the Administration of Rental Houses (AARH). The second group consisted of dwellings with a rent lower than 100 ETB per month, these dwellings were placed under

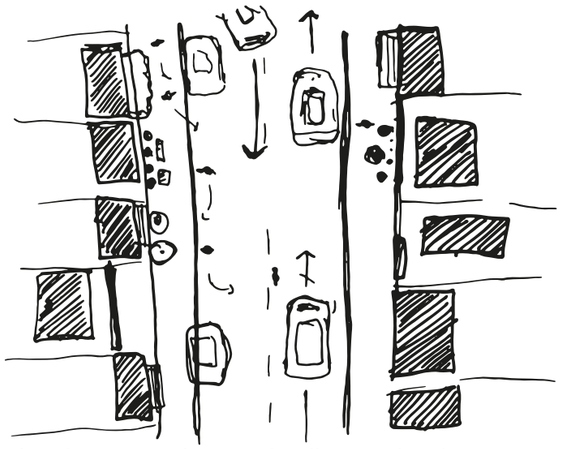


figure 19. Analysis of a street in a sefer (by author)

figure 20. Street market along main streets (CapitalEthiopia, 2018)

figure 21. Meskel square and its diverse use (by author)

new administrative units called “Kebele”. These units were the lowest tier of governance in the system introduced by the Derg. At that time (1975) 60 % of the housing stock existed of rental dwellings of which 93 % belonged to Kebele housing (Mahiteme, 2007). The quality of the housing and the services in these housing areas is so poor that they can be described as slums. Not only did the Derg government continue the housing shortage, they contributed to the deteriorating quality of the housing stock. The rent of the dwellings is in most cases so low that Kebeles were unable to maintain the structures due to lacking financial capital. The rent of these houses varies between 2 and 20 ETB per month, € 0,06 to € 0,60 (to compare: a cup of coffee on the street costs 5 ETB). As well as increase in squatter settlements throughout Addis Ababa (UN-Habitat, 2017).

The current housing stock in Addis Ababa is characterised by poor physical quality. Estimates are that only 17% of the complete stock is in good condition (UN-Habitat, 2007). 97% of the whole housing stock consists of single storey buildings and 60 % are attached row houses (UN Habitat, 2007). 20 % of the housing stock consists of informal dwellings, constructed mainly on prime urban land in the periphery of the city. The squatters on these locations do not own any form of legal tenure and thus fear eviction every day (UN Habitat, 2007). These settlements are also characterised by bad service provision. The share of formal housing in the city is there and mainly consists (50 %) of private cooperatives. Some studies however talk about 80 percent of the population that lives in slums (UN-Habitat, 2008; Baumeister & Knebel, 2009), while others talk about 80 percent that lives in informal settlements. (UN-Habitat, 2007). The situation of these informal settlements is quite unique compared to other developing countries in two aspects: the location and the social composition of the inhabitants. Most informal settlements in the Global South are located in dangerous sites, prone to disasters such as floods or landslides. For Addis Ababa, this does not completely apply; the informal settlements are located on prime real estate locations in the periphery (Melesse, 2005; Kassahun, 2010). The second aspect, social composition of the inhabitants, is also unique for Addis Ababa. Generally informal settlements are built and inhabited by low-income households, in Addis Ababa however they are also inhabited by middle-class households. Due to the lack of official housing provision people themselves started to construct their own houses (Mahiteme, 2007). The names of the settlements in Amharic is ‘*Yechereka Betoch*’, literally meaning built under the moonlight (Kassahun, 2010). The second category of informal housing is located within the centre of the Addis Ababa and is built as extension of the Kebele houses. It is prohibited by law to make changes on the Kebele houses and thus are all extensions illegal. This typology is described as ‘*Lastic Betoch*’, or plastic house (Kassahun, 2010).

A new typology of housing will be introduced in the next paragraph.

Typology	Sub-typology	Distribution
Formal		40 %
Informal	Ychereka betoch	21 %
	Lastic betoch	9 %
Kebele		30 %

(UN-Habitat, 2017).

figure 22. Housing typologies in Addis Ababa (by author)

figure 23. Typical Kebele house (by author)

1.3 THE IHDP AS SOLUTION?

The Integrated Housing Development Program (IHDP) was implemented in 2005 as a national strategy to provide affordable housing and alleviating poverty. It was viewed as a solution to the many problems in the country, related with housing. The term ‘ integrated’ assumes that the program would contribute to the creation of jobs as well. This paragraph will discuss the elements of the program, the achieved results and the use of space within the condominiums.

The original goal was to construct 400.000 units within eight years. In 2010, 80.000 units were constructed in Addis Ababa across more than 100 sites (UN-Habitat, 2011; Mota, 2015). The design and construction of the condominium sites was done in collaboration with the German Technical Corporation office, for that purpose a separate office of the government was created. Condominium housing here means the form of tenure where each household has its individual unit but shares ownership and responsibility for the communal areas of the building. The word itself is integrated in the every day language of Ethiopians. The condo units are allocated through a lottery system. People can apply for the lottery if they meet certain demands, including the ability to pay the down payment fee (ranging from 10 to 40 % of the value of the unit). 30 percent of the units are allocated to women (UN-Habitat, 2011). The location of the new neighbourhoods concerns both green- and brownfield development on the outskirts of the city, as well as former Kebele sefers in the central areas. Current inhabitants will be relocated and they receive multiple possibilities: resettlement in other Kebele housing, receiving a compensation, or they receive first option for a new condominium unit on the same location if they can afford the downpayment fee (UN-Habitat, 2011).

Typologies and generations

The condominium buildings are large scale modular structures, constructed with reinforced concrete and hollow concrete bricks. The aimed population density was 175-300 households per hectare (Haregewoin, 2007; UN-Habitat, 2011). There is a diversity in living typologies based on the payment construction. 10/90 schemes are generally aimed at low-income households, mainly in the form of studios and 1-bedroom apartments. Most low-income households have a large family size, thus not matching with the available typologies. This resulted in the moving back of low-income families to the chika sefers and subrenting the apartment to more affluent groups (students, young professionals). 20/80 and 40/60 schemes are generally asociated with middle to high income households and larger apartments. In later generations there were 10/90 schemes available that included 2-bedroom or larger apartments. This number was really limited

figure 24. Third generation condominiums in Klinto, south Addis (The Guardian, 2015)

figure 25. First generation building in Jemo condominium, west Addis (image by author)

however and mainly located in badly accessible locations.

Different ‘generations’ of the condominiums exist. The first generation consists of the G + 4 buildings. No elevator was needed, thus resulting in cheap production costs for the government, the only investor of the projects. This generation of condominiums is really common all over the Addis Ababa region. The second generation consists of G + 7 buildings, an elevator was needed resulting in more expensive units and therefore less affordable for low income households.
The third generation of condominiums is known for the highrise and the peripheral location. The buildings range from G + 11 to G + 30 for high income classes. The latter projects are for the first time financed by foreign investors (B. Kifle, personal interview, 21-2-2018).

Achieved results

One of the first problems are associated with the location of the condominium sites. The local employment opportunities are limited and the transportation to the areas where there is work is not cost-efficient

and is time-consuming. Jobs were created by the program, though only related to the construction sector 2000 micro and small enterprises have been created, and job opportunities around 60.000 have been created (Haregewoin, 2007). The IDHP has been used as an approach to redevelop the central areas of Addis Ababa, clearing the old Kebele neighbourhoods along the way. This led to the resettlement of large groups that depend on the central location and the strong social networks in their sefers. The main problem was that the groups are not relocated together, resulting in destroyed social networks and contributing to a tense situation in the new condominiums. People no longer know their neighbours, resulting in issues of mistrust and thus weak social networks (Heisel and Kifle, 2016).

Though the IHDP was aimed at creating housing for low-income groups, it mainly fails doing so. Many low-income households are unable to afford the down payment fee, and if they succeed are left with a large debt. There also seems to be a mismatch between the types of units they can choose. The cheapest option is the studio, but the poorest households often have large families that hardly fit into these (UN-Habitat, 2011).

The financing of the programme will not be manageable in the long-run. The financing of the project highly depends on the funding provided by the national government. Since Ethiopia is still a poor country, the financial tools of the government are therefore quite limited.

The construction quality of the flats is problematic as well (Haregewoin, 2007). There have been reports about burst sewage pipes, cracks in the concrete and in general construction delays. The construction materials are highly unsustainable since the national supply of cement is low, so the construction companies depend on resources from other countries (such as Turkey, Ukraine and China) (UN-Habitat, 2011).

Finally the poor electricity provision network making it impossible to bake injera in an electric oven. As well as problems related with water provision, mainly in the top storeys of the condominium buildings.

Spatial issues in the condominium

The condominiums were introduced as a way to create more open spaces for the inhabitants as alternative to the single storey Kebele compounds. However, another major issue of the IHDP is that many of the open spaces lack a design that matches the socio-spatial practices.

Most households were used to live close to the ground. As well as that this outside space was used before as a direct extension of the residential unit. This space was used for traditional daily practices such as baking the injera bread (traditional Ethiopian bread), doing laundry, preparing food by drying spices, cooking, preparing the coffee and slaughtering animals (UN-Habitat, 2011). The actual open space in the condominium sites is often

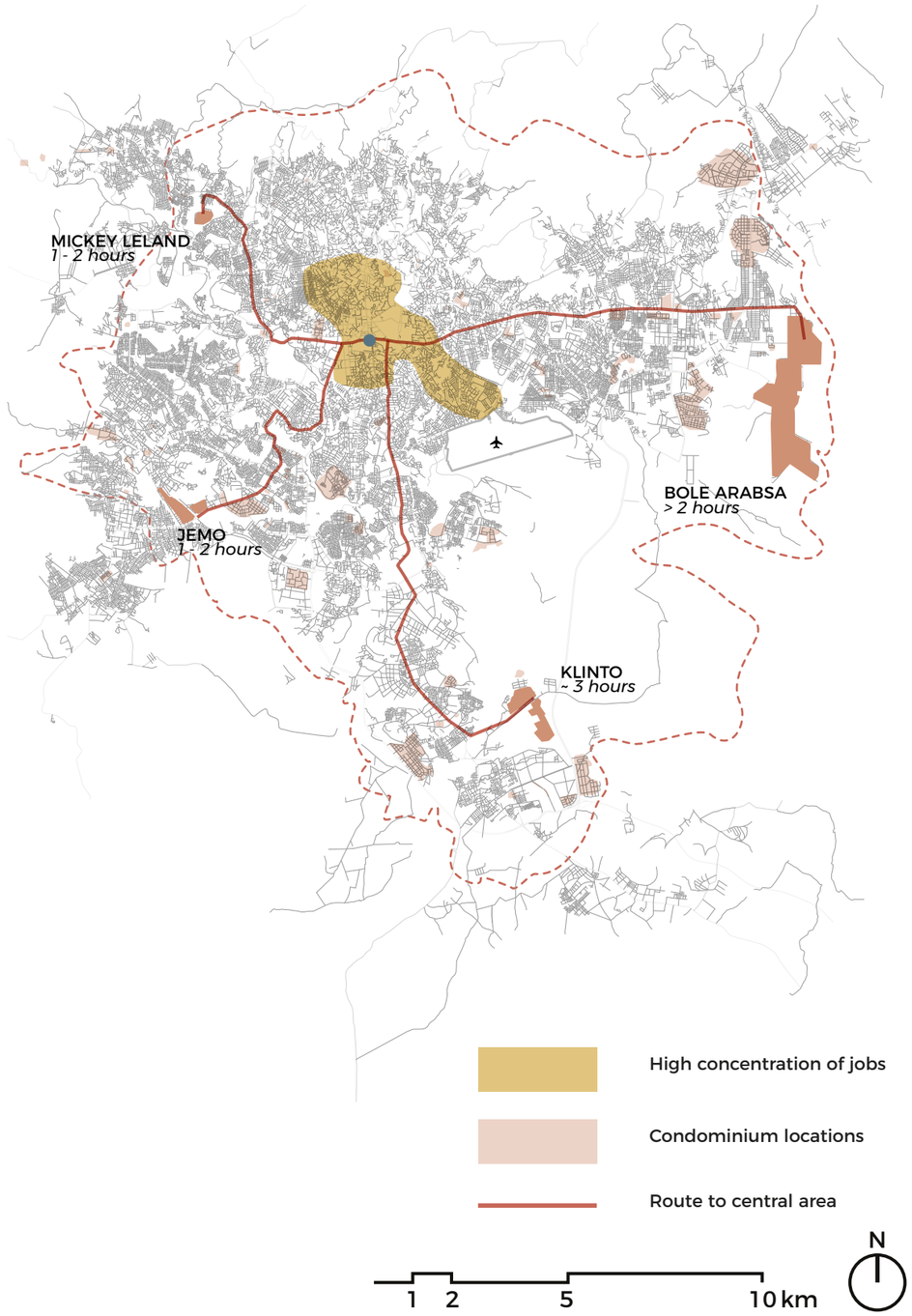


figure 26. Locations of condominium sites in Addis Abab (image by author based on Google Maps)

used for the parking of cars, as well as stowing satellite dishes. But also by households for private use, the practices that used to be conducted on the courtyard in the Kebele compound. Households that live on higher floors primarily use the communal corridor right in front of their apartment for these daily activities. The income generation activities that used to have a place in the Kebele compound are hardly possible anymore. People are not alowed to grow vegatables, or bake injera. For most inhabitants, the central issue is that the space hierarchy is unclear, they do not know to whom belongs what space. And since the residents need outdoor space for their daily activities, they use the spaces that are available. So either the communal corridors, or the space direct in front of the ground floor units.

The current use of the condominium open space is not only caused by spatial design, the management within the condominium sites is an issue as well. There is a resident's committee, but in many cases they do not represent the inhabitants. Instead the committee is viewed as an extension of the government to control the life in the condominiums (personal interview condominium resident, 27-2-2018). Though in some condominium sites there is a strong social network and committee that represents the inhabitants (Heisel and Kifle, 2016).

The communal buildings are not used properly either. Due to the design and layout of the buildings, but also due to the lack of management. The rooms in the buildings cannot accommodate for instance traditional slaughtering and the buildings are dirty and poorly maintained as a consequence.

Conclusion

The IHDP was seen as s solution to the housing problem in Ethiopia. The program does not address the more pressing matter: creating access to income generation. The sites are located far from the central areas, with the high concentration of jobs. The space within the condominiums can be used better as well by improving the desing and the governance of these spaces.

figure 27. Claiming the communal space for private use, close to the unit (image by author)

figure 28. Open space in condominiums, mainly used for parking cars (image by author)

1.4 POOR ACCESS TO LOCAL INCOME GENERATION

The summary of this chapter can be narrowed down to the fact that the rapid urbanisation in Africa and mainly Ethiopia puts an enormous pressure on the development of its cities. Where Addis Ababa is the uncontested primate city in Ethiopia, it keeps on attracting new migrants, aggravating the current problems related to employment, infrastructure and housing. The developments affect the residents of Addis Ababa as well as the future residents. For all the inhabitants of the urban area the access to a stable form of income proves to be vital. However since the Ethiopian government started to redevelop the central housing areas, problems got worse. More people were forced to live far away from the main job center, the central area of Addis Ababa. The result is high travel costs for many of the residents in terms of money and time.

On the level of the city region the transportation networks need to be reviewed and improved. The city should not only depend on the center for the provision of income generation, there are other options. Main streets and to some extent smaller open spaces have a huge potential for income generation practices. As well as within the smallest unit, the neighbourhood, or sefer in Amharic. The SWOT-analysis (see appendix III) has shown that there are open spaces that have the potential to accommodate income generation practices. Also the open spaces within condominium areas have the potential to turn the unused spaces (see image for instance) into spaces that can be used for the generation of income, or for social activities.

The outdoor space is such an important element for Ethiopians that the current open space use does not match the users.

The scope turns to the role that space plays in income generating opportunities and its link with how people live. This spatial element goes through many levels of scales, from the communal courtyard to the regional transport system. Therefore putting the focus on the spatial integration between housing location and income generation. This will form the main theme in this report, starting with the next chapter. There the focus will lie on the spatial integration, the objectives and goals, the vision and the methodology to achieve this.

figure 29. The unused potential of open space (image by author)

CHAPTER 2:
PRODUCTIVE OPEN SPACE SYSTEM:
VISION + METHODOLOGY

2.1 PROBLEM STATEMENT AND VISION

2.2 METHDOLOGICAL FRAMEWORK

2.3 [QUANTIFIED] OBJECTIVES

2.4 THEORETICAL CONSIDERATIONS

2.1 PROBLEM STATEMENT AND VISION

Problem statement

So then we arrive at the problem statement, central to this thesis. Based on the preliminary analysis of chapter 1, the main attention is given to the open space in the sefer and how this is currently underused. While the population of Addis Ababa continues growing, problems regarding accessibility to income generation are increasing as well. The first element of the problem synthesis puts the emphasis on the living environment on the scale of the neighbourhood, or the *sefer* in Amharic. Many inhabitants of Addis depend on the central areas for their income generation. But as more and more development is coming to these parts, the former inhabitants are pushed out. The same applies for the new inhabitants, they move to the city in search for an income.
The second element of the synthesis focusses on open space, and how this can be used in order to increase access to local income generation. In the way of connections, for instance a street, and open spaces that are all linked together as a system. Therefore the following problem statement is derived:

A productive public space system within sefers contributes to the increased accessibility to income generation, public facilities, recreation and social contacts. The linking of these productive space systems together with the subcenters results, on the regional level, to an accessible and affordable Addis.

Vision - A Productive Open Space System (POSS)

The productive public space system comprises of the space itself and the directly surrounding buildings (land-use). There is a distinction between productive streets, both in terms of productive functions and commerce as in connections and productive open spaces of different sizes. Each sefer is organised by the productive public space system, thereby contributing to the increased accessibility to income generation and others. Within the POSS three elements are embedded in the design of the open spaces. The first is the producing, the use of open space for productive practices. You can think of agriculture on large open space, or even small patches on the sidewalk. But as well more manufacturing practices that can happen at small open spaces.
The commercial, many open spaces in Addis are already used for this purpose. The sidewalk or open spaces are used for commercial activity as streetvendors. Both formal as informal, as well as mobile or fixed (market stall).
The last element of the POSS entails the social use. Space is then used for a

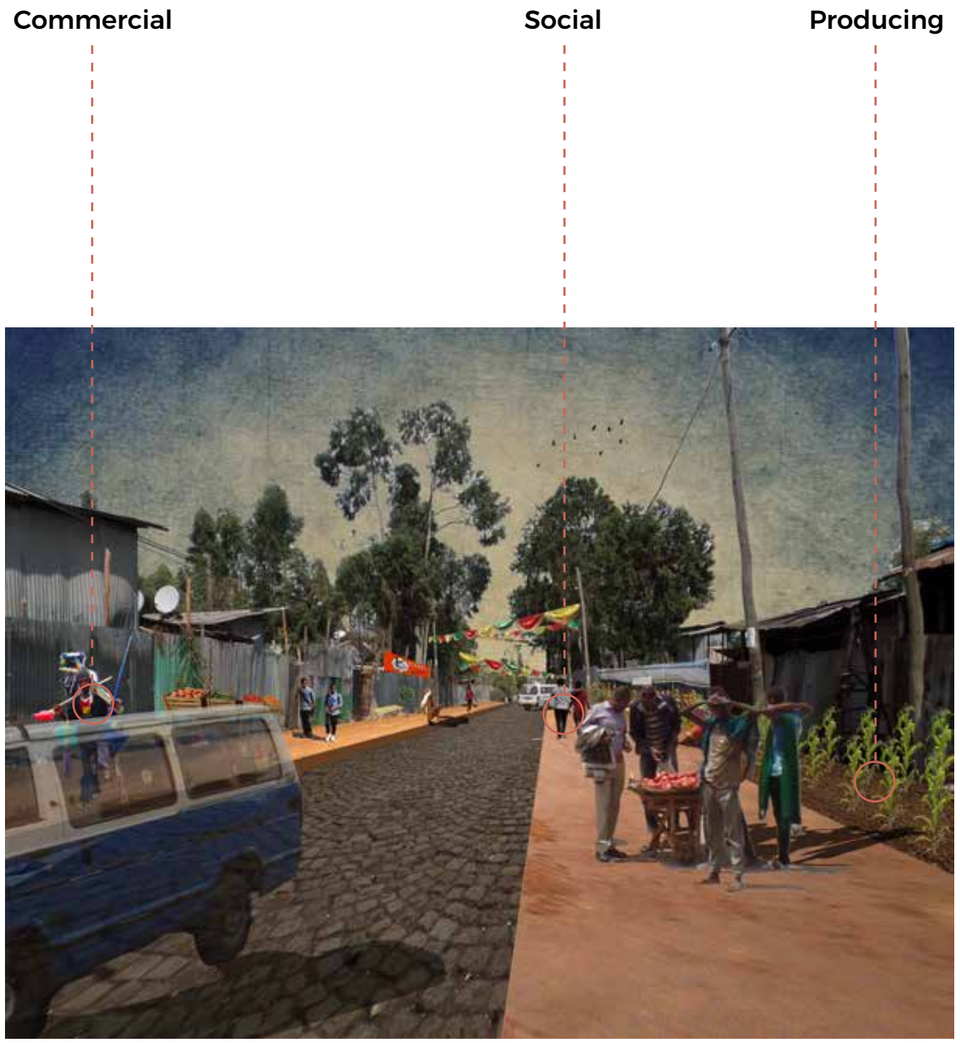


figure 30. POSS applied on a street (by author)

variety of social activites like networking, but also providing mutal aid and conversation. But also for recreation and children playing.

Finally the vision assumes that the increased accessibility to local income generation via the POSS, results in more affordable living areas in Addis Ababa. Therefore low-income households can invest in their families and start to improve their and their children's social status
This assumption will be explained more thoroughly in the theoretical framework (paragraph 2.4).

Objectives

The objectives of this project are directly linked to the proposed vision of the POSS. The vision is in the same sense also the design hypothesis, since there are only currently small aspects visible in Ethiopian daily life. The design objective of this project therefore is to design a productive open space system that increases the access to local income generation.

The overall and underlying objective of this thesis is to investivage how it is possible to create living areas that integrate income generation within.

The remaining paragraphs of this chapter will explain how the vision can be achieved

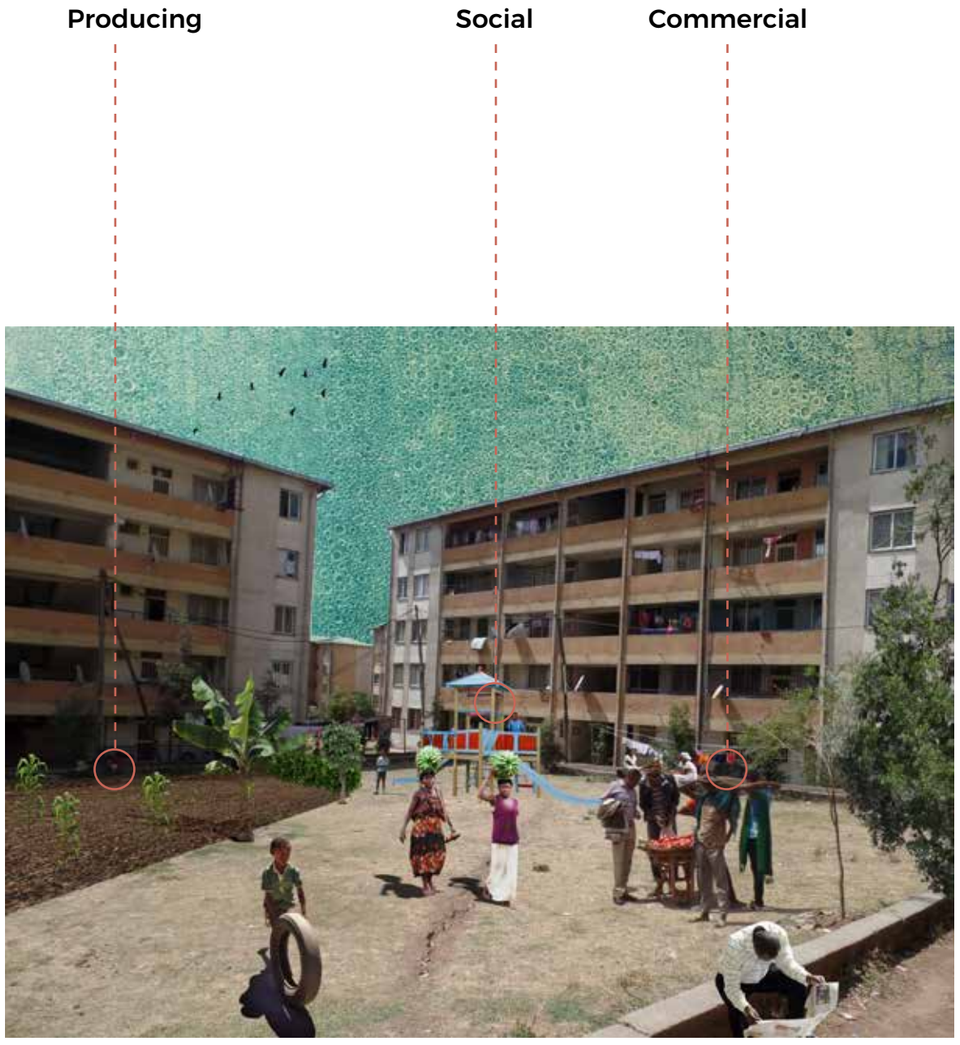


figure 31. POSS applied on a condominium open space (by author)

2.2 METHODOLOGICAL FRAMEWORK

Main framework

The first chapter and paragraphs of this one have been building up towards the framework as presented in the diagram (figure ??). The first chapter, entailing the problem field and preliminary analysis resulted in the presented vision. Of this vision an analytical framework is derived as are the objectives. The analytical framework consists of the spatial analysis of the region (chapter 3), the theoretical analysis (chapter 2.3) and the spatial and emperical analysis of the Weyira sefer (chapter 4). The results of this analysis eventually result in the design principles that will be presented in chapter 4.6. The quantified objectives are mainly derived from the theoretical analysis and shall be presented in the last paragraph of this chapter (2.4). The fifth chapter will talk about the implementation of the design principles and quantified objectives. Coming to the discussion of the applied design and methodology in the final chapter.

Research questions

The main research question that is central to this thesis is the following:

To what extent can a productive open space system contribute to increasing the access to local income generation?

The sub-questions that needed to be answered are thus related to the POSS, accessibilty and the spatial elements needed to increase accessibility.

1. What is the current access to local income generation on the level of Addis Ababa city region?
[spatial analysis using layers; policy analysis]

2. What is the current acces to local income generation in the Weyira sefer?
[spatial analysis using layers; on-site observations]

3. How are current open spaces used related to income generation?
[spatial analysis, on-site observations, qualitative interviews with inhabitants]

4. Which spatial elements are need to create a productive open space system, increasing access to local income generation?
[theoretical analysis, reference study, emperical research]

5. What is the role of planning in Addis Ababa and how can a POSS be implemented on the scale of the sefer?
[policy analysis, qualitative interviews experts]

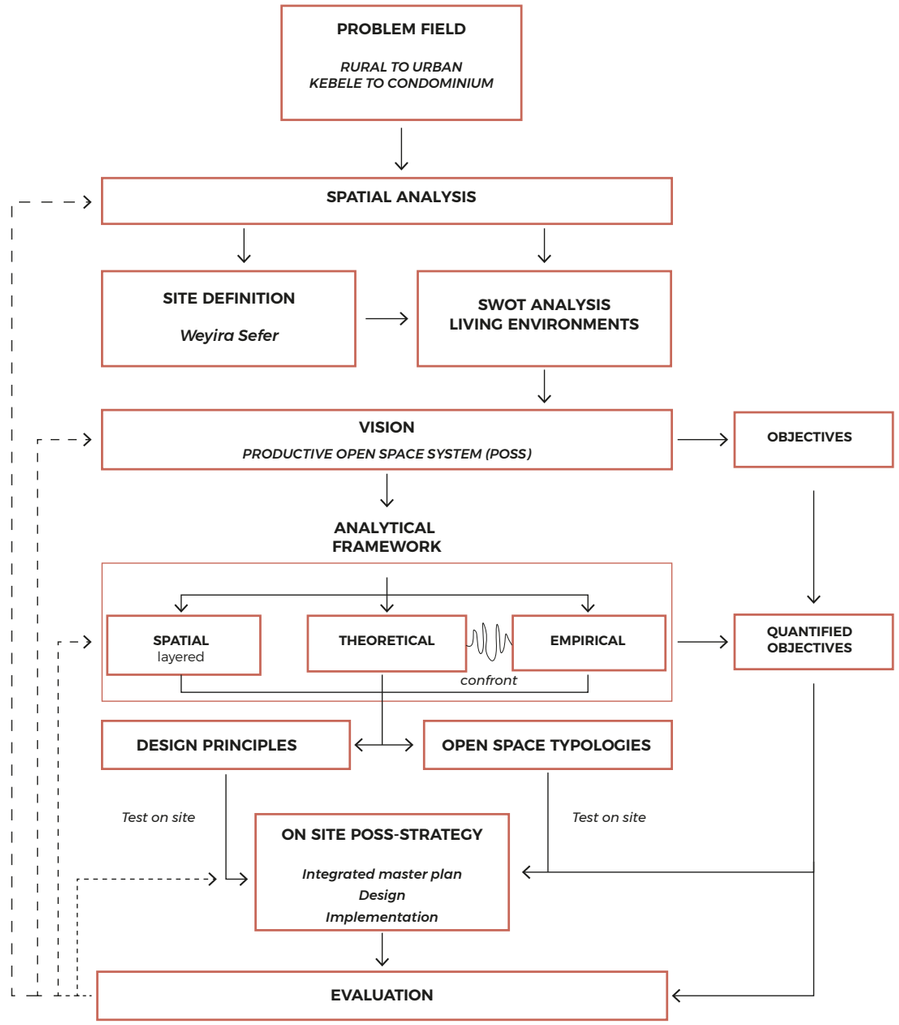


figure 32. Methodology scheme (by author)

6. How to accommodate extra inhabitants while increasing the accessibility to income generation?

Used research tools

Different sets of tools are used to conduct the research. The base for the research is the theoretical analysis gathered from multiple sources. Scientists in social science, architects and planners in practice, international organisations such as UN-Habitat and the World Bank. Another important part of the literature that was analysed is policy. This was mainly done however by analysing secondary literature, reports by UN Habitat or other researchers who described the Ethiopian policy. The majority of the policy documents issued by the Ethiopian government is written in Amharic, not in English. The UN-Habitat document that evaluates the IHDP (UN-Habitat 2011) was commissioned by the Ethiopian government for instance. Extra care was given to analysing this document, many other publications were consulted therefore to verify the reliability of the document.

Empirical analysis

The emperical analyisis forms the main body of research of the fieldwork in Addis Ababa itself. The fieldwork consisted of semi-structured interviews with professionals, semi-structured interviews with residents of the Weyira sefer and observations in the whole city, the sefer and another city in Ethiopia, Hawassa.

The semi-structured interviews took place with different stakeholders. The interviews were conducted with mainly professors from the partner university of the TU Delft in Addis Ababa: the Ethiopian institute of Architecture Building Construction and City Development (EiABC). With Darik Zebenigus, with her expertise in urban planning in Ethiopia. Bisrat Kifle, regarding the IHDP and housing in general. With Dr. Zegeye Chernet, mainly about urbanisation of Addis Ababa. One interview was conducted with Tamrat Eshetu, a planner working for the Addis Ababa planning commission, the office that just published the 2017 master plan. Finally some interviews were conducted with private professionals as architects and planners. The descriptions of these interviews can be found in the Appendix, part V.

The majority of the fieldtrip was dedicated to empirical research in the Weyira sefer. In this neighbourhood of Addis Ababa, semi-structured interviews were conducted with 15 residents. Inhabitants of different parts of the sefer, nine that lived in the condominiums and 6 that lived in

figure 33. Conducting research in the Weyira sefer (by author)

private or Kebele compounds in the more low-income areas of the sefer. The interviews were conducted with the assistance of Bizuayehu Jambere, a private planner affiliated with the EiABC. The questions concernced the daily life patterns of the residents, how they moved through the sefer and the city, their perspectives on the dwelling, on the space in the sefer and the availability of public services. The interviews were combined with on-site observations of various open spaces, as well as observations elsewhere in the city of Addis Ababa. Together with Bizuayehu Jambere I visited many condominium and kebele sefers from the north (Menen sefer) to the south-west (Jemo). Observations were conducted in the Piazza area where I was staying and finally in the city of Hawassa, a city located 250 kilometers south-west of Addis Ababa.

The descriptions of the interviews with the residents of the Weyira sefer can be found in the appendix, part V. The results of the emperical analysis are embedded in the rest of this thesis, mainly in chapter 4.

Spatial analysis: layered research and design

For the spatial analysis, a layered approach is used. This method is based on the layer approach by Dupuy (1991; Rocco, 2008). In this thesis the layers that are used relate to the POSS. The base layer, reflects the current situation in terms of landscape, governance and social demography. The base layer is of huge importance since it can differ highly over the Addis Ababa city region, therefore having a different situation for each sefer. The first analytical layer is the open space, what current use, as well as the accessibility. Secondly the income generation layer, what practices of income generation can be found, what clusters. The third layer shows the public facilities, the schools and the health centers. The fourth layer finally addresses the housing, current densities. The spatial analysis of the city region resulted in the chosen site, the Weyira sefer.

On the scale of the sefer the layered analysis was conducted using the same layers. The conclusions of this analysis resulted in the open spaces typoloy.

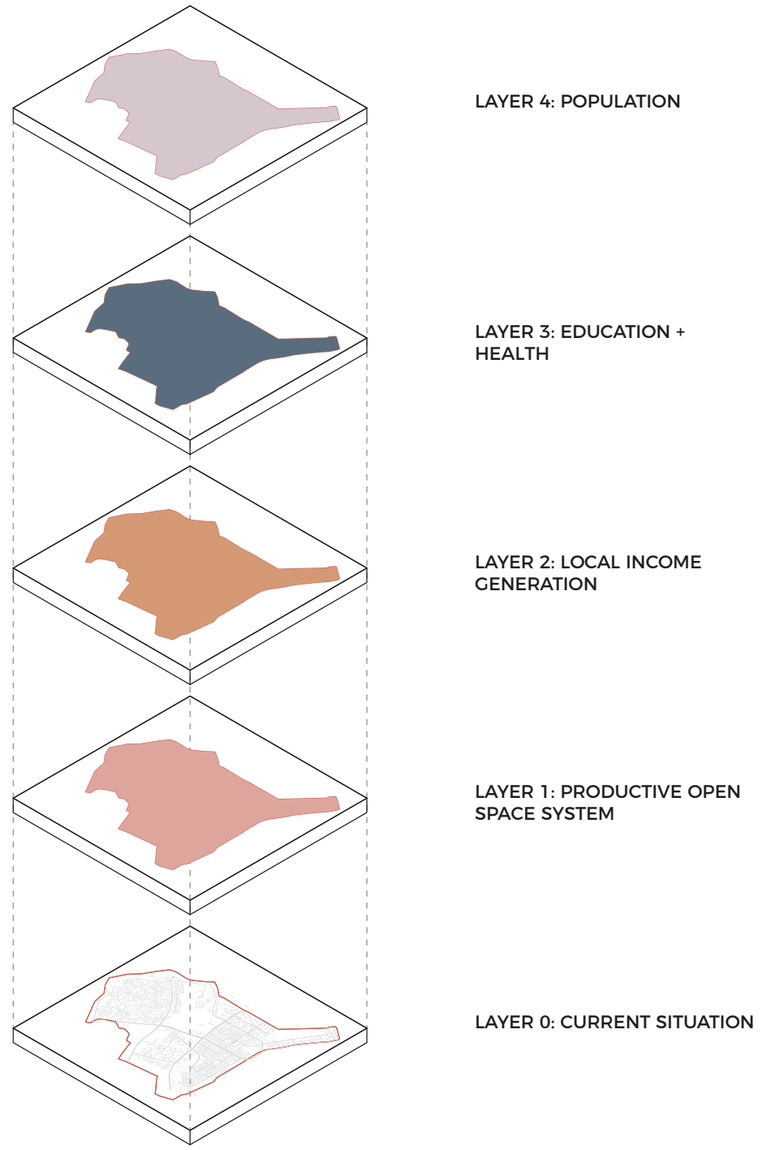


Figure 34. Layered analysis and design approach (image by author)

2.3 [QUANTIFIED] OBJECTIVES

The final element of the methodology to achieve the vision of a productive open space system is the space requirement approach. This element addresses if the vision is spatially possible. For that to achieve, it is first needed to transform the vision into objectives that can be measured. The objectives are related to the layers as presented in the methodological framework (paragraph 2.2), as well as to the main problems observed in the first chapter. For each of the layers there is a corresponding parameter that can be used in the design, but that needs to be specified regarding the footprint. The last column shows the quantified objective of the layers.

The quantified objectives

For the POSS layer: the amount of open space is a minimum requirement of 20% percent of the total amount of space of the sefer. Including the roads, since these elements are part of the space system. The travel costs are represented in time and money. Because of the current transport networks, many people are forced to transfer a couple of times to reach their destination. This results in a higher ticket fare compared to a single ride. The current travel time now is based on observations of my own experience of the trip between Piazza and the Weyira sefer. This costs currently (depending on the time) around 90 minutes and 10 Birr. The objective is to decrease the travel costs at least by half, by ensuring that the amount of transfers decreases as the efficiency and frequency of the transit.

For the Income generation layer: the focus lies on promoting local income generation practices. Here the focus lies on the four main sectors of economy in Ethiopia (The Worldbank, 2016). Agriculture is the main economy of the country, Addis Ababa is the main commercial hub, Service hub, because it is the seat of the national government, the city government and the Oromya state. Ethiopia is currently growing more towards a manufacturing country in the sense of large scale enterprises (for instance textile) and Micro and Small enterprises (MSE's).

For the Public facilities layer: acces to the basic public facilities are reflected in primary schools, secondary schools and health centers including sanitation facilities. The objectives show the need to have a primary school within a walking distance of 10 minutes. Because of average densities in the sefers of Addis Ababa, that covers around 250 kids. For the secondary schools the walking radius can be bigger, there should be at least one secondary school in each sefer. For health centers, especially public toilets the objective states that there should be one on sanitation unit for every 1000 inhabitants.

LAYER	PROBLEM	PARAMETERS	OBJECTIVES
POSS	Unused open space	% open space	20 % open space / total
	High travel costs (money and time)	travel time	1/2 * [current travel time]
INCOME GENERATION	Limited access to local income generation	amount of jobs in sefer	> 25 % of working population job in sefer
PUBLIC FACILITIES	Limited access to schools	amount of schools/ inhabitants	1:250 primary school 1:1200 secondary school
	Limited access to health facilities	amount of health centers/inhabitants	1:1000 health centers
HOUSING	Need to accommodate high population growth	population density	150 % * [current inhabitants]

figure 35. Layered approach (image by author)

For the housing layer: Related to the expected population increase, the objective reflects the current population density of the western part of Addis Ababa (see chapter 3.4) and the expected growth. In terms of available space and densities, the objective is that the population of the Weyira sefer can accommodate an extra 6000 inhabitants maximum.

Calculating the footprint

For the space requirement a compound is used that houses 16 inhabitants in 4 households. Current householdsize in the Kolfe Keranyo sub city is 5 (CSA, 2008), however this is likely to decrease, therefore a household size of 4 is used for the calculations. The appendix (VI) shows the full calculations for the whole sefer. Footprints are used, to show the minimal capacity of the sefer to spatially accommodate the vision. Some elements can ofcourse be stacked, housing, offices, but by using the footprints, the minimal capacity can be calculated. The full implementation, as the assessment, of this approach will be shown in chapter five.

POSS: 20 %

IG: The working population of the Kolfe Keranyo sub city is 50 % of the population (20-54 years). Whereas only 15% of the population has an age of 55 or higher (CSA, 2008). To achieve at least 25% of the working population within the sefer is actually 12.5% of the total population (50%*25%). Each of the economy sectors has its own space requirement, agriculture requiring the most, at least 20 m2, then manufacturing: 10 m2, followed by commerce and service jobs; 5 m2.

Public: To determine the footprint for primary schools, the age distribution for Kolfe Keranyo sub city is used (CSA, 2008). 20% of the population falls in the primary school age group (5-14) and 15 % falls under the secondary school age group (15-19). 2 m2 footprint for primary schools and 3 m2 for secondary schools.

Housing: 18.75 m2. including the private open space.

Numbers turned into space: applied on the Weyira sefer

To turn these numbers in something spatial, the Weyira sefer is used as an example of applying the footprints. In the map we can see if the footprints are applied on a patch of open land, following this calculation it can be concluded that this patch of land can accommodate 800 inhabitants, with a density of 333 inhabitants/hectare, achieving all objectives.

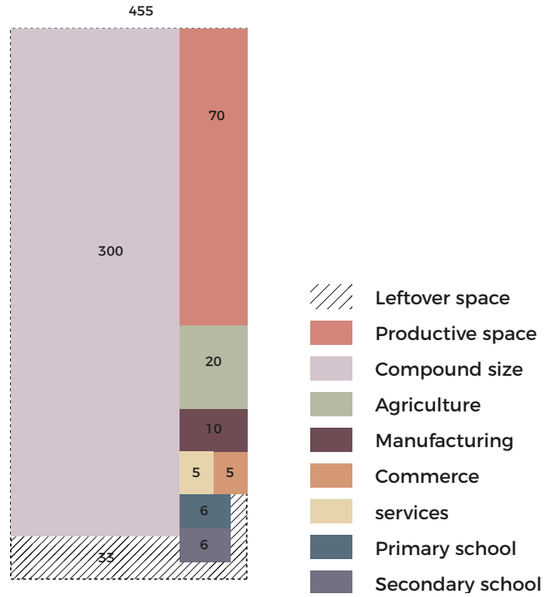


figure 36. Footprint required per element (by author)

figure 37. compounds (45) pasted in Weyira sefer (by author)

2.4 THEORETICAL CONSIDERATIONS

The theoretical framework of this thesis starts by elaborating on the main objective, to achieve social mobility for low-income households. The main arguments in this section are derived from Saunders' "Arrival city" concept (2011), coupled with findings derived from Aravena (2016). Going on step back we arrive at the concept of affordability. Instead of the focus on housing, this section addresses the affordable neighbourhoods or sefers. The main argument here is based on the premise of Charles Correa that low-income households mainly need to find a stable income, followed by a house (van Andel, van Gameren and van der Putt, 2015). The final section of the theoretical framework elaborates on the spatial elements of the Productive Opens Space System. Main considerations here are derived from Whyte (1980) and Gehl (2011).

Social mobility

Special attention is given to space and its relation to generating income. Important notion here is social mobility. People move upward on the social ladder when they become less poor, when there poverty is reduced. The relation between social mobility and space is an interesting element to elaborate on. Then it can be really a goal to create living environments that facilitate social mobility. In theory little has been written about the role of space or spatial elements on poverty alleviation. Perhaps it is because the effect of the built environment on poverty alleviation is limited, or it is hard to conduct such research. This paragraphs therefore mainly elaborates on contributions by journalists (e.g. Saunders, 2011) and architects in practice (e.g. Aravena, 2016).

In his book "Arrival City", Saunders (2011) describes neighbourhoods that function as arrival cities where rural migrants can become urban and start to be socially mobile. He also describes neighbourhoods that fail as arrival cities and contribute to a destabilisation of society. An interesting example for this is the Slootervaart neighbourhood in Amsterdam which formed the base of an extremist group who were responsible for the murder of a Dutch filmmaker (Saunders, 2011). He talks about elements of the built environment that contributed to the destabilisation of the neighbourhood. For instance anonymous public spaces, large open green spaces, no space for people to start their business and so on. An positive example is given of favela-dwellers in São Paolo who entered the middle class in one generation (Saunders, 2011). Through employment followed by education and again employment as an entrepreneur. The favela itself changed from a really dangerous place to a steady neighbourhood. First the security, then education and the link with the larger city, both physically as economically (p. 270). The economic development also led to a reduction in violence,

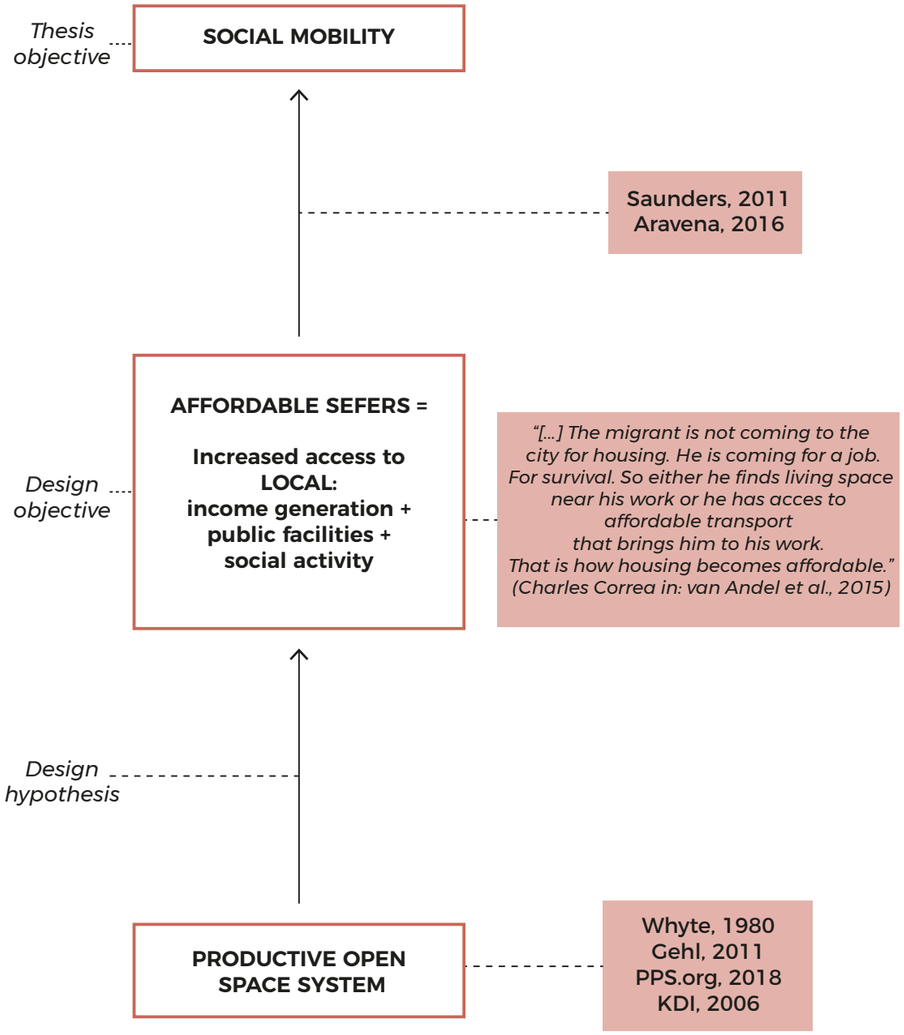


Figure 38. Theoretical framework (by author)

having a legitimate job reduced the need to live like a gangster (p. 273).

Other research comes from the the German pavilion at the 15th international architecture exhibition in Venice 2016 which is inspired on the Arrival city concept. They (Schmal, 2017) stated eight elements that should be met to be successful arrival cities and base this on examples of German cities and predominantly migrant neighbourhoods.

The arrival city is

- A city within a city; they look for opportunities in areas with high densities (p.64)
- Affordable; rents must be low to be attractive (p.72)
- Close to business; jobs emerge where there are already jobs, a good public transport system is essential (p.100)
- Is informal; tolerating semi-legal practices can be useful (p. 116).
- Self-built; strict housing construction regulations should not be allowed to stand in the way of much-needed self-built solutions (p. 154)
- On the ground floor; the success of a neighbourhood is determined by the availability of small-scale spaces on the ground floor (p. 172).
- A network of immigrants; ethnically homogenous districts enable community networks (p. 198).
- Needs the best schools; the worst neighbourhoods demand the very best schools to educate local children (p. 227).

(Schmal, 2017)

Comments need to be made that this is based on German cities as well that Doug Saunders is a journalist and not an urban practicioner. Interesting is that he bases his findings on interviews with the locals who experience the space in their daily practices. And that element is really important. This is also shown by Brazilian Ana Chagas Cavalcanti (2017) who emphasises the importance of labour for low-income neighbourhoods. She describes how labour practices shape the informal settlements, in her case the favela in the city of Maceió, Brazil (Chagas Cavalcanti, 2017).

Another interesting view comes from Pritzker price winner Alejandro Aravena. At the Biennale of Venice in 2016 he describes cities as places that can function as shortcuts towards equality (Aravena, 2016). There are certain spatial attributes on a lower scale that need to be included if cities want to be growth engines. He talks about the importance of public space and the ratio between private and public space. He also adds the intermediate, the collective space as an essential spatial element for people to for instance conduct social interaction. Secondly he mentions public transport as a key element. It is important to note that only the term public transport does not cover this, it has to be affordable public transport. Thirdly Aravena mentions infrastructure, Finally Aravena talks about housing in incremental and an open way. In order to channel the capacities of people themselves instead of depending on financial investments (Aravena, 2016).

The main elements of this theoretical consideration between space and social mobility can be summarised by a quote of renowned Indian planner/architect Charles Correa:

"[...] The migrant is not coming to the city for housing. He is coming for a job. For survival. So either he finds living space near his work or he has acces to affordable transport that brings him to his work. That is how housing becomes affordable [...] it is the product of three interlocking factors: job location, transport pattern and housing site."

(in: Van Andel, Van Gameren and van der Putt, 2015)

This quote highlights the importance of an integration between places where people live and where they generate income. The spatial aspect of this integration not only entails transportation infrastructure, but also open spaces and buildings where people can generate income. So for instance if an inhabitant of a sefer in the periphery of Addis Ababa generates income, he depends on a transport connection with employment areas. However he can also generate income on open spaces, in the form of agriculture or commerce, within its own sefer.

Spatial elements of POSS

The central theoretical considerations that are refered to are Whyte (1980) with the related Project for Public Spaces (2018), and Gehl (2011).

Whyte (1981) talks in his publications about what makes a space succesful. He conducted research to observe how people actually use a high mix of spaces in the city of New York. One of his interesting conclusions was that a space in order to be succesfull should have not only primary seating options as benches, but also secondary seating possbilities. He noticed that the seating opportunities in the sun were the most popular, relating urban design thus with natural elements (Whyte, 1980). Another striking conclusion of Whyte is:

"What attracts people most, it would appear, is other people."
(Whyte, 1980: p. 19).

The PPS shows four elements that each public or open space should have.

Accessible: transportation options closeby, the space should be a destination itself or the space should be on the way to the destination, connected to otehr spaces.
- Comfort and image: the space should be a safe and clean space. Offering seating possibilities as well as places for shelter against natural elements.
- Used by different groups; A space should be able to accommodate different acitvities in different moments, therefore attracting different groups.
- Sociability: A open space should be a meeting place, with a mix of people. (PPS.org, 2018).

The theoretical considerations derived from Gehl (2011) are related to the function of an open space. It should assemble people and events, not buildings. Therefore the space should have an diversity of functions around it, living, working and recreating. The open spaces should be bound by buildings and its diverse functions. The spaces ought to be as compact as possible, they need to be connected as a **system** of open spaces. The final argument regarding the relation between space and buildings is that the more narrow a building has, the more activities for the whole space (Gehl, 2011).

There are all theoretical elements based on Western literature and based on North-American/European research. The theory is therefore confronted with empirical data from Addis Ababa. The resulting confrontation led to the development of the design principles that will be discussed in the fourth chapter (4.7)

Figure 39. Confronting theory with every day reality in Ethiopia (by FullbrightMekelle.wordpress.com, 2018)

CHAPTER 3: LAYERED ANALYSIS ADDIS ABABA CITY REGION

3.1 BASE

Historical development

The first emperor (1886 - 1935)

The history of Ethiopia as a country is rich and dates back to many thousands of years ago. The land was roamed by of nomadic societies. But then around 1886 the emperor Menelik wanted to bring all of the lesser kings together. He first settled on the Entoto mountain ridge (north of Addis Ababa) but descended to a site, that was inhabited by the Oromo people, called Finfine, meaning hotspring (Tabor, 2014). Menelik II changed the name to Addis Ababa, meaning new flower in Amharic.

The spatial set-up of this first settlement was one of high diversity. Around the palaces of the kings, places were filled in by all other classes. Mainly people coming from the rural areas, escaping famine and looking for opportunities in a city that was developing from a military camp to a civilian capital (Mota, 2015). In between the palaces they formed settlements following an organic pattern that was related to the topography of the city. The growth focused on three areas of the city; the market, the St. Georges church and the Ghebi of Menelik II. These three areas represent the main centres of Ethiopian empire (Mahiteme, 2007). The development of the city in the first decades followed only the pattern of the topography and other natural elements. Legend has that the structure of the palaces and their location was planned out by the wife of the emperor, Taytu. Some say that she was responsible for the first masterplan of the city of Addis Ababa (Mahiteme, 2007).

1935- 1941 Italian occupation

Although the country proudly claims never to be colonised, they did have a brief period (1935-1941) where they were occupied by the Italians. Short as it was, the Italian occupation did have some influence on the planning and spatial layout of the city of Addis Ababa. The city functioned as the capital for the Italian East Africa and the Italian government tried to an urban structure on top of the disorganised city.

Orthogonal grid based on Roman legion camps. Inspired by a design by Le Corbusier. Proposing residential segregation between Ethiopians and Europeans. Many roads that were built during the Italian occupation. Not all of them followed the masterplans

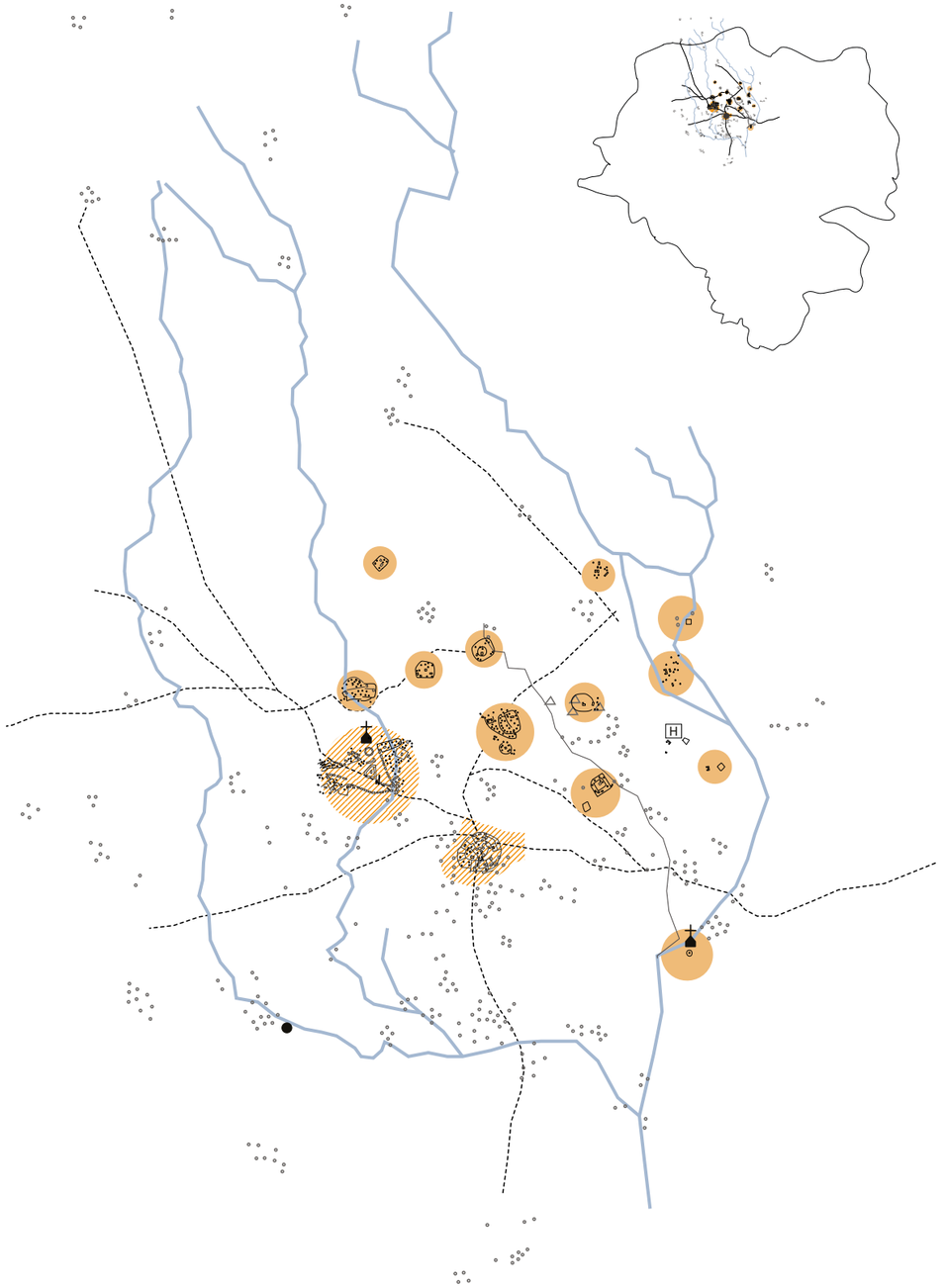


figure 40. First settlement of Addis Ababa (image by author, based on Global Housing Studio TU Delft, 2016)

1941-1974 Imperial regime: Haile Selassi I

During the imperial regime after the occupation of the Italians, many foreign planners made masterplans for the city. The first in the tradition of British townplanning, done by Abercrombie and later Hennessy. The second in French tradition, done by L. de Marien.

1974-1991 Dergue (Junta marxists):

nationalising the urban and rural land (!)
Ethiopian team of planners led by Hungarian Polonyi. South east development towards Nazareth, 100 kilometers from Addis. Still visible today as the main highway and railway follow this direction, as well as the main industry zone (Mahiteme, 2007).
Also Ethio-Italian masterplan, had a lot of potential but it took a long time before it could be implemented, so it was outdated the time it was accepted (8 years after the first design).

1991 - Ethiopian People's Revolutionary Democratic Front

Open market economy, inviting private development. Still no clear development of the city, there is no vision that can be found to structure development.

The Ethiopian government progressively implemented the IHDP to alleviate poverty and start to match the housing shortage.

Recent attempts to refine the masterplan have led to conflicts between the Addis Ababa and the national government on one side with Oromia on the other side. The masterplan has been scrapped. Protests of Oromo population led to around 150 deaths according to the activists as well as influential Oromo people that have been incarcerated. (The Guardian, 2017).

The most recent masterplan stems from 2017 and only addressed the autonomous region of Addis Ababa.

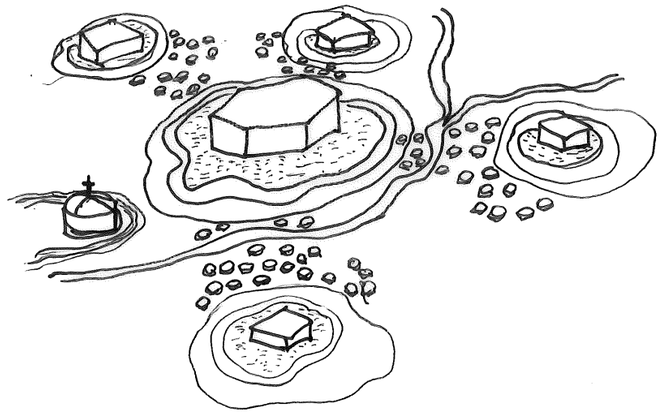


figure 41. Diagram of the first settlement of Addis Ababa (image by author)

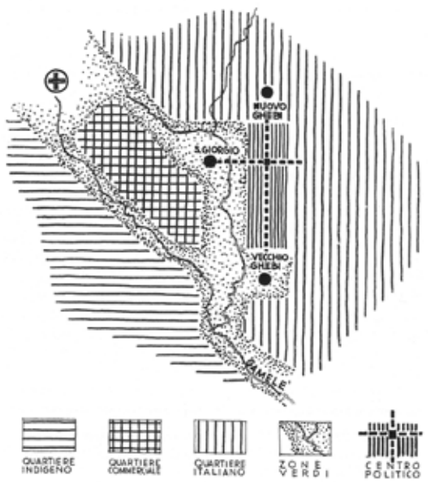


figure 42. Italian masterplan (Valle, 1937)

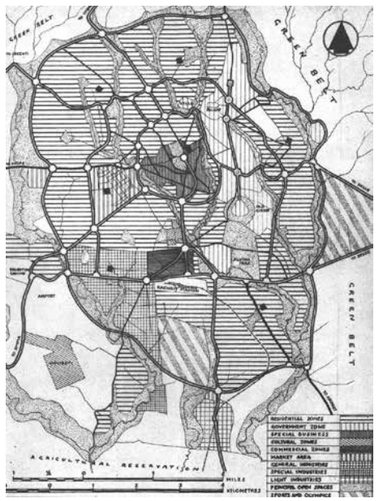


figure 43. Masterplan by Abercrombie (Amos, 1962

Landscape

The image on the facing page shows the elevation and the green areas in the urban area of Addis Ababa. The city lies in the heart of the country of Ethiopia on a mountain range that goes from the north-east towards the south-west. The highest points of the city are around 3000 meters and are located in the north of the urban area. This is the Entoto mountain, the place where Menelik II first build his palace and later descendend in the valley below. The main part of the city is located around 2200 meters and shows great variety in elevation. The southern part of the urban area slopes down even more towards 1900 meter. Thus can be seen that the waters follow this elevation and the main rivers Bulbula, Akaki end in the Aba Samuel reservoir located in the south-west.

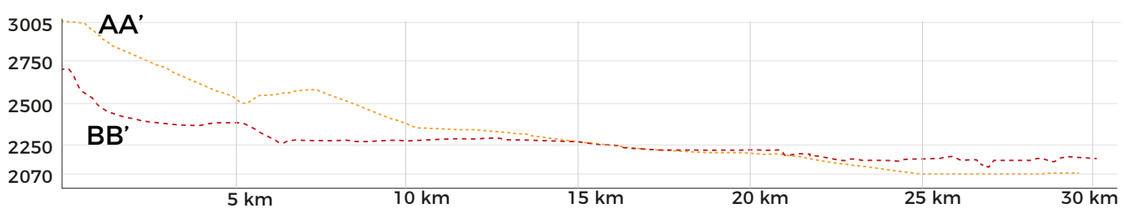


figure 44. Elevation section north-south (AA') and west-east (BB') (by author, based on Google Earth)

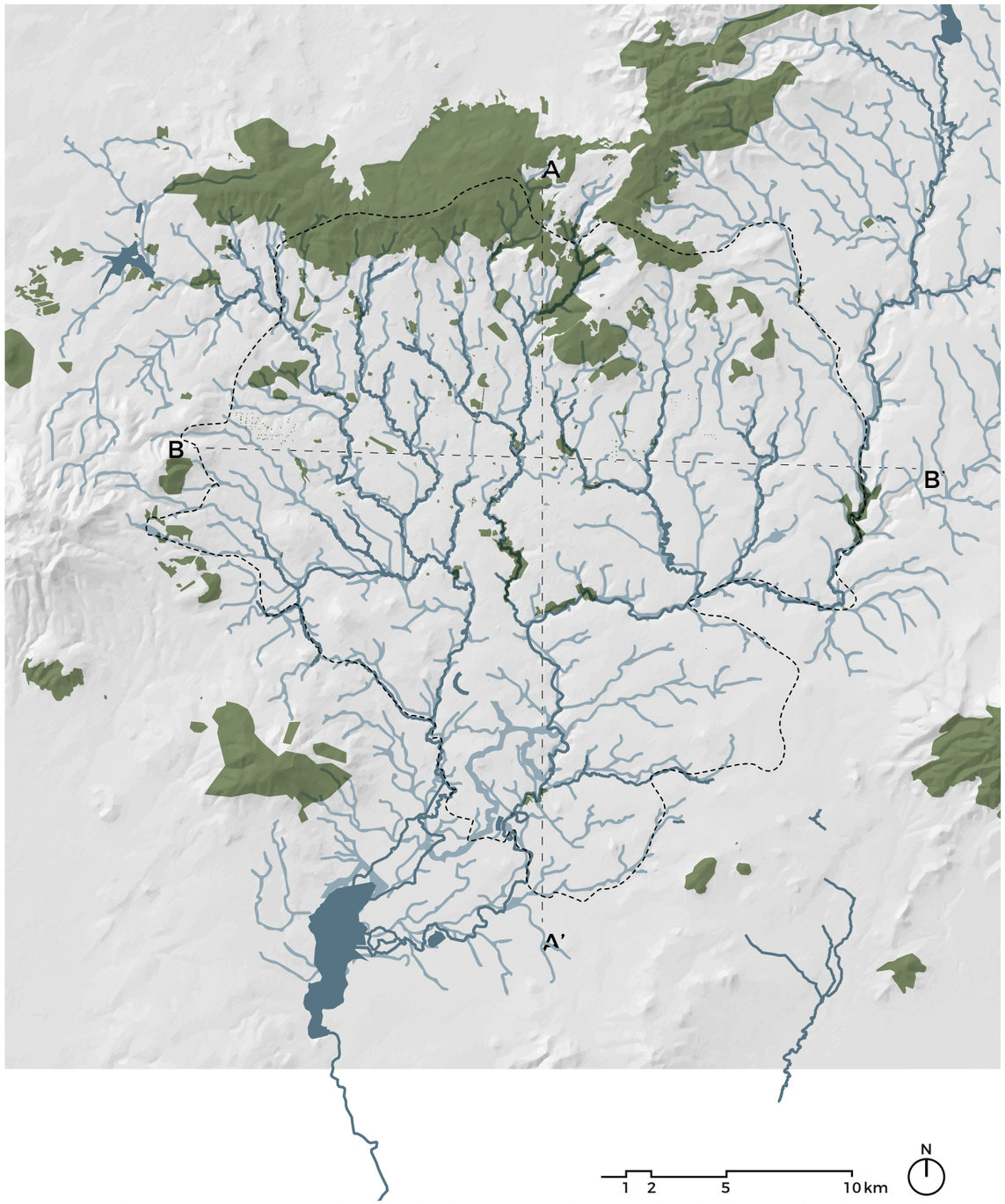


figure 45. Topography, parks, forests and watersheds (by author)

Governance

Governance in Ethiopia can be described on the national level as ethnic federalism. There are nine ethnic states and two autonomous urban areas: Dire Dawa and Addis Ababa. Since 1991 the country is ruled by the Ehtiopian People's Revolutionary Democratic Front (EPRDF), which holds 100 % of the chairs of the parliament. (Bongwa, Kassahun & van Dijk, 20111). The city government of Addis Ababa is then subdivided into ten sub-cities: Gulele, Yeka, Bole, Arada, Lideta, Kirkos, Addis Ketema, Kolfe Keranyo, Nefas Silk and Akiki Kality. The subcities consist of a council that entails administration and executive organisation. They are responsible for the implementation of policies from the city or national level. The subcities collect local taxes, however this revenue goes directly to the city council. Therefore the subcities cannot deliver proper services, since they lack financial tools (Bongwa et al., 2011).

Each subcity is then subdivided into 9 to 11 Woredas, the smallest administrative unit. This used to be called a Kebele but due to reforms the name and geographical limits changed. The Woredas should be centers for development and participation of its residents and it is responsible for the delivery of basic services. However, the Woreda lacks social and financial resources and is thus hardly able to deliver the services (Bongwa et al., 2011). Besides that, Woredas are not involved in the planning of local development. Plans are usually made by the city or sub-city council in collaboration with the Addis Ababa planning commission (Bongwa et al., 2011). For this Local development Plans are issued by the AA planning commission. The plans themselves are derived from the most recent Master Plan (2017) and should be embedded in the development of the city as a whole. The implementation of any plan is checked by the AA planning commission ensuring that the plan follow the 2017 Master Plan. There is a big issue regarding the enforcement however, the planning commission can impose penalties to the implementing parties, for instance a Chinese building company, but these penalties are not enforced by the representative government. Resulting in a violation of the law that is ignored by the government (T. Eshetu, personal interview, February 27, 2018).

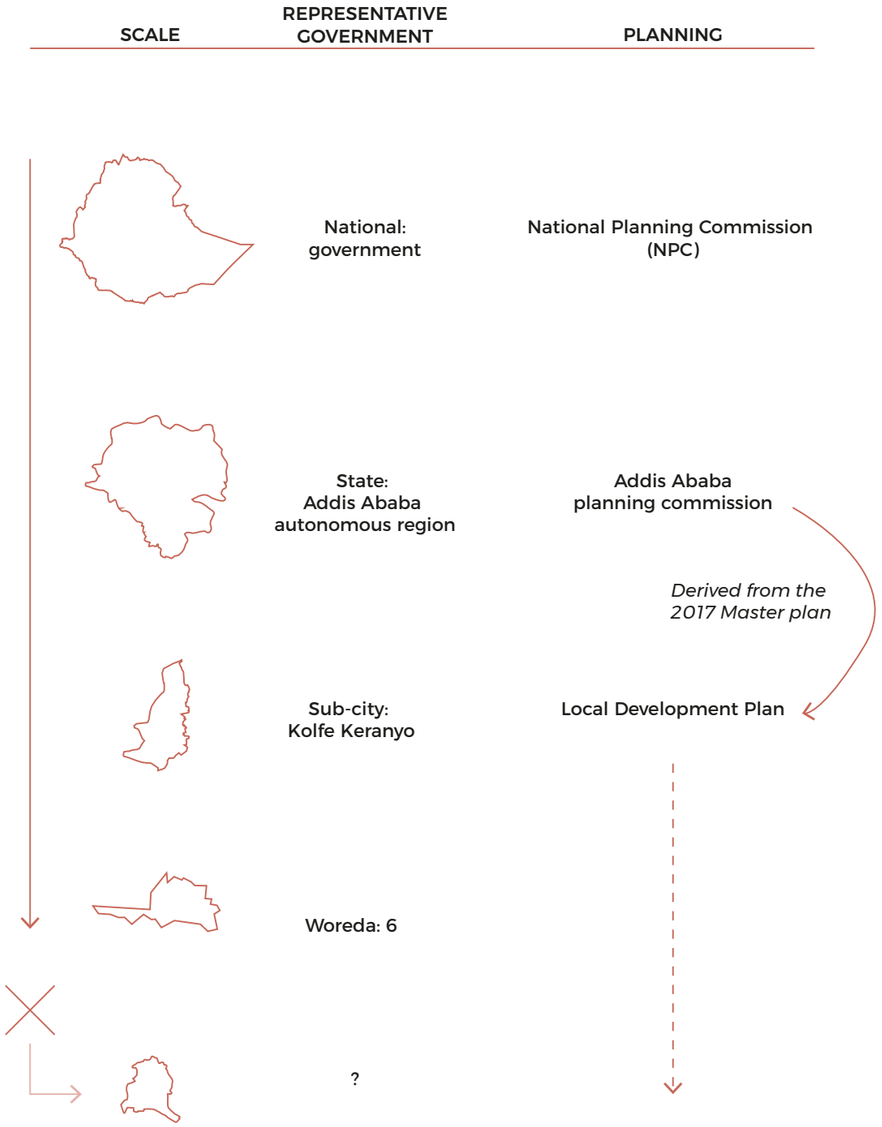


figure 46. Current governance and planning practice (by author)

Stakeholders analyis

The previous section showed how the governance in Addis Ababa is dominated by a vertical hierarchy. The influence of the private and civic sectors is small compared to the dominance of the public sector (the different bodies of government). When looking at the different stakeholders and their power it can be actually observed that the government organisations have the main resources in terms of manpower, knowledge and financial tools but lack the interest to improve the current situation. Where in the civic sector, for instance NGO's, have a huge interest, but lack the resources.

Private stakeholders are being used more and more especially for their financial resources. The Ethiopian government is realising that it needs financial capital in order to develop more. For this the Ethiopian government solely depends on Chinese investments. In exchange for rare minerals or for favorable loans, (The Guardian, 2015) Chinese companies invest in infrastructure and the recent years also more in buildings. Chinese companies are responsible for the construction of the Light Rail and more recently for the redevelopment of the train line from Addis Ababa to Djibouti (The Guardian, 2016).

In many developments the government takes the role as initiator, but also as implementer. In the case of the IHDP projects they control almost the entire project, some private firms are joining the process for consultation.

Also in the financing of projects, the government is responsible. In this case they use the government owned Central Ethiopian Bank.

In the case of provision of services the same applies, the water company for instance is owned by the government. Recent developments show that the Ethiopian government is liberalising its economy in many sectors. The telecom, electricity and logistics sector are opened up for foreign or domestic investors (Maasho, 2018).

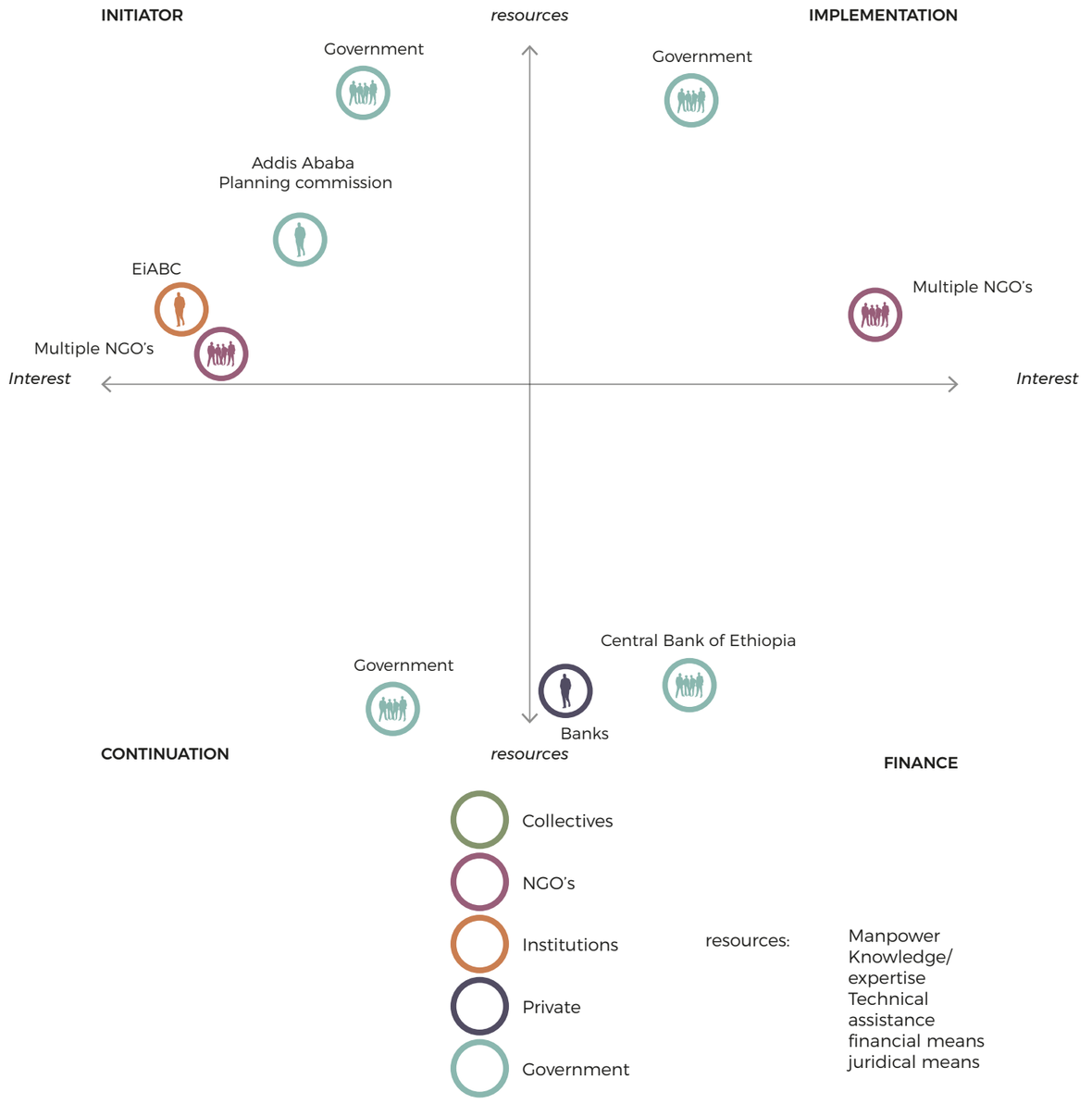


figure 47. Stakeholders diagram (by author)

3.2 OPEN SPACE SYSTEM

Accessibility

The city bus system is operated by Anbessa, a government owned company. The modal share of total transportation of the bus is 7% (Demdime, 2012). The company operates on 93 routes that rediate from the center of the city with 350 buses.

The Light Rail Transit was implemented in 2014. Because of the recent completion of this mode of transit, reliable data lacks. What can be said is that this mode of transport is more expensive than more common modes of transport as walking (which modal share is 44%) or the minibus system (34%) (Demdime, 2012).

To reach conclusions about accessibility, analysis regarding, proximity, frequency and capactiy are done (See appendix VII). The conclusion map uses the Kebeles (based on the 2007 census) as geographical units.

BOX 3.1 The minibus

Betty as well as Haile take the minibus, or Blue Donkey, every day for the transportation. There are approximately 12000 busses in the city. A minibus that normally fits 9 passengers is filled up to 15 passengers, making a comfortable commute impossible. Most minibusses run between hubs, so Betty and Haile have to transfer a couple of times in order to arrive home or at their work. During rush hour, you see large lines of people waiting for their minibus increasing the already long travel time of many inhabitants of Addis Ababa.

figure 48. The minibus (Geeska Afrika, 2016

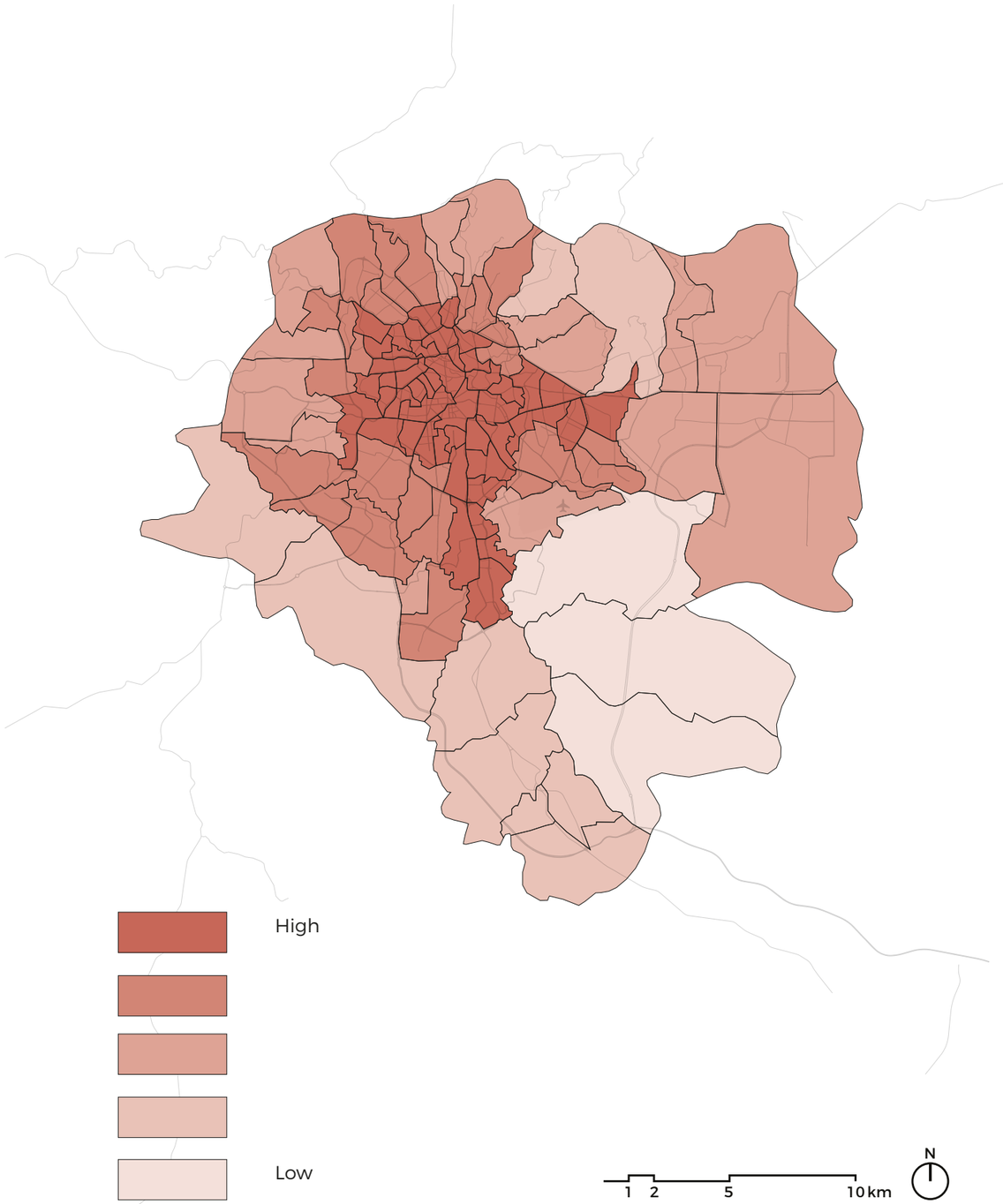


figure 49. Conclusion: Accessibility analysis (by author)

3.3 LAND-USE

Employment in the capital of a mainly rural country is characterised by commerce and services. More and more Ethiopia is experiencing an increased industrial boost due to investments from (primarily) Chinese companies. Addis Ababa is situtated in the heart of the country and forms the commercial heart of the country also towards the port in Djibouti. The trainline that connects Addis with the harbour in Djibouti has recently started operating, moving cargo in and out of the city (The Guardian, 2016). Explaining the prevelance of manufacturing, storage and logistics employment facilities in the city. These are located more in the outskirts, with a focus on the south, Akaki Kality. But also some factories located in the city, like Coca Cola located in Lideta next to the EiABC.

A lot of industries and large scale agricultural facilities are located out of Addis in the surrounding cities. Their headquarters however are all located in Addis Ababa, in order to get easier access to investment (Z. Chernet, personal interview 23-2-2018). Because of the railroad that ends south of Addis, in Sabeta, the focus of the manufacturing and industrial sector lies in the southwest.

Addis Ababa also serves as the political center of the country. All the federal governmental buildings are located in the heart of Addis. It also functions as the capital of Oromyia, the surrounding state. The third governmental tier is that of the autonomous state of Addis Ababa. Each sub-city and woreda have their own administrative offices.

Large amount of embassies and other international institutions like the African Union and the United Nations Eastern Africa headquarters. Also a lot of NGO's.

Commerce has been the main employment provider in the city of Addis since its founding. This continues today and commercial activity can be found all over the city. The main commercial area of the city is located in Addis Ketema sub-city in the area known as Merkato (derived from the Italian word for market). A newer form of commercial activity can be found in the richer sub-city, Bole. Here modern shopping malls dominate the streets. In general sense, all of the main roads in Addis are filled with commercial activity. Many are small shops, workshops, kiosks, cafes and restaurants, many are located in a singles storey dwelling.

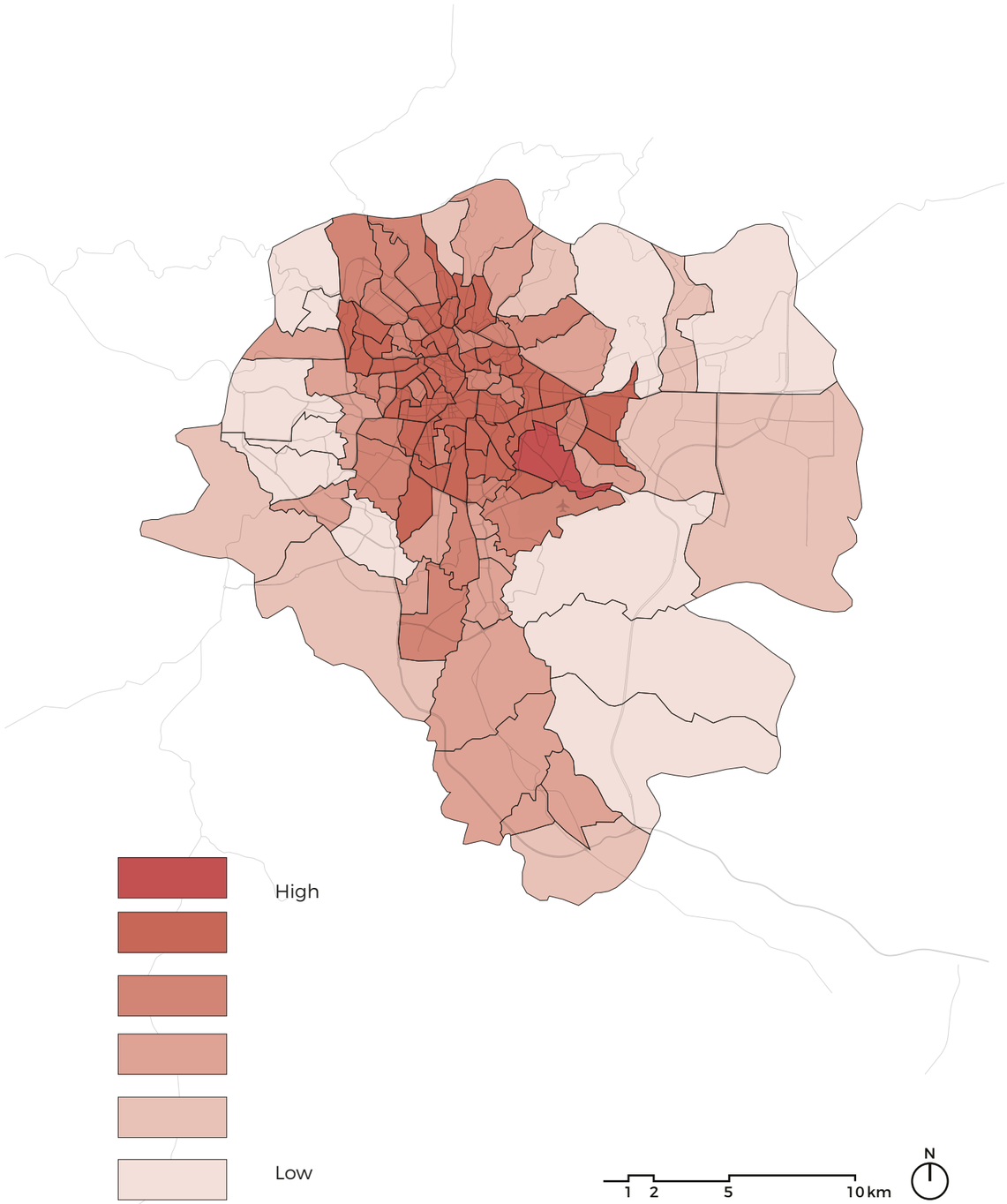


figure 50. Jobs density per kebele (by author)

3.4 HOUSING

Density

Here the current population density is shown. The highest densities can be found in the old Kebeles, located within the central areas of the city.

Those are the areas that are being redeveloped at the moment, since the government can make money by leasing out the land at the best location. The promise is that the current inhabitants will be resettled within 500 meters from the original location. However this is just a guideline which is not followed in most cases. Eventhough research by the EiABC has shown that a succesfull relocation and densification can happen given the right planning and design (Heisel & Kifle, 2016; B. Kifle, personal interview, February 21, 2018).

Other areas that currently have a low population density but mainly lack the infrastructure system or programme to accommodate the future inhabitants. Interesting areas for instance are the west (Kolfe Keranyo sub city) the south (Akaki Kaliti) and parts of the east (Yeka). However the two latter areas see a big development in the recent years with the construction of massive condominium sites. The terrain of the eastern and southern part of Addis are more suitable for large scale development, compared to the rugged terrain of the west.

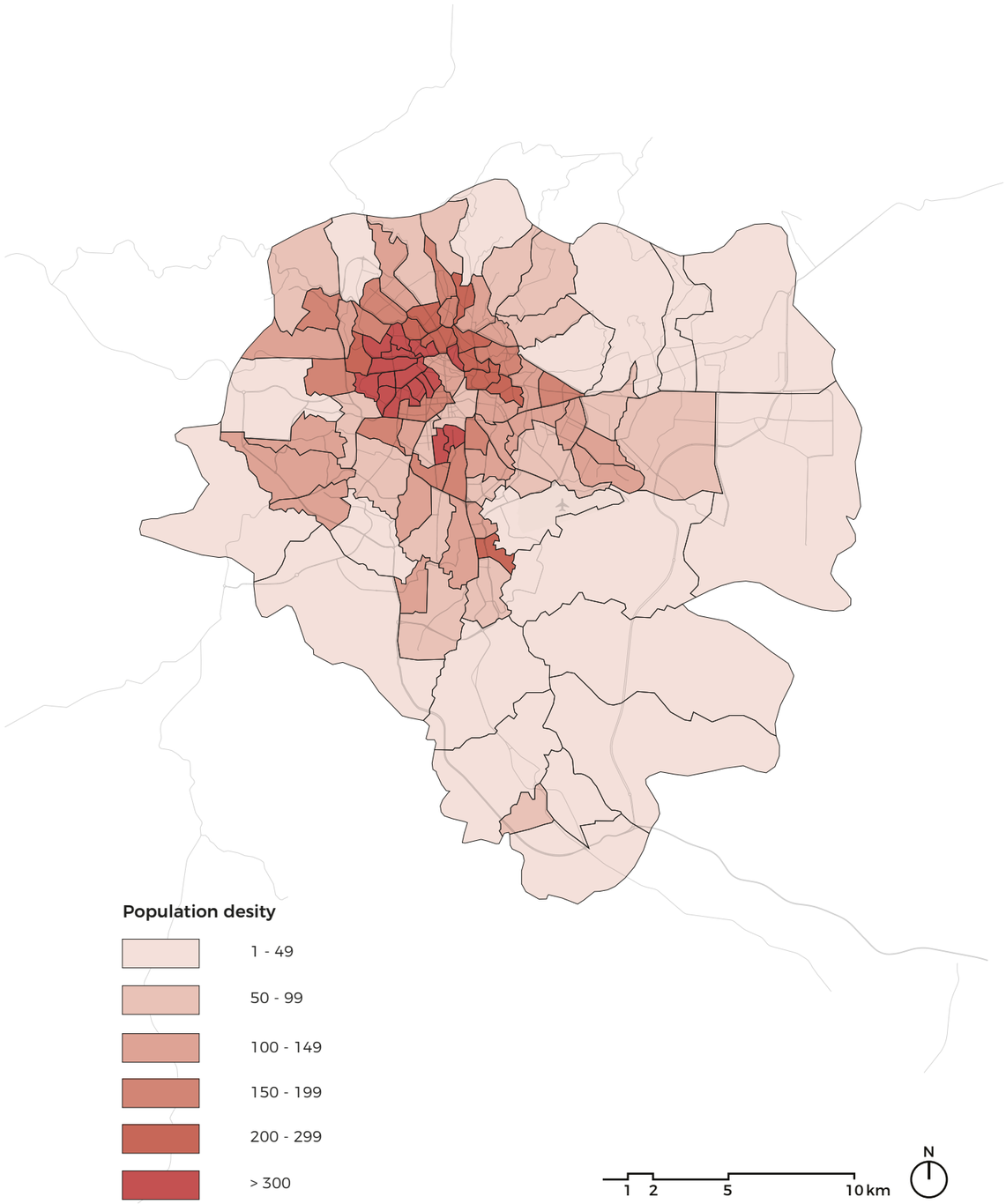


figure 51. Population density per kebele (inhabitants per hectare) (by author, data from CSA, 2008)

3.5 SYNTHESIS: ACCES TO INCOME GENERATION

Using the conclusion maps of the accessibility, land-use and housing layer, the access to income generation can be tested. The combination of the results in the map as displayed on the facing page (figure 53).

The main problem observed can be derived into four elements:
- open space network has potential but is currently underused
- infrastructure network is not able to accommodate current and future
- poor coverage of jobs, only concentrated in the central areas and poor coverage of schools and health facilities
- rapidly growing population that needs to be matched with jobs, infrastructure and other facilities.

The conclusion of the analysis results in the chosen site for further analysis and strategy, the Weyira sefer. The Kolfe Keranyo sub-city is one of the areas with a low accessibility, but is still located relatively close to the center.

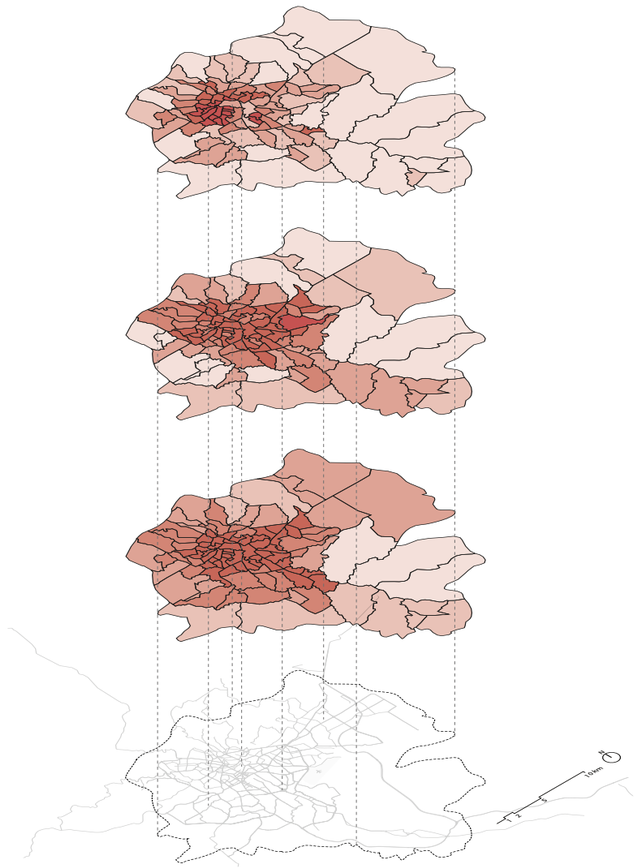


figure 52. Access to income generation analysis using layer approach (by author)

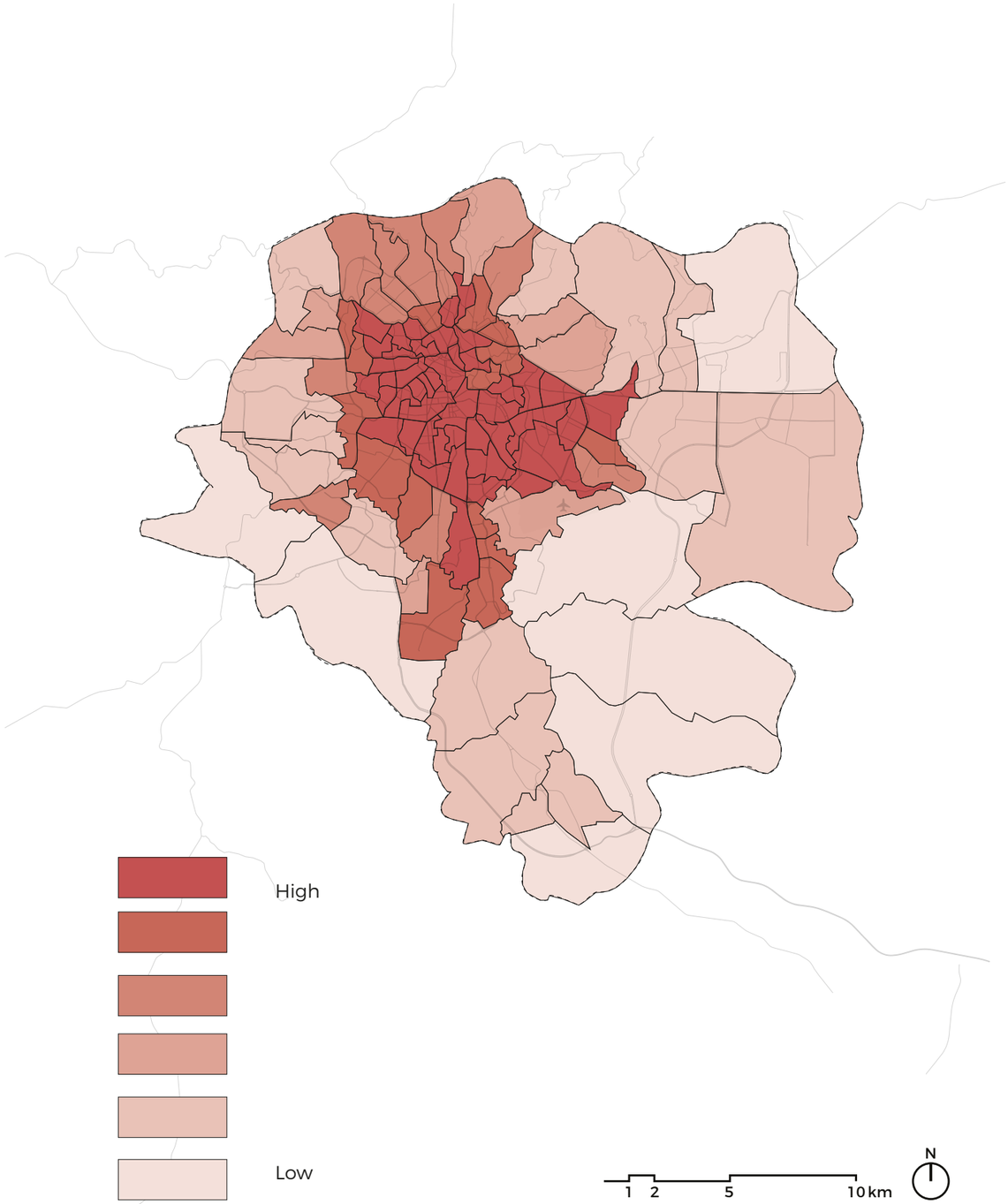


figure 53. Access to income generation per Kebele (by author)

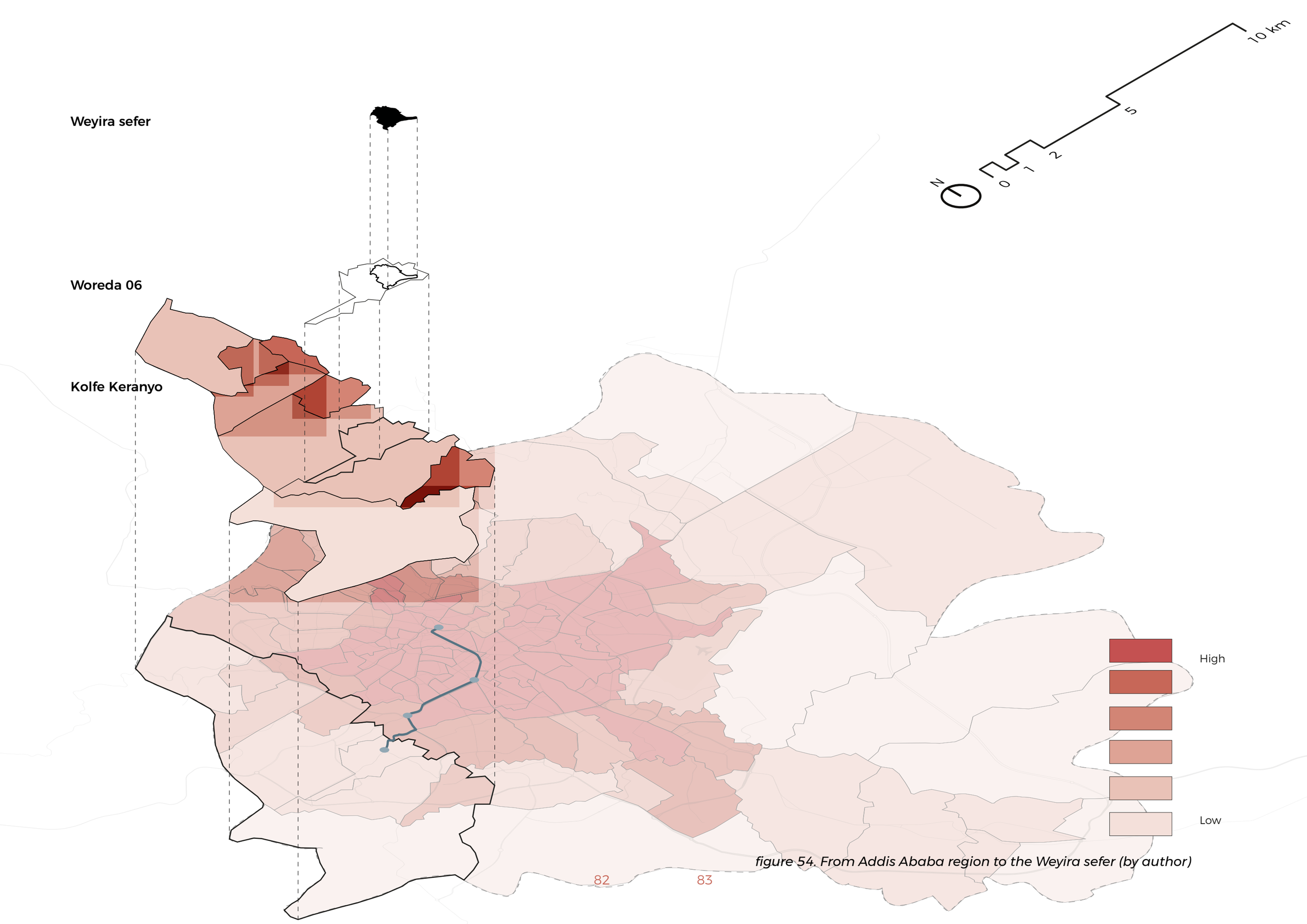


figure 54. From Addis Ababa region to the Weyira sefer (by author)

CHAPTER 4: LAYERED ANALYSIS WEYIRA SEFER

4.1 BASE

4.2 OPEN SPACE SYSTEM

4.3 LAND-USE

4.4 HOUSING

4.5 SYNTHESIS: POTENTIALS AND OPEN SPACE TYPOLOGIES

4.6 DESIGN PRINCIPLES

4.1 BASE

Demographics

The Weyira sefer is located in Woreda 6, in Kolfe Keranyo sub city. It is three kilometers from Tor Hayloch, the largest transport hub in the western part of Addis Ababa. Bordered by the Old Airport area (east), a affluent neighbourhood with many diplomats and embassies. To the west it is bordered by Bethel, another sefer that serves as a small hub in this area with a hospital. To the south lies Zenebworq with a large local market and further south lies Ayer Tena, a sub-center in Kolfe Keranyo and home to some secondary (and higher) schools.

The Weyira sefer has around 12600 inhabitants. Estimation based on data from the Woreda and amount of compounds and persons per dwelling approximately 5 (CSA, 2008). The demographic make-up of the sefer, based on the statistics of the whole sub city, is as following (CSA, 2008):
5 - 14: 20 %
15-19: 15 %
20-54: 50 %
55 + : 15%

Education in Ethiopia is characterised by eight grades in primary education (age 7 - 15) and 9th till 12th grade in secondary education (age 16 - 20).

Landscape

The western part of Addis Ababa is characterised by a hilly topography. Therefore it has seen less development in the past, resulting in a less dense area as compared to for instance the southern or eastern parts of Addis. The taxi terminal is one of the lowest points of the sefer and occasionally floods during the raining season. There is a small stream flowing past to

figure 55. Entrance to the sefer: the taxi terminal (by author)

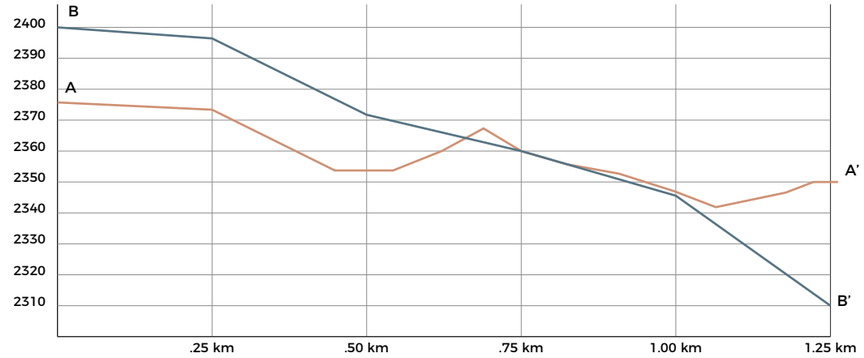


figure 56. Elevation profile Weyira sefer (by author, data from Google Earth, 2018)

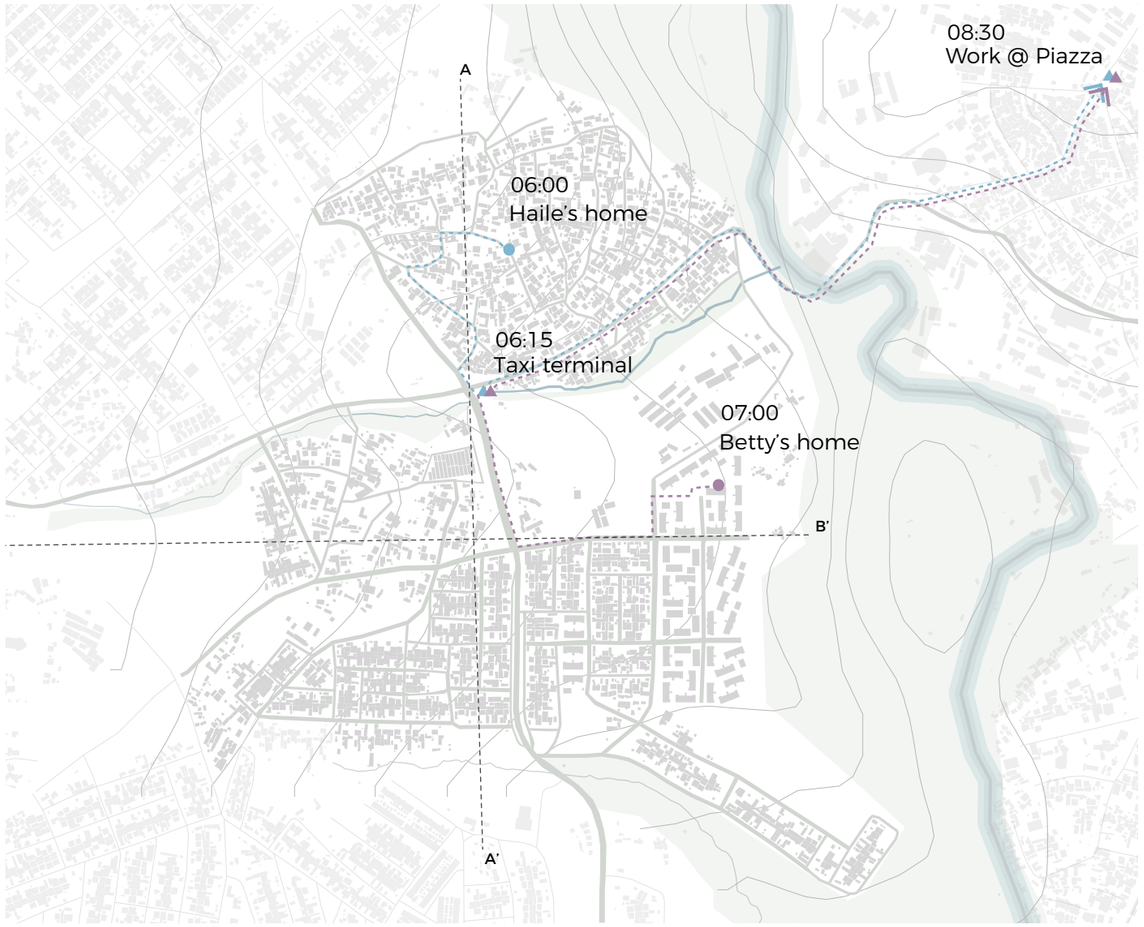


figure 57. Landscape of the Weyira sefer (by author)

the terminal towards the big Akaki river, marking the eastern border of the Weyira sefer. The name Weyira in Amharic means olive derived from the many African olive trees that used to grow here. Today however the area is characterised by eucalyptus trees and introduced by emperor Menelik II in the beginning of the 20th century.

Governance

The sefer falls within the administration of Woreda 06, Kolfe Keranyo sub city. The Woreda administration office is located near Bethel intersection, 10 minutes by car or 30 minutes by foot from the Weyira taxi terminal. As said before the Woreda is the smallest administration unit, but lacks human and financial resources to provide basic services in the sefers. Therefore many residents are using informal social support networks for their daily survival. Examples of these groups are *maheber* (religious) and most importantly, *Iddir*. An iddir is an association of social ties of for instance friends and family, bounded by geographical limits (a village/sefer), by profession and by ethnic background. The iddir provides mutual aid in case of emergencies (i.e. the death of a breadwinner) and provides financial suppor (Aredo, 2010). In recent times iddirs are expanded to also provide credit to entrepreneurs and are used for investments for development. The iddirs are getting more formalised by the registration of by-laws and by the legal acknowledgement of the respective woreda (Aredo, 2010).

BOX 4.1 Iddir

Haile is a member of the executive committee of the community Iddir. Together with three neighbours he is responsible of collecting money from those who are in the Iddir. At the moment the money is only used to compensate those who have an emergency. Just yesterday, his neighbour lost a son in a traffic accident. The family has no money to provide a proper Ethiopian funeral and thus the Iddir supports the mourning family. But the Iddir provides more than financial help, they also support each other emotionally.

Betty used to have a similar Iddir in her former sefer, now she hardly knows her neighbours and does not trust the residents committee of the condominium. Since all of the residents are placed her via the lottery, people with different backgrounds reside in the same building. Unfortunately, the social ties in de condominium are not so strong and their is a lot of mistrust. Betty decides that it is time to form a women's Iddir and thus starts to create a social network in her new home.

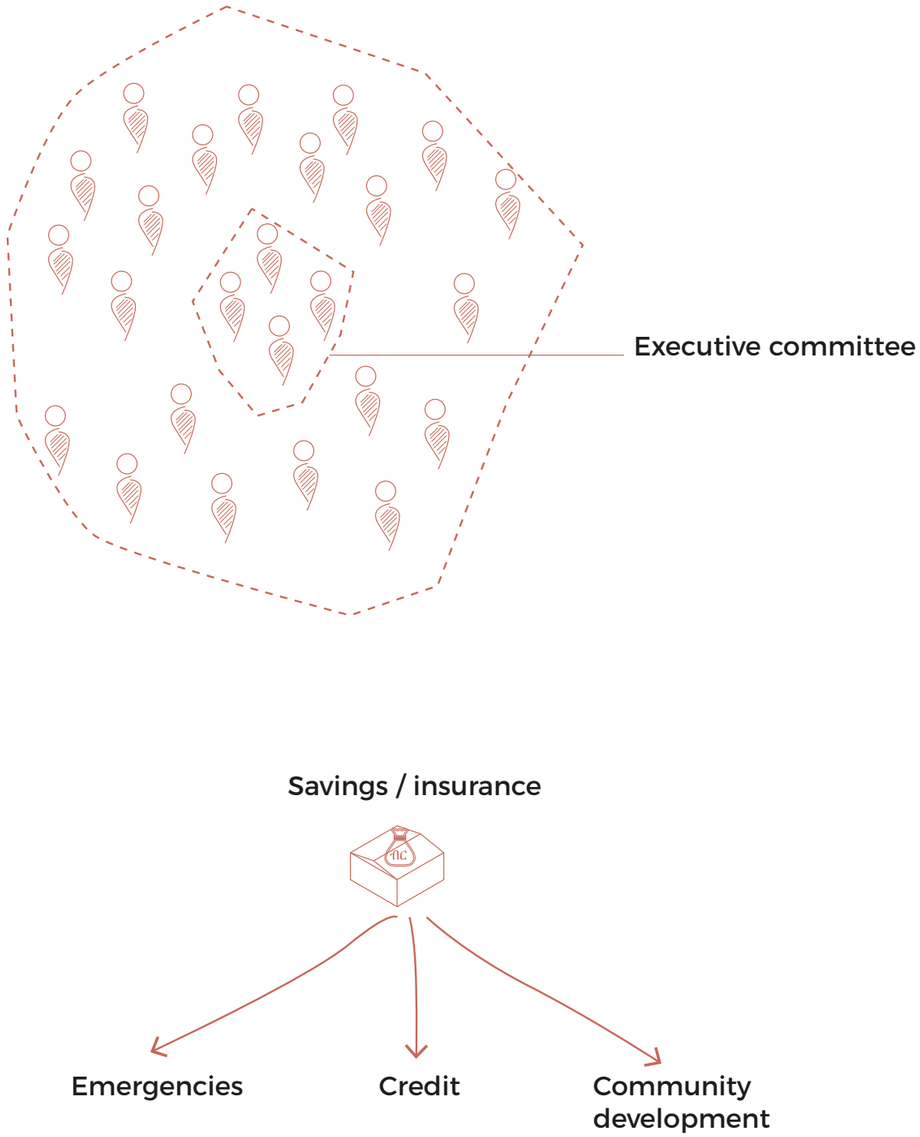


figure 58. Diagram of Iddir (by author)

4.2 OPEN SPACE SYSTEM

Current open spaces

Analysis of the current open spaces of the Weyira sefer shows that there are a lot of open spaces available for use. However all these area are unused, mainly because of the unclear ownership of these spaces. All the unbuilt space is owned by the government, but can be leased out. Some spaces in the sefer seem unused and the residents themselves do not know to whom the space belongs. Even if they do, they are not allowed to use this space without permits issued by the Woreda office. To make it even more difficult, many residents do not possess a title deed and are therefore not authorised to apply for a permit. In the condominium spaces the same issue is present regarding open spaces. For some spaces within the condominium it is even not possible to be used by restrictions of the residents committee. Or as showed before, the residents do not know who owns the space and do not feel that they can use it.

figure 59. Unused open space in the condominium (left) and elsewhere in the sefer (right) (by author)

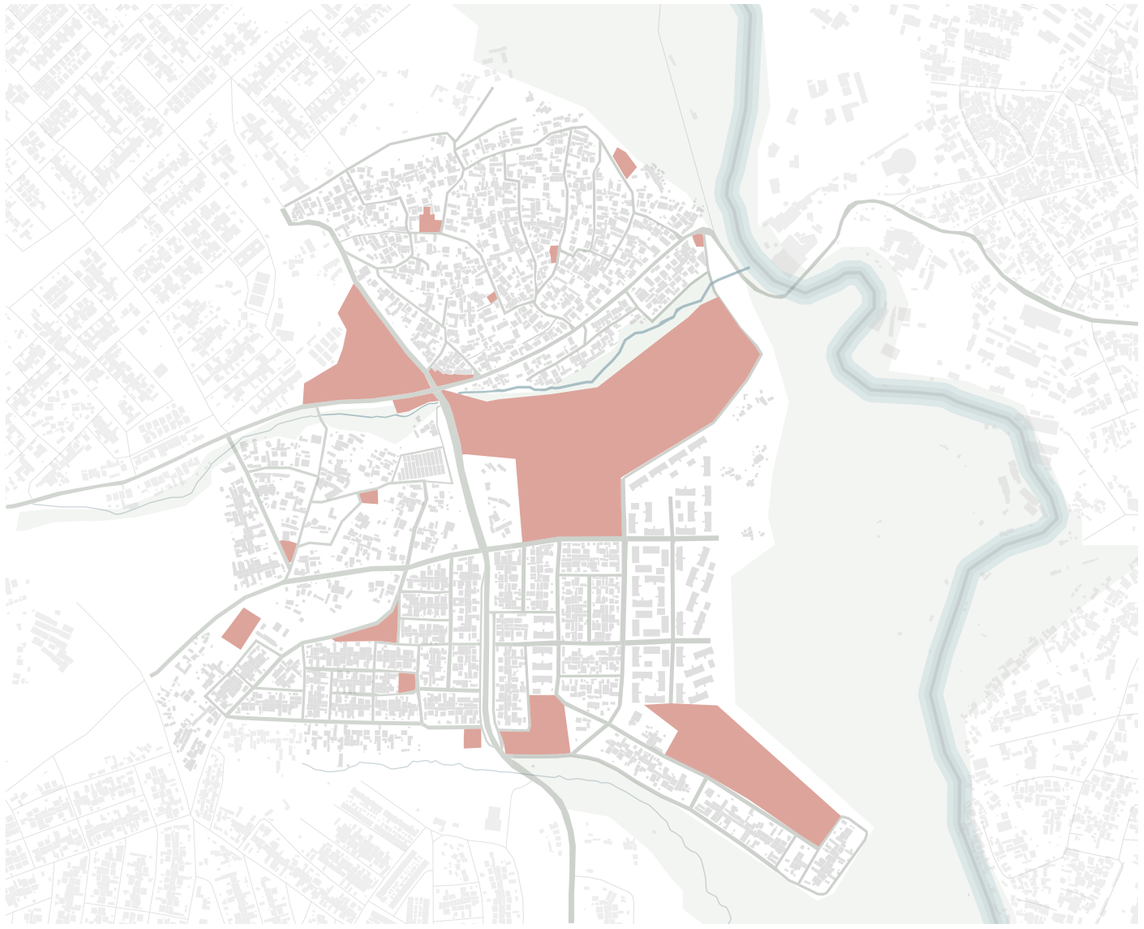


figure 60. Current open spaces in the Weyira sefer (by author)

Accessibility

The accessibility analysis for the Weyira sefer starts with the walkability analysis. The map show the walking radius starting from the taxi terminal. It is based on the slowest speed and is highly influenced by the topography as shown in the previous section.The topography plays a big part in the mobility, as well as the physical condition of the residents themselves and the state of the roads. Many of the roads are well-paved, cobblestones, but some are in a poor condition. Decreasing the accessibility and causing flooding problems during the rainy season (June, July and August).

The sefer is poorly serviced by public transport, the minibus is therefore the prefered modal choice. Eventhough people have to wait long times in order to get a minibus from the terminal to either Bethel (west), Zenebworq (south) or Tor Hayloch (east). From those hubs, people have to take another bus in order to arrive at their final destination.

figure 61. Impression of the road quality and steepness (by author)

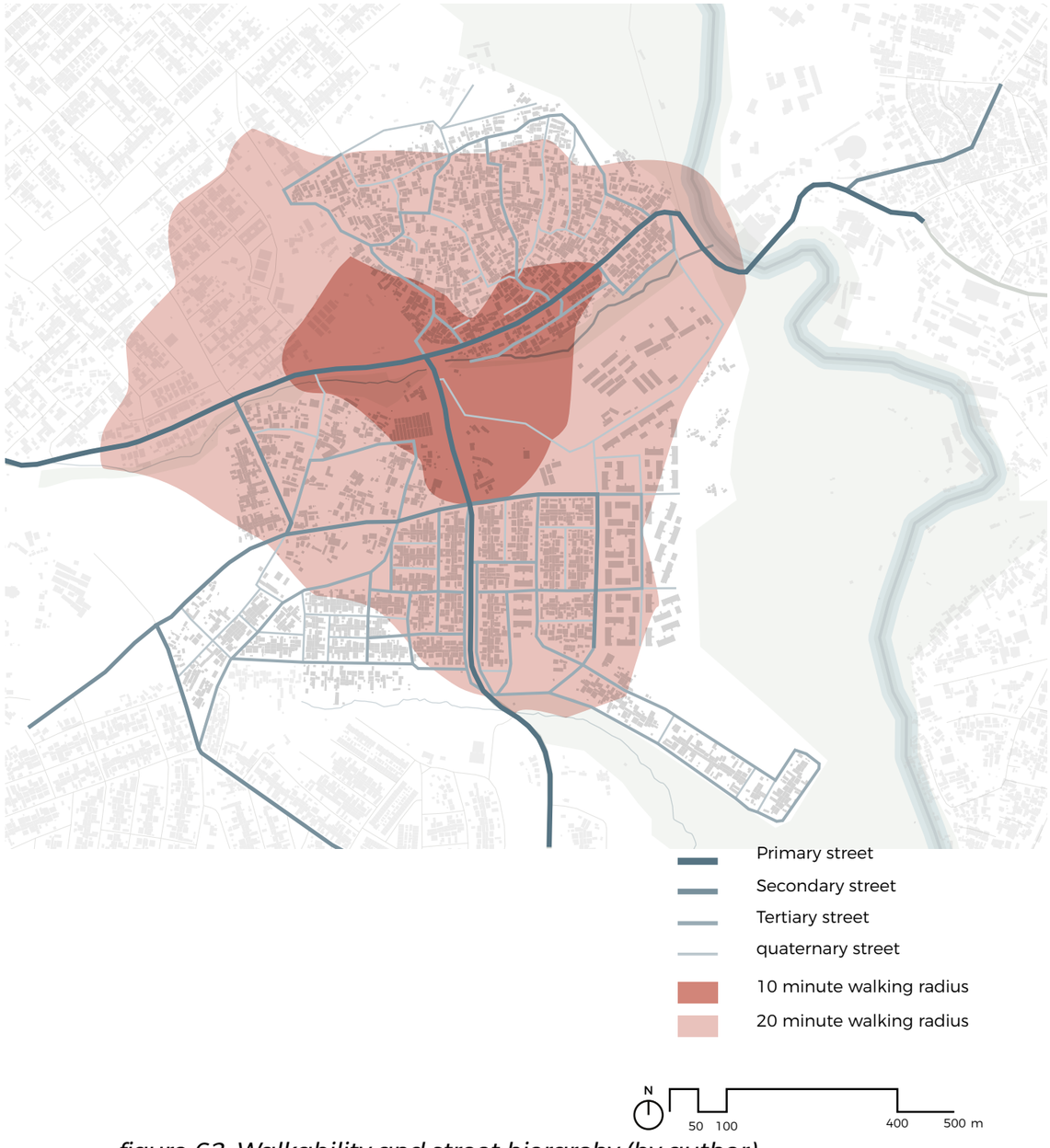


figure 62. Walkability and street hierarchy (by author)

4.3 LAND-USE

Income generation practices in the sefer

The opportunities to generate an income in the sefer boundaries are limited. There are some shops and cafes located at the terminal area. The rest of the commercial units are scattered throughout the sefer, furthermore clustered around the street towards the condominium. Other income generation opportunities are the workshops for manufacturing, located near the taxi terminal. Finally there is a small market area, also located near the taxi terminal. These limited options of employment within the sefer ensure that most inhabitants need to travel long distances to reach areas with high concentrations of jobs. The closest area right now is the Meksiko area, located at five kilometers, but a ride takes around one hour one way. A center that is in development at the moment is Ayer Tena, but this is still located at around 30 minutes by motorised transport.

Many of the residents go to the large markets at Zenebworq, located south of the Weyira sefer. By foot approximately 30 minutes, by taxi 10-15 minutes (1.5 ETB). Though for the people living at the hill, reaching the taxi terminal alone costs around 15 - 20 minutes. Some people go to Merkato market, but they take half a day for this and is more for special things to buy.

figure 63. informal markets next to the entrance to condominiums (by author)

figure 64. land-use map Weyira sefer (by author)

Public facilities

Schools

Within the boundaries of the whole sefer, there is only one primary and a secondary school. This school is located close to the taxi terminal. Since it is the only primary school in the sefer, many residents send their kids to other school outside the sefer. Some kids go to the schools by foot, taking at least 30 minutes. While some are able to get picked up by a bus, which is of course not affordable for everyone. Because of the poor service area of primary schools, you see a lot of schoolkids using the minibus to reach their schools. Higher education facilities are not nearby the Weyira sefer, posing a challenge for both the students as their parents.

Health centers

In the sefer itself there are no public health facilities. The most nearby facilities are located at Bethel, a mere 20 minutes walk from the terminal area. For the people living uphill, that makes up to a trip over the 30 minutes. The government provides some public toilets for the residents of the sefer. This is by far not enough to cover the whole sefer, there are only two public toilets in the uphill area and one near the taxi terminal.

Other

The administration office of the Woreda is also located at the Bethel area. So accessible to a certain degree. However, when residents want to get a permit for anything regarding their compound, they need to visit the office multiple times. Then the trip to the office becomes a burden for the residents.

Furthermore there are two churches to be found on the edges of the sefer. The St. Mariam in the east and the St. Giorgis in the western part of the sefer. There are also some churches located north, so more accessible for the residents of the uphill area.

figure 65. Shop in the Weyira sefer (image by author)

figure 66. Public toilet near terminal (image by author)

4.4 HOUSING

The current population density in the Weyira sefer differs for different parts. The most dense area is the condominium site, showing a density of more than 300 inhabitants/hectare. The other areas of the sefer that show a high density are the areas uphill from the terminal. As the eastern side, of the main road towards Zenebworq. The housing typology in these areas is mixed, though the uphill area shows more Kebele compounds since it is the oldest part of the whole sefer. The Kebele compounds are mixed with private low-income compounds, these look similar to the Kebele ones, but the residents own a title deed. The residents of the Kebele houses do not and depend on the government for the maintenance of the houses. As mentioned before, the western part of Addis is one of the cheapest area, therefore you see some private development in the form of large villas. They can mainly be found in the western area of the sefer, also resulting in a smaller density.

figure 67. A villa (left) and Kebele compound (right) (by author)

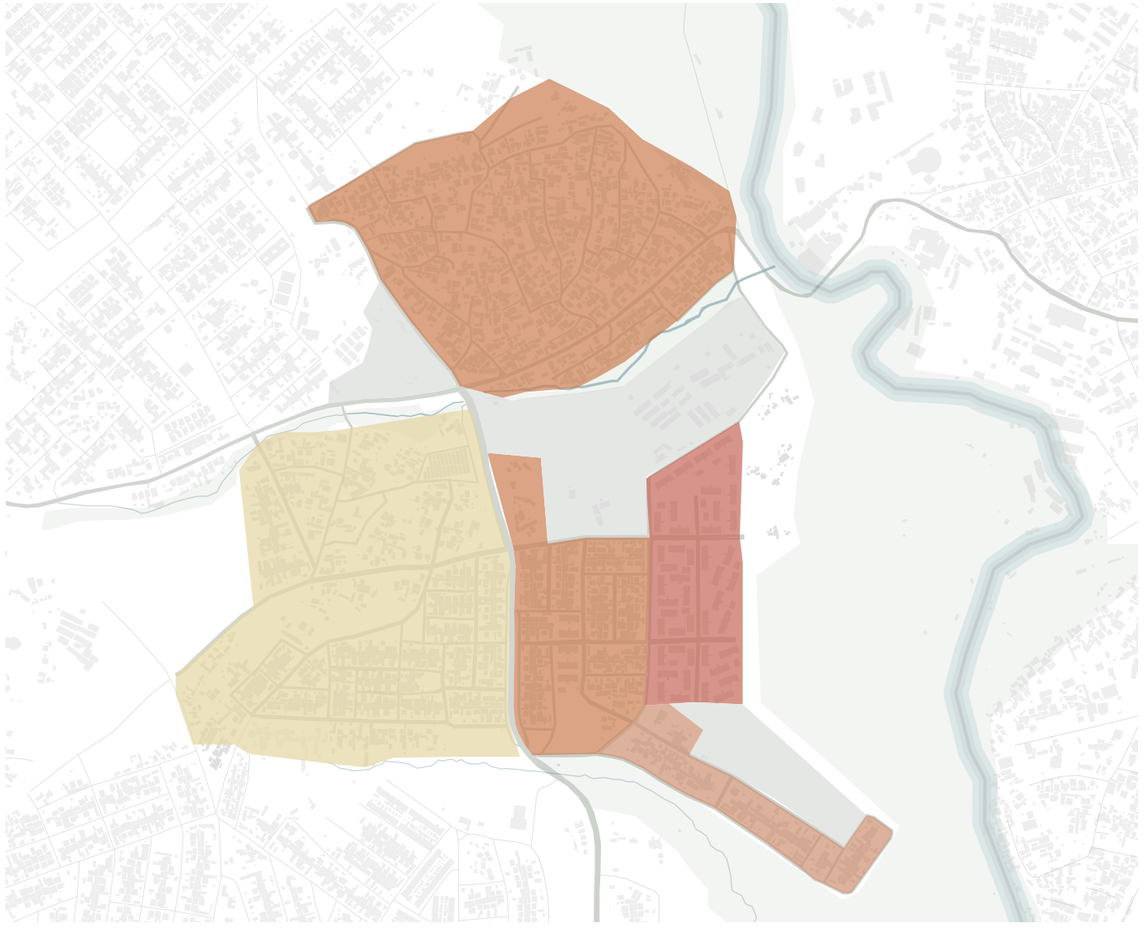


figure 68. Rough population density Weyira sefer

4.5 SYNTHESIS: POTENTIALS AND OPEN SPACE TYPOLOGIES

The layered analysis results in a synthesis that will form the base for the design strategy. The main conclusions of each layer are added together and it confirms the statement made at the end of the third chapter: the access to local income generation is limited. As we have seen, this is caused by different elements, first the landscape, which has an influence on the internal accessibility of the sefer. The walkability is low because of the challenging topography. The connection with other areas of the Addis Ababa city region is limited as well, resulting in high travel costs for the residents of the sefer. Secondly the open spaces, they are unused and some are inaccessible as well. Thirdly the land-use in the sefer, the limited opportunities for income generation. As well as the limited public facilities within the sefer. Finally the densities show that some areas of the sefer are affected more by the poor internal accessibility than others. Furthermore can be said that the sefer has the potential to accommodate more inhabitants in the coming decades.

Next to the spatial issues observed, the problems concerning governance, adressed in the base layer, are pressing as well. The (lack of) local governance ensures that the potential of the residents' human capital remains underused. As well as that the open spaces remain unused due to the poor governance and maintenance. A proposal for a more local governance approach will accompany the design strategy. But first, the synthesis of the analysis resulted in the creation of open space typologies, they will be discussed in the next section.

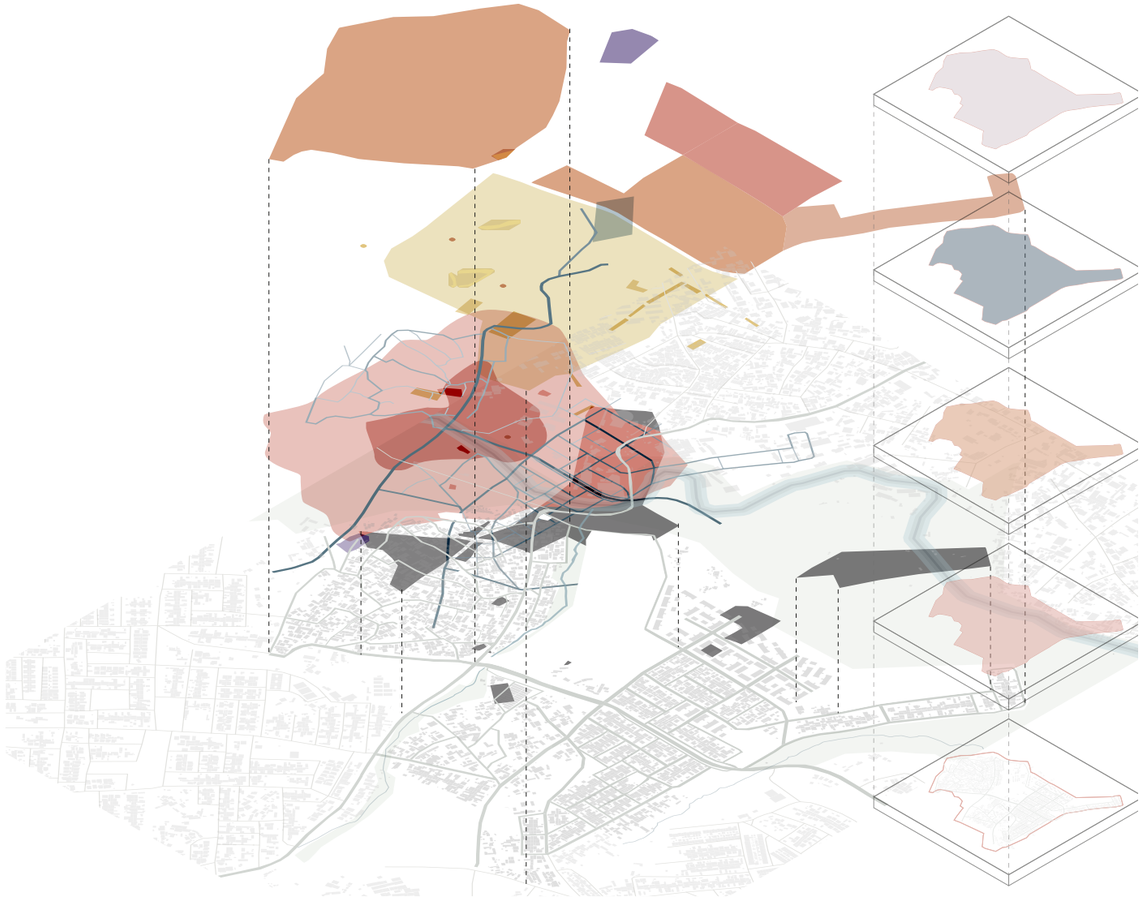


figure 69. Conclusion of the layered analysis

Open space typologies

The synthesis of the sefer analysis results in the distinction of different typologies of open space. The layers described in the previous paragraphs are used as criteria to define the typologies of open space. The criteria are based on the theses from the theoretical framework (chapter 2.4). The main argument is that people attract other people (Whyte, 1981). Following this it can be said that:
- if a place is better accessible, it attracts more people (criteria 2),
- if a place has functions like a clinic or a shop it attracts people (criteria 3)
- and finally if a space has a high population density, the space is more attractive (criteria 4) (Whyte, 1981; Gehl, 2011; PPS, 2018).

The first criteria is the current function and ownership of the open space. As mentioned before, all the land is owned by the Ethiopian government and is leased to private stakeholders. However, in many cases it is not clear who owns the space, resulting in the claiming of spaces by both public and private parties. In this case, all the open spaces observed are currently unused (expect for the terminal) and are owned by the government.

The synthesis results in the specific typologies of open space as depicted in the map on the facing page (figure ??). The typology first states what kind of hierarchy is linked to the space resulting in a proposal for population density and ratio of job concentration. The more accessible a space is, the higher the population density and job concentration. This is then reflected in the space typology, for instance the 'Sefer OS' typology is the most accessibe area of the sefer and the high jobs and population density is reflected in the programme proposal of this space.

Then each typology entails a specific proposal for the allocation of space in terms of (productive) open space and programme. The condominium open space is a different typology, primarily because the demands of the spaces are unique. The typologies are:

The Sefer OS:

The highest on the hierarchy of the open space network. The most accessible space and combined with the transport node it attracts the highest pedestrian flow, therefore it is best suited for commerce. The best place for inhabitants of the sefer to sell the goods they produced elsewhere in the sefer. The population density is high (>400 inhabitants per hectare), The open space is mainly allocated for commercial use and the programme around the open space is dedicated to employment in the form of commerce and services.

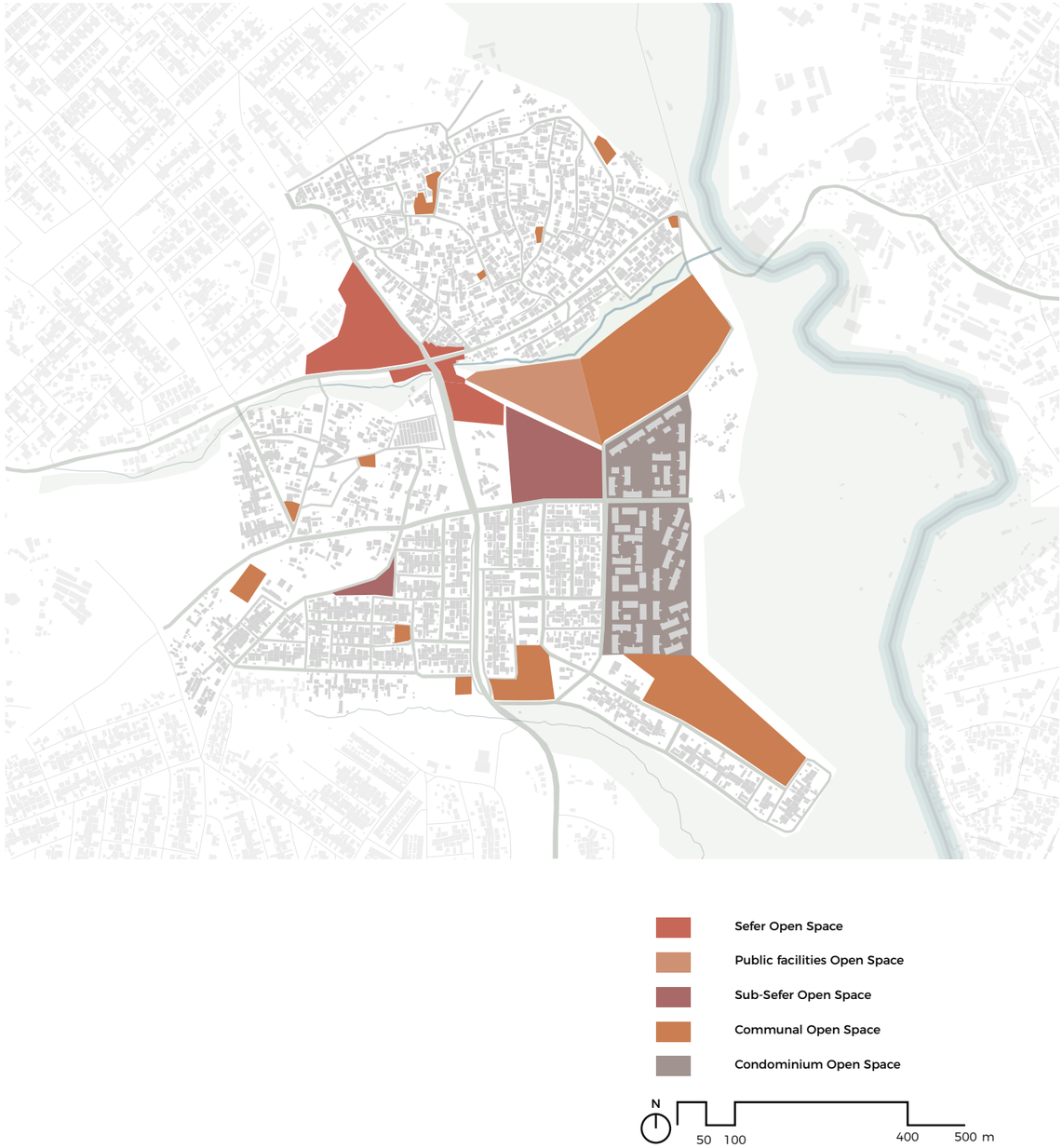


figure 70. Classification of open spaces (by author)

The public facilities OS

This space is almost as accessible as the main sefer open space, but the flow of pedestrians is less. Combined with the current only school in the sefer the typology will expand on this, by creating a public facilities open space. The open space is used for social purposes, a large public park and a sports facility. The programme is focused on public facilities meant for the whole sefer. That entails a bigger school, health facilities and a building focused on the social networks in the sefer. A facility for the sefer council, for NGO's and for the network of entrepreneurs, workers.

The sub-sefer OS

This typology is less accessible but serves as an important node in the productive open space system of the whole sefer. The use of the open space is mixed with a slight preference of commercial use, but also for producing (agriculture or manufacturing) and for social activity. The programme is for employment as well as public facilities like a primary school and a sanitation unit.

The community OS

The smallest open space typology is the less accessible and therefore serves a smaller area. The community living around the space is central for this typology. The use of the space is thus focused on accommodating social activity and producing that can be combined with running a household. For instance a communal agriculture field that is run by the women of that part of the sefer. The programme is focused on providing basic public facilities as the sanitation unit and if possible a primary school.

The condominium OS

The last typology is a special one, this concerns the open spaces in the condominium areas. Here there is an abundance of open space but there lacks a clear space hierarchy, resulting in open spaces with a lot of potential. Issues here concern, private and semi-private spaces, parking and the communal spaces for productivity. The open space use is similar to the community OS but with the addition to the 'puzzle' of private, semi-private and parking spaces.

The typology also prescribes what kind of design elements are needed to create the POSS, the next paragraph introduces them.

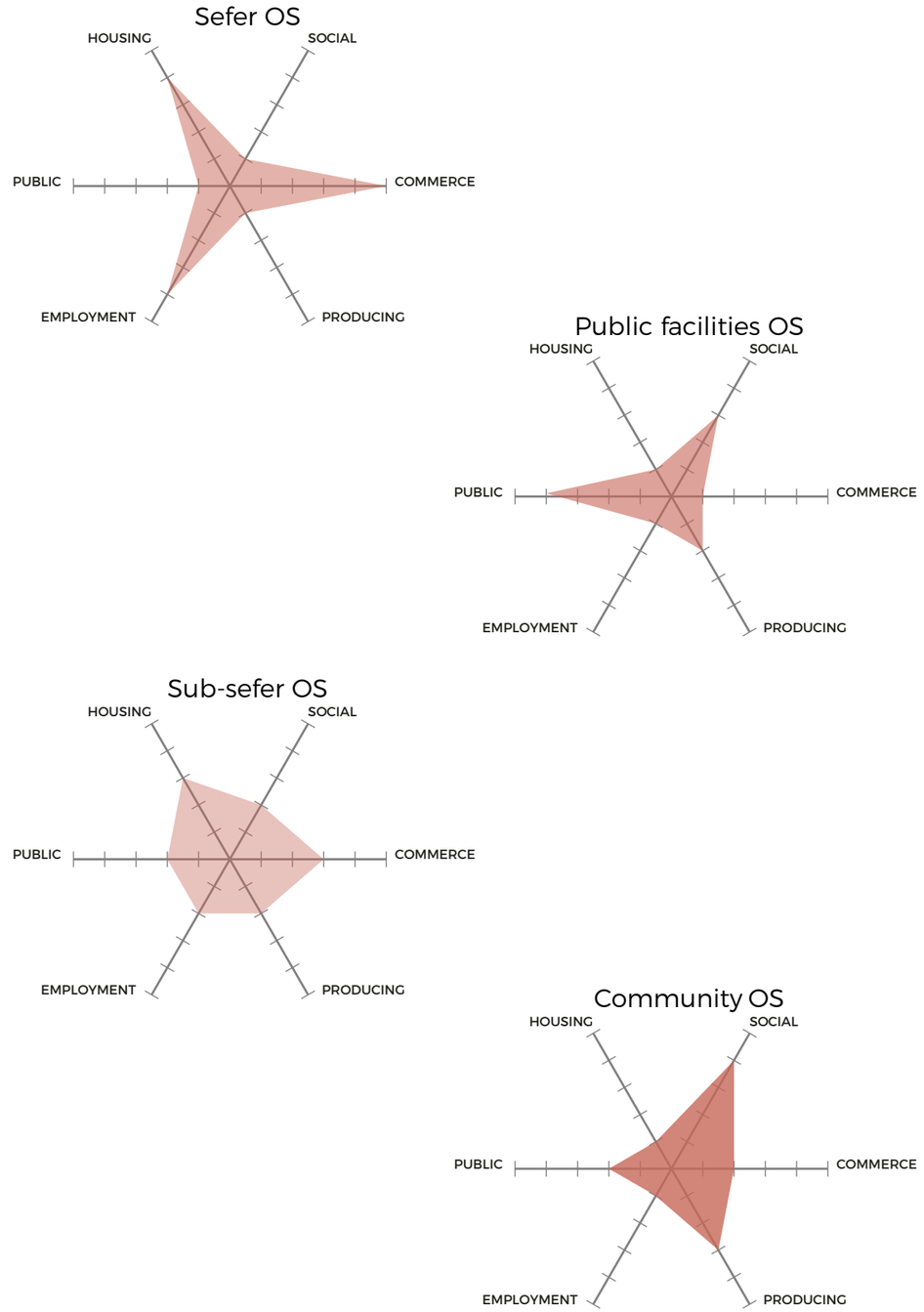


figure 71. Classification of open spaces (by author)

4.6 DESIGN PRINCIPLES

The design principles are derived from a mixture of emperical data, observations and interviews with residents, theory and reference projects. For the two latter methods it is tried to stay in the African context, but since there is lack of especially theoretic information in the African context, other literature is used as well. Principles regarding public space for instance are derived from Western theory, Whyte (1981) and Gehl (2011), combined with insights from observations in situ. Resulting in design principles that are as embedded in the Ethiopian context as possible. The design principles here are organised according to the proposal for the open space typologies. Focusing on open space, social, commercial and producing and programme, public facilities and employment. The principles are ordered in four categories:

Productive Open space System (POSS):
Streets and open spaces. The focus lies on how open space can be used for productive purposes, agriculture and manufacturing, and for commercial activities, cafes, shops, markets. The relation between the space and the surrounding functions, As well as the design elements that are required to create the desired spaces.

Infrastructure and networks (IN):
talking about roads, water runoff, electricity, public transportation and (regional) mobility networks

Landuse (LU):
Distribution and percentage of functions over the sefer, income generation activities; productive, commercial, service-related

Housing and private space (HP):
Guidelines for new housing development, land lease strategies, densification, guidelines for Condominium redesign, private compound use related to income generation.

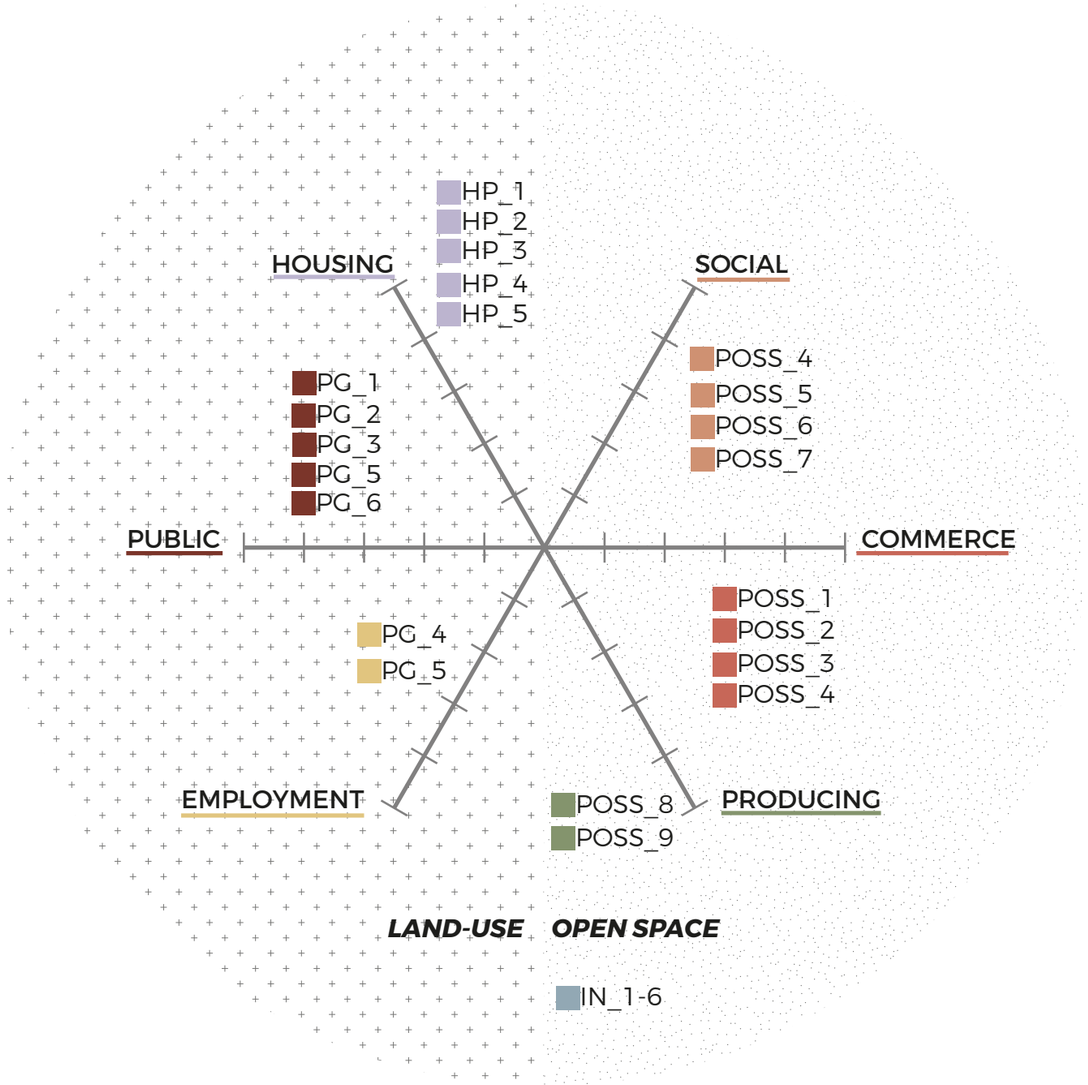


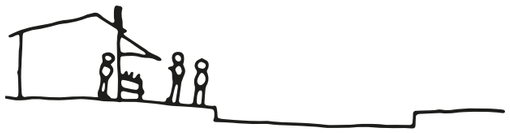
figure 72. Ordering of the principles (by author)

POSS_1 Active sidewalk

The emperical data shows that the sidewalk of major streets is used for many purposes. Most lively. So to accommodate more people and more activity, the principle states to widen the sidewalks along major roads. The relation between the sidewalk and the ground floor is essential, active plinth is required along the main streets to create productive sidewalks. (PPS, 2018).

Goal: increased access to local income generation

Sidewalk (The CityFix, 2018)



Principle drawing

POSS_2 Flexible commerce

This principle is focused on creating spaces for commercial use in the open space. This is in line with the many informal streetvendors (listros) observed in the central areas of Addis Ababa. They use whatever space possible to sell products, shine shoes or serve traditional coffee. Spaces will be reserved for this use, mainly on the edges to avoid obstruction of the walkways.

Goal: increased access to local income generation

Shoe shiner, bkpk.me

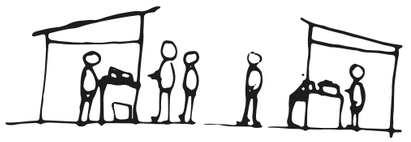
Principle drawing

POSS_3 Fixed commerce

In line with the previous principle to provide spaces for commercial activity. This principle states that they have a more formal character by providing basic structures like a table or a market stall.

Goal: increased access to local income generation and social

Market at Bethel (by author



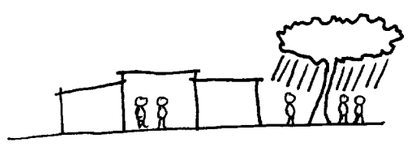
Principle drawing

POSS_4 shelter attracts activity

Shelter of any kind, tree canopy, pavillion, bus stop, provides more comfort for a public space. Comfort is needed to attract social and commercial activity. In the case of Ethiopia, shelter is needed the whole year due to the strong force of the sun and the heavy rains during the rainy season (June till August). A large shelter can also accommodate diverse income generation acitivities and larger events like wedding ceremonies.

Goal: increased access to local income generation and social

Community center (KDI, 2018)



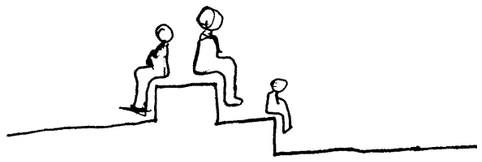
Principle drawing

POSS_5 (secondary) seating

Not only benches to sit on, but also steps and other elements of the built environment. Based on the research by Whyte (1981). For instance an concrete element for coastal defence in Mumbai. Attracts social and commercial activity.

Goal: increased access to local income generation and social

Marine Drive (scroll.in, 2018)



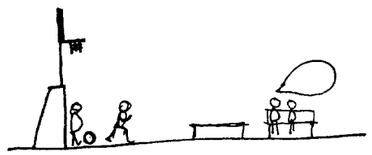
Principle drawing

POSS_6 Recreative sports space

Outdoor excercise. Ethiopia is a runners country, most wellknown is Olympic winner Haile Gebrselassie. Many Ethiopians see running as a way to escape poverty. Can diversify a public space if it is also used for sports in many ways, football pitch, running track, outdoor excercise facilities. Example of Meskel square which is a running paradise in the early mornings and used by many others during the rest of the day.

Goal: Increased access to social

Meskel Square, central Addis



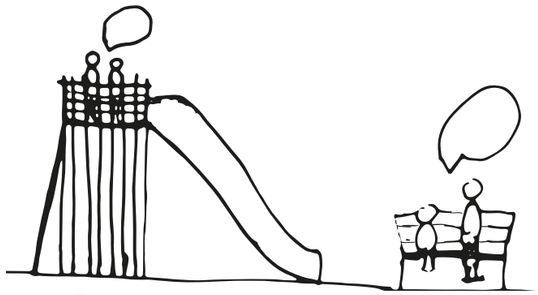
Principle drawing

POSS_7 Playground

Following the previous principle, this principle advocates for playing environments for kids, that in the same way become important social spaces for the respective parents. Playgrounds can be small as the refernce of the Kibera Public Space project shows.

Goal: increased access to social

Play structure (KDI, 2018)



Principle drawing

POSS_8 Communal agricultural

To use the potential of open spaces for productive purposes, communal agriculture is introduced. The rich soil and good climate can be used for agricultural practices on larger scales within sefers. Some households perform private agriculture in their own compounds, but can be extended in the open spaces in the sefer. To provide employment.

Goal: Increased access to local income generation

Agriculture (KDI, 2018

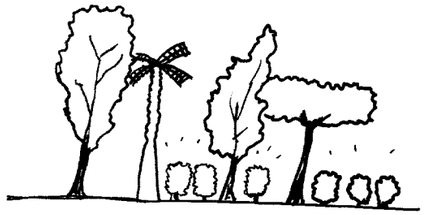
Principle drawing

POSS_9 Productive forest (agroforestry)

Restoration and protection of endangered trees and coffee plants, also for income generation practices. Tree plantations for timber, that can be used for the construction and maintenance of dwellings.
Shade grown arabica coffee (phys.org, 2018)

Goal: increased access to local income generation

Agroforestry - (BreedCAFS, 2018)



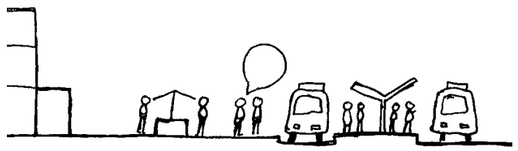
Principle drawing

POSS_10 Transit Node space

Combination of public transport and open space, generates a large amount of flows of people. Therefore following the quote of Whyte (1981) that people attract other people, best suited for commercial activities. Based as well on observations around the major transport hubs of Addis. Example of the cable car netwok and the public spaces around the transit stops.

Goal: increased access to local income generation & public facilities

Medellin



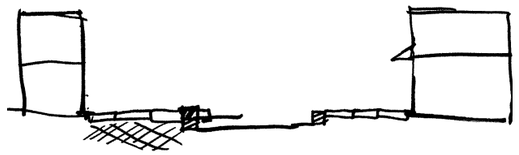
Principle drawing

IN_1 pavement material

Local pavement materials are used as much as possible. To increase the overall accessibility in the sefer, to access transportation hubs and local facilities. even surface

Goal: increased access to

pavement Jemo condominium

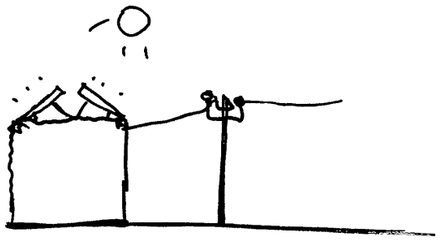


Principle drawing

IN_2 Back-up service provision

Re-using shipping containers for energy storage within the sefers. Due to the fact that Ethiopia is an importing country, many containers are left being used only once. Can be adapted to store energy within neighbourhoods. To serve as a back-up when the main energy provision fails, which happens a lot.

Re-used container (DesignIndaba)



Principle drawing

IN_3_Watermanagement

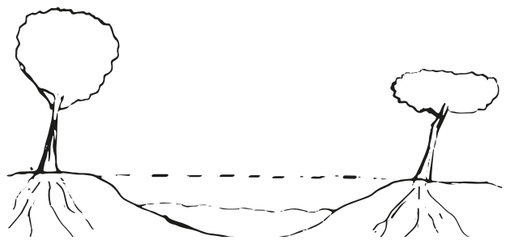
Hard and soft solutions to deal with the water runoff. The raining season in Addis is about three months, heavy rains occur for large parts of the days. They occur in other periods as well, in the form of heavy rain falls, so streets need to be kept accessible the whole year. Requires water retention areas and conveying the water.

Ditch (UrbanBluegrids, 2018)

Principle drawing

IN_4 Waterbuffer park

Preserving the river and expanding it as a public park, relate agriculture to this park and water provision. Park to highlight the rehabilation of indigenous trees and shrubs.



Reference

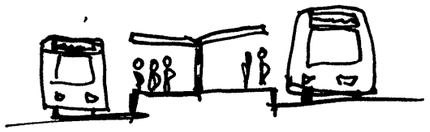
Principle drawing

IN_5_Addis BRT

A Mass Rapid Transit (MRT) system such as a bus system (BRT) to provide affordable transport for the residents of Addis. According to Peñalosa (2013), BRT's are the most affordable of all rapid transit sytems. Much cheaper than for instance light rail and metro The example here of Dar es Salaam (Tanzania). In Africa there are also BRT's to be found in South Africa.

Goal: Reduced travel costs

Dar es Salaam BRT-station



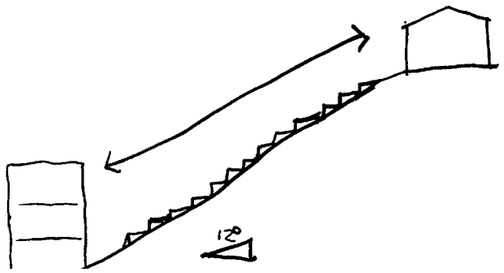
Principle drawing

IN_6_stepsinstreet

The topography of Addis Ababa forms a challenge for many of its residents, decreasing the walking range, thus decreasing accessibility. By applying steps on some of the streets with the steepest incline, the accessibility can be increased.

Goal: increased access to

Medellin (Zdnet.com, 2012)



Principle drawing

LU_1 sanitation building

Sanitation is one of the aspects that sometimes lacks in the Kebele compounds, or for other low-income households. They depend on public sanitation buildings. These units will attract a constant flow of people, being an interesting spatial element for other activity, such as social or commercial. Example of Kibera public space (KDI, 2018).

Goal: increased access to public facilities

Sanitation building (KDI, 2018)

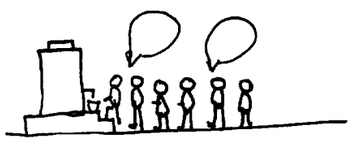
Principle drawing

LU_2 Multipurpose construction

For ceremonies but also for small enterprises and other uses. The structure itself is easy to construct and can be made of recycled material like corrugated iron sheets and eucalyptus timber.

Goal: increased access to public facilities, income generation

Multipurpose building (KDI, 2018)



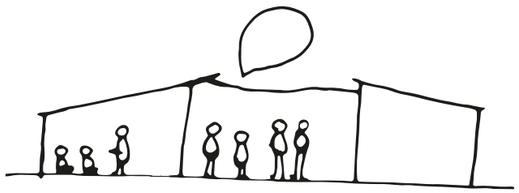
Principle drawing

LU_3 Sefer building

A building that in line with the previous principle accommodates multiple activities. The sefer building will mainly be the seat of the local council. Also the place for start-ups and small enterprises, as well as for local networks of workers, teachers and so on.

Goal: increased access to public facilities, income generation

Pavillion (Laura Straehle, 2018)



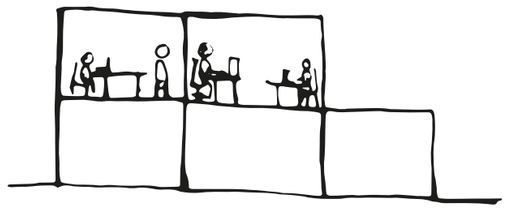
Principle drawing

LU_4 working spaces/ start-ups

Other facilities to provide spaces for start-ups and small enterprises in the form of incubators. Using current incubators like Ice Addis. Re-using the many available shipping containers to accommodate them.

Goal: increased access to local income generation

ICE Addis incubator



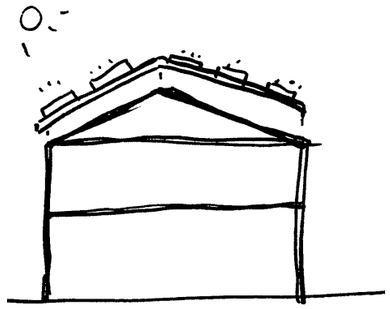
Principle drawing

LU_5 common building redesign

The common buildings in the condominiums are underused, mainly caused by the design. Dark, not flexible and not appropriate sizes. Redesign of the buildings result in a better use for multiple purposes. One use could be the roof, for water storage and pv cells, as back-up when the normal provision of services fails.

Goal: increased access to local income generation

Common building (Addis Streetscapes, 2018)



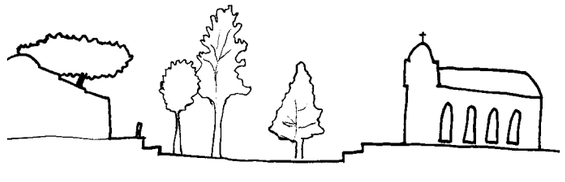
Principle drawing

LU_6 Church compound connection

This principle states that green areas becomes more accessible when combined with visits to churches. The principle shows that an green connection between different church compounds can increase the accessibility to these spaces which play a vital part in Ethiopian daily life. Since the character of these compounds is already green and quiet, this can be extended through the sefer.

Goal: Increased access to social

Beata church, central Addis



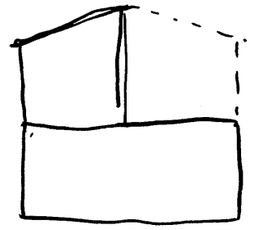
Principle drawing

HP_1 Incremental development

Range of different guidelines for new housing development. Taking into account mainly the incrementality and flexibility that is required. An example of such a project can be found in Cape Town, designed by the Urban Think Tank.

Goal: improved living conditions

Empowerment shack, (UTT, 2018)



Principle drawing

HP_2 low-rise density

The principle follows the design of the Belapur housing in India by Charles Correa. This reference shows how a dense development can be achieved while also creating spaces for income generation and public facilities. As well as the importance of the open-to-sky spaces for India (Correa, 1989) that is comparable with Ethiopian daily life.

Goal: improved living conditions

Belapur (India Fortune, 2018)

Principle drawing

HP_3 Private compound income generation

Use of private compound for income generation in the sense of subletting extra rooms, kiosks and injera baking.

Goal: increased access to local income generation

Courtyard - Weyira sefer

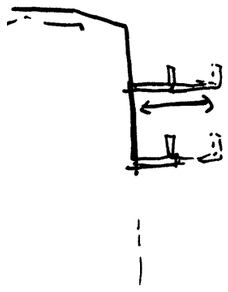
Principle drawing

HP_4 Condominium building redesign

The need to redesing the condominium buildings itself is mainly oriented to create a more flexible floorplan. As well as creating larger private outdoor spaces to accommodate daily practices. Example of a development in the informal settlements of Maputo, Mozambique. Where there is a large private outdoor space created for each dwelling.

Goal: Increased living conditions

Casa Malhodras - Maputo

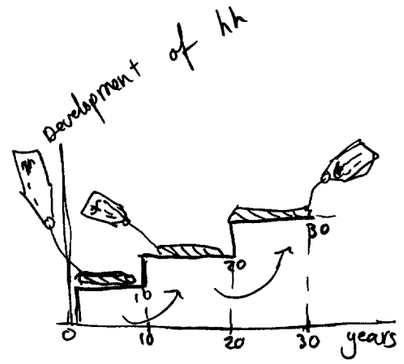


Principle drawing

HP_5 Gradual land lease increase

Land lease price now is fixed, but can be used as an instrument by the government to make revenue for the maintenance of keble houses or infrastructure. The land lease price gradually increases each 10 years matching the rising income of the respective household.

Goal: increased living conditions



Principle drawing

CHAPTER 5: DESIGN STRATEGY WEYIRA SEFER

5.1 [LOCAL] GOVERNANCE

Sefer council

The whole strategy starts with the shift to local governance, something that is missing right now. The Woreda is responsible for the development of the sefer and provision of service, but lacks tools for the implementation. It can also be observed that the residents of the sefer are not represented in the Woreda, missing the opportunity to engage with the local population. The proposal entails a local governance in the form of a council that represents the sefer. This council will consist of many different stakeholders representing all the inhabitants. The central element of this local council is the iddir. Within the sefer there are many iddirs, the presidents of the iddirs together will form the base of the council. This council is added with representatives from the religious institutions of the sefer (both mosques as churches). Furthermore by representatives of the Woreda office, the planning commission and of entrepreneurs and small business owners in different sectors.

The sefer council is mainly responsible for overseeing the implementation of the strategy. The implementation itself will be done by the residents themselves organised in the smaller iddirs. These iddirs are organised around the productive open spaces, where the social part of the POSS is used for the purpose of the iddirs. Depending on the size of the iddir, the space is either a permanent structure, a pavillion, or a space with shading like the canopy of a tree. The organisation of the implementing stakeholders around the open space in their living area makes them responsible for the preservation of the use. In terms of safety against robbery and safeguarding for the future developments. The main council will be accommodated in the Weyira sefer building, which will serve as a hub for the whole social realm of the sefer, including education, networks of workers and small business owners.

figure 73. Organisation of iddir and POSS (by author)

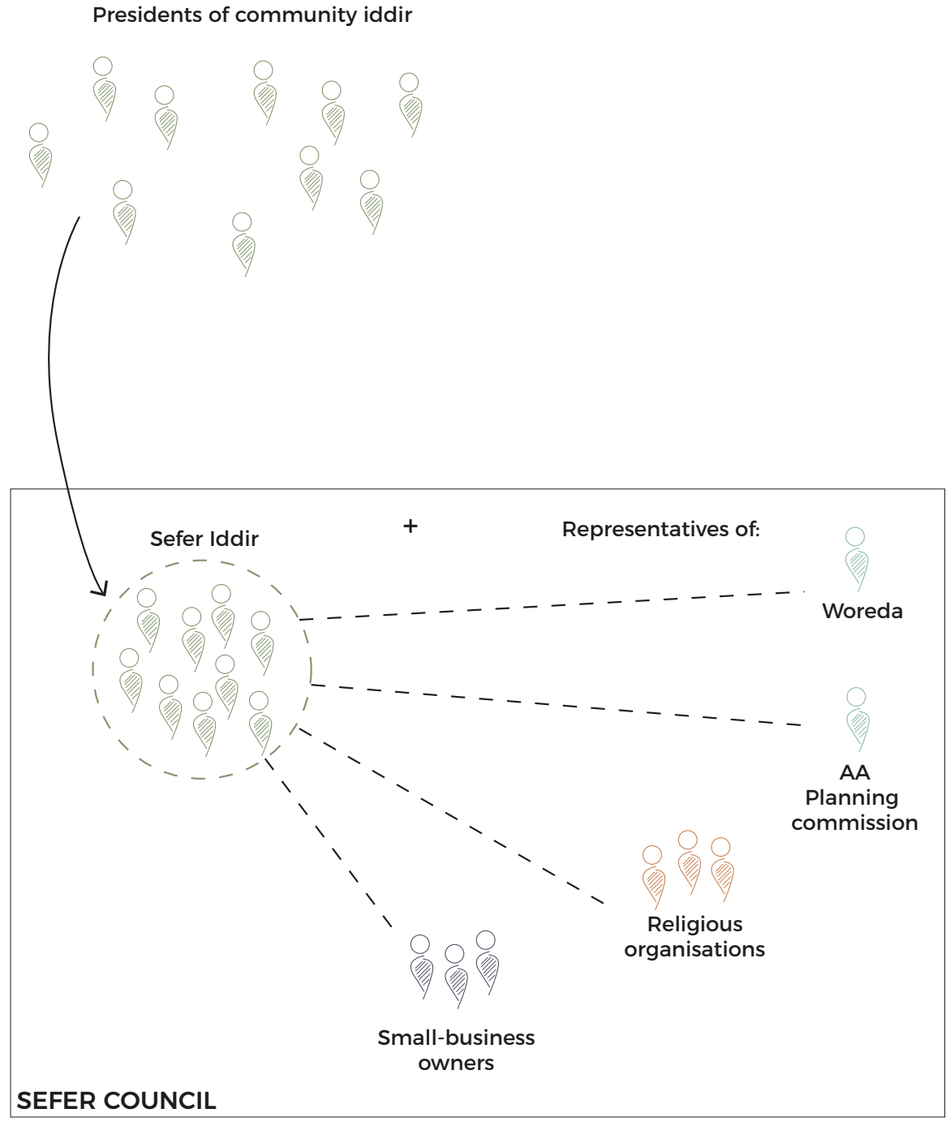


figure 74. Proposal of the sefer council (by author)

Meet the stakeholders

The stakeholders involved in the implementation of the strategy are divided in the 'traditional' public, private and civic sector. The civic sector is then divided into institutions such as the Ethiopian institute of Architecture, Building construction and City development (EiABC), in NGO's such as Orange Corners and in collectives of residents. The last group is traditionally strongly represented in the Ethiopian daily life. Especially during the Junta reign (1974-1991) they were large suppliers of housing (UN-Habitat, 2007). The iddirs can also be viewed as collectives, making the civic sector of stakeholders a strong player in the implementation of the strategy.

The stakeholders are furthermore categorised with aspect to the stage and role of the strategy. And then linked ranked with respect to interest and resources. The resources that stakeholders possess differ per case, some stakeholders possess a lot of knowledge and expertise (i.e. the EiABC) but lack resources like financial means. This example shows the importance of linking the different set of stakeholders (with their different interests and resources) with each other. The main role is for the sefer council, since this council will represent the proposed strategy from beginning to the evaluation and next phase.

The next paragraph will discuss the layered design of the strategy on the level of the sefer. The stakeholders as mentioned here and in the respective diagram will be mentioned with each of the design layers in the next paragraph.

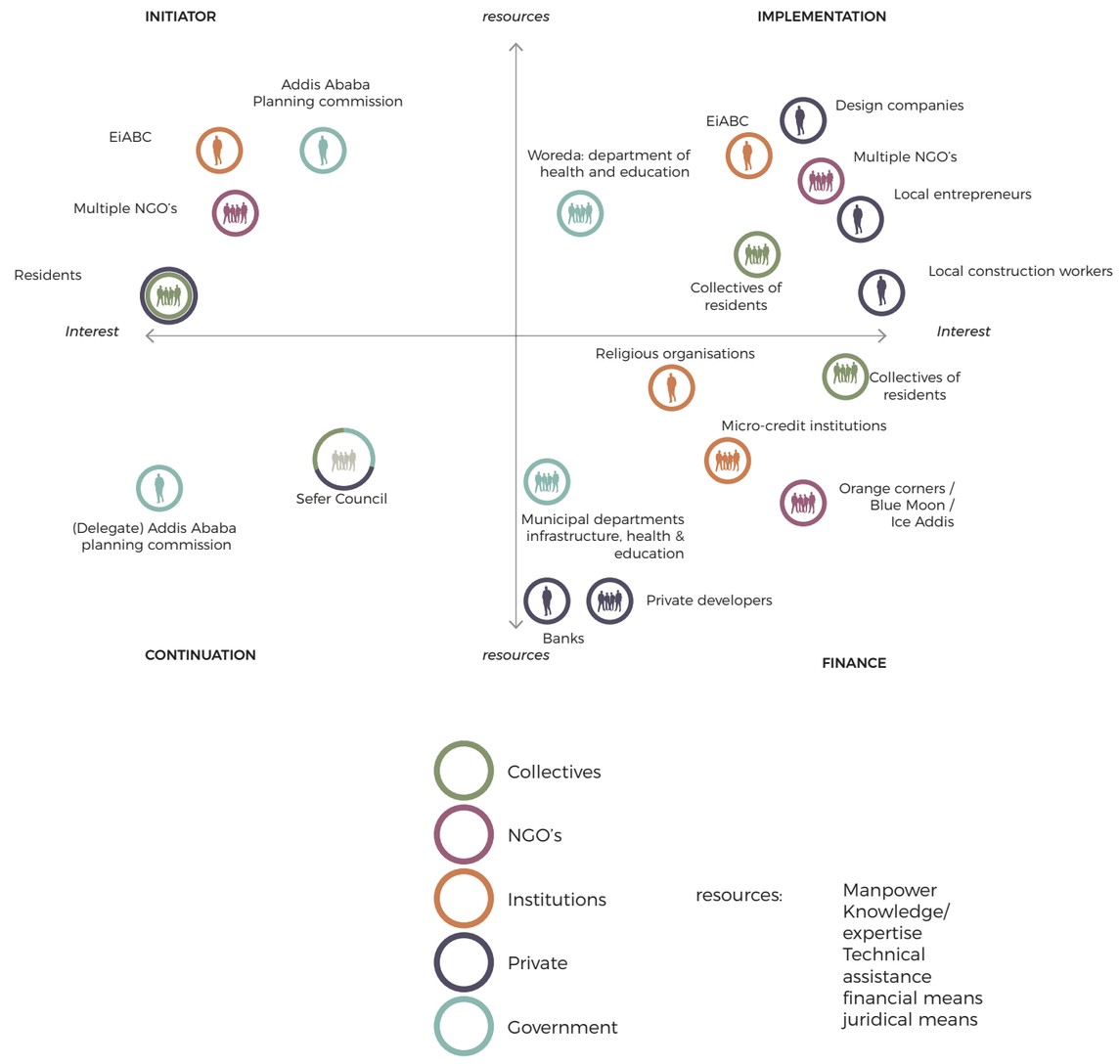


figure 75. Stakeholders in the implementation process (by author)

5.2 LAYERED DESIGN

The strategy starts with the notion that around 6000 new inhabitants will arrive in the Weyira sefer within the next 20 years. They will be mainly accommodated on the open area as well as due to densification. The same layers that structured the analysis will be used here as well. Starting with the POSS layer, followed by the income generation layer, the public facilities layer and finally the housing layer.

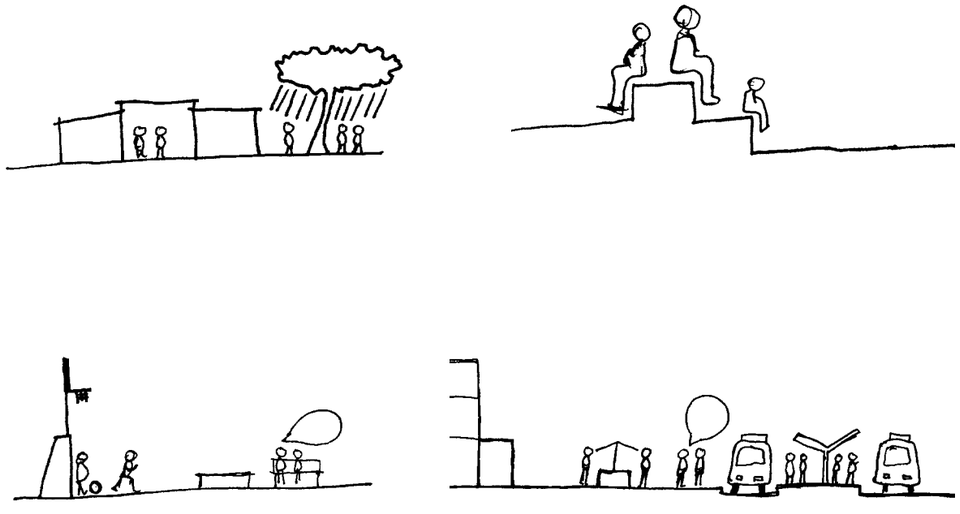
Layer one: Productive Open Space System

The design for this layer entails the open spaces themselves using the typology as described in the previous chapter. As well as new street connections within the system. Finally the transportation network to the surrounding areas via express bus departing from the terminal. As well as a local public transport network using the minibus. The map shows a 200 meter radius around the transit stops.

The stakeholders:

Ministry of infrastructure, the anbessa bus company for the express bus service. The owners and operators of the minibus.
Majority of the work will be executed by local workers and the local community itself.

The relevant design principles:



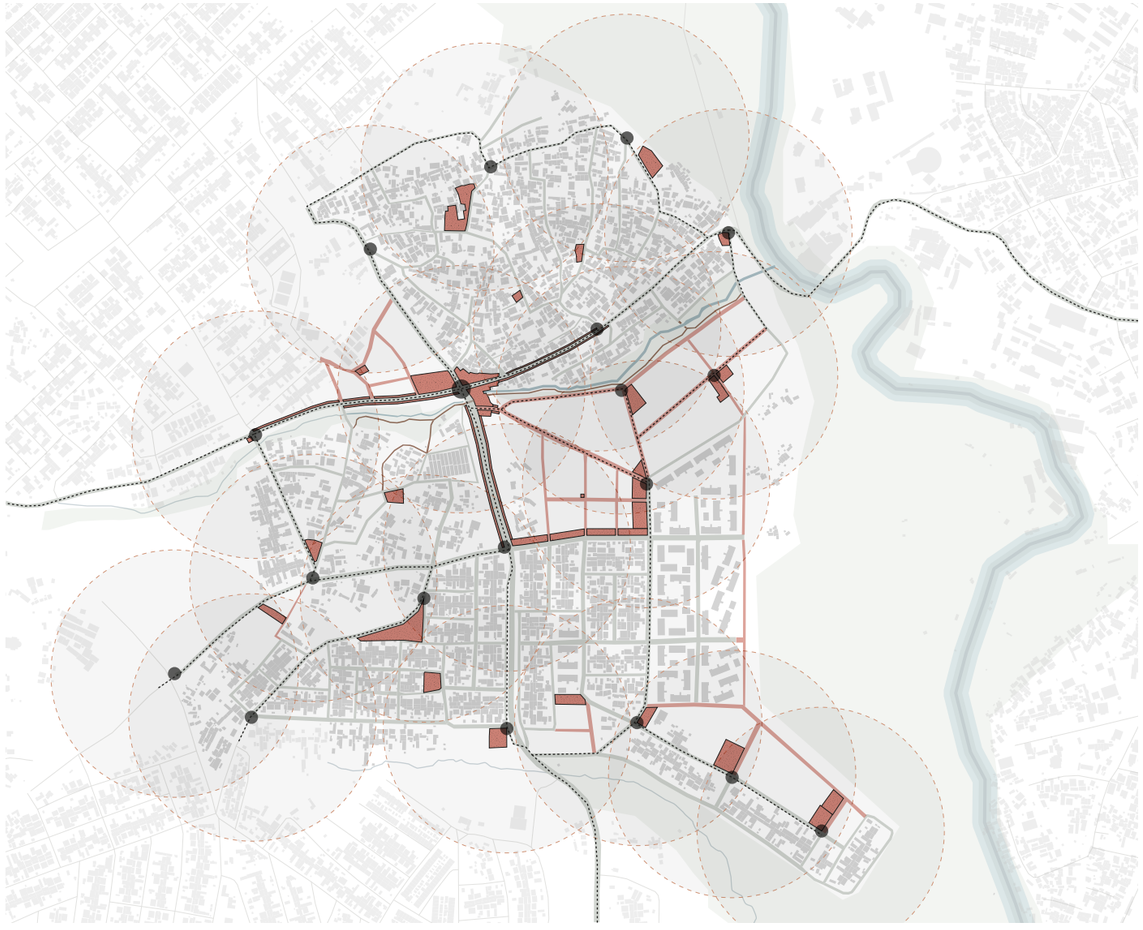


figure 76. layer 1: Productive Open Space System (by author)

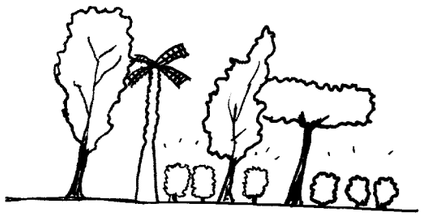
Layer two: Income generation

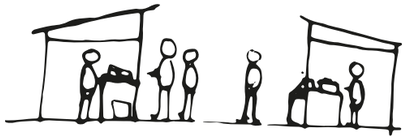
The design for this layer entails assigning the plots directly related to the open spaces with income generation opportunities. This will take place on the open space itself, as well as in buildings surrounding the open space. The income generation opportunities chosen here are based on the open space typologies. So the terminal space for instance shows a high concentration of commercial land-use. The agriculture land-use close to the terminal is used as a main facility for the productive use of the open space for agriculture. This will we operated by the Urban Harvest NGO.

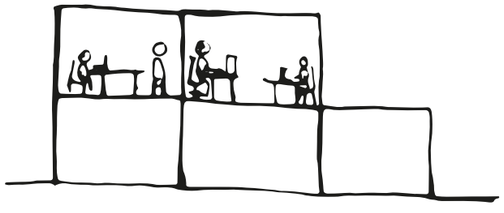
The stakeholders:

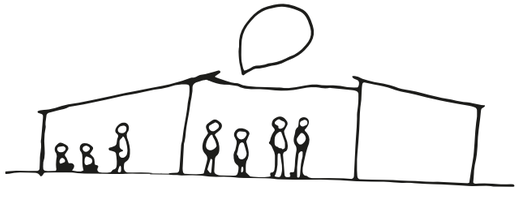
The EiABC university, the government. Orange Corners NGO, IceAddis, incubator. As well as a local network of workers, entrepreneurs. Private construction firms also need to be included for the construction of the buildings.

The relevant design principles:









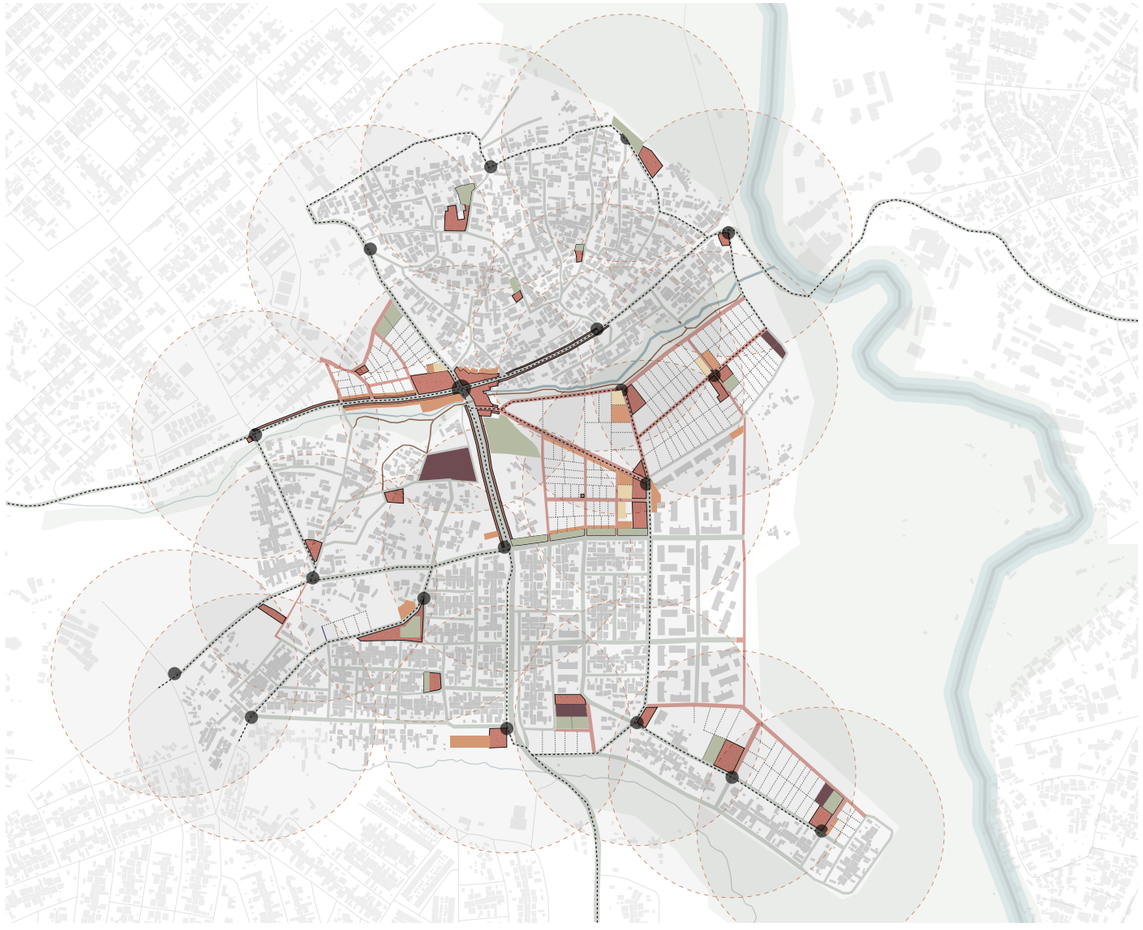


figure 77. Layer 2 Local income generation (by author)

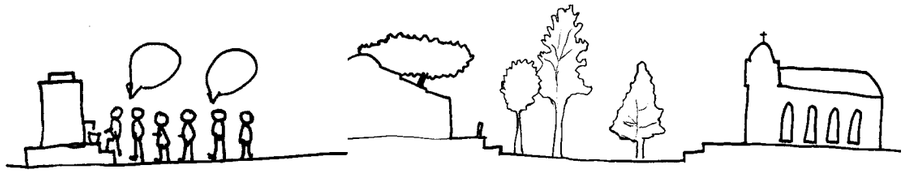
Layer three: Public facilities

The design for this layer entails the allocation of land to primary and secondary schools, as for sanitation units. The secondary schools are located at the public park, close to the terminal. The other secondary school is located in the west of the sefer, in order to be accessible by mainly the southern part of the sefer. The primary schools are scattered over every part of the sefer, to ensure that they are accessible for all inhabitants. Finally the connection between the two churches is ensured by constructing the park from the west to the east.

The main stakeholders involved:

Ministries of health and education. The United Nations, since education is part of the Sustainable Development Goals. The Worldbank for funding.
The important execution of this layer belongs to the local community, also by providing a local network of teachers, medical staff and so on.

The relevant design principles:



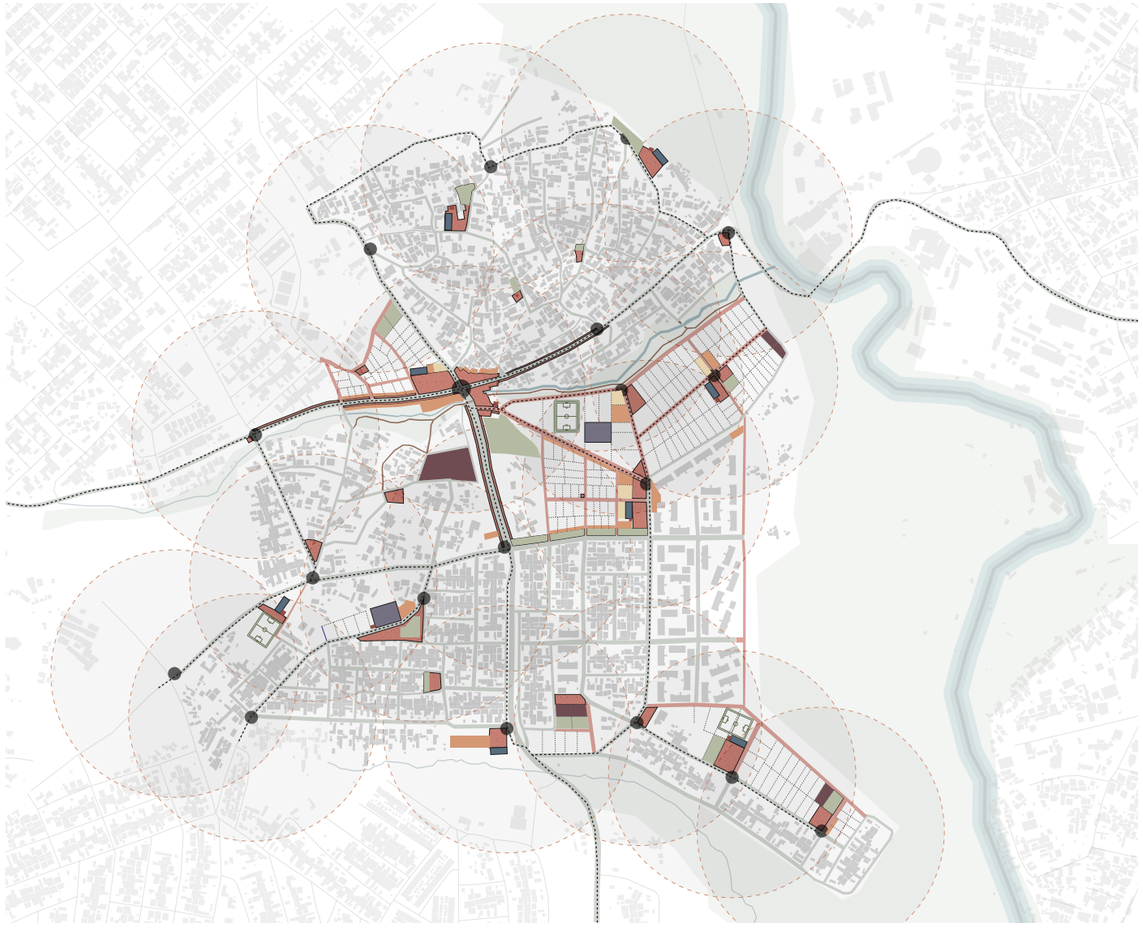


figure 78. Layer 3: public facilities (by author)

Layer four: Housing development

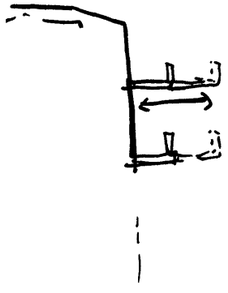
The housing development in the sefer follows principles of incremental references such as the Empowerment shack (UTT, 2018). As well the principles derived from Belapur housing in India by Correa.

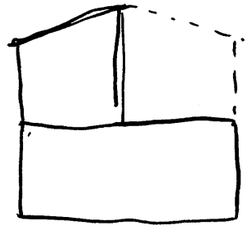
Importance is that first, or at the same time, the open spaces and income generating facilites are constructed. Thus ensuring that the accessibility to local income generation stays the primary focus of the strategy.

The main stakeholders

here are the private developers, social housing corporations. Future residents united in collectives. Construction mainly will be done by a network of local workers.

The relevant design principles:





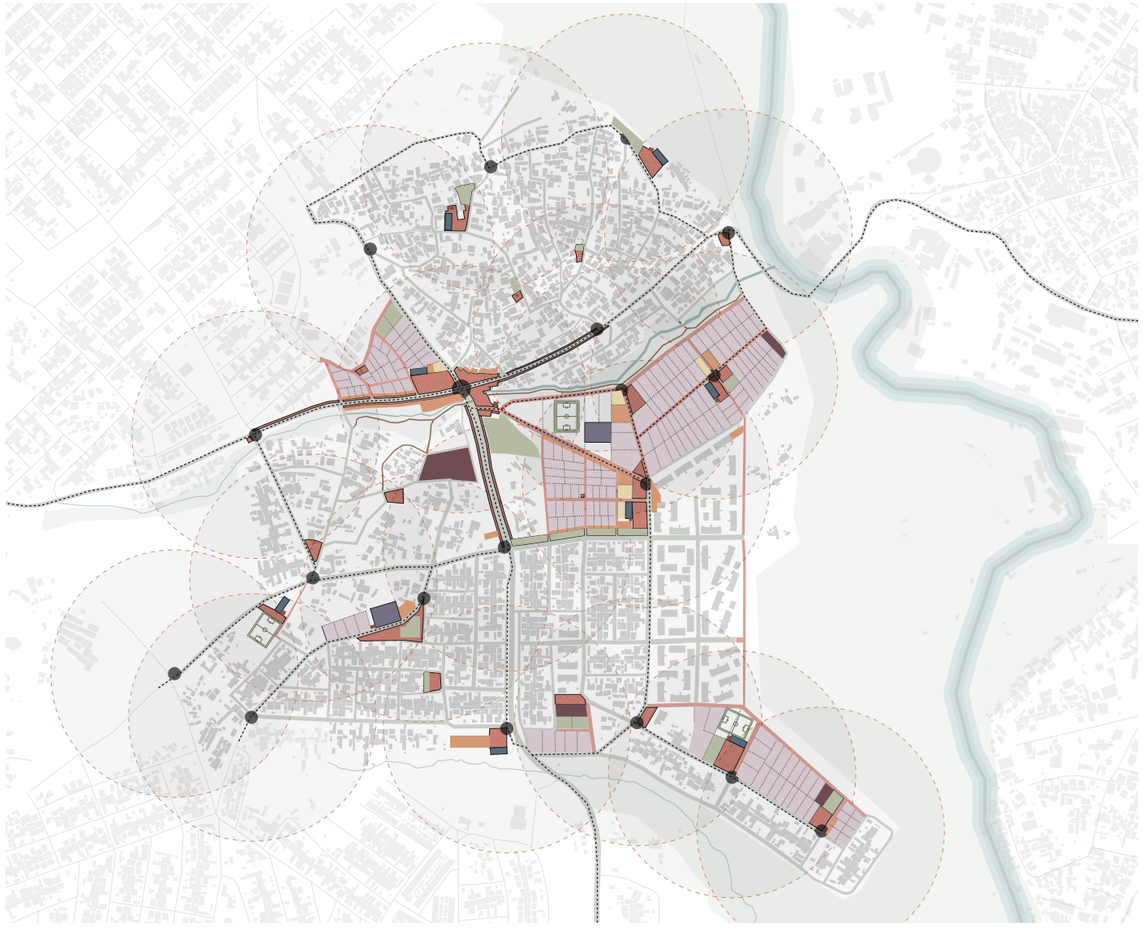


figure 79. Layer 4: housing development (by author)

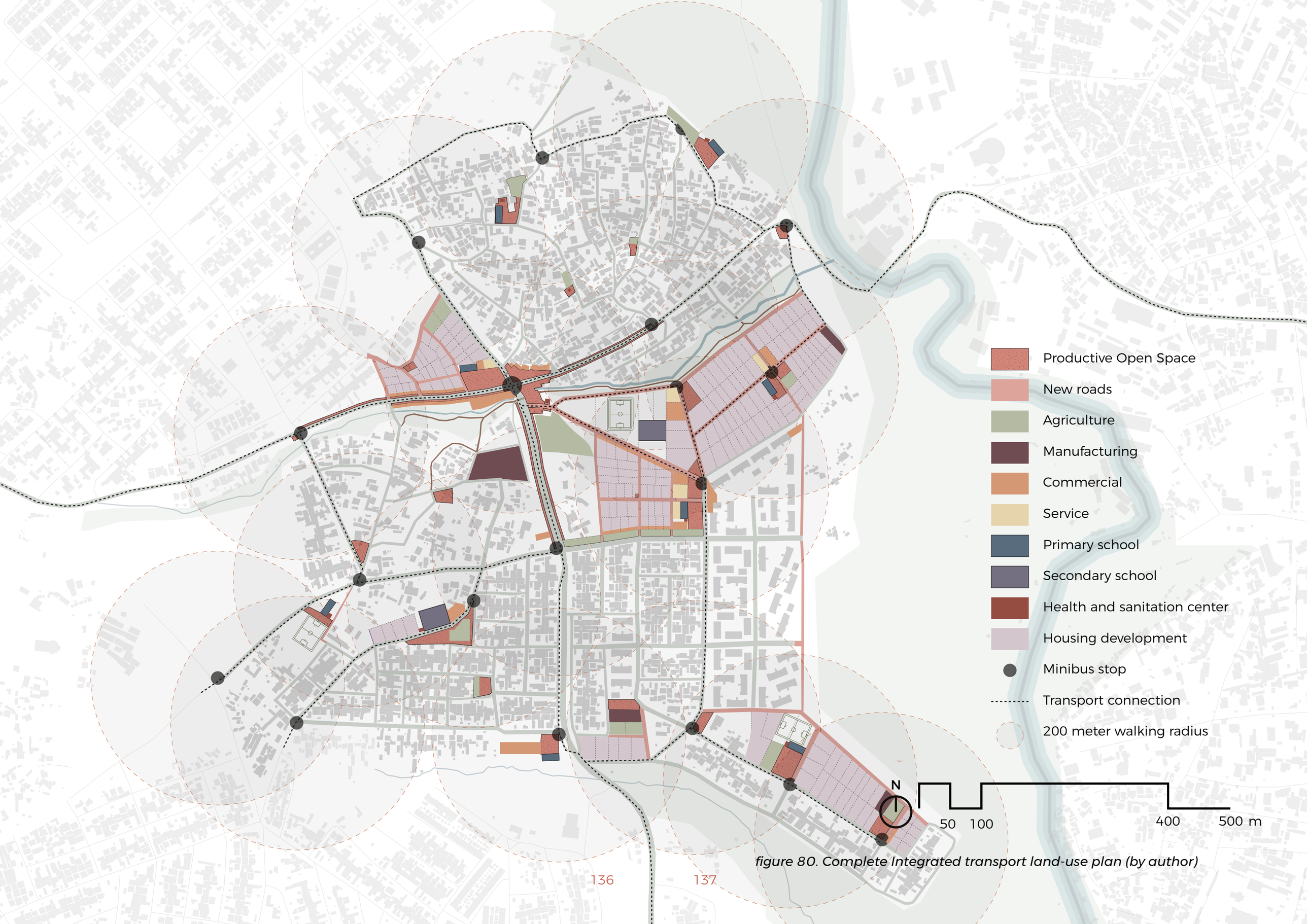


figure 80. Complete Integrated transport land-use plan (by author)

5.3 INTERVENTIONS IN THE SEFER

8:20
Work Betty
@ EiABC

17:30
St. Mariam

19:00
8:00
Haile's Home

8:00
19:10
Betty's Home

8:10
17:15
Bus terminal

figure 81. Overview of the interventions (by author)

Betty's home: the condominium

The design of the condominium has a specific approach compared to the open space typologies. The situation of the condominium prioritises the clear space hierarcy. Therefore the layers used here are different. Though the starting layer is the POSS. A sun analysis study is conducted to identify which places are best suitable for agriculture and where is shading required to accommodate social activity. The spaces with the least amount of sun are either used for parking cars or for daily activities.

The second layers shows the semi private space directly around the condominium building, this space can be used for daily activities. It is separated from the other spaces by vegetation and a pathway. The dark grey shows the spaces that can also be used for this function, mainly for the inhabitants to do laundry.

The final layer shows the parking spaces at the edges of the condominium site. These areas are the least favourable for agriculture or other use. Because of this organisation of space, the communal space can truly and only be used by the residents for commercial, producing and social activities.

The common buildings will be redeveloped by the residents committee to open buildings with moveable partition walls. The roof will function as rainwater collection as well as a electricity production.

The condominium buildings themselves need to be adapted, especially the roof, waterproofing the hallways. For new condominium complexes, need to either incorporate wider kitchens and bathrooms, and/ or provide wider hallways or balconies to conduct daily activities there. As well as storage units incorporated.

figure 82. Current situation of the condominium site (by author)

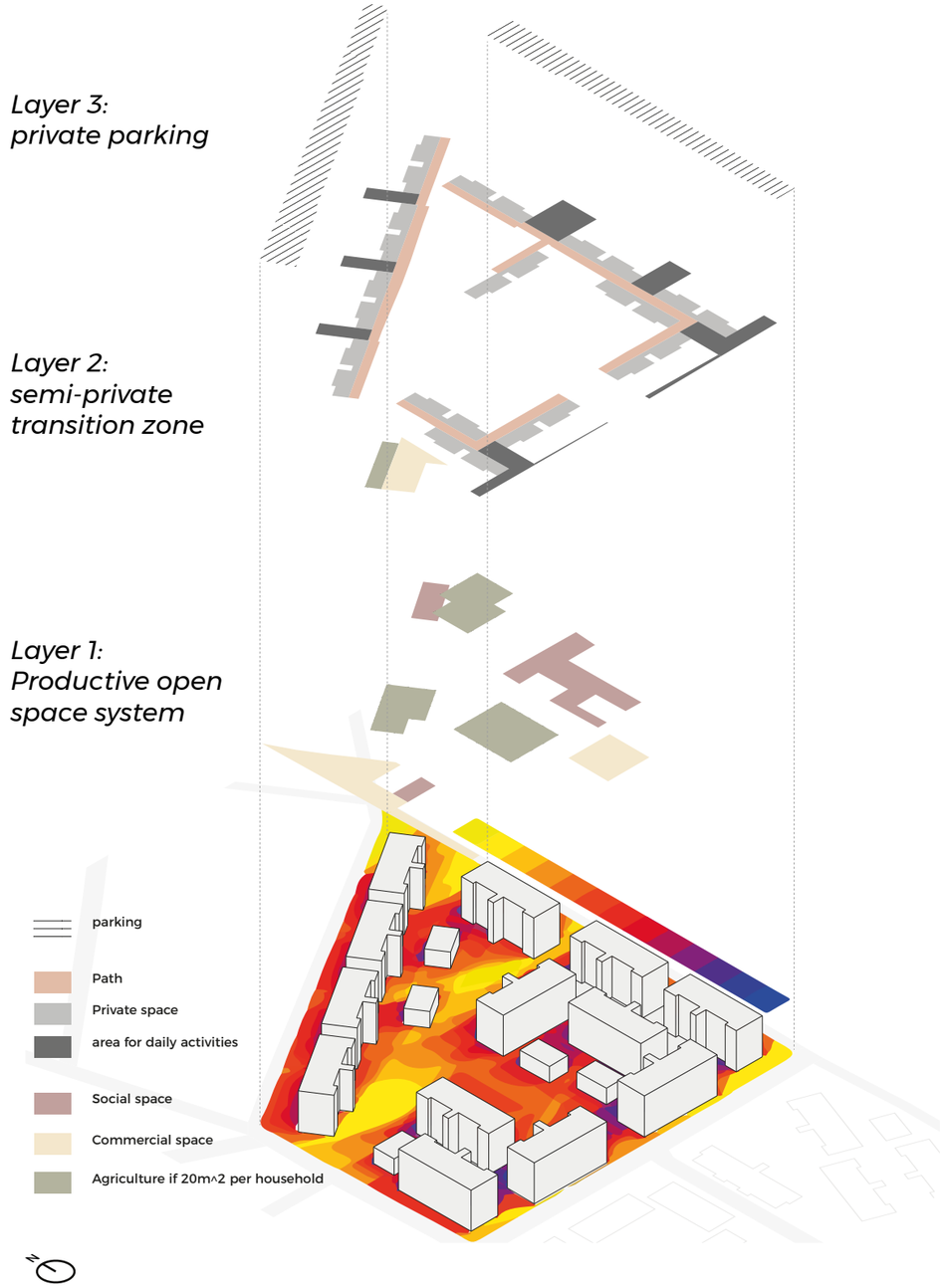


figure 83. Layered design condominium (by author)

Resulting in a condominium site that bursts with activity on the inside. The patches of agriculture will be managed by the residents themselves, generating income along the way. The shelters can be used for different purposes, such as ceremonies, by all the residents of the sefer. Because of the new minibus stop, the place is truly embedded into the rest of the sefer. Water will be harvested via the roofs of the flats and by the roofs of the common buildings. The water will be either used for the agriculture or to serve as a back-up when the municipal water provision fails. In future stages residents will be able to deploy PV cells on the roofs of the buildings to generate electricity.

figure 84. Impression of the condominium open space (by author)

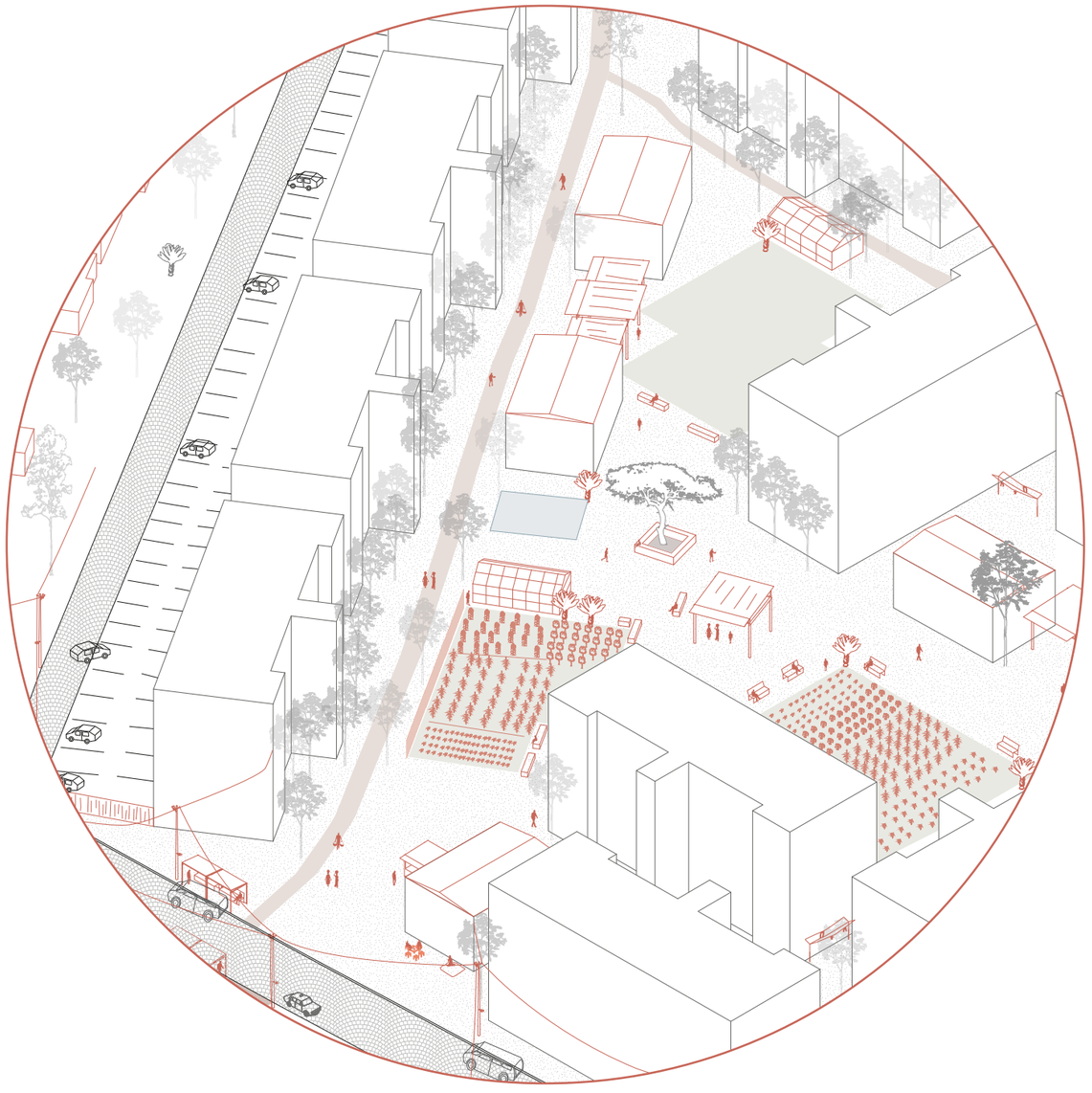


figure 85. Isometric view of condominium open space (by author)

Development of the new mainstreet

The new road that runs from the terminal towards the condominium will be one of the mainstreets of the sefer. The south side of this street will see a new housing development. The ground floor units will be allocated to commercial use. Kiosks, but also small cafe's and restaurants. Banks. Bigger shops. Butchers, bakeries and so on.

Housing development, for instance incremental housing, experimental housing together with local masons and the EiABC (technical assistance). (see appendix for housing principles).

The north side of the road will accommodate more public functions. One of the secondary schools will be located there. As well as a recycling building, main building for the start of solving the waste problem in the whole sefer (as in the whole of Addis). One building where multiple small and micro enterprises can start as businesses. Finally a sports field will be designed close to the sefer center.

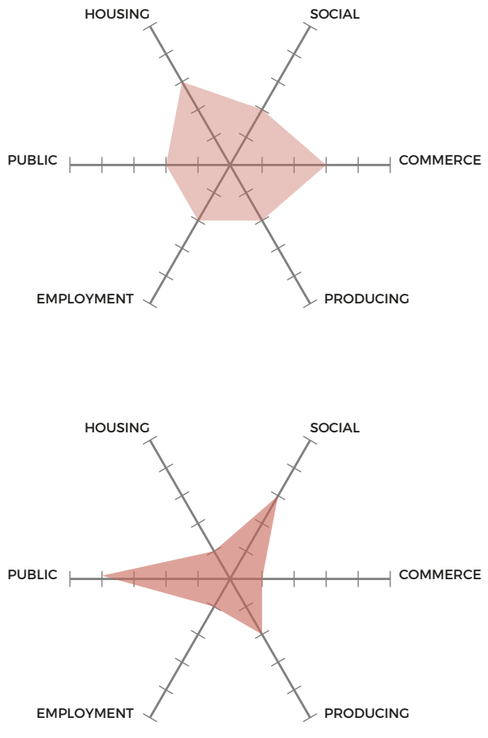


figure 86. Used open space typologies: sub-sefer OS (top) and public facilities OS (bottom) (by author)

figure 87. Mainstreet development (by author)

The Weyira terminal: sefer open space

The Weyira terminal will be the main entry and exit point of the sefer. It will also function as the heart of the whole sefer. Therefore the highest densities of population and jobs will be accommodated here.

The first layer for the design of the sefer OS will consist of the POSS: the open space itself as the sheds for the bus stops. New paths will be constructed along the river flowing to the east. The new mainroad will connect the terminal with the condominium site and beyond. The open space will be mainly allocated to commercial use, providing market stalls and other basic facilities.

The second layer will focus on accommodating employment, especially service and commerce. Agriculture will be placed if possible. At least one area will be used that serves as an example for the whole sefer regarding the agriculture. Network of incubator buildings for different types of start-ups throughout the sefer. This will be the main building, with other smaller ones located uphill, east and west. The buildings will facilitate different sectors, IT, manufacturing, agriculture current incubators in Addis (Blue Moon and others) will initiate this, along with Orange Corners from the Dutch embassy.

The third layer shows the design of the housing that will be developed next to the terminal space. This housing will show a high density.

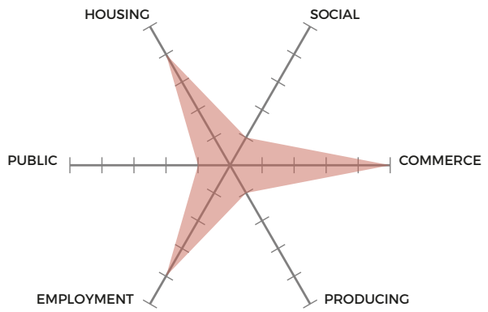


figure 88. The sefer Open Space typology (by author)

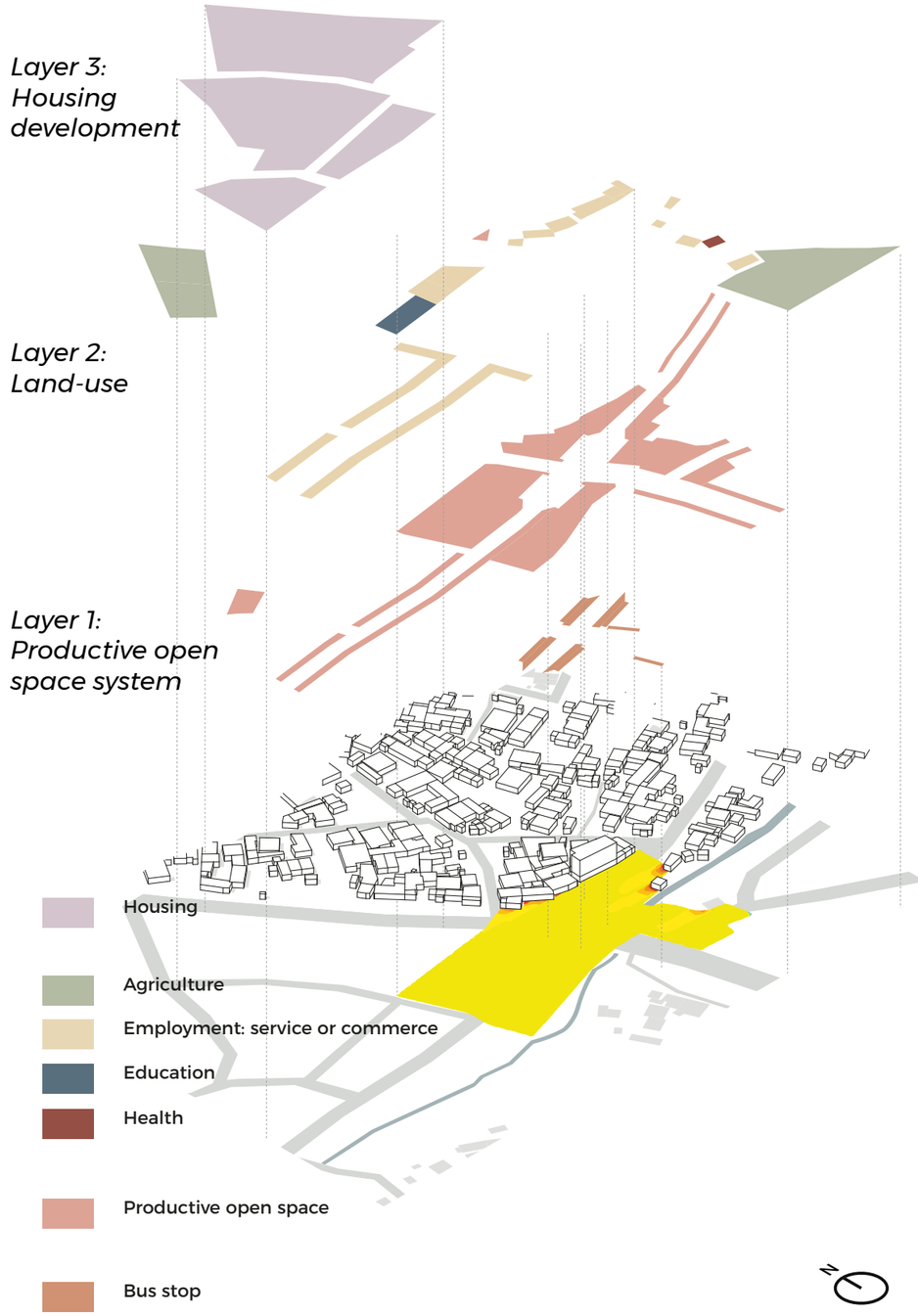


figure 89. Layered design terminal (by author)

Resulting in a vibrant heart of the sefer that is alive with a lot of activity. The accessibility of the sefer center is high, within 15 minutes you are able to reach Tor Hayloch and Ayer Tena. The spaces themselves are alive with a lot of commercial activity catering to the needs of its inhabitants.

figure 90. Impression of the terminal (by author)

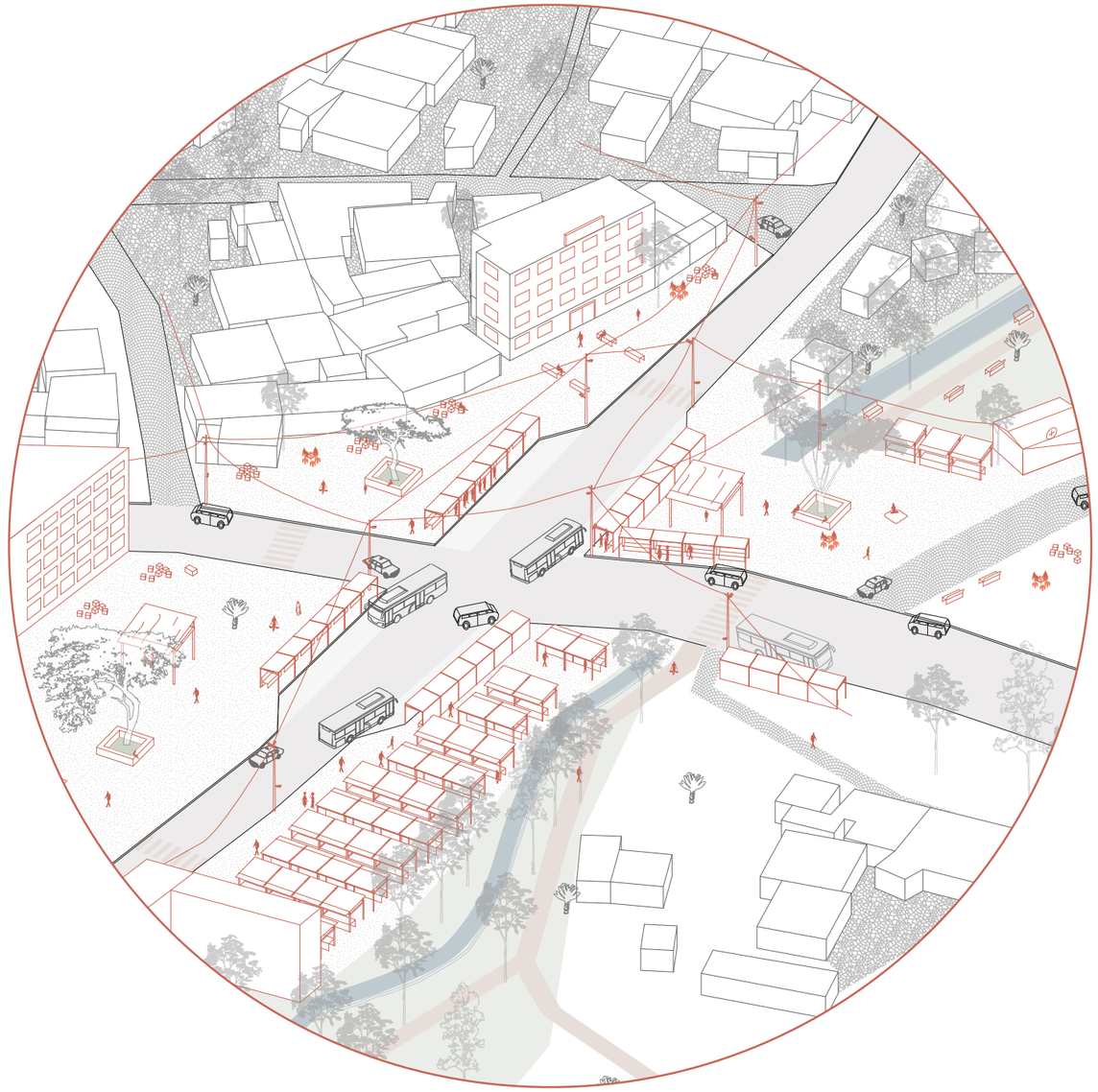


figure 91. Isometric view of the terminal open space (by author)

Haile's home: the community open space

The character of the community area is the community itself. The use of space is mainly for producing, in the form of agriculture. As well as social activity to strenghten local social networks such as iddir. A sunstudy showed which areas are best suitable for agriculture and which areas need shading in order to accommodate social and commercial activity.

The space furthermore is allocated to a primary school building and a sanitation unit. The roof of the school harvests water, which is redirected to the agriculture patch behind it.

The rest of the space is used for commercial purposes, for instance selling produce that is harvested on the agriculture field.

figure 92. Community open space typology (by author)

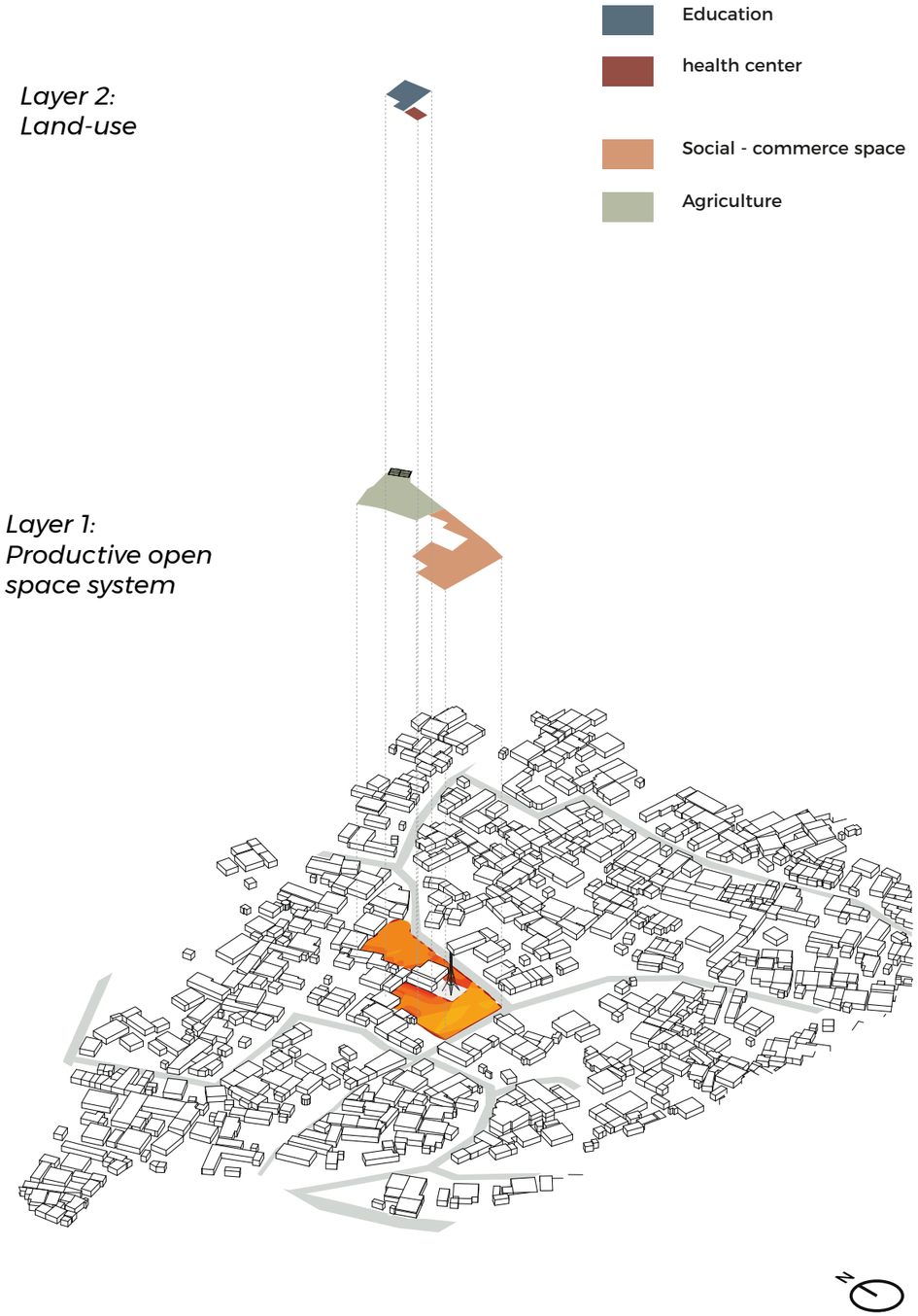


figure 93. Layered design community open space (by author)

Resulting in a vibrant space where the community is really the central focus point. The space in front of the telecom tower is frequented by all the inhabitants that live nearby. It is the central meeting point for the different iddirs and a small commercial space as well. The space north of the telecom tower is used by the women of the households nearby to grow their own vegetables and teff (Ethiopian wheat). All other products that are left over will be sold at the small market or to shops and restaurants nearby in the sefer. The school and the sanitation unit are a welcome addition to the area.

figure 94. Impression of the community open space (by author)

figure 95. Isometric view of the community open space (by author)

5.4 PHASING

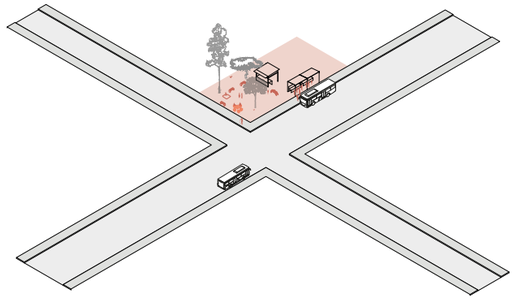
The general sequence for the implementation of the strategy follows the principles as displayed in the facing page (figure 96). The stages follow more or less the layers that were used for the analysis and the design. The first stage states that the POSS containing the open space itself and the connections are vital. Without this intervention, the rest can happen, but will have no positive effect on the access to local income generation. The second stage then adds first income generation opportunities as well as public facilities, school and sanitation unit. Followed by the development of housing around it. The final stage shows the further incremental development of the housing of the second stage and the densification around the POSS. These stages will be applied on areas in the sefer for new development.

The timeline diagram (on the next pages) shows the phasing of the strategy implemented in the Weyira sefer. The implementation follows the same stages but shows some exceptions. Therefore the first phase of the implementation is highlighted, in this phase it is essential to overcome the current deficit. The phase sees the construction of the POSS for the whole sefer, in such increasing the accessibility to local income generation for all the inhabitants. The next phases follow the development of the new areas, using the stages as explained before. Each of the developments will add a certain amount of local jobs, as well as inhabitants. The relation between jobs and inhabitants is displayed in the graph below the timeline.

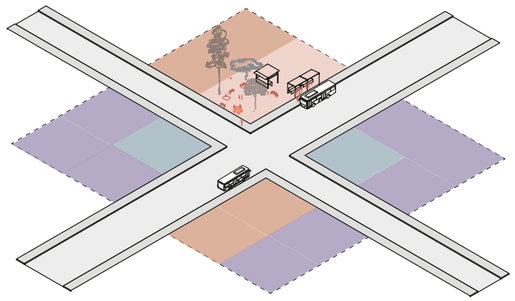
The whole strategy starts with the adaptations in the governance structure. The shift towards a local governance that is embedded in the social dynamics of the sefer makes certain strategic interventions possible.
The connections with the outside areas depend less on this shift in governance, they can stand on their own. But for continuation and implementation better done in collaboration with the local government.

The areas to be newly developed first need to be serviced, will be provided by the government (department of infrastructure). Then later, developed by collectives of residents, NGO's private developers and individuals. Each of those developments show how many inhabitants will be accommodated accordingly.

Stage 1:
POSS and transport stop



Stage 2:
Income generation and facilities



Stage 3:
Increase housing development

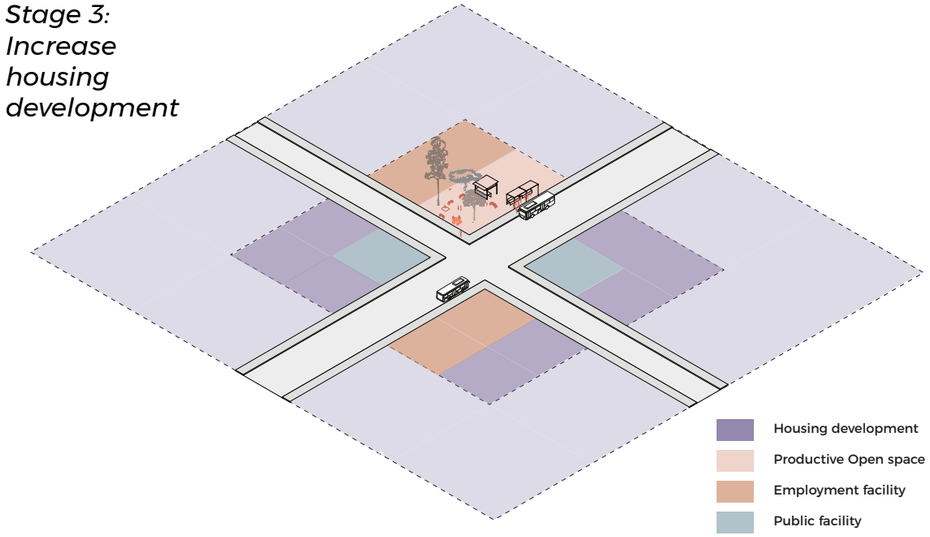


figure 96. Phasing approach (by author)

figure 97. First phase of the strategy (by author)

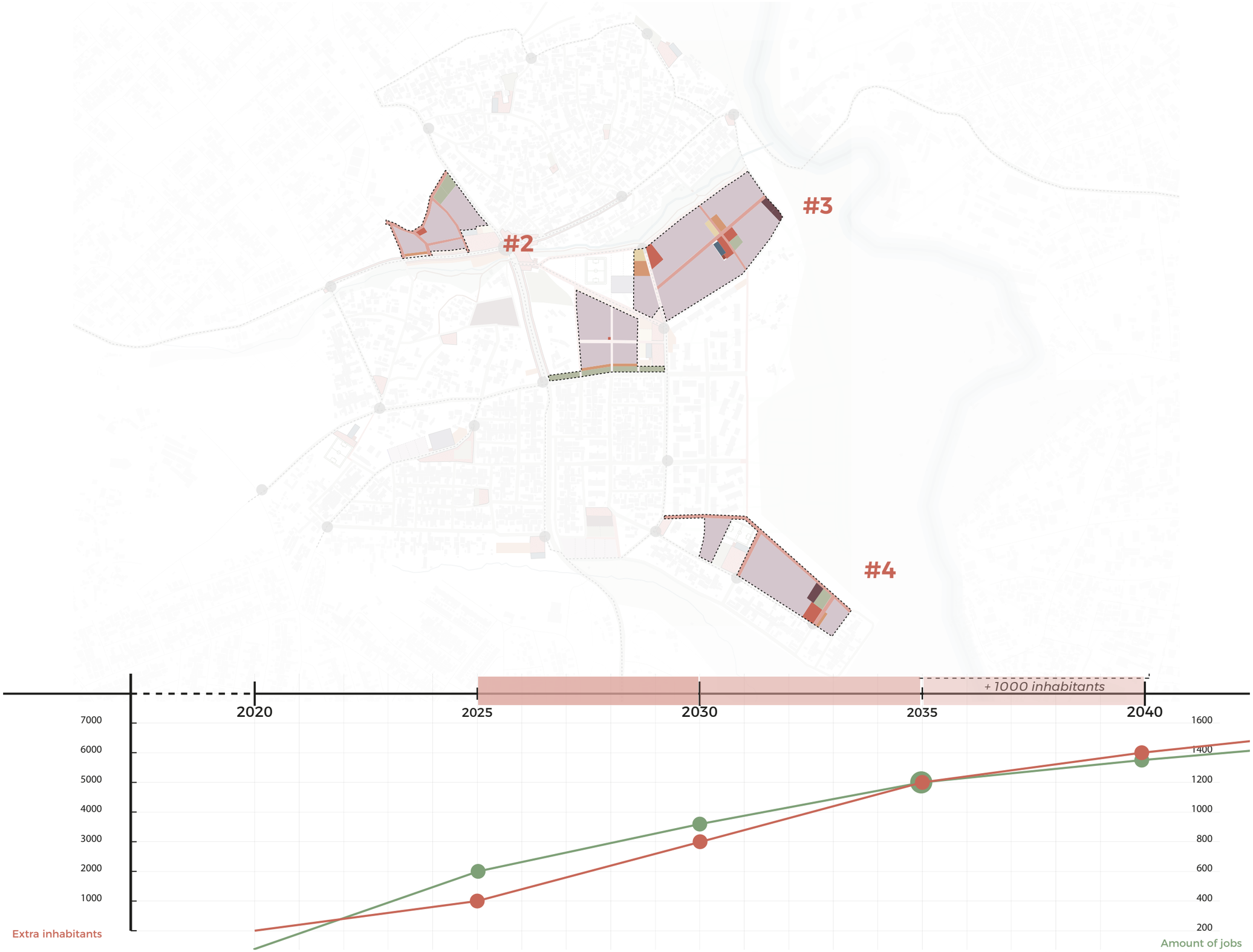


figure 98. Last phases of the strategy (by author)

5.5 PERFORMANCE OF THE STRATEGY

Space requirement principles recap

The performance of the strategy will be assessed by reflecting on the quantified objectives as determined in chapter 2. The starting point for the strategy is the notion that there already is a deficit for the current population. Based on the population projections it is estimated that the Weyira sefer will need to accommodate an extra 6000 inhabitants in the next 20 years. We start by showing the current deficit in terms of area (footprint) and then show for an increase of 1000 inhabitants what that means spatially.

Starting with the current deficit, this can be viewed as the first phase of the strategy (figure 97). As was observed in chapter 4, the lack of access to local income generation practices was the main problem. Caused by both the poor internal accessibility, but mainly by the lack of employment oppportunities within the sefer itself. So the first phase of the strategy will focus on decreasing this deficit of jobs, but also of primary and secondary schools and health centers. And last but not least, the productive open space that requires 20 % of the total amount of space. The diagram (figure 99) shows what this footprint is for each of the objectives and the total space requirement of 24.012 m². At the starting point of the strategy there is around 140.944 m² of open land available for development. So by only focussing on the first phase of the strategy, 17 % of that land is needed.

But the population of the sefer is going to increase. Here is calculated what it means when the population increases with 1000 inhabitants. The space requirement is calculated for income generation opportunities, public facilities and for housing. The starting building footprint is based on 18.75 m2 per person, derived from traditional housing patterns in Addis Ababa. For each increase of 1000 inhabitants is another 17 % (24.264 m2) required of the open land, resulting in the total consumption of the available land just before 5000 inhabitants are accommodated.

The calculations as shown here can be seen as parameter that can be tweaked in order to achieve the objectives as determined in chapter 2.3. The followin section of this paragraph will show what the actual space footprint is of the four layers by using Rhino3D and the grasshopper plug-in. The results of this analysis will be compared with the main objectives of this project.

Current deficit =

1574 jobs	15.740 m²
7 primary schools	1.750 m²
2 secondary schools	2.400 m²
6 health centers	120 m²
0 dwellings	0 m² +
	20.010 m²
20 % Open space	4.002 m² +
total	**24.012 m²**

+ 1000 inhabitants =

125 jobs	1250 m²
200 primary students	200 m²
150 secondary students	0 m²
1 health center	20 m²
250 dwellings	18.750 m² +
	20.220 m²
20 % Open space	4.044 m² +
total	**24.264 m²**

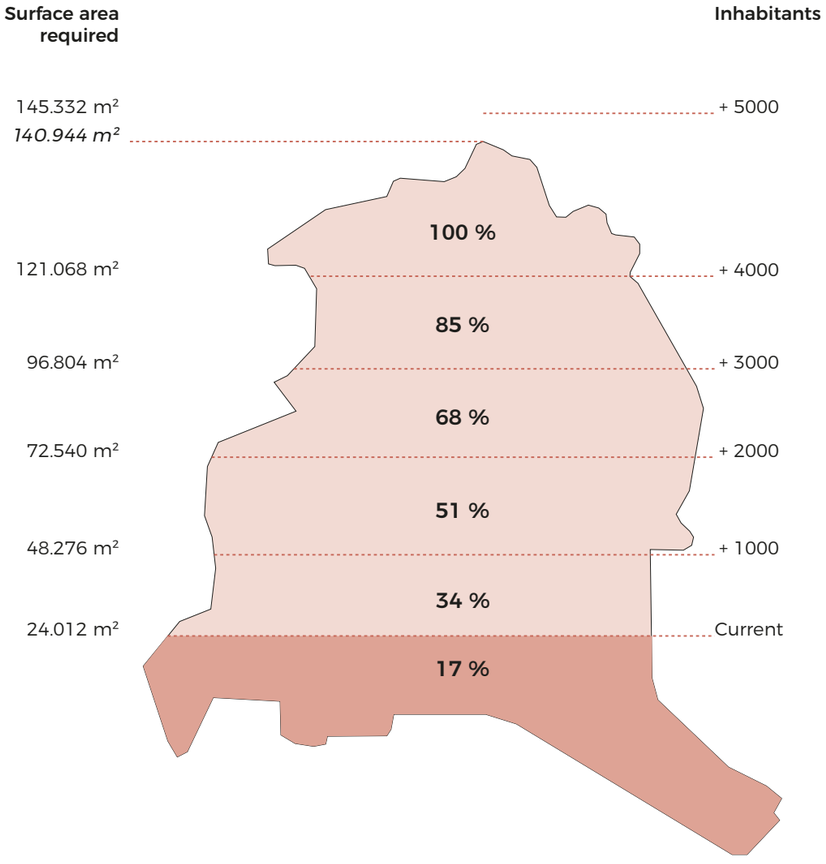


figure 99. space requirements and population increase (by author)

Objectives achieved? (assessment of applying the principles)

So we return to the objectives of chapter 2.3, to complete the assessment of the POSS strategy. The diagram shows the four layers, Productive Open Space System (POSS), which includes the infrastructure, the income generation practices, the public facilities and finally the housing. As shown, and in line with the observations in the previous section, not all the objectives are achieved. First, the POSS objective of 20 % open space is achieved, the travel time could not be verified using the data however. Though expected is that the travel time inside the sefer decreases due to new connections and an internal public transport system. The connection of the sefer with the other areas of the city is likely to increase due to the introduction of express bus services. The introduction of a city-wide MRT-system is in line with the expected reducing of travel costs. For the income generation layer, actually more than the aimed 25% is achieved (38 %), however the distribution does not match with the objectives. When designing the sefer, some places were better suited for commercial IG instead of manufacturing. Caused by the fact that manufacturing combined with a high population density is not desirable due to the nuisance associated with it. For the public faciliteis layer the objectives are achieved. Finally the housing is not achieved when taking 18.75 m2 or 75 m2 per dwelling as a footprint.

In order to achieve all the objectives, some parameters can be changed. all except for the POSS layer, this is the core of the strategy and needs be maintained at 20 %, otherwise the whole strategy is weakened.
For the other layers it means:

- decrease the amount of agriculture and manufacturing jobs (those practices require the most amount of space). Especially important when the population is going to increase more

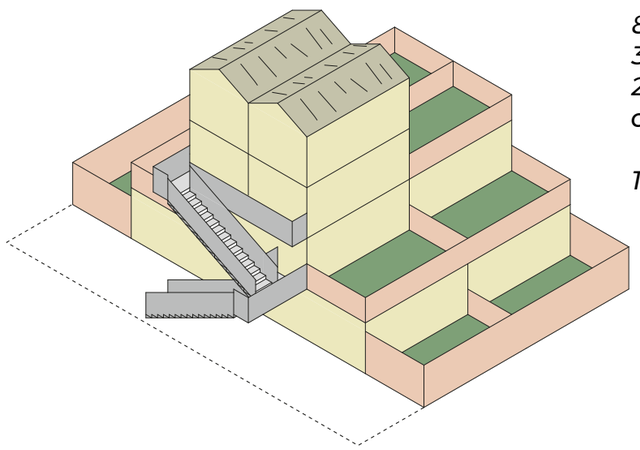
- decrease footprint for public facilities. Or combine facilities. Already the schools consist of multiple floors, but important to be in more places of the sefer to ensure that all schools are within 10 minute walking distance for all the inhabitants of the sefer.

- Or increase the density of housing by building more vertically. Different densities according to accessibility (see the space typologies). Importance of private open space to avoid condominium problems. An alternative typology is shown here (figure 101), achieving the objective of accommodating more than 6000 inhabitants [67.096/10.6 = 6329 inhabitants]

Other alternatives for housing need to be studied as well.

LAYER	OBJECTIVES	SURFACE IN STRATEGY	ACHIEVED	Y / N
POSS	20 % open space / total	151.826 m²	*22 %*	
	1/2 * [current travel time]	-	*N / A*	?
INCOME GENERATION	manufacturing [10m²]: 581 jobs	5120 m²	*512 jobs*	
	agriculture [20m²]: 581 jobs	12756 m²	*637 jobs*	
	service [5m²]: 581 jobs	4502 m²	*900 jobs*	
	commercial [5m²]: 581 jobs	7274 m²	*1454 jobs*	
	2324 jobs within the sefer		*total: 3505 jobs (=38%)*	
PUBLIC FACILITIES	250 m² footprint for 250 primary students (= 2 floors)	2000 m²	*8 primary schools*	
	1200 m² footprint for 1200 secondary students (= 3 floors)	2400 m²	*2 secondary schools*	
	40 m² per sanitation unit	360 m²	*9 sanitation units*	
HOUSING	6000 inhabitants [18.75 m²]	67.096 m²	*3578 inhabitants*	

figure 100. Objectives achieved? (by author)



8 dwellings (56m2)
32 inhabitants
28 m2 open space/hh
compound 340m2

10.6 m2 footprint/person

figure 101. Alternative housing typologies (by author)

CHAPTER 6: DISCUSSION

6.1 RETURN TO THE VISION

To reach a conclusion of the the whole project it is first necessary to compare the POSS strategy with current approaches. Followed by the return to the vision and hypothesis. And finally considerations for further research.

Why and how is the proposed strategy better than the current approaches (including the IHDP and the running Master Plan)?

First and foremost it proposes to integrate on the sefer scale the way people generate income, where they work and their mobility. In other words it tackles the issue of lack of affordable housing by making good accessibility to income generation the first priority for future development.

Secondly that means that a different form of governance is required, a more local approach corresponding with the focus on the sefer. This local governance enables the residents to fully use their social and human capital resulting in a decrease in expenses for the government. Different stakeholders, more private actors but also via Iddir networks the civic sector.

Thirdly, focusing on creating open space system that continues to the private space, resulting in housing typologies that correspond with Ethiopian daily life. Proof of life in the condominiums shows that each household, as is in line with Ethiopian daily life, requires an open space. The less private an open space becomes the better it can be used for income generating practices or for social activity.

Fourth, the layering analysis and strategy ensures the replicability. Compared to the condominium approach it looks at the current situation in the field of landscape, demographics, ethnicity and governance. The broad set of possible design (principles) ensures that different locations follow the same ideology (vision) but have a different result. The IHDP only focusses on providing housing and does hardly look at the current situation.

Fifth, the POSS strategy focusses on what is there such as the landscape and build environment, but also the social dynamics. The importance of informal social networks like Iddir are vital for the implementation of the strategy ensuring the positive and durable results for the residents. Where the IHDP literally destroys what is there, in build form and by relocating its former residents seperately, also the social dynamics.

	CATEGORIES	POSS STRATEGY	CURRENT APPROACHES
ACCESSIBILITY	to income generation	>25 % within own sefer	high travel costs
	to public services	schools + health within sefer	high travel costs
	Integration	housing - employment	no integration
GOVERNANCE	Implementation	local: focus on civic sector (iddir)	top-down, only government + private actors
	use of resources	focus on human capital	lack of financial capital
	Stakeholders involvement	horizontal; all stakeholders involved whole process	vertical hierarchy
SOCIAL	mixity	mixing of income groups	creation of income enclaves
	social sustainability	existing social networks	relocation disrupts social ties
SPACE-USE	productive use	open space for productive use	open space for more buildings
	water resilience	Protective buffer zones around rivers	Protective buffer zones around rivers
HOUSING	typologies	Mixed	Copy paste and modern materials
	private space	creating private open spaces	No private open space

figure 102. Conclusion matrix (by author)

The POSS strategy is a welcoming alternative to the current approaches. It highlights the potential of the human capital of all the (many) inhabitants of Addis Ababa. Furthermore the strategy aims at using

The Productive Open space system as a spatial element to increase access to local income generation can be confirmed based on this thesis. The design of the POSS is highly based on results from empirical research combined with strong theoretical considerations. Thus can be said that designing a Productive Open Space System increases the accessibility to local income generation. Though some issues still remain:

One of the first issues observed is the dependence on a change in governance. The local governance needs to give more authorisation and responsibility to the people themselves. However if the ruling government does not do this, many elements of the strategy are in danger. Furthermore is the current political climate in Ethiopia insecure. A new prime minister was chosen a couple of months ago, while the previous one issued a state of emergency (the second one in two years time). All those national and state politicics will affect the governance of Addis Ababa as well that of the Woreda's.

Second issue observed concerns the limited frame of reference, limited theory about public space use in Sub-Saharan Africa. Many of the design elements are based on these references and theory, completed with empirical dat. The method of data collection can influence these elements, since I am from a different (design) culture.

The third issue regards replicability: much of the specific design and the implications for space allocation are related to current densities, built space and open space in the sefers. This is different across the metropolitan area of Addis Ababa, thus requiring other calculations and for some sefers, other goals. For instance the sefers located in the central areas of the city are more dense and have less open space area, however the accessibility to income generation now is much higher compared to the Weyira sefer. Thus can be said that this strategy is replicable mainly for the sefers located >10 kilometers from the central areas of Addis.

The fourth issue concerns the step from the sefer towards the city region. What is the relation with the surrounding sefers and the smaller and larger centers in the area and how does this relate to the rest of the region. The next paragraph tries to give some insights on this matter.

figure 104. Return to the vision the POSS (by author)

6.2 REGIONAL DREAM

The example of the Weyira sefer has shown that it is essential to provide opportunities for income generation within the own sefer, and the sub centers surrounding the sefer. The need is there to create more centers for employment, as alternative to the central areas of Addis Ababa. The Weyira sefer of course does not stand alone. It is surrounded by other sefers, with similar and different issues. The ethnic backgrounds differ, income status, but also the topography for instance. Though the sefers all have in common that they are linked to a center nearby. In this case the Bethel junction. This small center in the western Addis shows a high concentration of jobs, activities and services. The clustering of the sefers with this small center is the first step. Followed by the clustering of this agglomeration with others around the mayor urban sub-center: Ayer Tena. Thus forming the western cluster that is shown here (figure 105). For each of the sefers, the Ayer Tena center is easily accessible and provides a lot of jobs next to the local jobs that are present in each sefer. Thus forming a strong network of sefers and centers with a high accessibility to local income generation.

The city of Addis Ababa is way more than only the western part. The city region consists of diverse areas with their specific characters. The central area Piazza, Merkato and Meksiko see a large number of historical sites and government buildings. The Bole area is the 'modern' center of the city and the upcoming middle class. This is where all the fancy malls and nightclubs can be found. But it is also home to the airport, a major job concentration for that cluster as well. The south, Akiki, shows a higher concentration of industrial jobs, while the east, Ayat, will develop more manufacturing sites. So the need is there to conncect all these diverse parts with eachother. BRT-lines will be constructed to especially link the large centers. So creating the line Ayer Tena - Meksiko for instance: a 15 minute busride (now more than one hour). The BRT network will service highspeed center-to-center busses, as well as busses that stop on smaller centers in between.

Final development of the city region follows outside the border of the autonomous state. Towards the new train station and agricultural hub, or towards the larger industrial plants further in the region. Even the connection with Adama, 90 kilometers south of Addis, becomes a potential when the new trains are running.

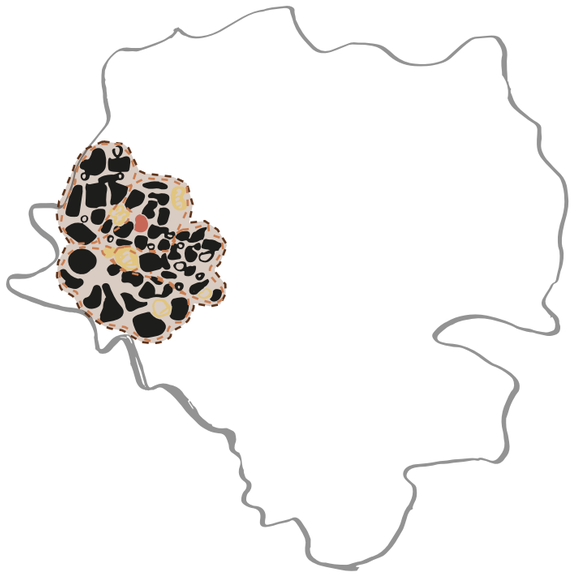


figure 105. First cluster of regional POSS development (by author)

figure 104. Connecting the first cluster with other clusters (by author)

6.3 CONCLUSION

Finally we arrive at the conclusion of this thesis report regarding the spatial integration of income generation and housing. The journey has taken us from the metropolitan area of Addis Ababa, through the sefer, the neighbourhood and back via the sub-city to the city region again. It has shown that there is a clear need to accommodate the future inhabitants, in such a manner that they have access to income generation. Be it in the form of a workshop space nearby, a hole-in-the-fence for commerce or a office job in the downtown area of Bole. All of these job locations haven in common that they require a good accessibility. Here as well this has many forms, walkability within the sefer, a public transport network within the sub-city and high-speed bus services between the largest nodes of Addis Ababa.

We see that the daily life of Haile's family and Betty's family now is focused on the sefer itself. The strong social networks in the sefer support every resident and enable the growth of each family. As more and more inhabitants arrive to the Weyira sefer, the sefer becomes more diverse along with it.

Life goes on in the buzzing metropole of Addis Ababa, its residents have enough worries on their own. Surviving each day, making sure that there is injera on the table when life becomes harder and more expensive. With every added individual, the pressure on the already tense city increases. But also the potential that this individual brings, a potential for growth for all the inhabitants of Addis Ababa, the new flower that is ready to proudly show its colours to the world.

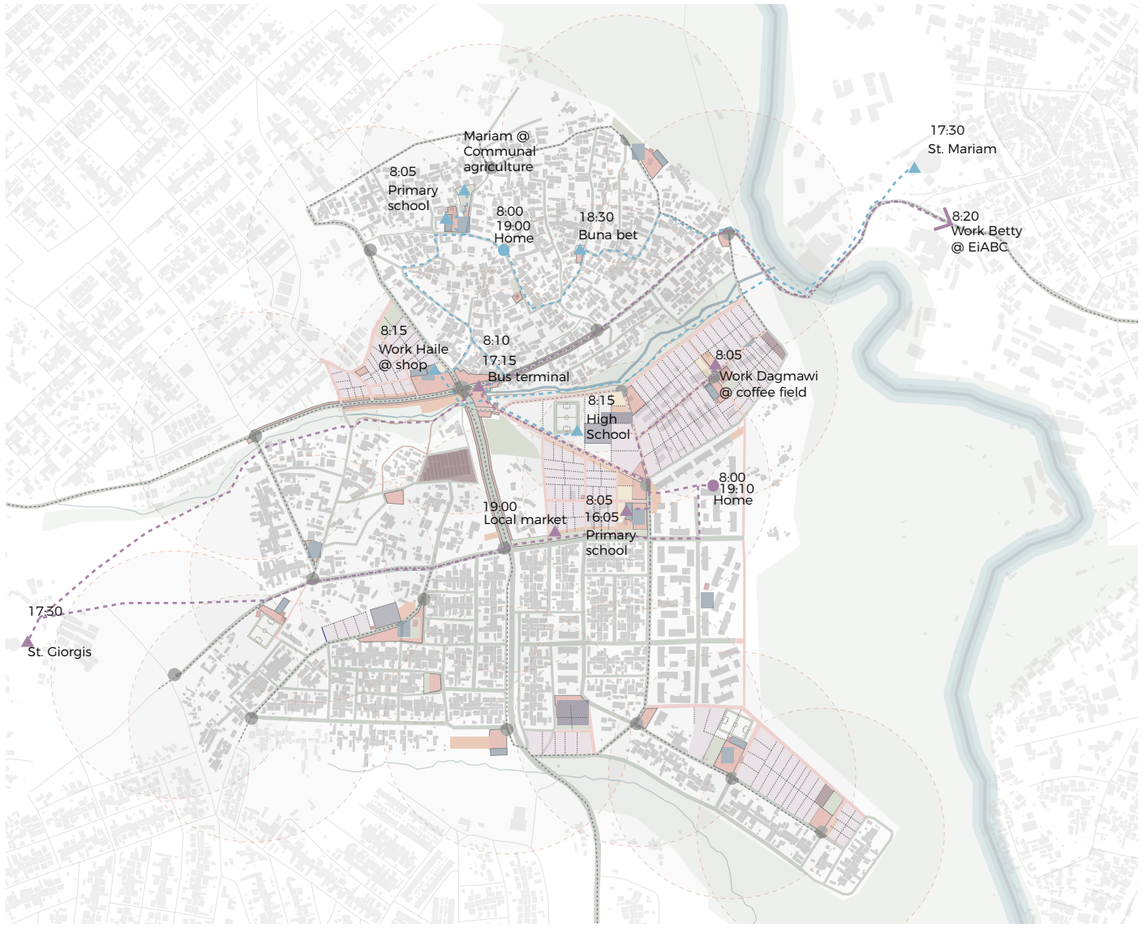


figure 105. Daily life trajectories after implementation (by author)

6.4 REFLECTION

When I arrived at the Bole international airport of Addis Ababa almost all research that was done before the fieldtrip needed revision. The differences between the city in numbers, statistics, pictures and maps cannot be compared to the total package of sensorial experiences of the city. One of the most striking observations was the amount of people pretty much on every corner of every street. Way more than the official four million inhabitants estimated by the Ethiopian government. An observation that was confirmed during the stay by multiple experts. Given these realisations it presses even more for strategic interventions aimed at accommodating more inhabitants and integrating the housing with access to income generation.

Coming from a general interest in growing populations and the effect this has on city planning and the daily life of its low-income inhabitants to a design strategy for a specific neighbourhood in Addis Ababa was a long journey. The first months of the research project were dedicated to the theoretical background of informal urbanisation and social mobility. Looking back, it can be said that the research at that time was too general and the scale was too big. The aim was to construct a tool to identify locations in the metropolitan area of Addis Ababa where densification should happen and the small-scale design should show how this would happen. However due to the lack of sufficient and reliable data, the tool was not developed as planned. So the goal of the thesis was sharpened to identify how housing and income generation could be spatially integrated. Again, I stayed too long on the regional scale, also caused by the fact that the fieldtrip to Addis Ababa took place in February 2018. The fieldtrip changed almost the whole project again, another neighbourhood was chosen, spatial analysis prior to the fieldtrip needed to be adapted and many new insights and observations had to be considered and processed. All these changes are inevitable in a one-year project and even essential for a good process and product. I learned a lot from all the steps taken in the project, especially from the ones where I, looking back, took too long to draw conclusions and take decisions. I tried to take something from all those lessons and integrate it in the project. And thus, my mistakes contributed something good for the project, as well as for the final products.

The rest of this report will focus on the process of the whole thesis research. It starts with the societal relevance, the chosen methodology and universality of the results. The report continues with the discussion of the ethics and concludes with a discussion about the role of the urbanist.

Societal relevance

The project tells the story of the current rate of urbanisation and the related growth of urban poverty. Because so many people migrate to the city in search for a better life, generating an income within cities becomes the main issue for cities to address. The demand of housing growths accordingly with the influx of migrants. In most countries adding to the already backlog of housing provision. There is a clear need for city governments and national governments to provide housing and income generation (or let people provide the income generation themselves). This thesis zooms in at the two issues addressed and aims at integrating both in the development of extension areas and the redevelopment of current living areas. Conducting research regarding the spatial integration of income generation and housing resulted in design strategies to tackle these issues for future development.

Methodology of the project

The methodology that was chosen consists of spatial analysis, theoretical and policy analysis and empirical fieldwork. The combination of these methods can contribute to a rich research part of the whole project. However, since the research was conducted in an African country multiple issues were observed regarding the reliability of the methodology.

Firstly, the spatial analysis, as said before, there was a deficit of reliable up-to-date and sufficient (spatial) data. Prior to the fieldwork, the mainly statistical data that was available was outdated, the data was gathered in 2007. The amount of data itself was limited and not all data was reliable due to other modes of data gathering and many missings amongst the data. Concerning the provision of geographical information, again there were almost no up-to-date maps of GIS data available and/or accessible. Therefore OpenStreetmap was used as a source, but since this is an open data method, not all geographical data was reliable or complete. I tried to overcome this by using satellite images as reference, with many shortcomings as well. Next to that I received some essential geographical information from Ethiopian students.

Secondly the policy analysis, issues observed here were that most of the policy documents were written in Amharic, thus depending on secondary sources describing those policies. In that process, information is lost as well as the objectivity of a policy document.

Thirdly the empirical field work. During fieldwork, observed problems were the biased observations and the ‘lost in translation’ issue due to the use of an interpreter. The lack of trust of local residents towards the researcher, was resolved by the interpreter who put the interviewees at ease before

starting the interview. This conversation always took more than 10 minutes and of all the residents addressed only one resident did not want to do the interview. This could nonetheless have influenced the given answers. Another issue in line with the latter is that the government of Ethiopia can be viewed as an authoritarian one, having the effect that inhabitants of the country are hesitant to give their opinion in fear of repercussions. Especially since they view Western people as delegates from the Ethiopian government. Eventhough I met some Ethiopians who were quite critical on their own government, so the bias could be limited.
Finally regard concercing the empirial data is the bias by the researcher himself. Based on my own background I see and interpret observations in my own way. To make observations more objective, photo analysis was conducted. However it was not possible to take pictures of all the observations I made, due to the sensitivity of the inhabitants. I tried to overcome this by using pictures of others, for instance from architecture students who visited Addis Ababa as well.

Generalising the results

The aim of the research was to provide insight on the use of the open space in order to increase the access to local income generation. This research was conducted in Addis Ababa, Ethiopia and can therefore only directly be applied in Ethiopia. However lessons can be learnt, since many African countries follow the same path towards huge increases of urban population and urban poverty. Some principles can therefore be used as starting point in other Sub-Saharan African countries. Extensive research on the specific countries and their culture is needed. Also important in this respect is that Ethiopia is the only African country (excluding Liberia) that was never officially colonised. This historic notion has a huge effect on governance, planning practices and socio-cultural dimensions. Which needs to be considered prior to the research and implementation of the proposed approach.

Within the context of Addis Ababa, the research on the Weyira sefer generates site specific design interventions, but also more general principles. The issues: lack of accessibility, solid waste, pollution, unreliable provision of public services and so on are general problems for the whole of Addis Ababa. Solutions proposed can be applied elsewhere. However specific issues regarding existing housing stock and topography vary across the city, so they need special attention. By using a more quantified approach and using a model to calculate footprints for specific programme, the possiblity of replicating the strategy increases. The model asks for specific parameters , for instance amount of inhabitants, that can vary with every sefer. Spatial analysis is needed to define the ‘layer zero’ consisting of the current socio-spatial dynamics, the landscape and the built environment.

Ethics

This section of the reflection report addresses the issue of ethics. In the case of this project one element stands out: the European scholar in an African context. Especially one who is only educated with European / North-American theories and approaches. As well as without any experience concerning research or design in the developing world.

I tried to overcome issues by talking with a lot of different people, from scholars to students to local residents. During the stay in Addis Ababa I learned a lot about Ethiopian culture and tradition and how this is embedded in daily life. An important example of this is the religion, this plays an essential part in the structure of the daily life and churches (as well as mosques) can be found in every small neighbourhood. Most of the times the name of the neighbourhood is derived from the church. That is something you can only experience by staying in the city for some weeks.

Some moments during the fieldwork, the interviewees expected that I would be able to really change things in their environment. This might have influenced the answers they gave to me in a sense that they exaggerated the issues. However it can also mean that they mention the issues that are the most important for them.

The last issue concerning ethics addresses the focus of the thesis project. The scope of the research is derived from current problems and theoretical notions, however the specific deduction is done by me. This can be a bias since my background influences the deduction as well as objective principles and concepts. So perhaps my research project addresses problems that are not the main problem or not the main priority for the low-income inhabitant of Addis Ababa. I am convinced of the relevance and the priority of the problem, thus passing along this view to others as well. Other issues might be more pressing, like the political situation in Ethiopia for instance.

Role of the urbanist

My role as an urbanist in this project, does not per se entail the role of the urban designer to produce specific designs. In my opinion that should be done by the community, aided by an urban designer. Which could be me, but then as an embedded researcher and designer. Right now, my role is to ‘sketch’ the design which can be filled in later by the residents of the

sefer itself (helped by designers, engineers, NGO's and so on). After the first P4 moment I realised that I could perfectly show a design and that I am needed to do so, in order to fully explain my vision and hypothesis. The design principles that were derived from the spatial, theoretical and empirical research need to tested on site. Which results in a design of key places in the sefer.

My approach as an urbanist is to be realistic as possible and to convince other stakeholders based on realistic, achievable goals. Convincing others was my greatest personal goal before the graduation process and is one of the most important of the many new things I learned at the TU Delft. During the year I sometimes experimented with the tools that the urbanist possesses to try to persuade others. Struggling to find my own style of communication. Learning a lot every day, also from my fellow students. And in the end coming to a style of communicating that suites me personally and that can be effective in presenting my strategy as the best possibility.
In my eyes it is best to stay modest as an urbanist, but it is also our role as urbanists to show other possibilities of development and design. But not per se adding the value of 'better', simply only providing alternatives to the current developments in Ethiopia.

New insights after P4_1

The realisation that many of the steps I had taken so far into the process lacked a written text or diagram. The steps were made implicit by me in my own head, but were never made explicit. This of course had effects on the structure and consitency of my thesis for my 'audience', but also for myself. Sometimes I lost track of my own thoughts and I could not fully explain why I made certain decisions, eventhough I did make decisions for a reason.

A crucial element in that sense was the design principles that I could base on "western' theory confronted with empirical data resulted. Added with references, though very limited, I could clearly derive principles to implement in the Ethiopian context.

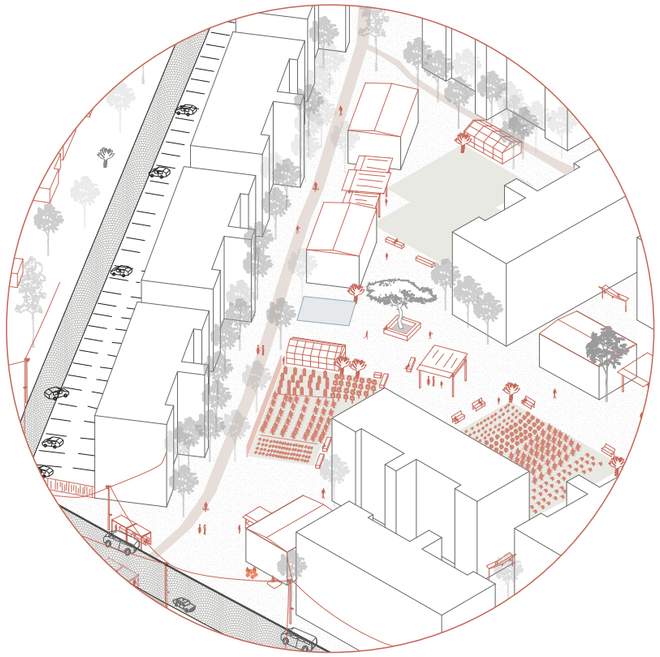
Getting closer to the design came another insight that some design decisions I took were kind of random. Because of that, I started to quantify my design objectives and tried to integrate the performance and evaluation into the design itself. That resulted into the use of parametric design program Grasshopper, which was used to design the integrated transport and land-use plan and the designs of the locations. Bsed on this approach, I was able to show the key objectivs of my thesis from problem analysis all the way to the design and the evaluation of it.

But in the same line, adding that Addis is so diverse, for instance in landscape, height, current inhabitants and so on, it would require proper research for each individual site. However, in my opinion this should be the case for every plan, no plan can be copied and pasted into another area disregarding the specific conditions completely. I hope that the improved methodology for both the research as the design can result in a clear guideline to study other neighbourhoods in Addis Ababa adding to a more accessible and affordable Addis in the long run.

EPILOGUE

Betty's life 10 years later

Betty Bekele happily lives in the condominium, now with her husband and two kids. Her parents and family luckily live in one of the nearby condominium units. Betty combines her work in the center of Addis with helping in the condominium Iddir. Her husband, Kenisa, works nearby in the incubator. He drops of the kids to the local primary school and then walks to his work five minutes away. The family can easily visit their other relatives on Sundays.



Haile's life 10 years later

The Kassahun family now happily lives in their Kebele compound uphill. Haile's wife still takes care of the house and the kids, but she is now able to work with her neighbours on the agricultural field. They have a strong women's Iddir. The kids of the Kassahun family see a bright future ahead of them. The oldest son, Teddy, just graduated from secondary school and will be going to the EiABC to become an urban planner. Haile himself was finally able to open a garage and fixes the minibusses that run frequently through the sefer.

APPENDIX

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III. HISTORY OF URBANISATION

IV. SWOT ANALYSIS

V. INTERVIEWS FIELDWORK

VI. SPACE REQUIREMENTS

VII. REGIONAL ANALYSIS MAPS

VIII. SCENARIO ANALYSIS

IX. EXTRA MAPS

I. BIBLIOGRAPHY

Abate Abreha, D., (2007). *Analysing public transport performance using efficiency measures and spatial analysis: The case of Addis Ababa, Ethiopia.* ITC.

Aravena, A. (2016). *Reporting from the front* retrieved from: https://LSECiti.es/u32c6138a.

Aredo, D. (2010). The Iddir: An informal insurance arrangement in Ethiopia. *Savings and Development*, 53-72.

Andel, F., & Gameren, D. (Eds.). (2015). *Woningbouw wereldwijd : Betaalbare woningen voor groeiende steden = global housing : Affordable dwellings for growing cities* (DASH, [12 13]) (M. Tol, Trans.). Rotterdam: Nai010 uitgevers/.

Barrios, S., Bertinelli, L., & Strobl, E. (2006). Climatic change and rural–urban migration: The case of sub-Saharan Africa. *Journal of Urban Economics,* 60(3), 357-371.

Bogale, Y. A. (2012). *Evaluating transport network structure: Case study in Addis Ababa, Ethiopia.* University of Twente Faculty of Geo-Information and Earth Observation (ITC).

Bongwa, A, Kassahun, S. & van Dijk, M.P. (2011). *Decentralization and service delivery in Ethiopia*. Maastricht: Shaker publishing.

CSA (2008). *Ethiopia, Summary and Statistical Report of the 2007 Population and Housing Census,* Addis Ababa: Central Statistical Authority.

Chagas Cavalcanti, A. R. (2017). How Does Work Shape Informal Cities? The Critical Design of Cities and Housing in Brazilian Slums. *The Plan Journal*, 1(2).

Clapham, C. (2006). The political economy of african population change. *Population and Development Review*, 32(S1), 96-114.

Cobbinah, P. B., Erdiaw-Kwasie, M. O., & Amoateng, P. (2015a). Africa's urbanisation: Implications for sustainable development. *Cities,* 47, 62-72.

Cobbinah, P. B., Erdiaw-Kwasie, M. O., & Amoateng, P. (2015b). Rethinking sustainable development within the framework of poverty and urbanisation in developing countries. *Environmental Development*, 13, 18-32.

Correa, C. (1989). *The new landscape : Urbanisation in the third world*. Sevenoaks: Butterworth Architecture.

Demdime, F. T. (2012). Integrating public transport networks and built environment.: The case of Addis Ababa and experiences from Stockholm.

Dupuy, G. (1991). *L'urbanisme des resaux, theories et methodes.* Armand colin.

Erulkar, A. S., Mekbib, T.-A., Simie, N., & Gulema, T. (2006). Migration and vulnerability among adolescents in slum areas of Addis Ababa, Ethiopia. *Journal of Youth Studies,* 9(3), 361–374.

Fay, M., & Opal, C. (2000). *Urbanization without growth: A not so uncommon phenomenon* (Vol. 2412). Washington: World Bank Publications.

Fielding, A. J. (1992). Migration and social mobility: South East England as an escalator region. *Regional studies*, 26(1), 1-15.

Fox, S. (2012). Urbanization as a global historical process: Theory and evidence from sub-Saharan Africa. *Population and Development Review,* 38(2), 285-310.

Grauman, J. V. (1977). Orders of magnitude of the world's urban population in history. *Population Bulletin of the United Nations* No.8 - 1976. New York: United Nations.

Gehl, J. (2011). *Life between buildings: using public space*. Washington: Island Press.

The Guardian. (2015). *China denies building empire in Africa*. 12 January, 2015, by: David Smith.

The Guardian. (2016). *Next stop the Red Sea: Ethiopia opens Chinese-built railway to Djibouti*. 6 October 2016, by: Agence France-Presse.

The Guardian. (2017). '*Addis has run out of space': Ethiopia's radical redesign.* 4 December 2017, by: Tom Gardner.

Haregewoin, Y. M. (2007). Integrated housing development programs for urban poverty alleviation and sustainable urbanization: the case of Addis Ababa. In *ENHR International Conference on Sustainable Urban Areas. Rotterdam.*

Heisel, F., & Kifle, B. (2016). *Lessons of Informality: Architecture and Urban Planning for Emerging Territories-Concepts from Ethiopia.* Basel: Birkhäuser.

Hjort, B., & Widén, K. (2015). Introduction of sustainable low-cost housing in Ethiopia–an innovation diffusion perspective. *Procedia Economics and Finance,* 21, 454-460.

Icebauhaus. (2017). *SICU project page.* Retrieved from: http://icebauhaus.sudile.com/index.php/SICU_Project_Page, on 08-01-2018

Iliffe, J. (2007). *Africans: The History of a Continent.* Cambridge University Press.

Kassahun, S. (2010) Urbanization and Its Impact on the Making of Informal Settlement in Addis Ababa. In: J. Fransen, S. Kassahun & M.P. van Dijk (Eds), ***Formalization and informalization processes in urban Ethiopia incorporating informality*** (pp. 71-85). Maastricht: Shaker publishing

Lowry, I. S. (1990). World urbanization in perspective. *Population and Development Review* 16: 148–176.

Maasho, A. (2018, June 5). *Ethiopia opens up telecoms, airline to private, foreign investors*. Retrieved from: https://www.reuters.com/article/us-ethiopia-privatisation/ethiopia-opens-up-telecoms-airline-to-private-foreign-investors-idUSKCN1J12JJ.

Mahiteme, Y. (2007) *Carrying the Burden of Long-term Ineffective Urban Planning' An Overview of Addis Ababa's Successive Master Plans and their Implications on the Growth of the City.* Working papers on population and land use change in central Ethiopia, nr. 7. Acta Geographica-Trondheim, Series A, No. 16, October 2007.

Mota, N. J. A. (2015). From the Kebele to the Condominium: Accommodating Social and Spatial Practices in Ethiopia's Politics of Affordable Housing. In *Interdisciplinary Conference "Housing: A Critical Perspective*", Liverpool, UK, 8-9 April 2015.

OPP. (1995). NGO profile: Orangi Pilot Project. *Environment and Urbanization,* Vol. 7, No. 2, October 1995.

Peñalosa, E. (2013). *Essay: Buses: not sexy but the only solution.* Retrieved from: https://urbanage.lsecities.net/essays/buses-not-sexy-but-the-only-solution.

PPS.org (2018). *What makes a succesful place?* Retrieved from: https://www.pps.org/article/grplacefeat on August 2018.

Rocco, R. (2008). *An urban geography of globalisation: new urban structures in the age of hyper-connectivity.* TU Delft, Delft University of Technology.

Roy, A. (2005). Urban informality: toward an epistemology of planning. *Journal of the american planning association,* 71(2), 147-158.

Saunders, D. (2011). *Arrival city: The final migration and our next world.* Toronto: Vintage Books Canada.

Schmal, P. C. (2017). *Making Heimat: Germany, Arrival Country.* Hatje Cantz Verlag.

Turner, J. C. (1968). Housing priorities, settlement patterns, and urban development in modernizing countries. *Journal of the American Institute of Planners*, 34(6), 354-363.

UN-Habitat. (2003). ***The challenge of slums: global report on human settlements.*** Nairobi: United Nations Human Settlement Programme.

UN-Habitat. (2007). *Situation Analysis of Informal Settlements in Addis Ababa.* Nairobi: United Nations Human Settlements Programme.

UN-Habitat. (2011). *The Ethiopia Case of Condominium Housing: The Integrated Housing Development Programme.* Nairobi: United Nations Human Settlements Programme.

UN-Habitat. (2014). *The state of African cities 2014; re-imagining sustainable urban transitions.* Nairobi: United Nations Human Settlement Programme.

UN-Habitat 2017: *The State of Addis Ababa 2017; The Addis Ababa we want.* Nairobi: United Nations Human Settlement Programme.

Whyte, W.H. (1980). ***The Social life of small urban spaces.*** Washington: The Conversation Foundation.

The Worldbank. (2016). *Ethiopia's great run; the growth acceleration and how to pace it*. World Bank Group; Washington.

II. LIST OF FIGURES

III. HISTORY OF URBANISATION

Before the industrial revolution, cities remained quite small, only five percent of the global population lived in urban areas (Graumann, 1977; Fox, 2012). Urban settlements were characterised by high mortality rates due to an abundance of epidemic diseases, cities depended upon an influx of rural migrants. This observation states that there is a constant flow of rural-urban migration when all other drivers remain the same. When mortality rates decrease however, rapid urbanisation can occur. This can be acclaimed to two drivers: first the natural population growth in urban areas is positive, second demographic pressure is put on rural areas, pushing migrants towards cities (Fox, 2012: p. 290).

Cities do not only sustain themselves through an influx of rural migrants, they also depend on a surplus of energy in the form of food and fuel to support a non-agricultural population (Lowry, 1990; Fox, 2012). The availability of surplus energy is further determined by the agricultural productivity and the transportation costs, explaining why big historical cities were located near large waterways.

Effect of technological innovations in agricultural productivity (fertilizers), reduced transportation costs (steamships, trains, later cars) and in medical sector. Combined with institutional changes. Led to declining mortality rates in the whole country, and a surplus energy in form of food and fuel. This propelled natural population increase both in rural and urban areas.

Mainly what happened in Europe, there is a relation with economic development, that has more to do with the decline of fertility rates in urban areas and later in rural areas. The more affluent people get, the less they depend on having kids. As well as public providing of pensions and other welfare state related aspects. (mainly in North-Europe, Netherlands). Having more kids becomes a (financial) burden when people become more affluent, dependency drops.

The institutional and technological innovations spread to other parts of the world through trade and colonialism. Pre-industrial Africa was characterised by obstacles to surplus energy production and spread of diseases. Resulting in high mortality rates across the continent. After the first World War, colonial suppressors did start to implement the institutional and technological innovations: controlling epidemic diseases, expansion of infrastructure and the introduction of agricultural improvements. Mortality rates did decline, however urbanisation remained limited due to restrictions by the colonial regime. As well as poor living conditions and limited employment opportunities in sub-Saharan African cities. After the second World War, colonial powers started to launch modernisation campaigns. This led to upgrades of public education and health services, infrastructure development and industrial investments (Iliffe, 2007; Fox, 2012). Mortality rates fell and the population increased. Higher demand of labour in urban areas accelerated urbanisation in sub-Saharan Africa.

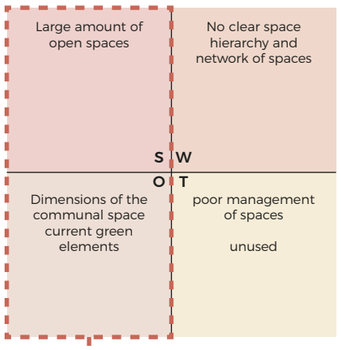
In the postcolonial era, mortality rates kept on declining, while at the same time fertility rates remained high, influenced by cultural preferences (Boadi et al., 2005; Iliffe, 2007; Clapham, 2009). High rural to urban migration happened in this period, caused by increase in urban employment opportunities in cities. But also economic growth. All these factors resulted in the highest rate of urbanisation between 1960 and 1975: 5.1 percent (Fox, 2012: p. 298). This period was followed by one of economic decline, however the population kept on increasing. This is explained by a continued mortality decline and expansion of the food supplies by imports and foreign aid.

Between 1995 and 2000 natural increase accounted for 52 percent of the increase in urban growth in Eastern Africa (Boadi et al., 2005). Currently urbanisation rates remain high, but also vary across countries. There is still a decline in mortality rates, but also a decline in fertility rate in urban areas.

IV. SWOT ANALYSIS

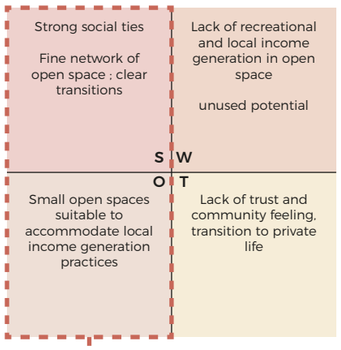
PRODUCTIVE OPEN SPACE

CONDOMINIUMS



Potential to use open spaces, make productive

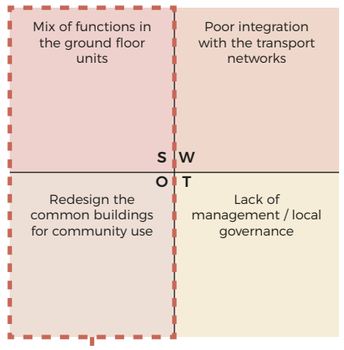
CHIKA SEFERS



Potential of strong network to connect unused open spaces

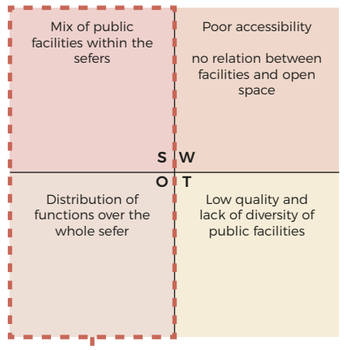
LAND-USE & PROGRAMME

CONDOMINIUMS



Potential of the common buildings for mixed public facilities within condominiums

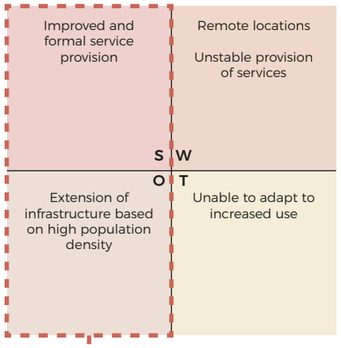
CHIKA SEFERS



Distribution of facilities to increase accessibility to public facilities

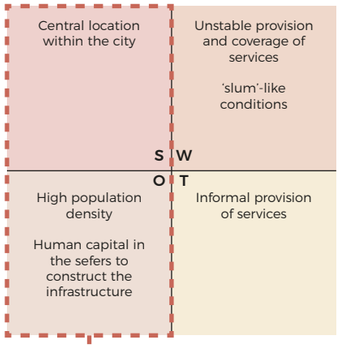
INFRASTRUCTURE & NETWORKS

CONDOMINIUMS



Improving and upgrading of service provision and roads

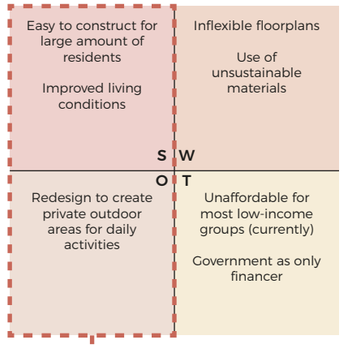
CHIKA SEFERS



Using density and local knowledge and skills for stable service provision and roads

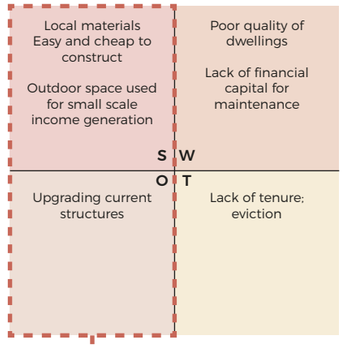
HOUSING & PRIVATE SPACE

CONDOMINIUMS



Creating better quality living environments and reducing housing shortage

CHIKA SEFERS



Sustainable and cheap typology, private outdoor space used for income generation

V. INTERVIEWS FIELDWORK

Interview with Helawi Sewnet 16-2-2018

The 'interview' with Helawi consisted of my presentation of the work so far, the P2. We talked about the issues that I addressed, he helped me to sharpen my approach.

The notion of Kebele: this lowest administrative tier does not exist anymore. This was changed some years ago (2015?), It now is: Sub-city – Woreda – District. So the woreda's replace the Kebeles in a sense, with the districts as the smallest to delineate the sefers. (neighbourhoods, or literal translation: village). I use the Kebeles in my analysis merely as a geographical entity on which I can base data and conclusions. The Kebele house, came to being in the Dergue government time (1974-1991). The government nationalised all the urban and rural land and claimed the dwellings that did not have a owner. Most of these dwellings became really cheap rental dwellings managed by the Kebeles, thus Kebele house. The rent of these houses varies between 2 and 20 ETB per month, € 0,06 to € 0,60 (to compare: a cup of coffee on the street costs 5 ETB). The other important aspect of Kebele house is that the maintenance of these dwellings is quite poor. Because of the low rents and the notion that Ethiopia is a poor country, the Kebeles were and the Woreda's now, lack the financial capacity to maintain the dwellings.

Land prices

Helawi suggested me to make a map that shows the land leases price per sub-city. Each sub-city has a minimum land price determined by the government. The actual land price varies and follows the free market. This is most visible in the sub-cities of the center of the city: Arada, Addis Ketema, Lideta, Kirkos, and in Bole sub-city. Construction sites dominate the streetscape, fancy malls arise where first single storey residential structures resided and cars are parked everywhere.
The relocation process for Kebele houses is such that the residents receive a compensation for the structure (limited as it is) and receive other land (land lease) in the outskirts of the city.
[add sketch about land price]

New master plan (2017), Local development plans, total renewal areas and upgrading areas.

Building permits and materials

There is a building code with states that only modern materials can be used to receive a building permit. This entails: concrete, Hollow Concrete Bricks (HCB), glass, aluminium, wood. Chika (adobe, straw) is no longer permitted.

Fitsum Abrera – professional architect 18-2-2018

Water deficiency – potential for rainwater harvesting

Fitsum lives in a condominium complex (Lafto > 10 km from the center, min. 45 minutes by car). He rents a studio for 3000 ETB per month. He lacks running water most of the days, he realised after a while that he only has water on Saturdays and Sundays. I was wondering if there was no way of rainwater harvesting or storage on the condominium buildings, but because of the shape of the roof, pointed, there is no harvesting. (in the whole of Addis, no matter what kind of roof I did not see any form of rainwater collection. Which is a missed opportunity, because even in the dry season it rains quite often).
Fitsum advised me to visit multiple condominium sites such as Jemo, Lideta, Yeka Aboda, Bole Arabsa.

Traffic management, planning

We also talked about traffic and transportation in Addis. Fitsum uses the car from the office to drive to his work, on the way he pick up a colleague in Piazza. He is almost always stuck in traffic, only the Sundays are nice to drive. I visited his place on a Sunday, it was a smooth ride over almost empty roads.

Starting point is that streets in general are not designed for many cars. Car ownership in Addis is not that high: around 600.000 private cars (on a population of 6 million). However, there is a lot of motorised traffic on the road in the form of minivans, trucks and busses. Minibuses are the most convenient way of transport and are everywhere on every street. There comes another issue addressed by Fitsum, there is really poor traffic management. There are no clear traffic rules and drivers do not seem to know how to drive efficiently. On a roundabout they pick the inner lane even when they have to take a right immediately. And vice versa, other drivers pick the outer lane but they make a left turn. Result: everybody needs to wait for each other, chaos and congestion no matter what time of the day. There are also a lot of car accidents, another consequence of poor traffic management. Crossing a street as a pedestrian is dangerous and challenging, other accidents happen with motor bikes.
Finally, streets are not well-planned and/or managed. Some streets are too narrow to accommodate flows of traffic and parked cars, basically because

the designers did not anticipate on so many cars to be parked. As a result, this was in the Gotera condominium, streets were turned into one-way streets resulting in a maze and still congested streets.

The right lanes of the streets are used by too many different functions. Loading of goods, parking cars, bus stops and minibus stops. Especially the latest causes a lot of disturbances, the drivers of the minibuses have the habit of stopping and then continuing slowly in order to fill the bus. They make speed and change lanes again, blocking the through traffic. Better management and planning can increase the efficiency of the right lane.

NOTE: A new car costs around € 30.000 for a small one. From € 10.000 for a second-hand car.

Darik Zebenigus 19-2-2018

Recent masterplan

The recent master plan was developed by an independent (government) body: the Addis Ababa planning commission. They received a full mandate by the city administration for the implementation.

The legal status of the master plan is that it is approved by the city government and is thus the only document and has a legal status. That is the rule, however there are always loopholes to change the plan. The change with the 9th masterplan is that the planning commission now also takes care or oversees the implementation. Local development Plans are the lead document on the local level, they “should” derive from the master plan [see interview with Tamrat for more information].

Wider regional planning?

Because of the tensions that were sparked by the 9th master plan, which included the surrounding Woreda’s of the Oromya state. So there is no regional planning on levels like infrastructure and housing. But there is some economic ties based on federal planning to create industrial zones and parks over the country. Example of this is the railway line connecting Djibouti to Addis, the old one (created by the French) ended in the heart of the city, the new one (by the Chinese) ends in Sabeta, a suburb of Addis Ababa. The focus of the railway line lies on connecting different industrial parks with each other and the port of Djibouti.

Relation between EiABC and the city

The relation between the EiABC and the city is quite good, architecture and so on are only teached at the campus. Since 7 years there is a collaboration with the government. Most graduates of the EiABC end up working at different planning departments of the government, therefore there are close ties with the EiABC.
For every aspect of city planning, environment, transport, land-use, housing there are separate offices at federal level. So the department of infrastructure make their own plans, done by engineers not by planners.

Bisrat Kifle 21-2-2018

Integrated Housing Development Program (IHDP) different generations

The IHDP was not really integrative, the only aspect that received attention was the physical form of housing. So construction material, practicality, standardisation.

The first projects or pilot projects consisted of GTZ (a German company for technical cooperation) designed condominiums of G + 2 or G + 3. Small scale and mainly group relocated residents close to their original living place (see Spaces documentary for this example). The government loved this idea and they started to implement it on a large scale in the IHDP, adding some floors along the way:

1st gen. G + 4 (2005-2010): affordable to construct, no elevator needed. Standardised units, easy and cheap to produce. The federal government was the only investor, borrowing money from China.

2nd gen. G + 7 (2010-2012): Lideta was the first ‘high-rise’ condominium complex, relocating a lot of people as well. Elevators were needed, central location thus less affordable than the first generations. Mainly inhabited by middle class and higher. Maybe only the smaller typologies, studio and 1-bedroom, inhabited by lower income groups.

3rd gen. (2012-…) G + 11 in the outskirts, enormous projects only located in the periphery of the city, like Bole Arabsa: 20 kilometers from the center resulting in a commute of > 2 hours.
G + 18 for higher and middle class, also in the outskirts and other areas, car based.
G + 30 also for higher and middle class, financed by foreign investors for the first time.

Typologies

The payment schemes are a percentage downpayment in order to enter the waiting list, the lottery and the rest of the amount as monthly mortgage fee. 10/90 for low-income, 20/80 for middle-income and 40/60 for high-income households. If you are able to pay the down payment, you enter the lottery system and you put the money away on the Ethiopian Central Bank. If you 'win' the lottery you will receive a highly subsidised, way cheaper than the open market, unit somewhere in the city.

One major flaw in the 1st generation plans was that the government associated the payment scheme with the typology. Thus 10/90 schemes gave right to a studio or 1-bedroom. However, the average household size is way higher for low-income households. This resulted in overcrowded units, more expensive than before so people moved back to their old sefers and rent the condominium unit out to professionals, starters, students.

In later generations, the government learned from their errors by providing different typologies for the 10/90 payment scheme. But now the amount of these 10/90 units was a limited number and they were only located in the condominium projects in the periphery of Addis.

Financing

At this time, 2018, the government was struggling with financing and thus with finishing the condominium projects. Only focus now was to finish the projects in the coming years.
Open spaces

The open spaces in the sefers was communal, belonging to the multiple households living in the same compound. In the condominium projects there is a lack of management of open spaces. Different social groups are put together because of the lottery system, there is mistrust, jealousy towards each other.

Creating open space should be the driver of densification and development. But in reality the single storey settlements are destroyed and the open spaces created are filled in by more high-rise buildings, or are used to park cars.

"High rise buildings were implemented to create more open spaces, not to fill these spaces with even more high rise buildings"

Positive aspect of the IHDP is that a lot of jobs were created. Local contracters, local material producers in micro and small enterprises (the HC bricks). Local consultants, architects and local labourers.

Housing alternatives

[POLITICAL ISSUE]
Bisrat showed one of the alternative designs done by the EiABC, that could accommodate more people, created more open spaces and was cheaper to construct. The government liked the idea and were considering the implementation, but then the prime minister changed his mind and threw the great plans from the table. Why? To protect and justify the current condominium approach. He thought that implementing new designs would endanger the government, that in a sense the government would need to admit that the current designs are bad and that there are better solutions. That would create tensions and possibly riots, so the PM did not whish to continue this plan.

Housing should be provided by a range of stakeholders: private developers, semi-public and cooperatives. The government should merely function as a facilitator of housing.

Cooperative housing as an alternative, an approach that was used before the Derg government. A group of households unites and leases a piece of land somewhere in the city. The households construct the dwellings themselves, also more incremental schemes this way.

Another alternative is to provide more 'hostel' type of housing. For students, or young professionals. Housing schemes with a small private room and shared facilities as kitchen and bathrooms.

Why only owner occupied dwellings? Why not also some more rental units.

Zegeye Chernet 23-2-2018: Urbanisation in Addis Ababa

Addis Ababa as uncontested primate city

The explanation behind the rapid urbanisation of Addis Ababa starts with the notion of pull and push factors. The main pull factor of migration for Addis is that it is the capital of everything. It is the uncontested primate city of the whole country. It is the political, commercial, cultural, economic, logistic heart of the country (even the whole Horn of Africa region). The only thing Addis 'lacks' is the historical function, there are way older cities like

Mekele and Gondar in the north of Ethiopia. But Addis Ababa, founded in 1986 by empress Taitu, became the capital of the new Ethiopian empire. The difference on all the aspects mentioned above is so huge, resulting in secondary cities with a population of not even 500.000, Dire Dawa being the next biggest city.
The growth of Addis can be explained by rural-urban migration but also by urban-urban migration. Because of the domination of Addis, for most people the migration to a secondary city is the first step in their journey. When you are a successful shop-owner in Bahir Dar, you can be even more successful in Addis.

Dr. Chernet estimates that the urbanisation rate currently is around 10 %, this is incredibly high, way higher than the official number of 2.4 (UN-Habitat, 2017). The truth lies somewhere in the middle, because the growth of the city at the moment is unprecedented. As is the size of the population, official numbers state 4 million inhabitants, but most scholars estimate a minimum of 6 million inhabitants. Which is more in line with the everyday congestion witnessed everywhere in the city. According to Dr. Chernet the government does not want to acknowledge this difference, because the amount of residents determines the representatives in the city government, meaning a bigger government and less control.

Push factors: rural poverty caused by population growth and degradation of the rural land.

Informal urbanisation

The urbanisation of the city happens informally, housing service provision and economy. Through times this used to happen all over the city, the old sefers in Arada and Lideta for instance used to be informal settlements. They were nationalised in the 1974's Act by the Dergue government. Most service provision in these settlements still happens informally (Jembere, 2018).
Now the informal processes only take place in the periphery and on reserved areas like river banks and mountain slopes. The city government is quite tolerant towards informal economic activity, but absolutely not towards informal housing. Land is too precious for the government, i.e. they can make a lot of money with it. Many of the informal street vendors in Piazza and Merkato are recent migrants and they live informally on the streets or in the sefers.

National policy (GTP II)

Facilitating economic activities by providing infrastructure (roads, but also internet) and good services like education and health in secondary cities and emerging cities. This needs to be done according to Dr. Chernet, a parallel strategy focussing on rural development with an urban focus. The federal spatial plan, GTP II, tries to implement this. Another example of a new national approach is the construction of sustainable new towns in rural Woreda's. the BuraNEST initiative by the EiABC together with the ETH Zurich is a grassroots project to create sustainable new towns. This initiative is now acknowledged by the federal government and embraced, the goal is to construct 8000 of these new towns.
The GTP II strives to decentralise the economy more and to invest in industry. This is clearly visible in the construction of industrial parks all over the country. One example is the Hawassa industrial park, creating a lot of jobs for the local population.

Note: because of the current situation it is hard to implement such a plan, political issue.

There are development (economic) corridors within states, but also between different states. The hard boundaries of today need to be blurred in order to implement and continue the corridors. The aim now is to take the pressure off of Addis Ababa. Development of secondary and emerging cities needs to be promoted.

Bizuayehu Jembere – 25-2-2018 entrepreneurship and others

Quickly about the land lease regulations in Addis:

People acquire the lease for a minimum of 50 and a maximum of 90 years. The rate for the lease is fixed from the moment it is given. There are payment schemes here as well, similar to the condominium schemes. The 15/85 and the 25/75 payment schemes, so pay the first part upfront and the rest will be paid every year. The price of the yearly amount is influenced by the interest rate and the inflation. Though there is no relation with the actual value increase of the property. That causes extremely high prices at the moment that can only be paid by wealthy private developers, creating a high-income dominance. If the price would increase say every 5 years, people can actually truly invest in their property and thus even the lowest of the income groups are able to buy land and create an investment in the form of a dwelling. For the government this will mean more revenue (spread out of a longer trace of time) and a more evenly spread out distribution of income groups through the city. Currently when individuals or cooperatives are able to acquire land, they do so in the outskirts of the city where the

prices are quite low. They start building their house and the only revenue the government receives is the land lease paid every year. This does not align with the actual value, for instance if a family build a three storey villa, they would only pay a small amount for the land lease.

Entrepreneurship, start-ups

There is a policy providing loans for start-ups. You would need a tax registration number, which entails that you need a title deed. (most of the low-income households that live in the Kebele houses do not have this). The regulation also dictates that the applier needs to pass the centre of competence examination issued by the government. The applier of the loan needs to pay for this, for a maximum of three times these tests can be taken. According to Bizu most people have to take it three times, they always find some mistake you make, the government likes you to pay.
Regarding the provision of space, there are some incubators in Addis:

- IceAddis: related to innovation and tech since May 2011 (iceaddis.com), located in Bole Medhianalem.
- xHub: related to leadership and entrepreneurship in general since 2014 (xhubaddis.com), Bole Medhianalem
- BlueMoon: related to agribusiness, (bluemoonethiopia.com) located in Bole Medhianalem

The incubators provide workspace, help, networks and high speed internet connection.

The other relation between space and SME's is the construction sites of the city. The SME's are allowed to start their business, producing Hollow Concrete Bricks (HCB's) on site. After construction is completed, they either move to other construction sites or they stay at the current site and keep producing from there. We observed this in the Jemo site, between Jemo 3 and Jemo 1. Easily accessible by trucks located on the main street towards Sabeta.

Micro financing

Credit and savings association in on state level and federal.
Financing and loans institutes, projects with women and disabled persons on federal level
Micro financing, up to 1.5 million ETB
Development bank of Ethiopia.

For low-income individuals, you need to possess 10% of the total investment

yourself.

Tamrat Eshentu – Addis Ababa Planning Commission 27-2-2018

History of the masterplan – background, procedure?

Previous master plan was the 'spark' that caused the riots. It was actually made in collaboration with the surrounding Woreda's from Oromya. Plan is to revise the master plan every 10 years. So this 10th edition proposes the direction for the coming 10 years, considering an population increase of 2 – 3 million inhabitants.
Things added in this plan: the relocation of inhabitants needs to be done within 500 meters from the original living place. But in theory, reality will prove differently (as has been the case).
According to Tamrat, there is no open land available in the whole area of Addis. Though there are small patches of land available.

Other novelties in the plan are decentralisation and mass rapid transit in the form of Bus rapid transport. Tamrat states that the land-use and the transportation are interlinked. Tamrat has been working on the land-use plan for quite some years, however he does not have access to the transportation plans, so I question how integrated it is. [note: not a lot of people seem to know the planning commission project office]

Transportation system integrated?

Arterial roads in Addis measure around 30 meters in width. Street parking needs to be avoided, also to ensure more efficient use of the road. So public car pars are planned in the city as well, one example is in Merkato. Most of these parks will be realised underground, because there is a shortage of land.

The planning and design tool to deal with better transportation now are dedicated bus lines. These bus lines can be used by the different bus line parties: Anbessa (government owned), Alliance (small, privately owned), the Sheger express buses (government owned), Public Service Employees Transport Service Enterprise (PSETSE) (providing free transportation for civil servants in peak hours). At the moment the largest part of the Addis population uses the shared taxi's / minibuses that dominate the street. They run frequent and almost everywhere in Addis. The minibuses are loved by the middle-income groups (that do not have a car) and some of the lower income groups. For the lowest income groups however even the minibus can be expensive. Every ride costs around 2 ETB, it is quite common to take

2-3 taxis to arrive at your destination. Contributing to 12 ETB everyday and at least 1.5 hours of transport time. Example is the trip from the Woyira sefer to Piazza, it takes 2 transfers, 3 taxis in total and 10 ETB, around 1 hour of transportation. (Distance is 8 kilometers, which can be done by car without traffic in 30 minutes). On the dedicated bus lines, minibuses are not allowed, so not solving the current traffic congestions caused by the constant stopping and driving of the minibuses (using all lanes). There are around 12.000 of these buses, estimation by Tamrat.

Legal status of the plan, local development plans,

There was a proclamation accepted by the city government, so the 10th edition of the master plan is the legally binding plan. The regulations are checked by the planning commission office. The parties responsible for the implementation are accountable, by law, so the PC office is legally able to give penalties to the implementing parties. One giant however, these penalties are not enforced according to Tamrat there is a political reason for this.

The local development plans (LDP's) are developed by the planning commission itself, after the funds for the development are allocated. We talk about real developments, not single plots. The government is the only party that can develop the larger development areas. In most practices, the country lacks the technical capacity. The government is not really willing to allow the help either.

How is the planning commission operating?

Integrates the design, planning and the implementation. It oversees! Because all the separate aspects of the master plan are distributed over different agencies of the government: housing, environment and transport authority. So in theory the PC office is responsible for the implementation, however they only oversee it and they actually lack resources to check and control the implementation.

The land-use plan is in theory a really flexible plan, it only says what functions are not allowed on the location. For instance a location for residential uses states that manufacturing, treatment plants, cemeteries, slaughterhouses, quarries and stadiums are not allowed. Furthermore, it says that at least 60 % of the buildings should be residential. One big flaw in the flexibility of the plan is that it does not say what the distribution of income-groups is concerning housing. So then in depends on the implementation of the Housing Agency of the municipality.

Regional cooperation

Due to the 9th master plan that contributed to the riots and such the current master plan does not anymore include the surrounding cities of the Oromya region. Especially on the level of housing and transportation that is a really dangerous issue, the growth of Addis is continuous and fast, causing pressure on the growth of the surrounding cities as well. There is no integration with the city of Addis whatsoever, except for roads. There are no fast public transit connections with the centers of Addis. Some facilities like water provision are being done in collaboration with the surrounding cities, but more on an informal level.
Also the industries, most of the large scale ones are located in the surrounding cities, they place their head office in the city of Addis however to receive funding. It has more status when a company is located in Addis Ababa instead of the surrounding cities. [For instance, there are only architecture companies based in Addis. Some large ones have sub offices in the secondary cities of Ethiopia].

The recent constructed railway line connecting Addis to Djibouti port does not even end at Addis itself, the terminal station is Sabeta, a suburb in Oromya state. The other station is located just outside the boundary of Addis Ababa autonomous state. The plan is to propose another train line from there to the center of Addis, or the LRT should be extended to that station. There is a huge cargo depot. The train line can in the future serve as a suburban train connecting cities like Debre Zeit (~50 km) and even Adama (~100 km).

Involvement of stakeholders

The stakeholders involved in the process were only government actors. Research was done by multiple administrative tiers, from the municipality to the sub cities and woreda's. Also all the other public organisations like the Housing Agency, transport authority were involved. But there was absolutely no cooperation with residents or private stakeholders. Or NGO's whatsoever.

Interviews with residents of the Woyira sefer (Kolfe Keranyo – Woreda 06)

5 residents in Kolfe Keranyo condominium 2
4 residents in KK condominium 1 (GTZ)
6 residents in old sefer, north of terminal and hill towards st. Giorgis

Topics:

- Importance of location
- Public services accessibility
- Infrastructure provision
- State + layout of the dwelling
- Quality of open spaces? Management of open spaces?
- Space and activities (indoor and outdoor)
- What needs to be changed to improve the living conditions?

Example 1: Interview – Condo 2 // 2-bedroom apartment // 3rd floor

_____

Background and daily life patterns

Man who lives with his family of 4 in total plus one maid. They have been living in the condominium from around 8 years, so almost since the beginning. He works for the government, the family used to live in the ambassador area (near Meskel sq.) in an apartment from the Rental Housing Agency (RHA). The RHA is a governmental organisation that rents out apartments for its employees, they pay from up to 100 ETB per month. This agency came into being after the nationalisation of all dwellings in 1974, the dwellings under 100 ETB became the Kebele houses, from 100 ETB were managed by the RHA.

He works as civil servant in the construction of the new condominium site, Bole Arabsa. This location is around 26 km away from the sefer, he spends at least 1.5 hours one way on transportation. By minibus. His wife also works, for a private company. Most of their daily life is focused within the vicinity of their living place. They go to the churches St. Mariam Augusta and st Giorgis Bethel. As well as the market visits and the kids' school (Bethel). The family views these facilities as accessible, they are able to either use taxi's or bajaj or walk. Only to meet family and friends they have to go to the Piazza area.

Importance of location.

They note that it is a really quiet area to live, not so dense and not so much congestion. Because they have small kids, they like that they can play safely. They are satisfied with living in this sefer, also because the price is way lower here than in other areas of the city.

Layout space, house

The family observes that the space is too small for them. It is not enough to accommodate all the activities inside. They note that the kitchen and the bathroom are too narrow to move freely. They have around 50 m2 area.

Provision of infrastructure services

Stable provision of water and electricity.

Quality and management of open spaces

They observe that the management of the spaces is okay, most people have their own parking space. Functions are clearly separated by the management committee and there is enough green space.

Space and activities

As said before the space does not meet the needs of the family. The inside space is too small to host all the activities. However the outside space is also limited, because they live on the 3rd floor they use the corridor for washing and cooking. The communal buildings are also not suitable enough for the daily activities.

To improve?

To improve the living conditions the family states:

- Backyard, or balconies. A more private outdoor space
- Waterproofing of the corridors, especially for the washing activities. The corridors are open and not well sheltered against rain and wind.
- More outside spaces to be used
- Swimming pool

VI. SPACE REQUIREMENTS MATRIX

THEME	UPHILL	WEST	CONDO	EAST	SOUTH	SEFER SCALE	NEW1	NEW2	NEW3
Current inhabitants	4750	3250	2388	1552	650	12590			
Area (in hectare)	17.2	16.6	4.9	5.3	2.9				
Density (inhabitants/ hectare)	276	195	486	293	225				
Primary school kids	950	650	478	310	130				
Required primary schools	2	2	1	1	1				
secondary school kids	712	487	358	233	97	1887			
Required secondary schools	-	-	-	-	-	2			
Extra inhabitants	350	1730	-	38	220	3662	839	2094	729
Local income generation (amount of jobs)	638	623	299	199	109	1574	105	262	91
Health centers	3	2	1	1	1	10	1	2	
Added primary	70	346	-	8	44		168	419	146
Added secondary	53	260	-	6	33		126	314	109

VII. REGIONAL ANALYSIS MAPS

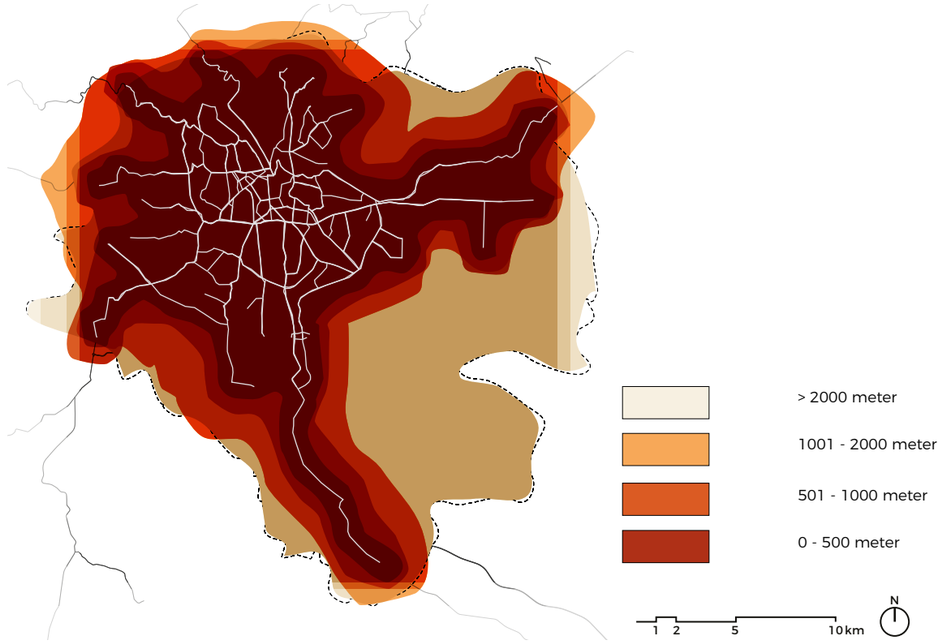


figure a Proximity to public trasport (image by author, based on Bogale, 2012)

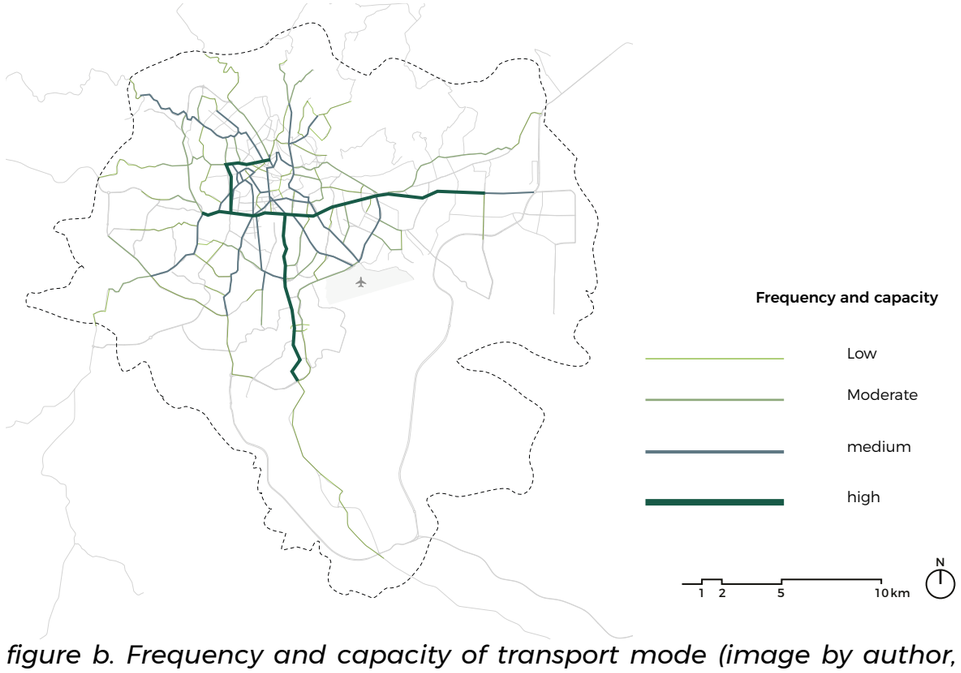


figure b. Frequency and capacity of transport mode (image by author, based on Abate Abreha, 2007)

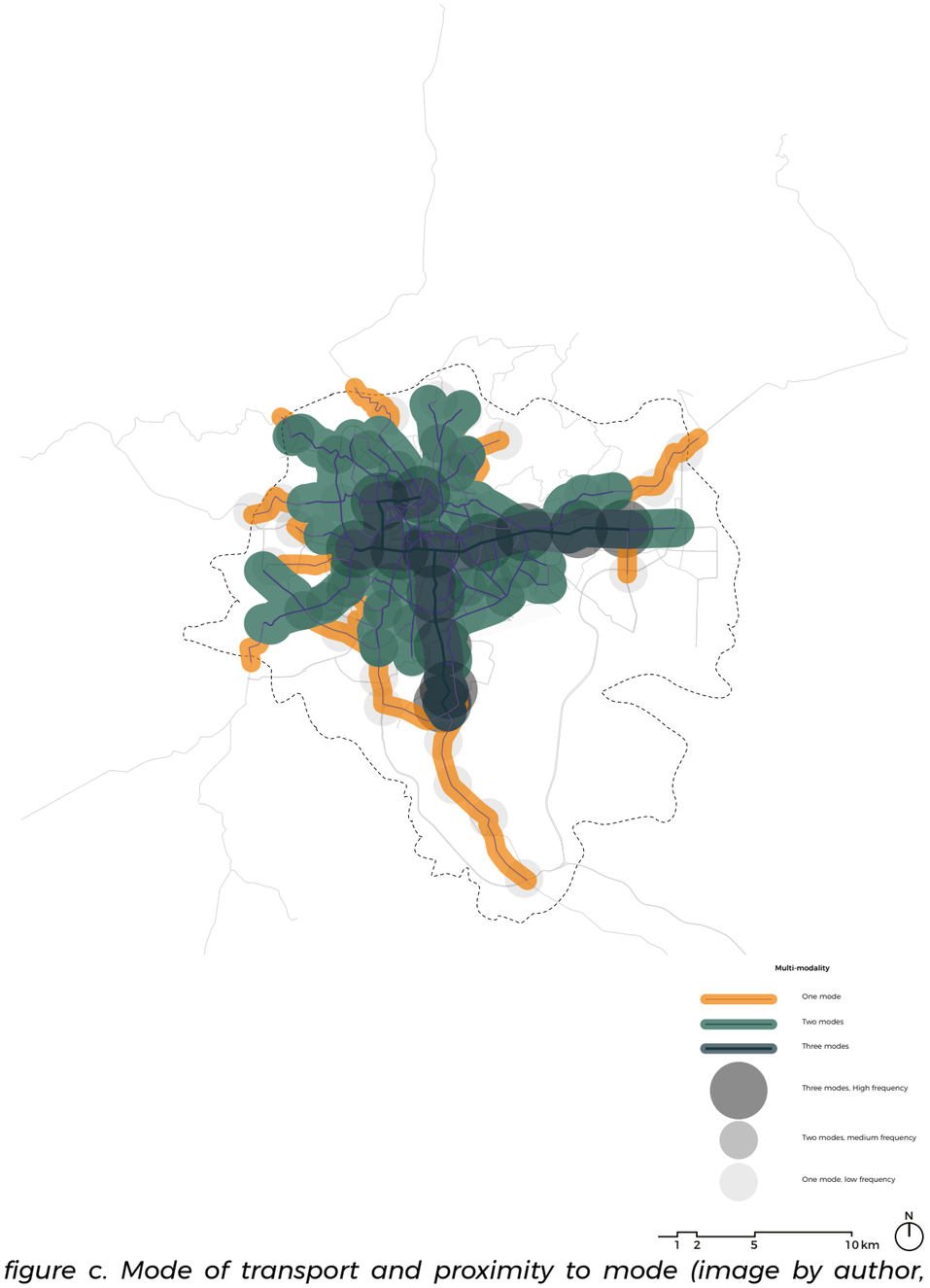


figure c. Mode of transport and proximity to mode (image by author, based on Bogale, 2012)

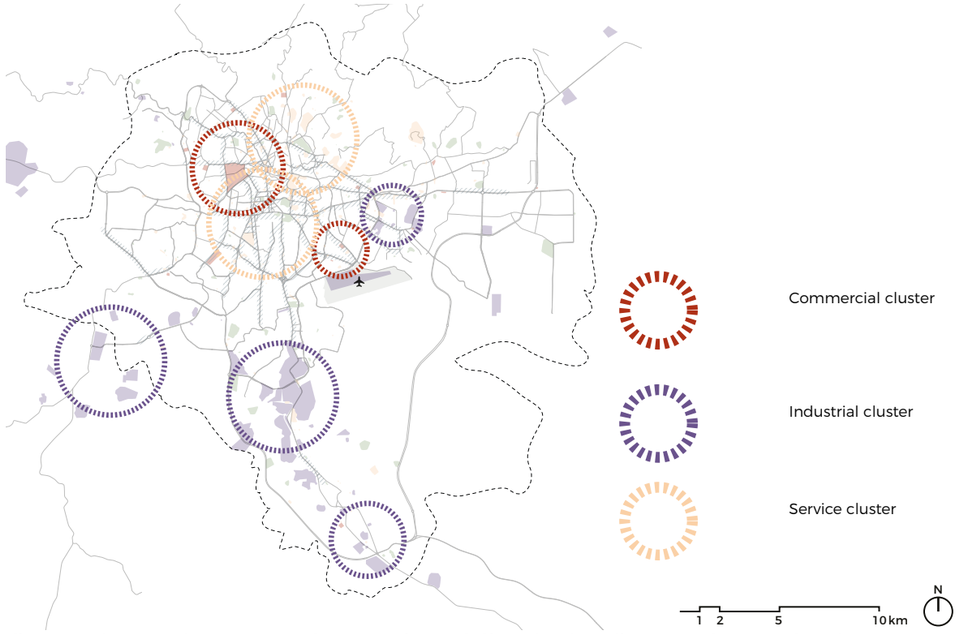


figure d. Employment clusters in Addis Ababa (image by author)

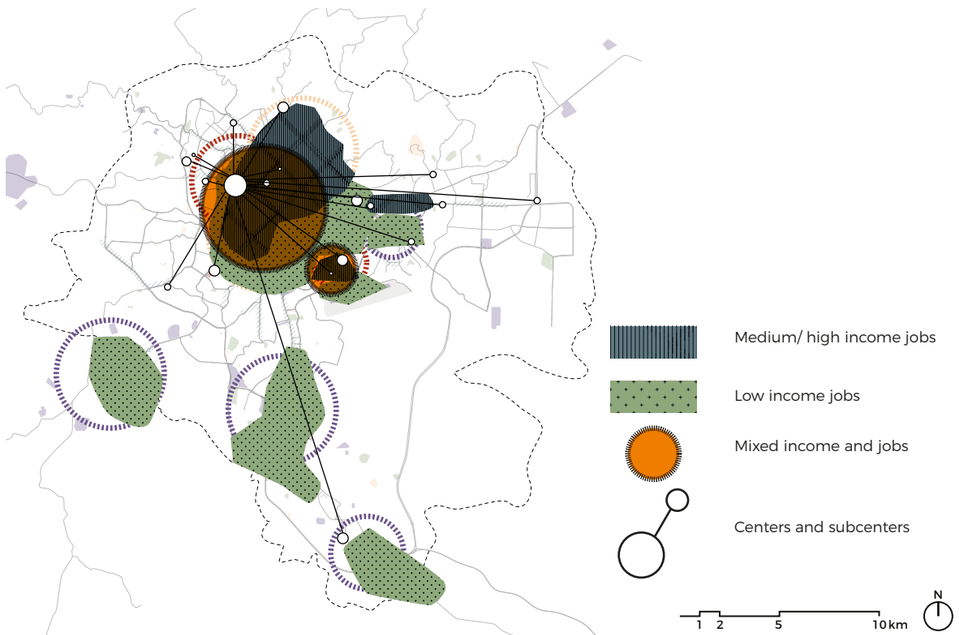


figure e. Mixing of jobs, centers and subcenters (image by author)

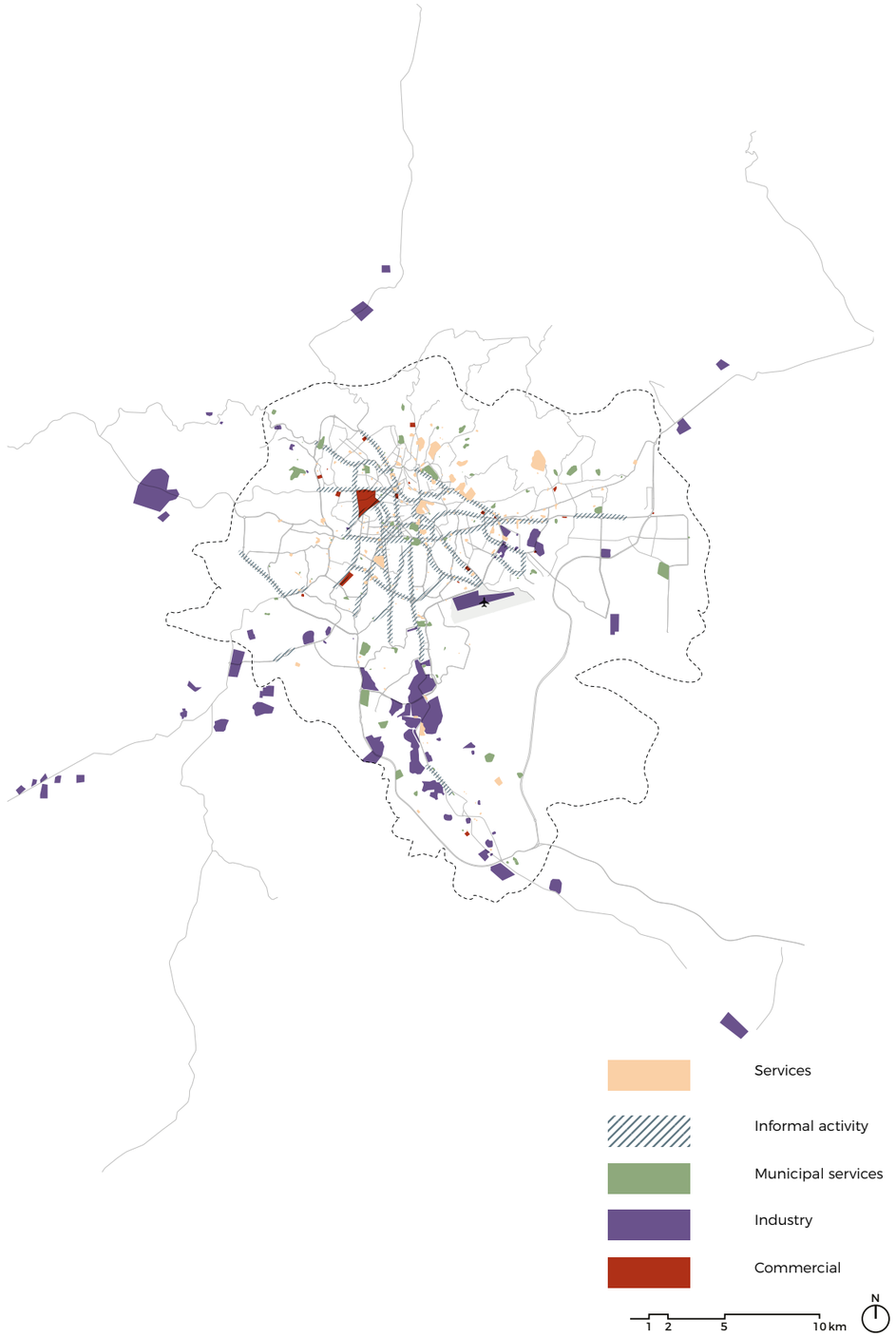


figure f. Employment locations in Addis Ababa (image by author)

VIII. SCENARIO ANALYSIS

The spatial integration analysis shows that there are many areas that lack a proper spatial integration. To improve the spatial integration on the regional level, scenarios are used to investigate other approaches. The paragraph starts with the scenario, what happens when the current policies are continued.

Scenario zero:

What if? Ethiopian government continues the current policies?

The first scenario is actually the scenario zero, based on the current situation. The development within the borders of Addis Ababa is structured by the IHDP, but at the same time due to a lack of affordable housing and land, informal settlements are arising in the periphery. The developments of the IHDP are focussed on the Kebeles in the east and the south-east of the urban area of Addis Ababa. At the same time, smaller scale condominiums are being constructed in the inner city to replace the dilapated Chika houses. Due to both developments, low-income households are pushed to the limits of the urban area, informal settlements are the only possibility left.

figure g. Scenario zero: (image by author)

Scenario one:

What if? Only the areas (kebeles) with a currently high integration are developed?

In this scenario the focus lies on the central areas of Addis Ababa. Acoording to the research, these kebeles show the highest spatial integration. Those areas have a lot of employment opportunities and are considerably better accessible by different modes of transport. Therefore the integration is highest here. Thus better to develop only these areas, to further increase the density of jobs and inhabitants and increase the accessibility. Key issue in this scenario is to increase the accessibility in the whole city, but specifically the accessibility of the center.

The diagram below shows which kebeles are capable of accommodating inhabitants.

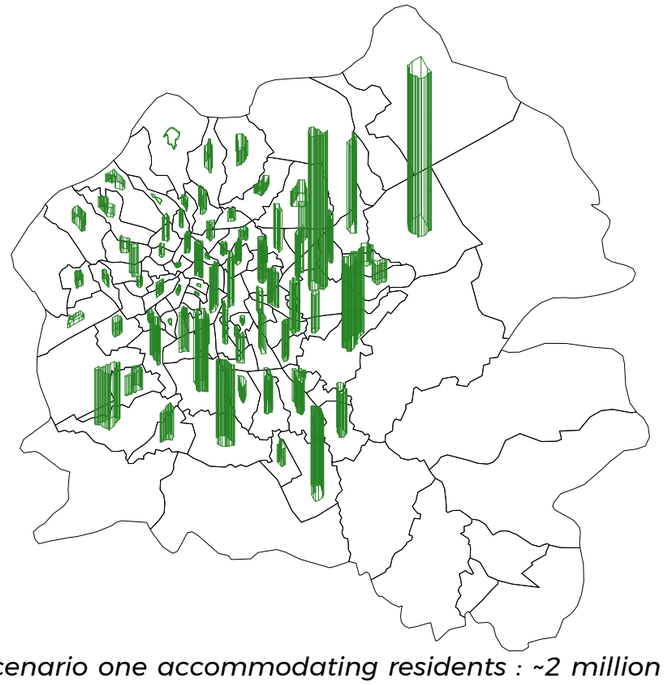


figure h. Scenario one accommodating residents : ~2 million (image by author)

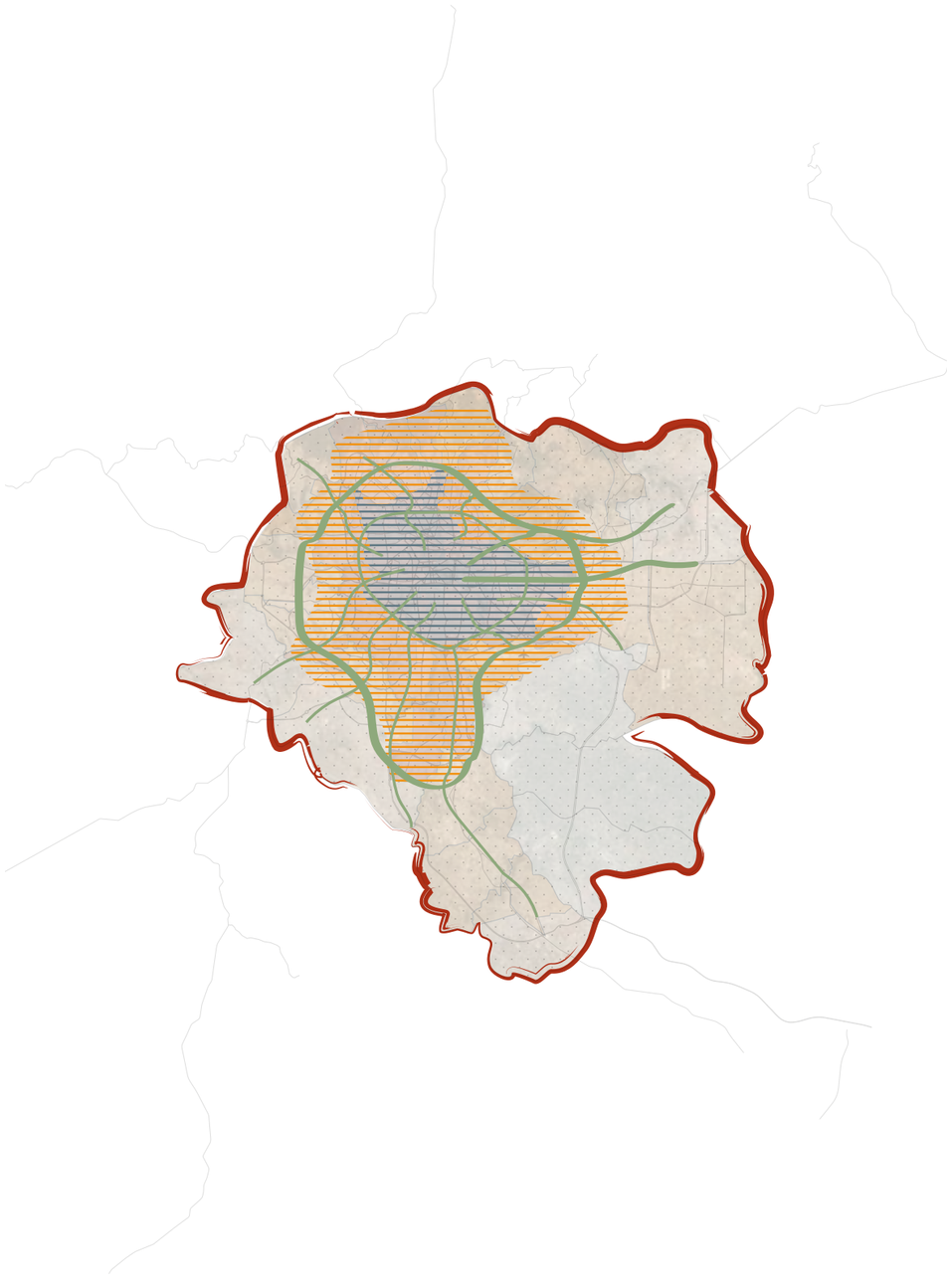


figure i. Scenario one, (image by author)

Scenario two:

What if? Only development of the outskirts, bring the jobs to the people.

This scenario approaches the low integrated kebeles, located in the outskirts of the city. The idea is to bring more jobs to those areas, instead that the residents of the kebeles depend on the jobs in the central areas of the city. Accessibility within the outlying kebeles is increased as well.

This results in accommodating more inhabitants than the first scenario. The kebeles in the outskirts simply have more surface available to increase the amount of residents.

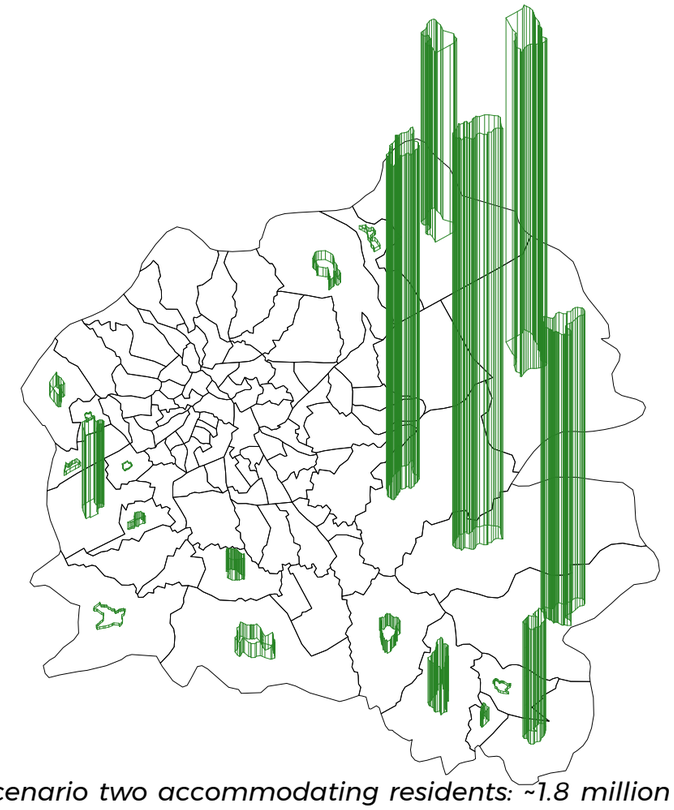


figure j. Scenario two accommodating residents: ~1.8 million (image by author)

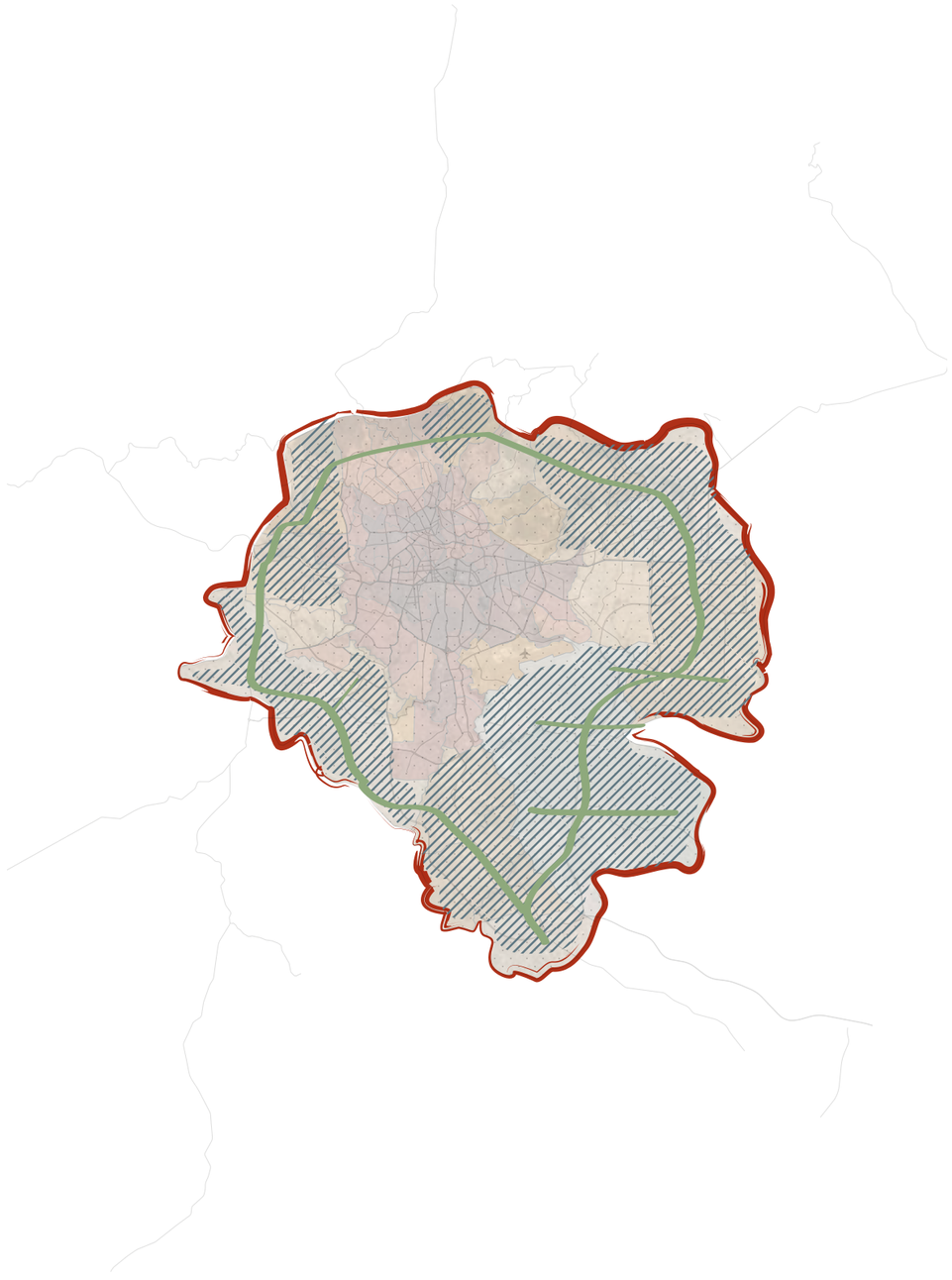


figure k. Scenario two: (image by author)

Scenario three:

What if? The population density is increased around major transport hubs?

The last scenario is based on the proposed mobility network, depending on new BRT connections across the city. The direct influence area of the transport hubs (0-2 kilometer) will see a density of 400 inhabitants per hectare, the secondary influence area has a density of 200 inhabitants per hectare. Again this scenario shows the largest increase in the eastern kebeles, this time accompanied by an extensive development of the hub itself in terms of employment, other functions and public transport.

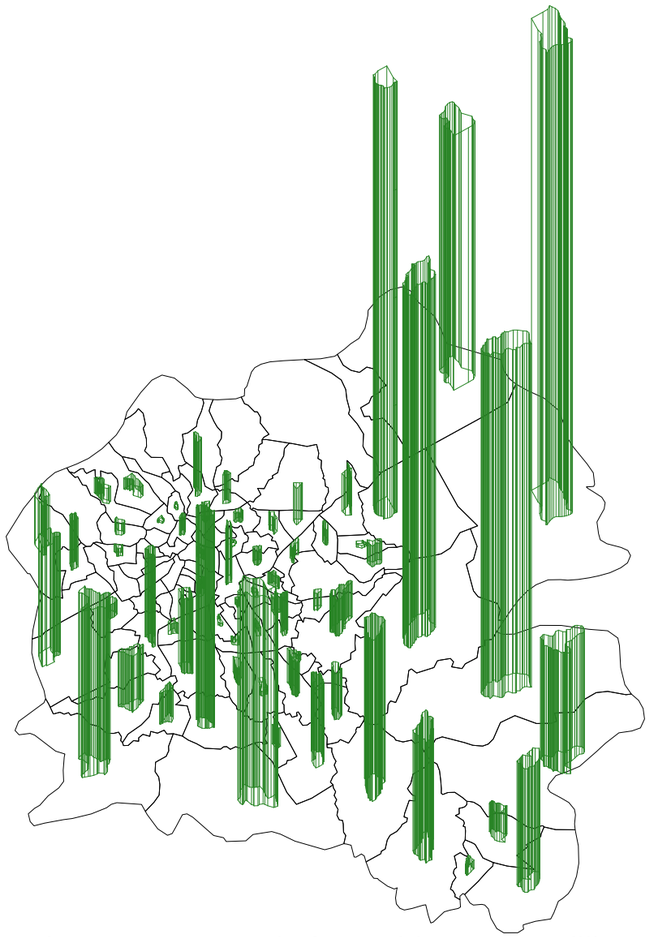


figure l. Scenario two accommodating residents: ~4.1 million

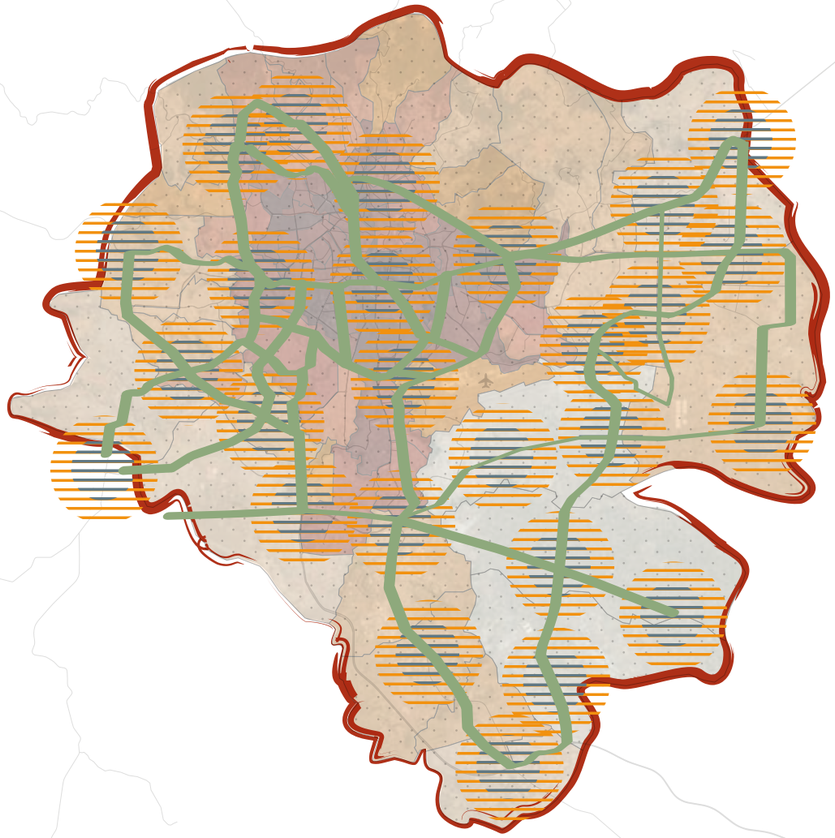


figure m. Scenario three (image by author)

IX. EXTRA MAPS

figure n.Masterplan for the condominium site (by author)

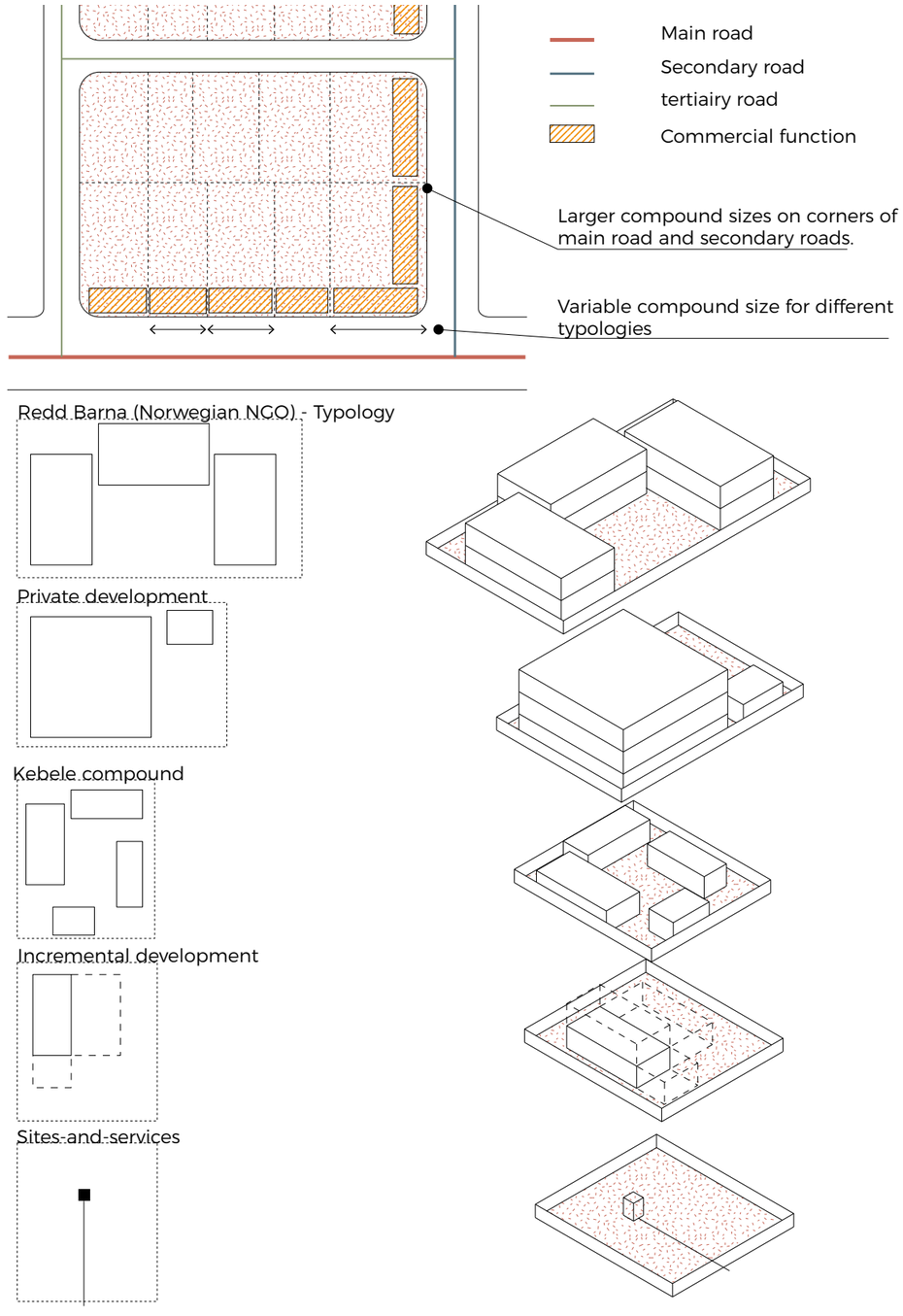


figure o. Housing development principles