



HARD DATA
ADDIS ABABA LIVING LAB

index



<i>page 4</i>	1. GEOGRAPHY
<i>page 6</i>	• 1.1 CLIMATE CONDITIONS
<i>page 10</i>	• 1.2 ELEVATION
<i>page 12</i>	• 1.3 CO2 EMISSIONS
<i>page 14</i>	• 1.4 DEFORESTATION
<i>page 16</i>	2. DEMOGRAPHY
<i>page 18</i>	• 2.1 POPULATION DENSITY
<i>page 24</i>	• 2.2 AGE DISTRIBUTION AS PERCENTAGE
<i>page 28</i>	• 2.3. PERCENTAGE RURAL POPULATION
<i>page 30</i>	• 2.4 RURAL DENSITIES
<i>page 32</i>	• 2.5 ADDIS POPULATION DENSITY
<i>page 34</i>	• 2.6 MIGRATION
<i>page 38</i>	• 2.7 ETHNICITY
<i>page 40</i>	• 2.8 HEALTH- LIFE EXPECTANCY
<i>page 42</i>	3. ECONOMY
<i>page 44</i>	• 3.1 GDP
<i>page 46</i>	• 3.2 ECONOMIC DEVELOPMENTS
<i>page 48</i>	• 3.3 EMPLOYMENT AND LABOUR MARKET
<i>page 52</i>	• 3.4 HOUSEHOLD INCOME
<i>page 54</i>	• 3.5 INCOME GROUPS
<i>page 56</i>	• 3.6 FOREIGN INVESTMENT
<i>page 60</i>	4. LIVING CONDITIONS
<i>page 62</i>	• 4.1 HOUSING COST
<i>page 64</i>	• 4.2 CONSTRUCTION MATERIALS
<i>page 66</i>	• 4.3 ACCESS TO PUBLIC SERVICES
<i>page 72</i>	• 4.4 EDUCATION
<i>page 76</i>	• 4.5 INFRASTRUCTURE
<i>page 78</i>	• 4.6 A COLLAGE OF CITIES
<i>page 80</i>	5. REFERENCES

Img 1.01: Farmers, one carrying a plow, in the Western Highlands of Ethiopia.



1. Geography



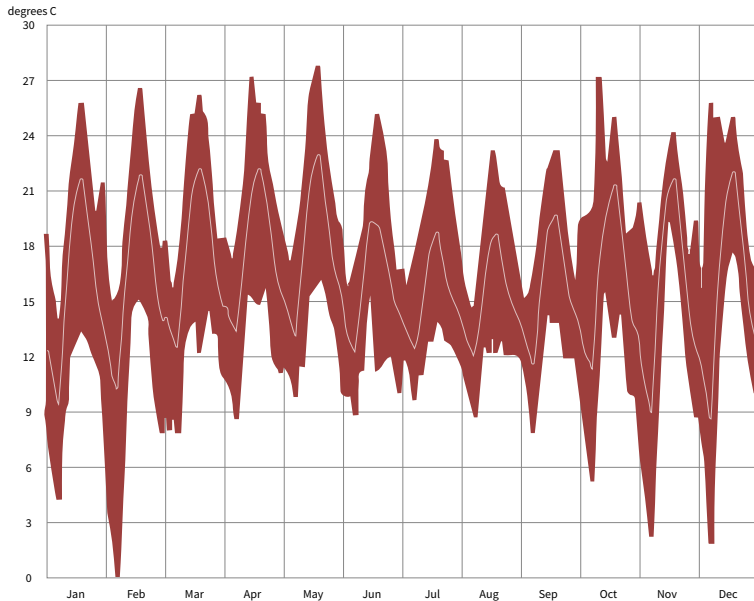
On the Horn of Africa, bounded by Eritrea to the north, Djibouti to the northeast, Somalia to the east, Kenya to the south, and South Sudan and Sudan to the west, Ethiopia is the most populous landlocked country in the world. Five topographic features are identifiable in the Ethiopian topography: the Western Highlands, the Western Lowlands, the Eastern Highlands, the Eastern Lowlands, and the Rift Valley. The Western Highlands are the most extensive and rugged topographic component of Ethiopia. The North Central massifs form the roof of Ethiopia, with elevations ranging from 4,533 metres for Mount Ras Dejen, the highest point in Ethiopia, to the Blue Nile and Tekeze river channels 3 km below. Lake Tana—Ethiopia's largest inland lake and the main reservoir for the Blue Nile River—is located in this region, at an elevation of about 6,000 feet (1,800 metres). (Encyclopædia Britannica. 2019.)

1.1 Climate conditions Ethiopia

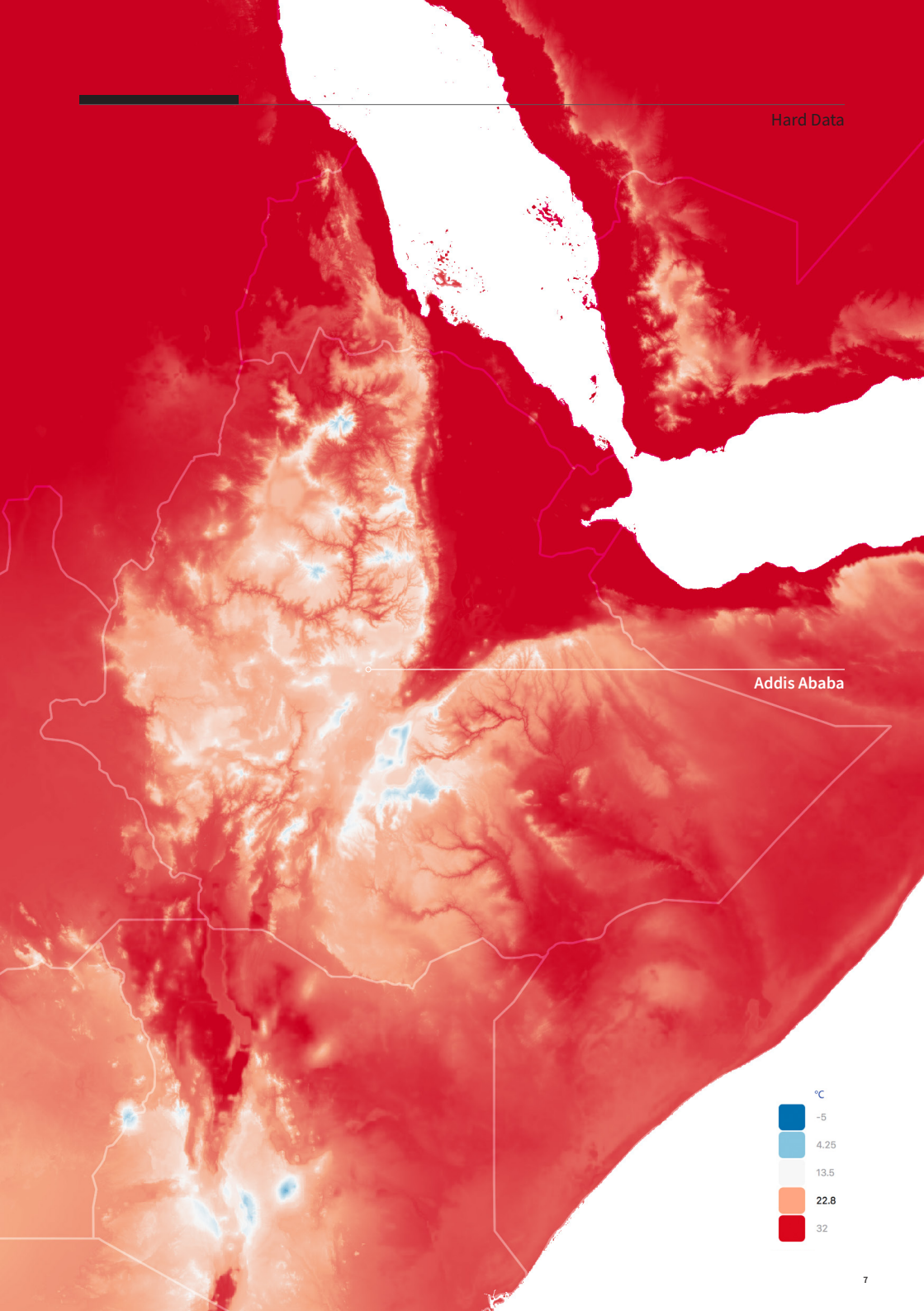
SUBTROPICAL HIGHLAND CLIMATE

There are multiple different climatic regions in Ethiopia, types ranging from equatorial desert to a humid subtropical climate. The altitude plays a major role in these differences in climate. Addis Ababa is situated at an elevation of around 2400 meters and has the climatic type of a subtropical highland climate. (Beck et al) In the diagram below

the maximum and minimum temperature range of Addis Ababa. On the horizontal axis the months within a year are shown, and within every month an average 24 hour cycle is plotted. The average temperature of 16 degrees celsius doesn't change so much during the year, though during the summer season there's a little drop.



Hard Data



Addis Ababa

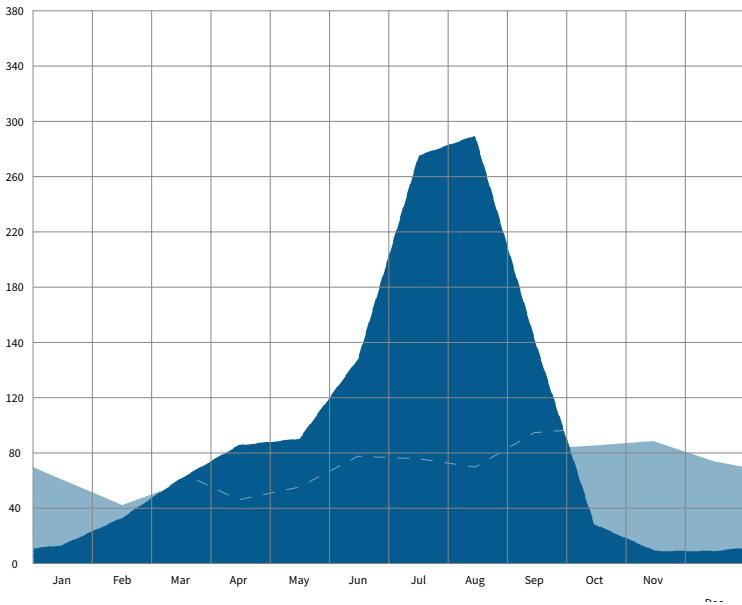


Precipitation

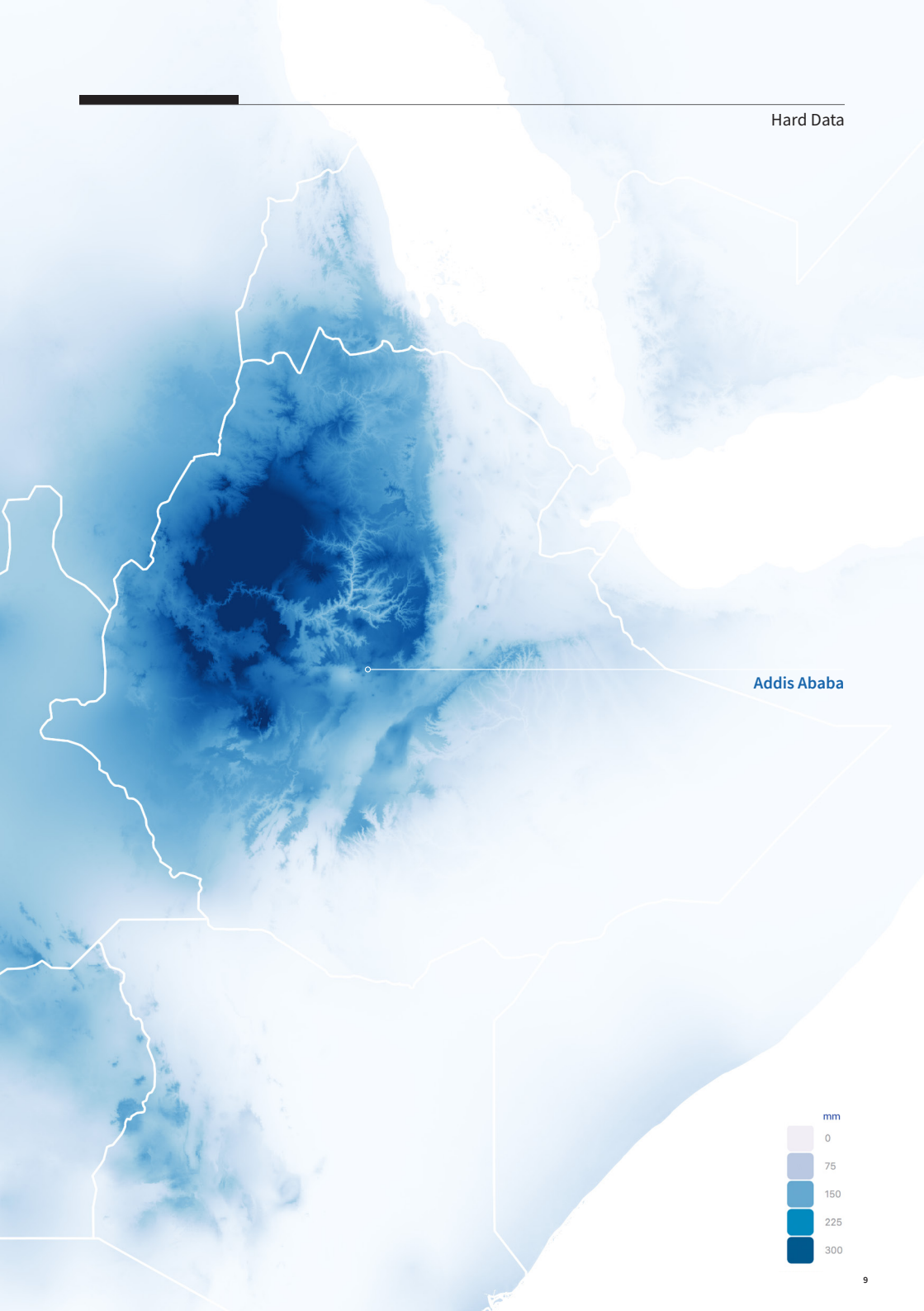
W H E T S U M M E R / D R Y W I N T E R

Addis Ababa has two seasons: a wet summer and a dry winter. The dark blue graph below shows the monthly precipitation in Addis Ababa. (World Weather Information Service 2019) In the months of July and August it can rain up to almost 300 mm per month. For a comparison a lighter blue

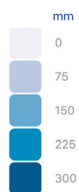
graph on the background is plotted, which shows the monthly precipitation of Amsterdam. (World Weather Information Service 2019) The map on the right shows the rainfall in the month of July. You can see the strong correlation between topography and precipitation. (Fick & Hijmans 2017)



Hard Data

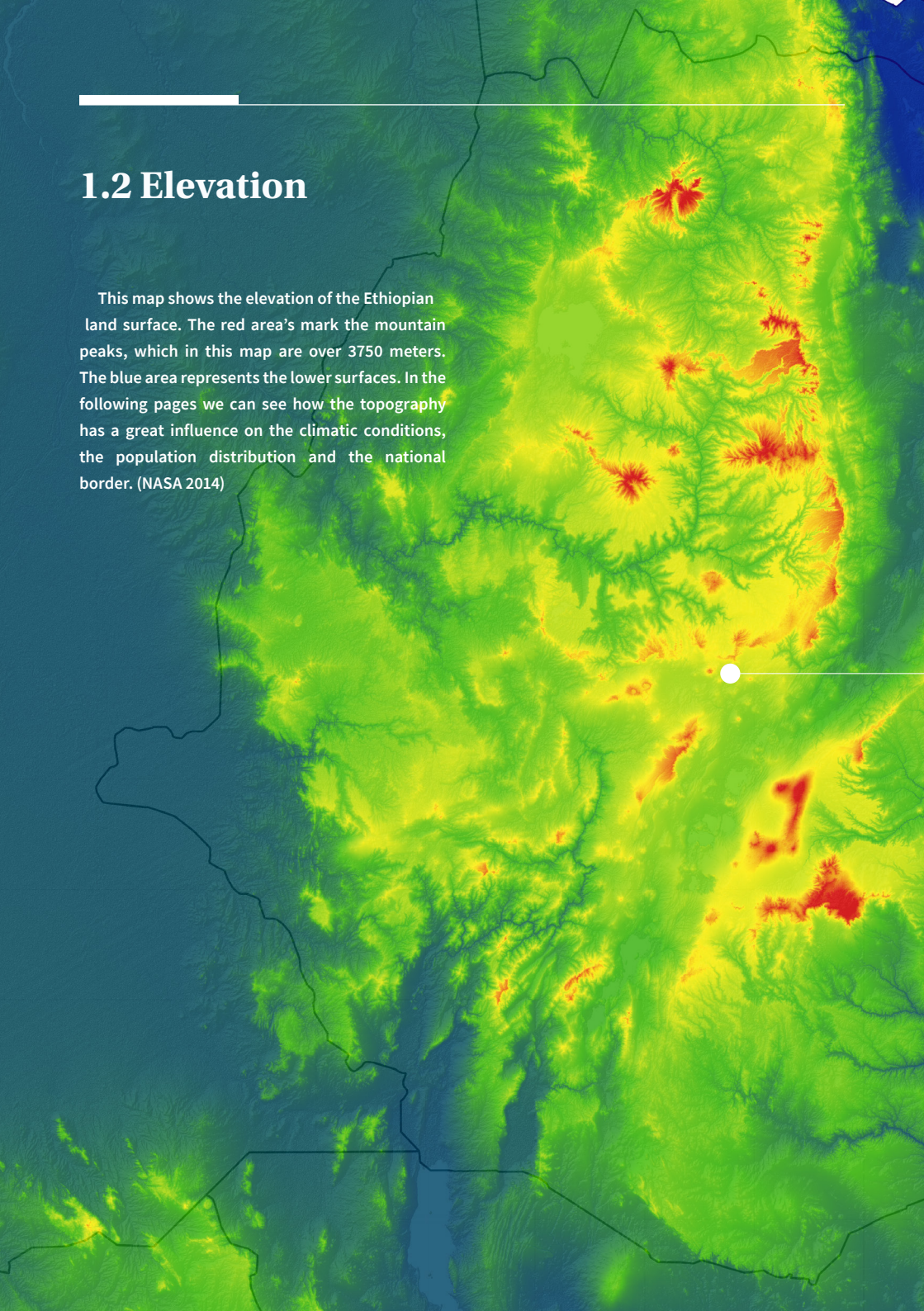


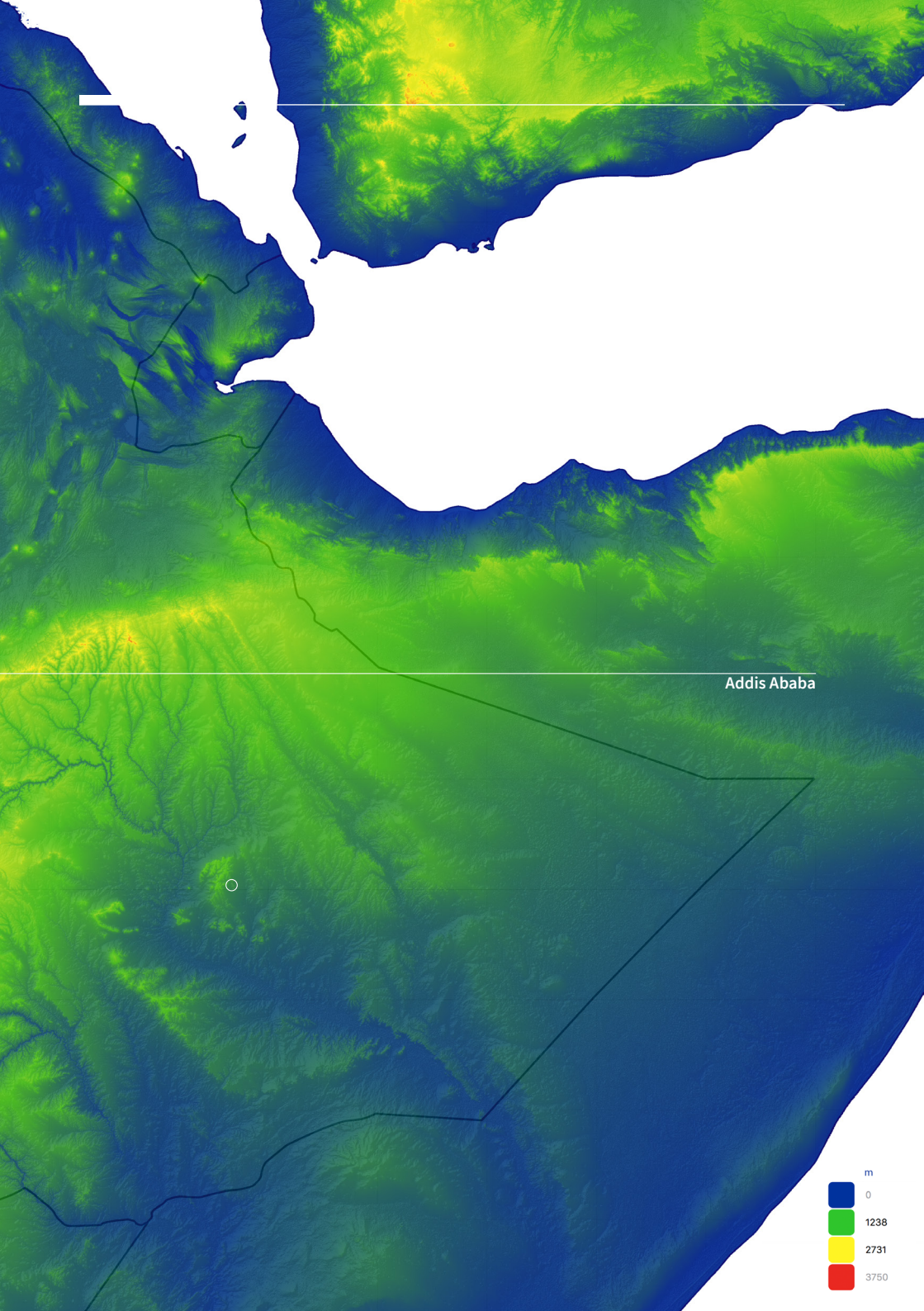
Addis Ababa



1.2 Elevation

This map shows the elevation of the Ethiopian land surface. The red areas mark the mountain peaks, which in this map are over 3750 meters. The blue areas represent the lower surfaces. In the following pages we can see how the topography has a great influence on the climatic conditions, the population distribution and the national border. (NASA 2014)





Addis Ababa

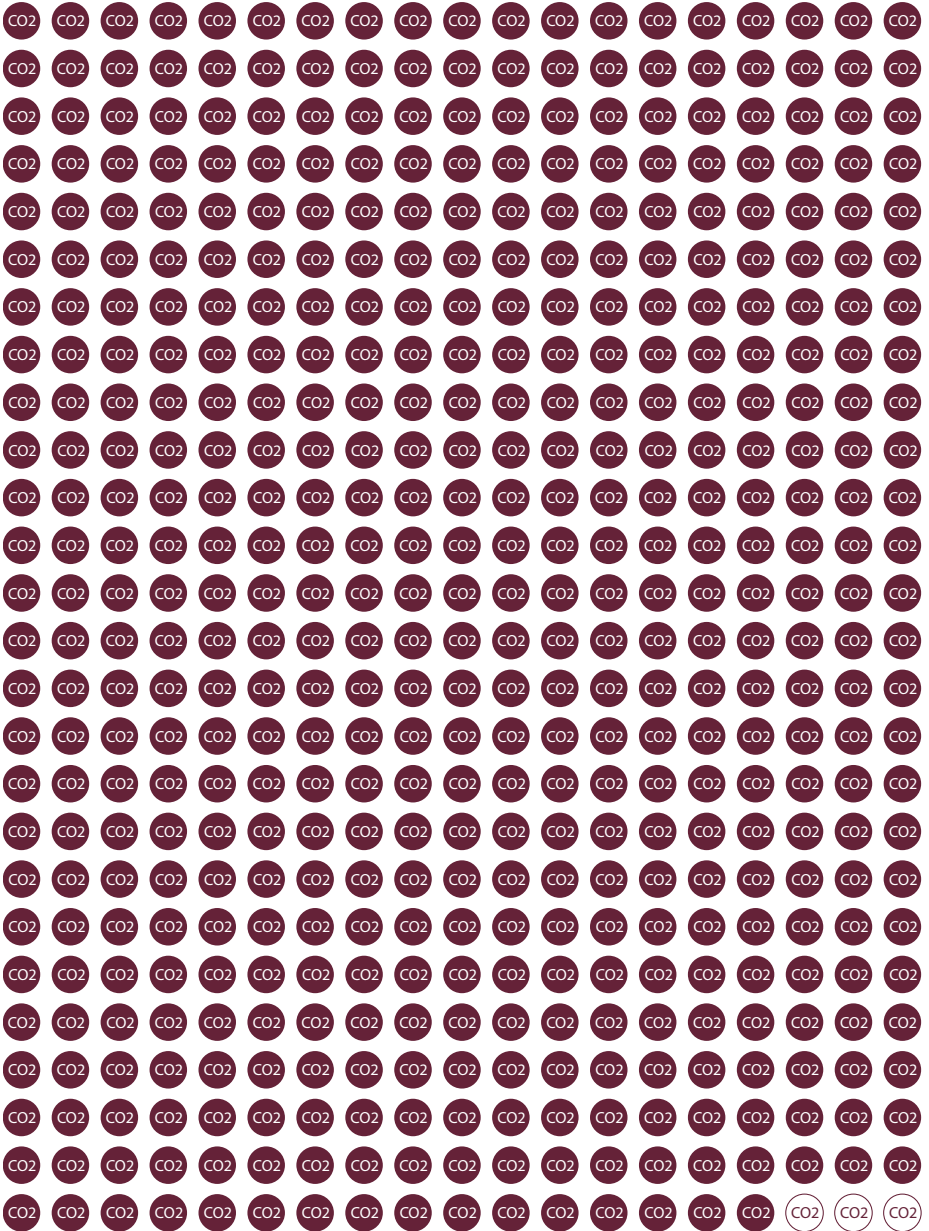


1.3 CO2 Emissions

140 TIMES MORE CO2 EMISSIONS PER CAPITA

Developing countries tend to have the argument that sustainability is not a problem which should be tackled by them, but by the developed countries. They have a point on this. In fact the developed countries are also the most polluting countries in the world. The diagram on the right is made to illustrate this. The spheres in blue represent the carbon dioxide emission per capita of the United States. The white ones the emission per capita of Ethiopia. On average an Ethiopian emits 0,188 metric tons of carbon dioxide per year. A person in the US 16,503 metric tons. That is 13885% more. (World Bank 2018)

However, this is more nuanced than it seems. The economy of the United States is also many times bigger than the Ethiopian one. Besides that is also a heavy exporter, while Ethiopia at the moment has a trade deficit. Perhaps a fairer way to look at it is to show the CO2 emission per GDP of a country. Then we see that the Ethiopian economy is still more efficient when it comes to CO2 emissions, but just 400%. (World Bank 2018)

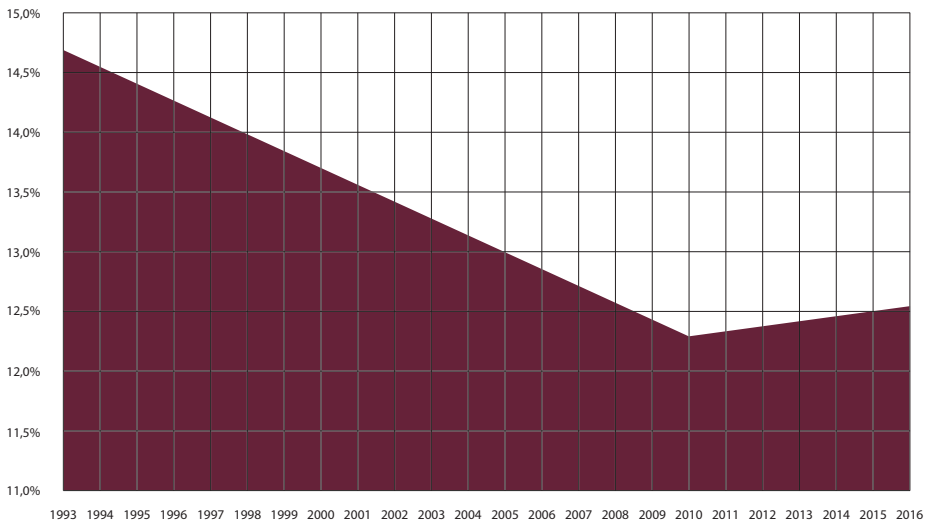


1.4 Deforestation

As a developing country, Ethiopia still enjoys a vast amount of natural resources. However, as the population continues to grow, along with growing demand for farm land, commercial agriculture (coffee plantations), fire wood and construction materials, deforestation is an undeniable threat to the environment. Furthermore, the decline in forest area will also increase the chance in drought, as the ground is less capable in holding water to the subsurface. This creates a vicious circle in which deforestation will led to desertification so on and so fourth.

In the statistics (World Bank, n.d.) it is visible that the share of forest area has been slowly decreasing before the turn of the century. The decline is stopped in 2010, as a result of government slowly changing attitude towards environmentalism. Legislation were passed to limit the cutting of trees. The government also lead multiple large-scale reforestation campaigns in the whole country, including one in lat July 2019, "Green Legacy", when Prime Minister Abiy Ahmed claim that 350 million trees were planted in one day. This change in attitude towards deforestation is expected to further positively impact the environment. (Paget, S., & Regan, H., 2019)

Forest area as percentage of land area



(World Bank, n.d.)



img 1.02 Prime Minister Abiy during the 'Green Legacy' campaign

Img 2.01: Mursi



2. Demography

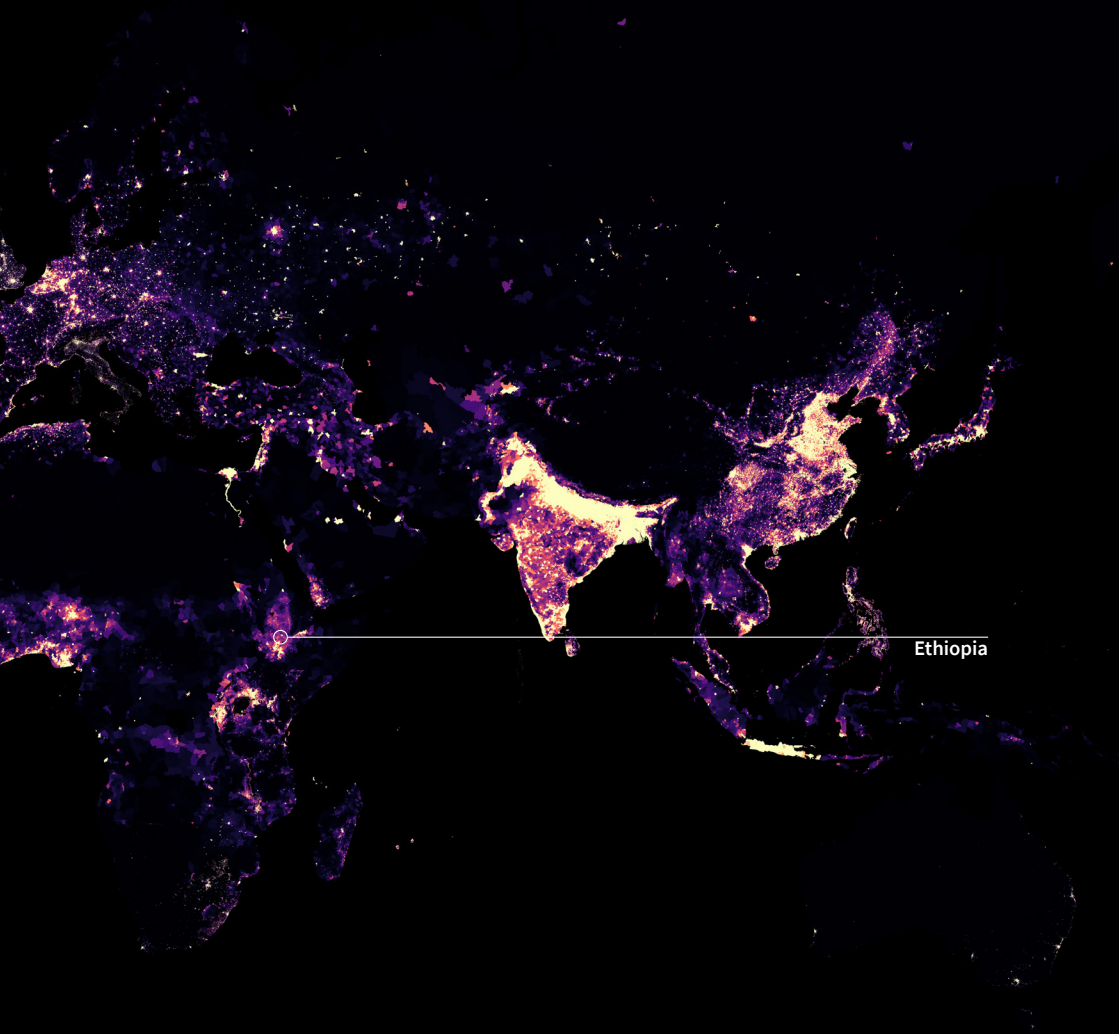


Ethiopians are ethnically diverse, with the most important differences on the basis of linguistic categorization. Ethiopia is a mosaic of about 100 languages that can be classified into four groups. The vast majority of languages belong to the Semitic, Cushitic, or Omotic groups, all part of the Afro-Asiatic language family. A small number of languages belong to a fourth group, Nilotic, which is part of the Nilo-Saharan language family. Under the constitution, all Ethiopian languages enjoy official state recognition. However, Amharic is the “working language” of the federal government; together with Oromo, it is one of the two most widely spoken languages in the country. In the 1990s ethnolinguistic differences were used as the basis for restructuring Ethiopia’s administrative divisions. (Encyclopædia Britannica. 2019.)

2.1 Population density

This map, not to confuse with a night photograph of the world, shows the population density in the world. When the population density is over 500 people per square kilometer the area will show a bright yellow color, and then gradually turns from purple to black when density decreases. (CIESIN 2018)





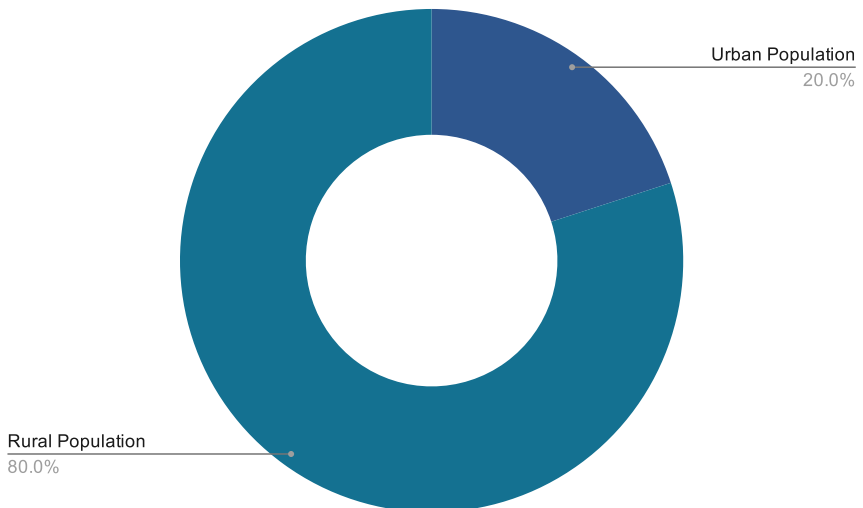
Ethiopia

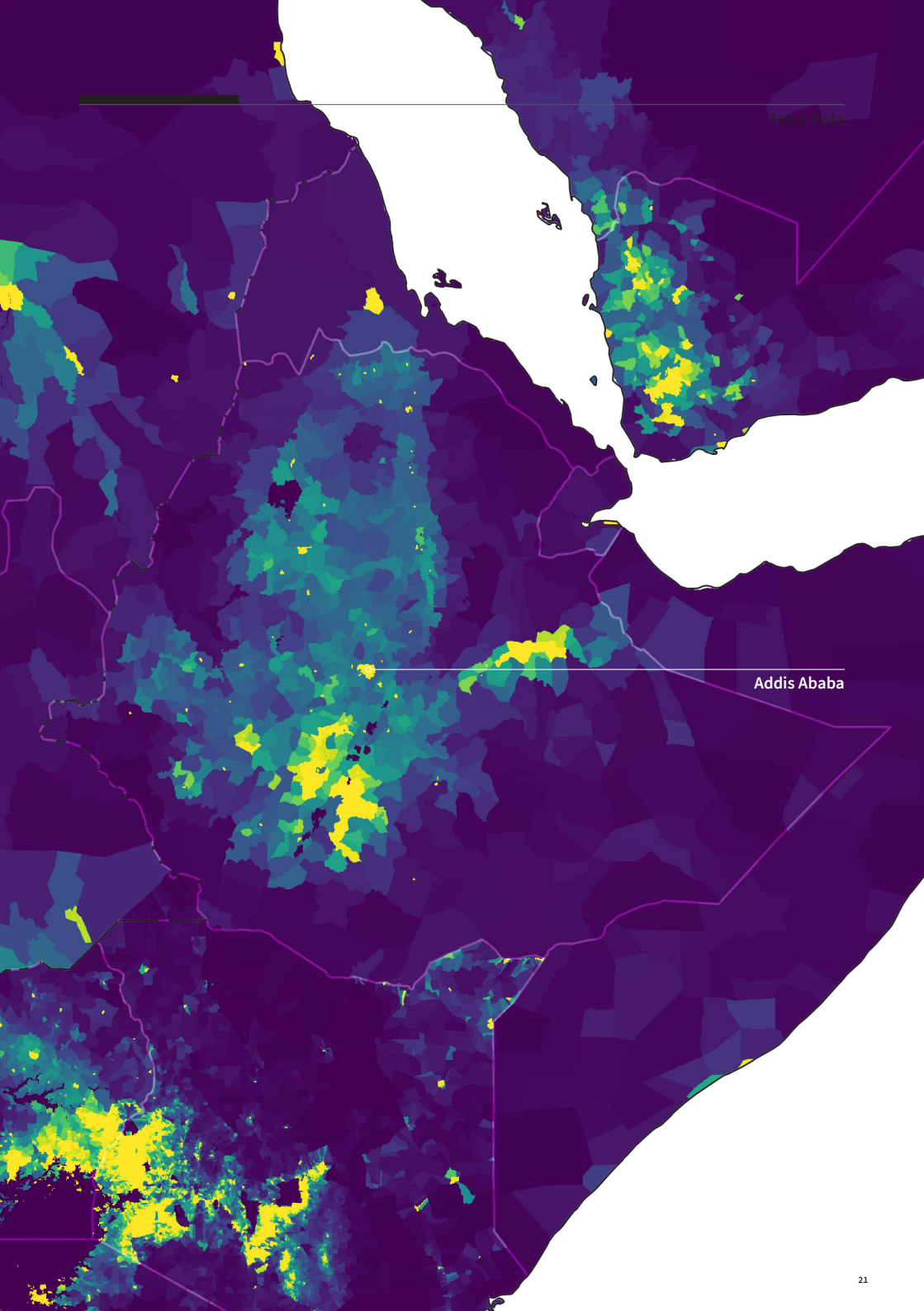
Population density

POPULATED HIGHLANDS

Ethiopia is one of the least urbanized countries in the world. With an urbanization rate of 20% at the moment of 2019 it ranks 175th of 188 listed by the World Bank (World Bank 2019). Nonetheless it hosts in around a 110 million inhabitants. This means that there are 88 million people

living in rural areas. The map on the right shows the population density in people per square kilometers. The yellow areas indicate regions with over 500 inhabitants per square kilometer. The map makes visible that most of the people inhabit the Ethiopian high plateau. (CIESIN 2018)



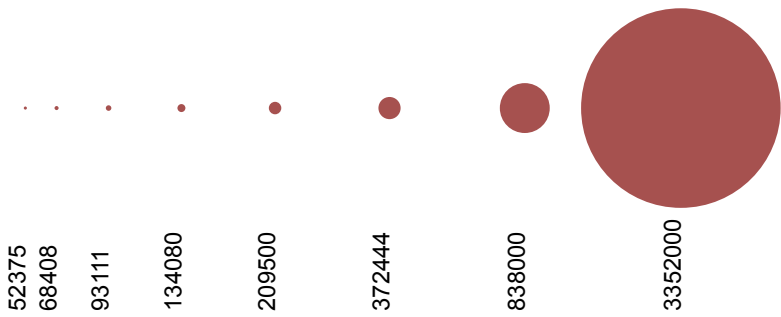
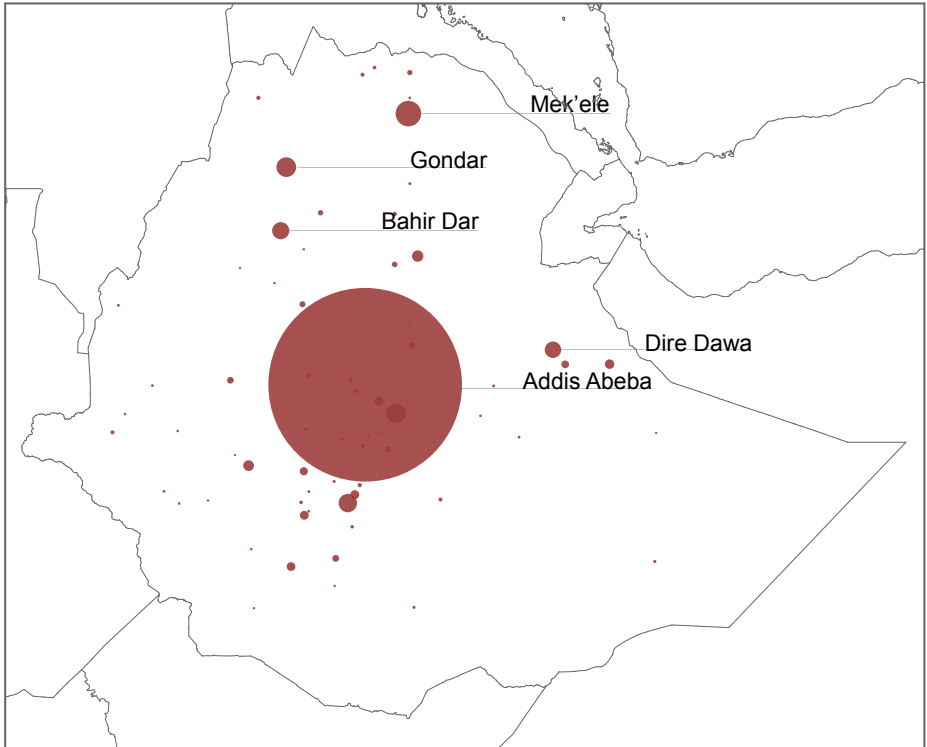


Population density

MEGAPOLIS

The distribution of the people living inside urban areas in Ethiopia is very unequal. From the 20% of urban population almost 1/5 was living inside Addis Ababa, with at the time of 2016 3352000 inhabitants. The second largest city was Mekelle with 441991 inhabitants.

The drawing on the right is made to illustrate this. The radius of the circles represent the amount of people living in one city. (Central Statistical Agency 2007)



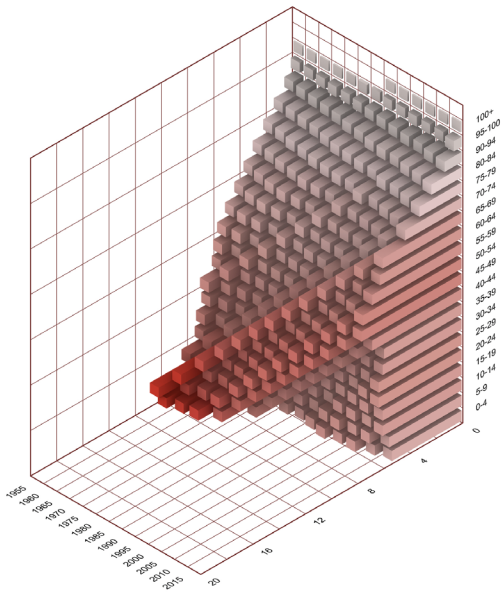
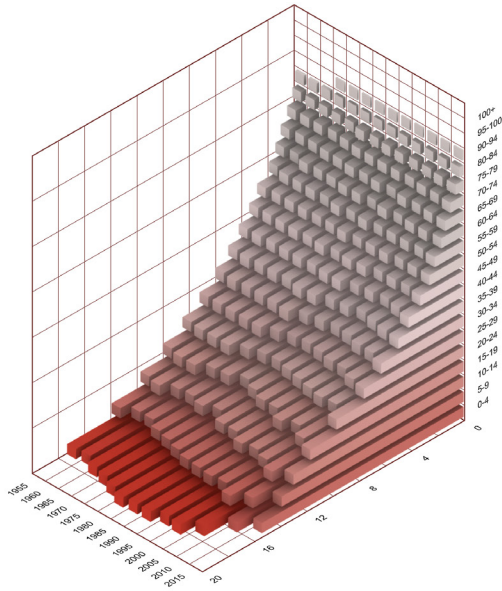
2.2 Age Distribution as Percentage

3 - DIMENSIONAL POPULATION GRAPH

The triangular pyramid shape which is shown in the diagram on the right reflects a growing, or expanding population. The top one represent the Ethiopian situation and the botom one the Dutch situation. The age structure of a population is measured in percentages and affects a nation's key socioeconomic issues. Countries like Ethiopia with young populations (high percentage under age 15) need to invest more in schools, while countries with older populations (high percentage ages 65 and over) will need to invest more in

the health sector. Ethiopia is a predominantly agricultural country that is in the early stages of demographic transition. The last decade has shown a decrease in ages under 15 and increase in the percentage of the active working sector (15-40). The age structure can also be used to help predict potential political issues. For example, the rapid growth of a young adult population unable to find employment can lead to unrest.

Theodora, 2019.



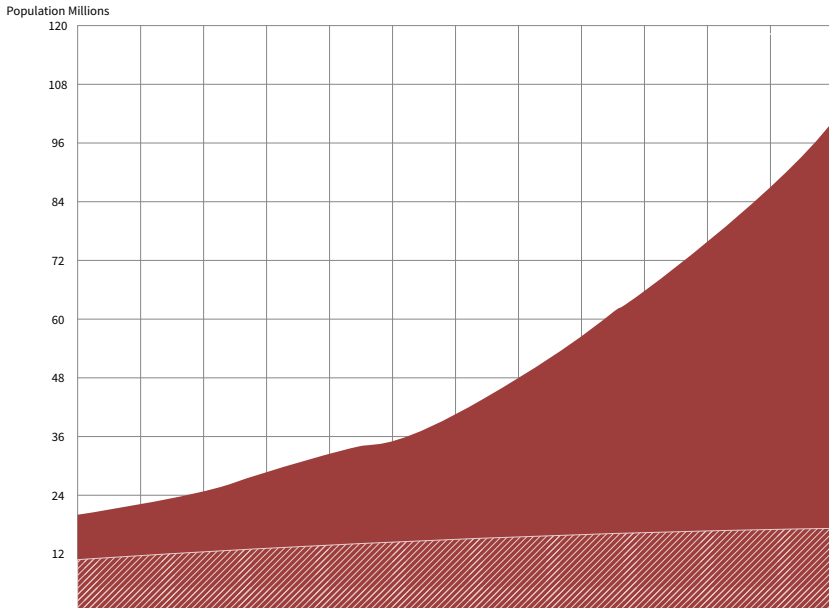
Population density

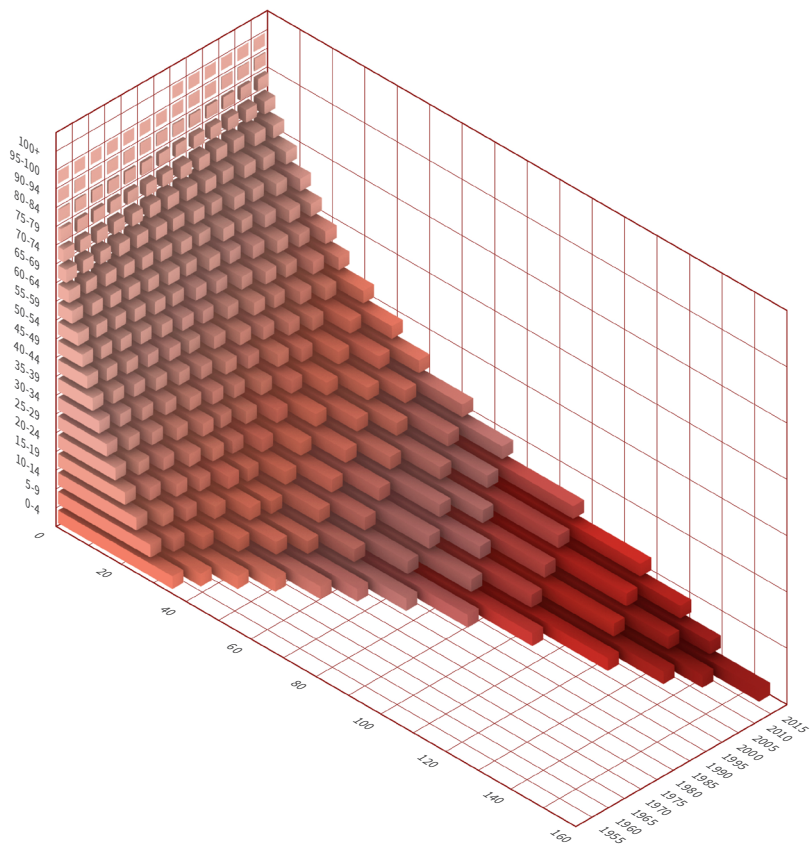
Age distribution in real numbers

As of October 2019, The current population of Ethiopia is 112,976,188, based on Worldometers elaboration of the latest United Nations data. Since 1955 the population quintupled from 20 000 000, see the bottom graph. (World Bank 2019) As a comparison the Dutch population is shown in a thin white line. As opposed to the diagram on the previous page, this diagram clearly visualized the rapid population growth in Ethiopia. This is Infant,

child, and maternal mortality have fallen sharply over the past decade, but with the fertility rate only slowly declining, the population continues to grow rapidly. The diagram on the right visually represents the rapid population growth Ethiopia has been experiencing. Ethiopia's rapid population growth is putting increasing pressure on land resources, expanding environmental degradation, and raising vulnerability to food shortages.

Worldometers, 2019.



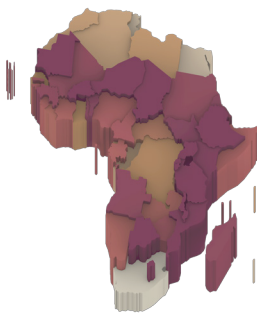


2.3 Percentage Rural Population

Rural population refers to people living in rural areas as defined by national statistical offices. It is calculated as the difference between total population and urban population.

Ethiopia remains one of the least urbanized countries in the world (16 percent), compared to the Sub-Sahara Africa average of 30 percent. Road investments, particular those in transportation corridors in the highlands, have greatly increased connectivity, so that the number of people residing in or within three hours of a city of 50,000 or more, rose from 6.24 million in 1984 (15.5 percent of the population) to 38.7 million in 2007 (48.5 percent of the population).

The rural-urban transformation in Ethiopia,
Dorosh P.A., 2010



1960

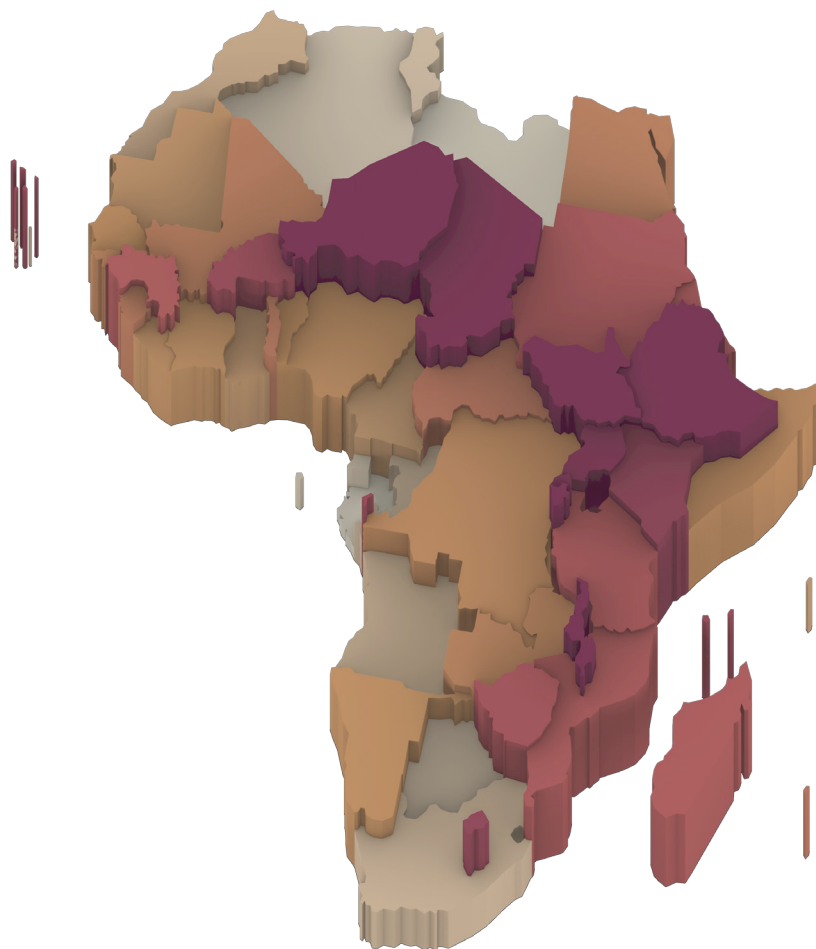
Top 15

RURAL POPULATION RANKING, 2018

1	87.0%	Burundi
2	83.6%	Niger
3	83.1%	Malawi
4	82.8%	Rwanda
5	80.4%	South Sudan
6	79.2%	Ethiopia
7	76.9%	Chad
8	76.2%	Uganda
9	73.0%	Kenya
10	71.9%	Lesotho
11	71.0%	Comoros
12	70.6%	Burkina Faso
13	67.8%	Zimbabwe
14	66.2%	Tanzania
15	65.4%	Sudan



1990



2018



World Development Indicators, 2019

2.4 Rural Densities

The rural densities show how busy rural areas are. In contrast to the map with percentage of rural population, the rural density map shows which countries are heavily populated.

Ethiopia aims to reduce youth mobility caused by poverty, through innovative policies that will create jobs and business opportunities for young people in the agricultural sector and in rural areas more broadly.

Method

e.g. Ethiopia,

Population : 105 350 016

(indexmundi, 2017)

Urban 2017 : 20.31 [%]

(World Development Indicators, 2019)

Urban pop. : 21 873 824

Rural pop. : 83 476 192

Country Area : 1 127 127 [sqkm]

(World Bank, 2019)

Urban Area : 5166.7 [sqkm]

(World Bank, 2019)

Rural Area : 1 121 960.3 [sqkm]

Country Density : 93.5 [p/sqkm]

Urban Density : 4233.6 [p/sqkm]

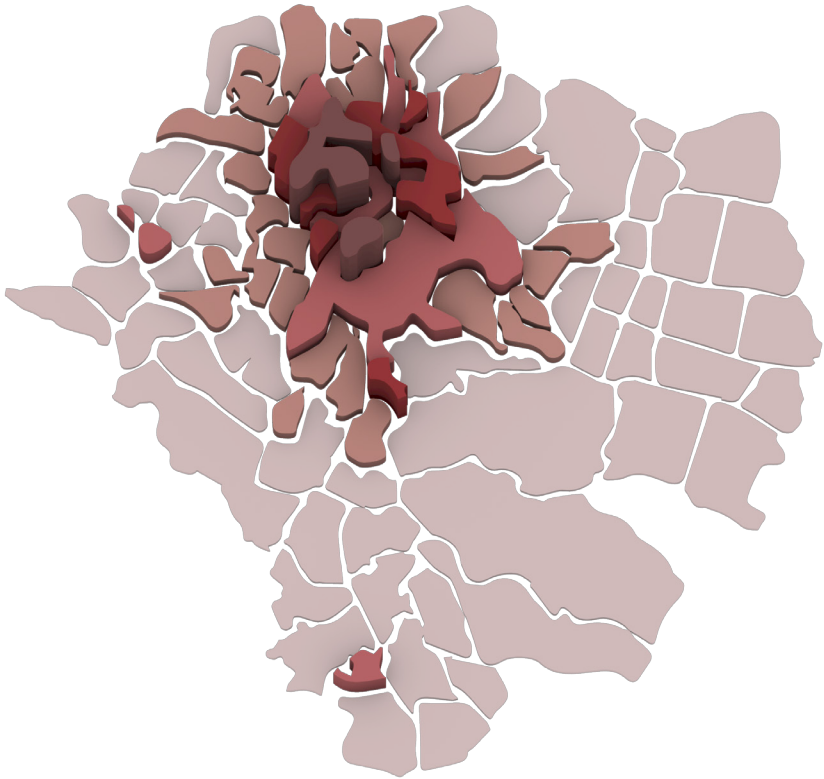
Rural Density : 74.4 [p/sqkm]



Indexmundi, 2017. ; World Development Indicators, 2019. ; World Bank, 2019.

2.5 Addis Population Density

In this figure we see the population densities in Addis Ababa. It can be observed that the central area has higher population. These areas correspond to the old city. Lower population density can also be observed in the southern part of the city where these areas are mostly agricultural areas. The two sub-cities Bole (East) and Nefas Silk Lafto (South-West) have large development of new real estate and flourishing suburbs with low population density.



Density [p/sqkm]



2.6 Migration

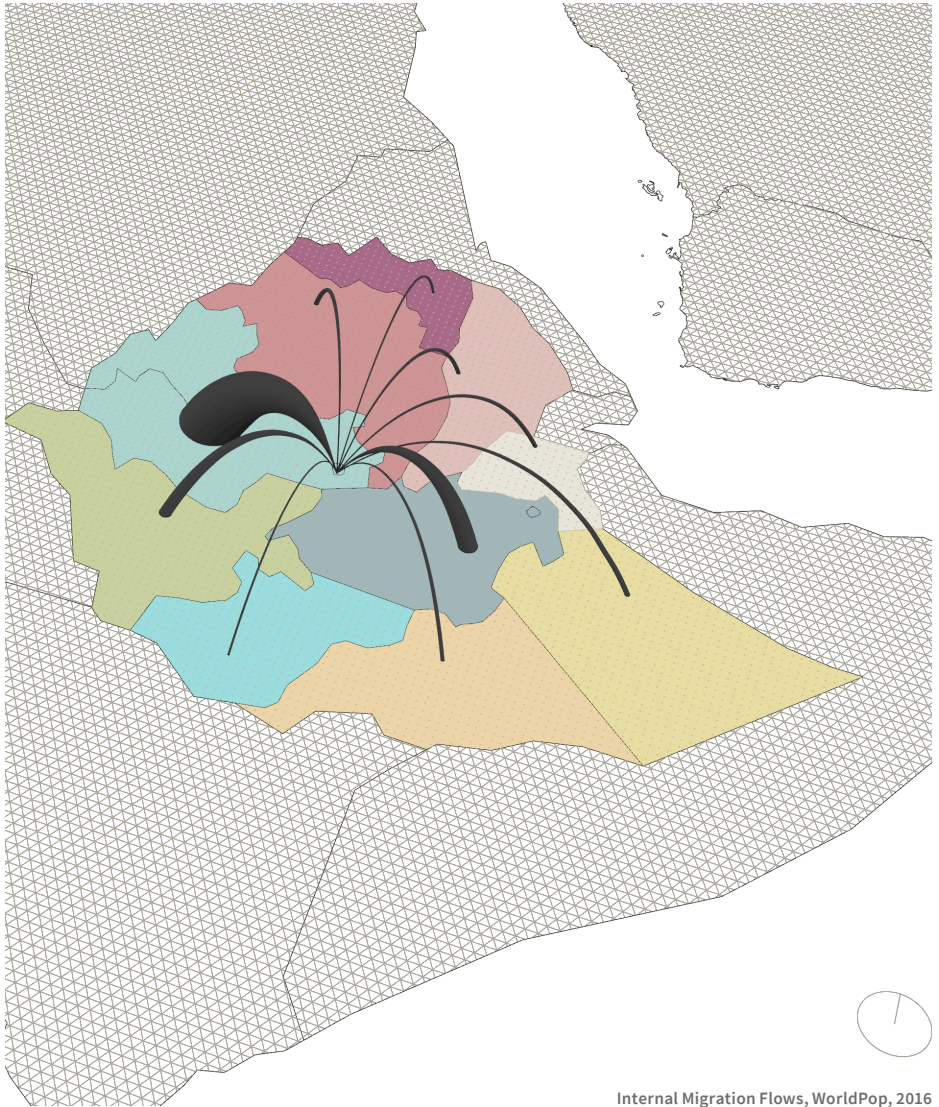
The diagram on the right represents national migration flows towards Addis Ababa.

This map was created through information provided by WorldPop. Their work is focussed on quantifying human migration patterns at subnational scales. In brief, the mapping of population movements was done through the use of mobile phone call data records (CDRs). Worldpop organisation shares data collected for many low and middle-income countries. Population flows, displacements and commuting patters are estimated by tracking individual SIM cards through local phone towers. These numbers are an estimation based on this tracking methods.

2005 - 2010

Migration patterns based cellular usage

29928	West Oromaria
8751	East Oromaria
5790	SNNP
2482	North East Somali
2366	Amhara
2175	North Somali
2078	Afar
1702	South Somali
1345	Tigray
964	South Omaria



Internal Migration Flows, WorldPop, 2016

Migrant City

IT IS EDUCATIONAL OPPORTUNITIES OFFERED BY
THE CITY THAT IS THE MOST IMPORTANT REASON FOR
MIGRANTS TO COME TO ADDIS ABABA - MOLLER 2010

Who are the migrants to Addis Ababa?

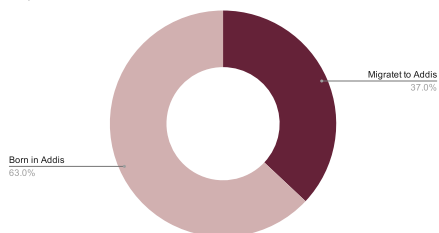
Form a survey in 2008 came out that 37 percent of the population of Addis Ababa were migrants who were not born inside the city. An interesting fact is that during the period 2002-2007 almost two-thirds of them were female. The majority came alone or along with one other relative and very few children were brought along. Half of them came from another town in Ethiopia and almost 90 percent stated that they had no intention of Addis Ababa again. (Moller., 2010)

Why do they move to Addis Ababa?

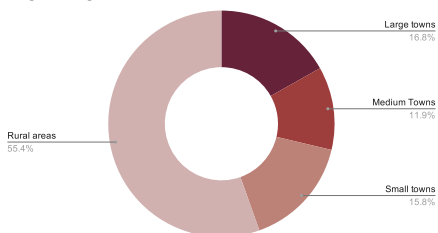
The report stated that: “Contrary to what many believe, it is educational opportunities offered by the city that is the most important reason for migrants to come to Addis Ababa – especially for female migrants.” (Moller 2010 p6).

More than half of the migrants questioned in the survey stated that they migrated from rural areas and almost 90 percent stated that they were not expecting to move within the next three years. This is because most of them say that their life conditions within the city improved compared to their previous condition.

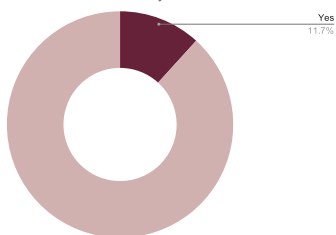
Population Addis Ababa



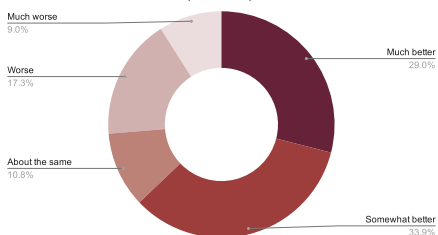
Origin of migrant



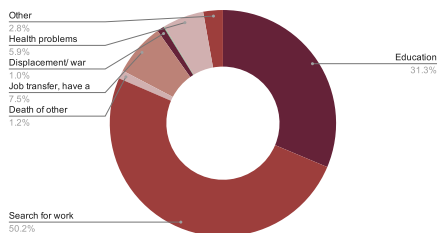
Expect to move within the next three years?



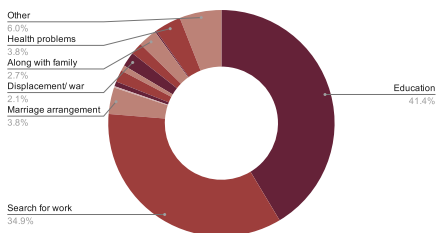
Current life conditions compared to previous condition



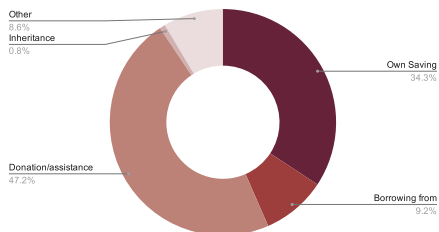
Males vs. Reason to migrate



Females vs. Reason to migrate



Source of capital for transport cost of migrating



2.7 Ethnicity

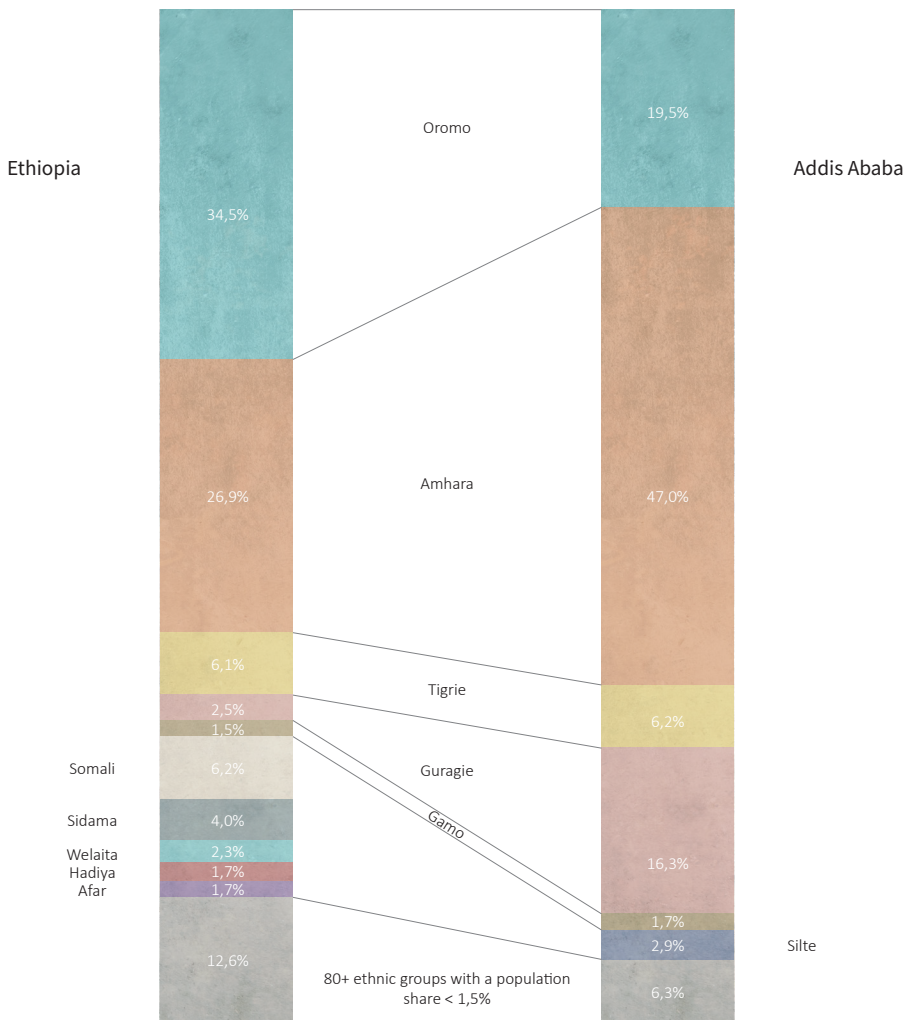
The ethnic makeup of Ethiopia is defined by a vast diversity of indigenous groups and immigrants from mostly neighboring African countries. Oromo, Amhara, Somali and Tigrayans make up around three quarters of the total population. Besides these four major ethnic groups, there are more than 80 different ethnic groups throughout Ethiopia.

The Oromos, predominantly concentrated in Oromia Region in central Ethiopia, are the largest ethnic group in Ethiopia, with a share of 34,5% of the total population. The second largest group is the Amhara, inhabiting parts of the northern and central Highlands of Ethiopia, particularly in Addis Ababa and the Amhara Region, constituting more than a quarter of the population. The following two large groups are Tigrie and Somali, both with around 6 percent of the population. The former is an ethnic group primarily inhabiting the highlands of Eritrea and the Tigray Region of Ethiopia, while the latter are predominantly inhabiting the easternmost region with the same name, bordering the country of Somalia. (Federal democratic republic of Ethiopia population census commission, 2008)

In Addis Ababa, the ethnic makeup is still largely made out of the Oromo, Amhara and the Tigrie. Only the Somalis share of the national population is not reflected in Addis Ababa. In the capital city, the Amhara overtake the Oromo to be the largest ethnic group, with almost half of the

city population. Oromo still constitute around a fifth of the city. Interestingly, the Guragie make up 16% of the city population, which is not the case on a national level. (Federal democratic republic of Ethiopia population census commission, 2008)

Population percentage by ethnic groups/nationalities



(Federal democratic republic of Ethiopia population census commission, 2008)

2.8 Health-life expectancy

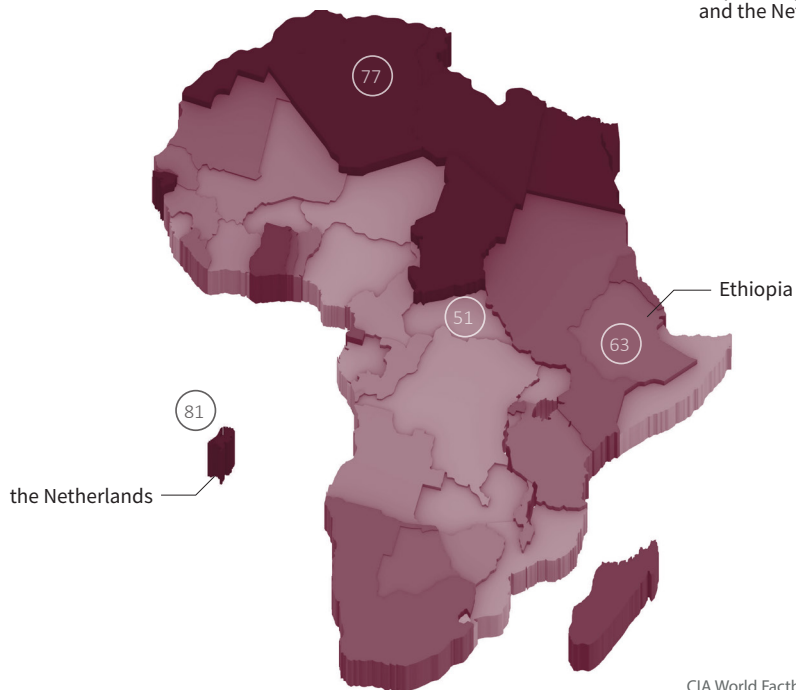
According to the life expectancy data published by the CIA World Factbook (2017), Ethiopia is ranked on the 195th place out of 223 countries in terms of life expectancy at birth. In Ethiopia the life expectancy is 63 years old. Looking at the African continent we can for example see that in northern African countries like Morocco, Libya, Tunisia and Egypt have the highest life expectancy at 77 year. This is generally correlated with the higher level of wealth and therefore better healthcare. On the other hand, the African country with the lowest life expectancy of 51 years is Chad, located in the Sub-Saharan Africa. Neighboring to Ethiopia there is Somalia that is also amongst the lowest in terms of life expectancy at birth, with 53 years. In the African context, the average life expectancy of all countries is 62.3, with a median of 63. Therefore we can conclude that Ethiopia is just about average amongst the African countries when it comes to life expectancy.

Drawing a comparison with western countries, for example the Netherlands, we can see that there is still a certain distance between the life expectancy of the developed countries and the developing countries. The average life expectancy at birth in the Netherlands is 81, which is at least 4 years higher than all the African countries.

In another comparison between Ethiopia and the Netherlands there is a high difference to be found in the number of physicians working in each country. According to the World Health

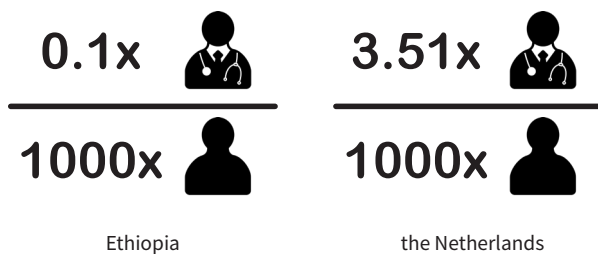
Organization's estimations, countries with fewer than 2.3 health workers (physicians, nurses, and midwives combined) per 1,000 inhabitants would be insufficient to achieve coverage of primary healthcare needs. (CIA World Factbook, n.d.)

Life expectancy in Africa and the Netherlands



CIA World Factbook. (2017)

Physician density



(CIA World Factbook, n.d. a).

Img 3.01: Traders in rural market



3. Economy



Under Haile Selassie I, the production and export of coffee were advanced, and manufacturing of textiles and footwear were established locally. After World War II, tourism, banking, insurance, and transport began to contribute more to the national economy. The communist Derg regime (1974 - 1991), nationalized all means of production, including land, housing, farms, and industry. Faced with uncertainties on their land rights, the small farmers who form the backbone of Ethiopian agriculture became reluctant to risk producing surplus foods for market. Although land has remained nationalized, conditions in rural Ethiopia have improved slightly, as the government has given considerable attention to rural development. Still, the question of land ownership has remained contentious and has hindered the development of commercial agriculture. (Encyclopædia Britannica, 2019.)

3.1 GDP per Capita

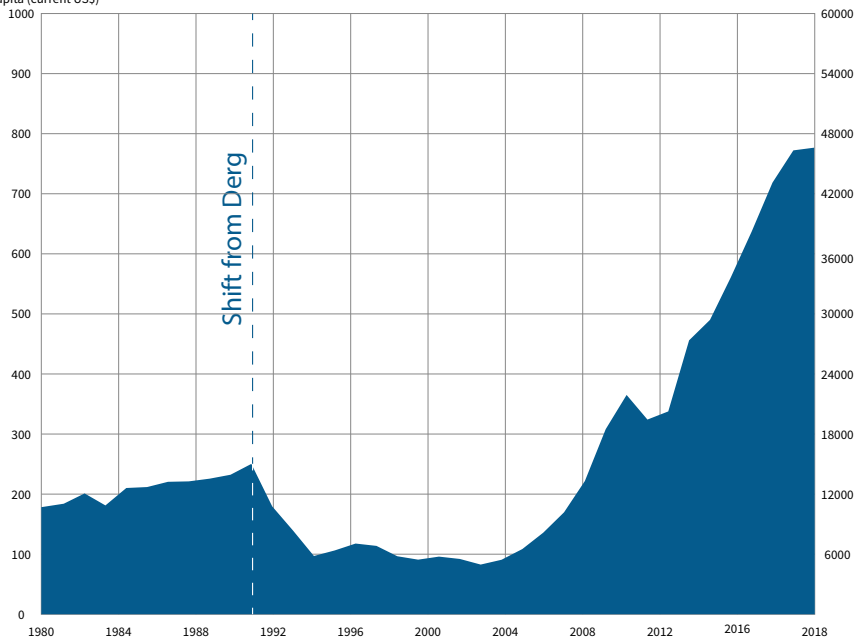
Ethiopia's GDP developments

Since the nineties the Ethiopian government has been in the process of privatizing many of the state-owned businesses and moving toward a market economy. During this course the private sector has boosted Ethiopia's GDP to the extent that it is now perceived as the fastest growing economy in the world. The GDP diagram shows a fluctuating GDP which is mainly a result of political changes. After the fall of the Derg regime

in 1991, there was a sharp drop in the GDP which did not really recover until 2005. The economic instability regained its balance mainly due to a national focus on production and industrialization also supported by foreign investments. In 2010 these strategies proved successful as the growth reached double digits and has remained to do so until this day.

International Finance Corporation, 2012.

GDP per capita (current US\$)



3.2 Economic developments

ETHIOPIA

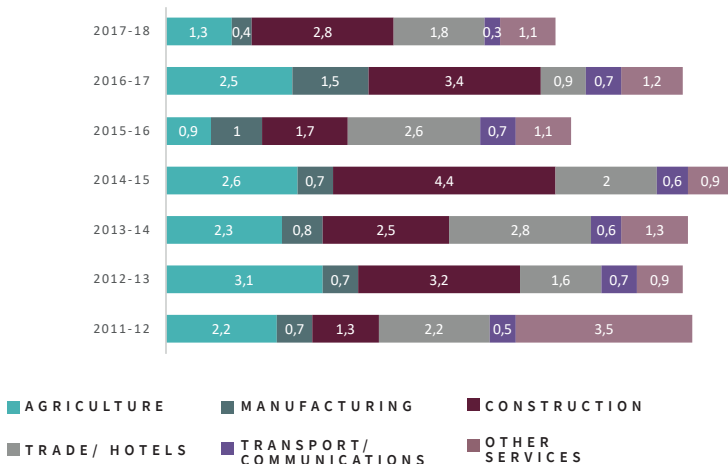
The graph on the right shows the shares of agriculture, industry and services of the Ethiopia's GDP within the years 2010-2011 and 2015-2016. What is remarkable is the fact that the GDP growth is mainly driven by the share of the service sector, even though the agriculture (crops) sub-sector led the share of the GDP.

The share of services which includes transport and communication, education and sanitation represents a flourishing force. Others such as tourism, real state and retail trade have declined from one year to the other, perhaps because of the high costs of the inputs (World Bank, 2019c). By

last, the industry sector represents the smallest share of the GDP. Nonetheless, its rapid growth from 2010 to 2015 has envisioned a prosperous future, especially in the construction subsector.

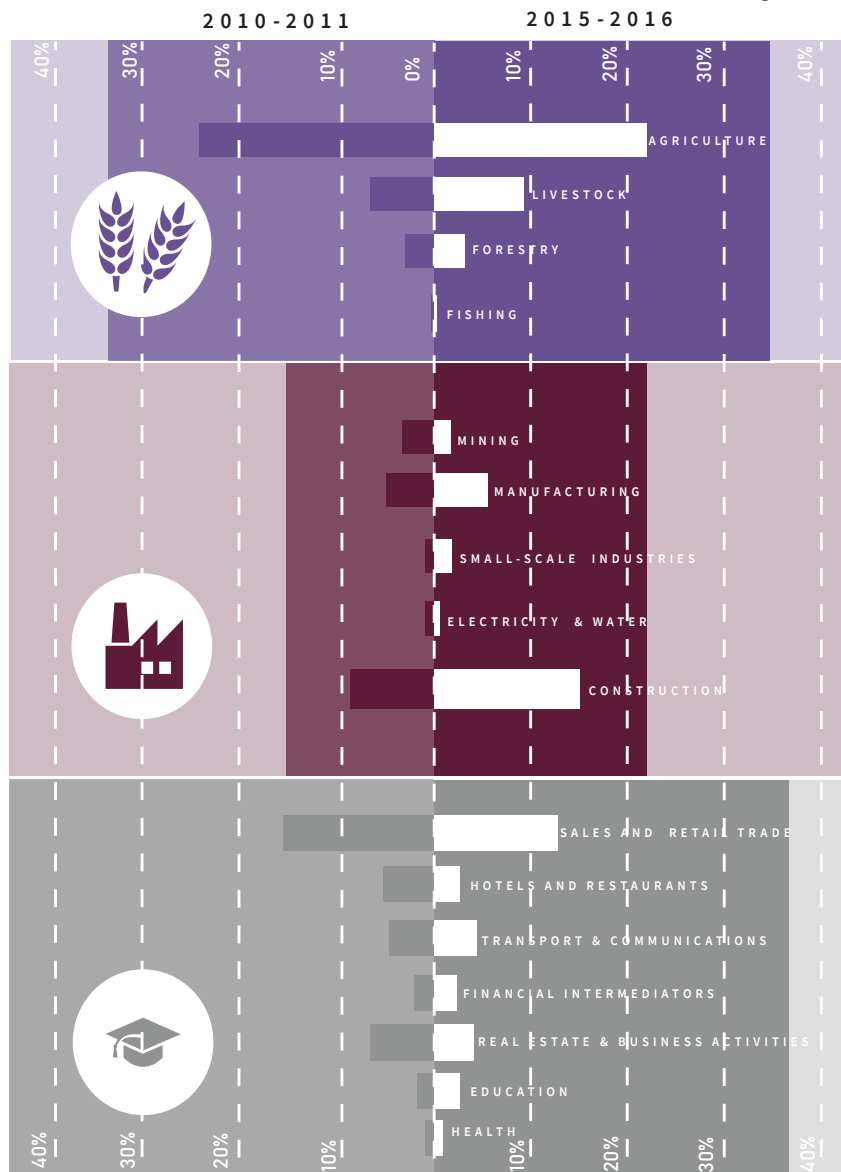
On the other hand, the chart below refers to the subsector's growth. For instance, agriculture has experienced a growth deceleration, whereas construction presents the highest growth in 2018 with 2.8% of the GDP, fostering new employments. However, it has experienced a low growth according to the predictions, perhaps due to the high prices of the imported materials.

Sectors' growth within the economic activity



World Bank, 2019c

Percentage shares of GDP

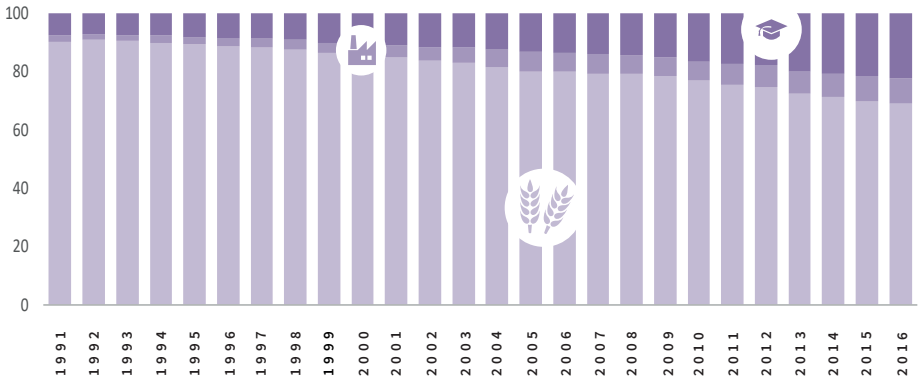


World Bank, 2019c

3.3 Employment & labor market

Employment by sectors

ETHIOPIA



World Bank, 2019d



AGRICULTURE



INDUSTRY



SERVICES

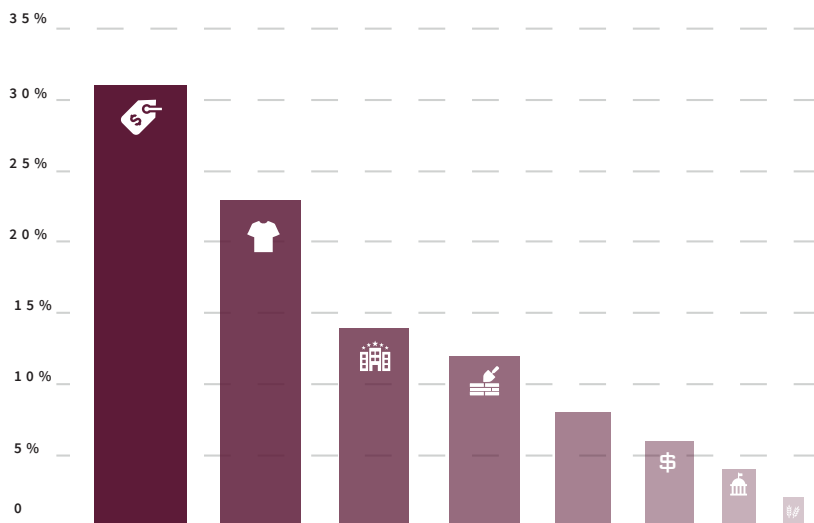
As 80% of the total population in Ethiopia remains rural, agriculture is the main source of income for the majority of population. Still nowadays, more than 70% of the total working population is employed in the agricultural sector, whereas the other two sectors employ the 30%. The service sector has had an important increase since the 1990's, employing 20% of the population, and today, as it is seen on the graph *Percentage shares of GDP*, has become the principle source of the GDP. However, retail prevails, and with it, informality (World Bank, 2018). On the other

hand, the industry sector which represents just the 10% of the employed population has emerging as a very fruitful business. On it, construction and manufacturing will enhance productivity and will improve the livelihood and living conditions of the population.

By contrast, in Addis Ababa, the service sector employs the majority of the population within the trade and manufacturing sub-sectors (30% and 23% respectively), whereas the urban agriculture do not exceed more than 5% of the employments.

Urban employment by sectors

ADDIS ABABA



UN-Habitat, 2017



TRADE



MANUFACTURING



SERVICES



CONSTRUCTION



OTHERS



FINANCE

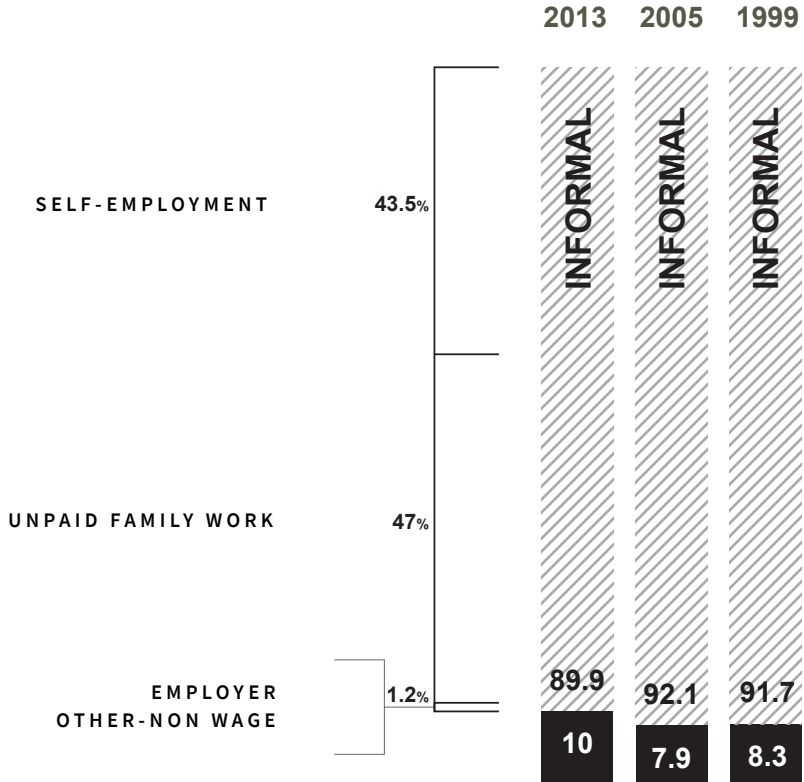


GOVERNMENT

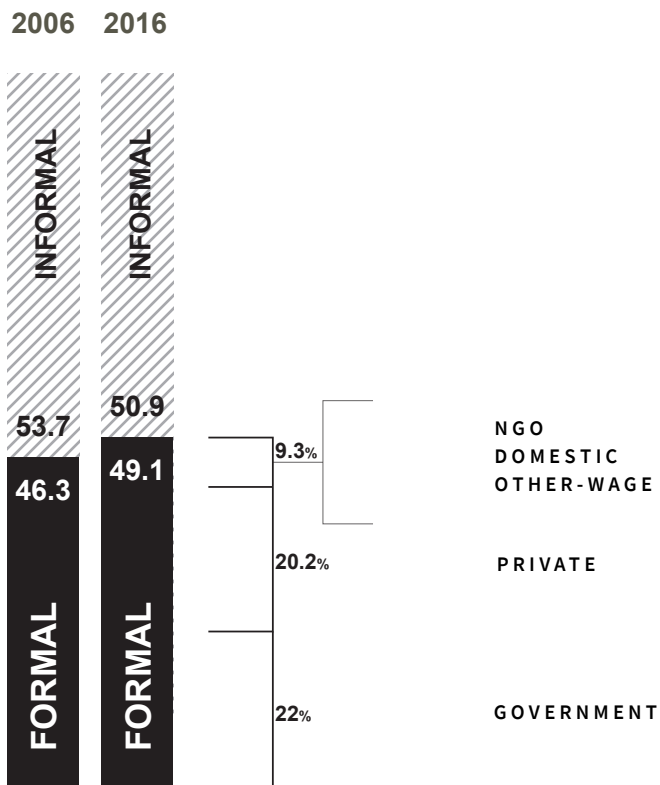


AGRICULTURE

Formal/Informal



Rural



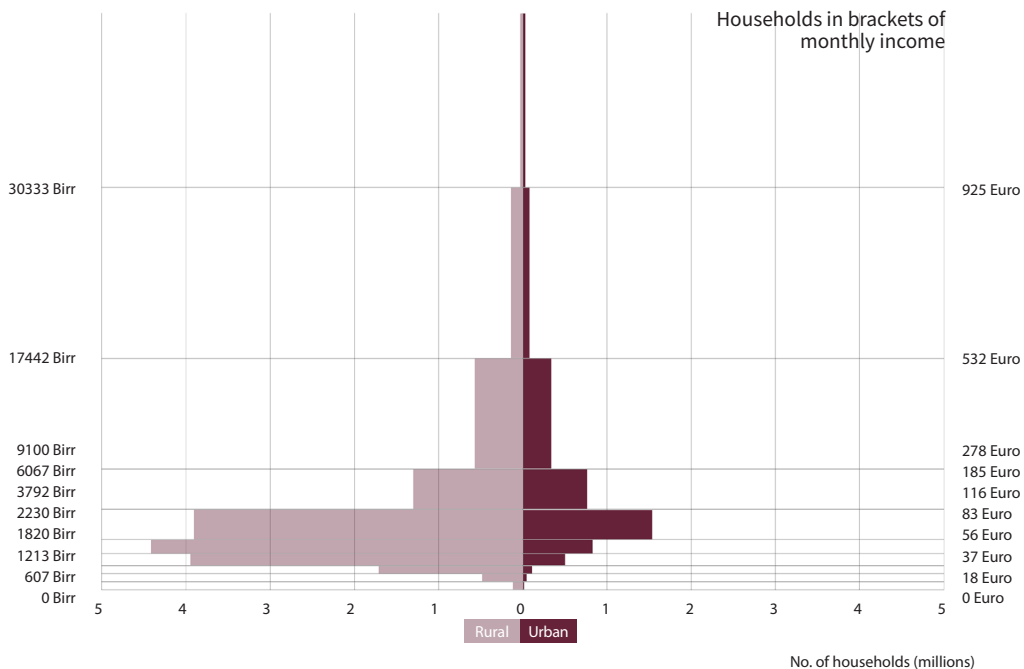
Urban

UNDP, National Human Development Report, 2018.

3.4 Household income

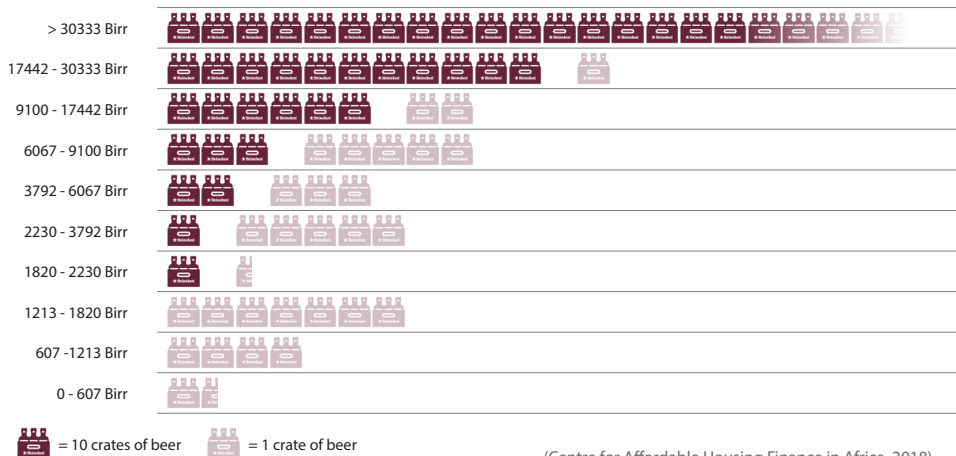
The majority of Ethiopian households can be classified as low income group, with a monthly income ranging from 56 to 185 euro. The rural area generally have more households in a lower income brackets. (Centre for Affordable Housing Finance in Africa, 2018) The income of the lowest bracket only ranged from 0 to 18 euro, while the highest brackets have a income of 925 euro or more.

To illustrates the purchasing power of households in each brackets, the median income in each bracket is used as a measuring instrument to determine how much crates of beer people from that income bracket can afford. According to Taye (2018), the beer price at the time is 215 Birr. The income disparity is clearly visible, as people from the lowest income bracket can only afford one and a half crate of beer.



(Centre for Affordable Housing Finance in Africa, 2018)

Monthly income purchase power per bracket

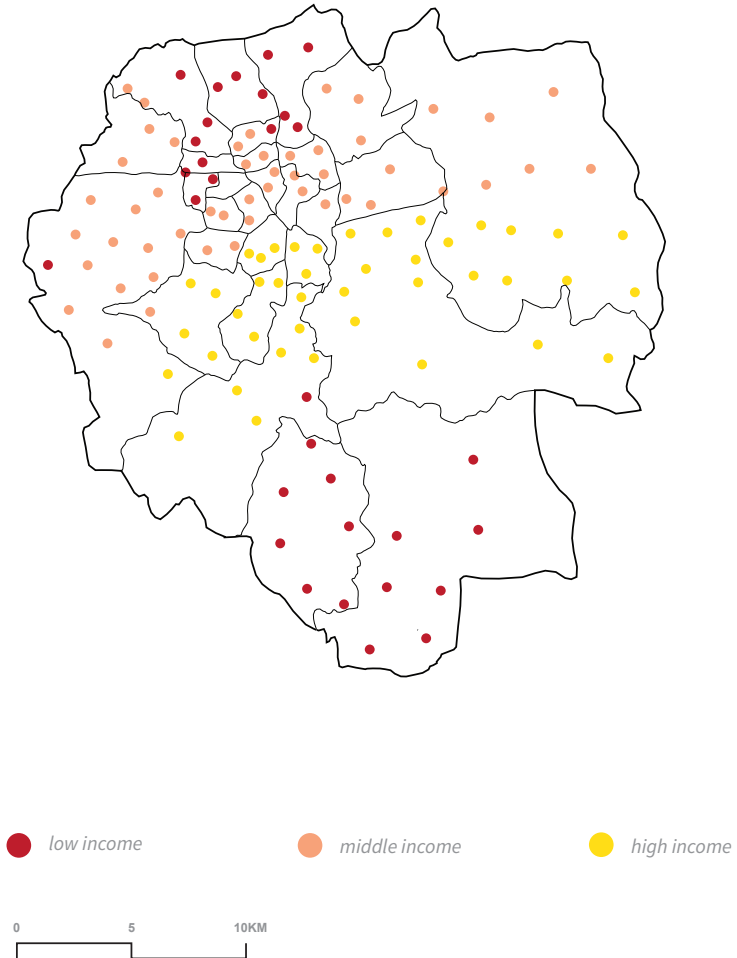


(Centre for Affordable Housing Finance in Africa, 2018)

3.5 Income groups

The income levels are divided into three classes, high, medium and low. It can be observed that the central area has income level are medium to low. These areas correspond to the old city. Mainly central sub-cities, Arada, Cherkos, Lideta and Addis Ketema are characterised by slum settlement. In recent years, even though the government have been working on reducing the slum from central areas, some still remain. Low income class can

also be observed in the southern part of the city where these areas are mostly agricultural areas. High income levels are observed in the two sub-cities of Bole (East) and Nefas Silk Lafto (South-West). These sub-cities have large development of new real estate and flourishing suburbs.



Evaluating Transport Network Structure: Case Study in Addis Ababa,
Y. Bogale, 2012.

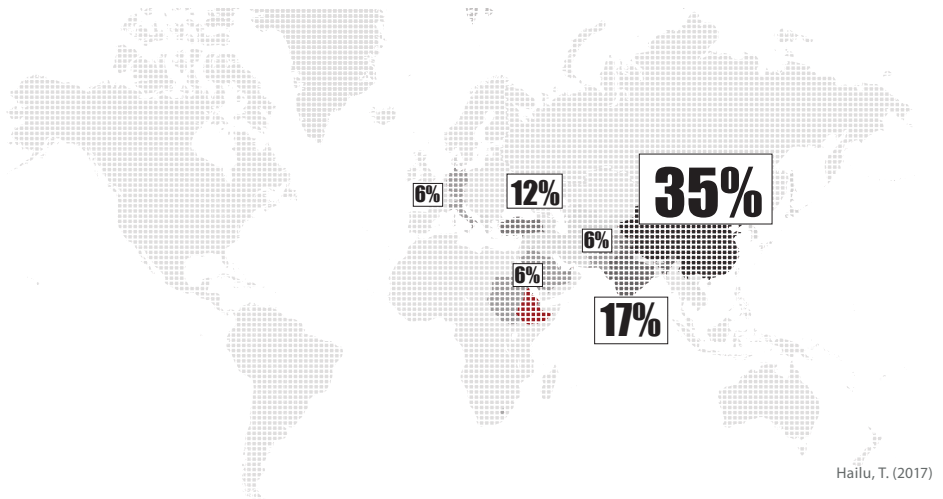
3.6 Foreign investment

From 2001, Ethiopia has experienced an enormous economic development and partly is due to FDI. As in many Asian countries, FDI played a key role in the enhancement of the quality of life of the population reducing poverty and fostering the creation of national saving culture. This knowledge has been transferred to other developing countries that can also take advantage of the FDI in order to improve their living conditions (Atlaw et al., 2014)

Ethiopia is one of those countries that has managed to attract foreign investors. For instance, in 2018 attracted \$ 3,3 billion in FDI, being the fifth largest FDI in Africa (United Nations Conference

on Trade and Development, 2019). Manufacturing (45%), agriculture (15%), real state (real state) and renewable energies (7%) are the most popular sectors to invest in this country (Legese, 2019). Likewise, the Industrial Parks Development is a very prosperous market due to their strategic locations along important economic corridors, connected to ports by the railway lines. Moreover, the tax exemption incentives, the lower levels of corruption compared to other African countries, and the large amount and cheap labor force foster a friendly environment for investment (Nordea, 2019).

Foreign investors in Ethiopia



Hailu, T. (2017)

Img 3.02: Employees of the Chinese-owned Huajian International Shoe City prepare a shipment of women's loafers for export to the United State



Ethiopia FDI Inward flow

2016- 3.9 Bn USD

2017- 4.0 Bn USD

2018- 3.3 Bn USD

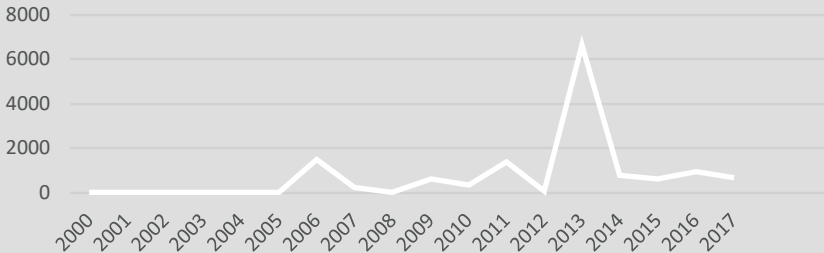
Nordea, 2019

Investment percentage in the main sector by China



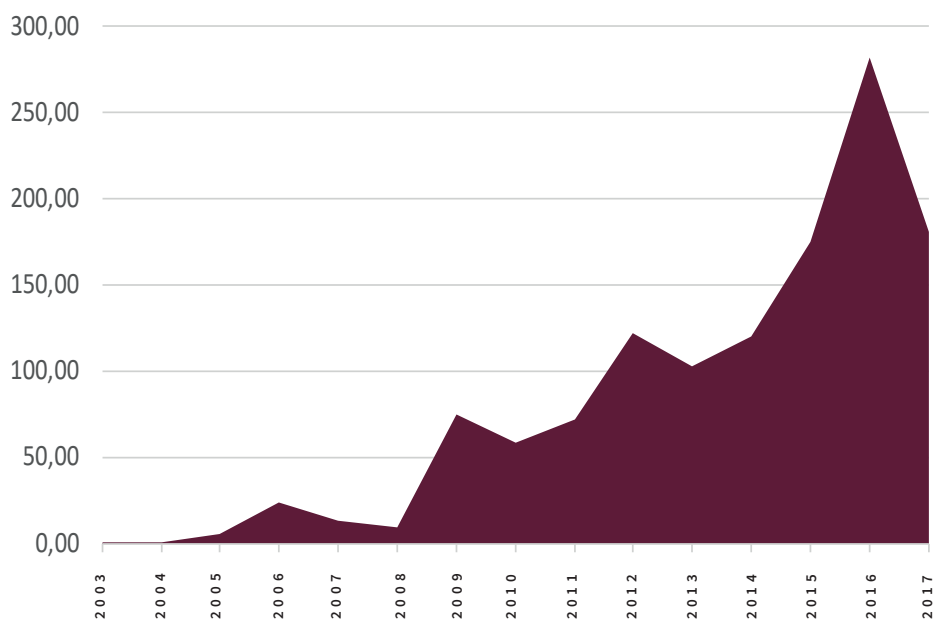
El Orden Mundial, 2019

Chinese loans to Ethiopia by mm USD



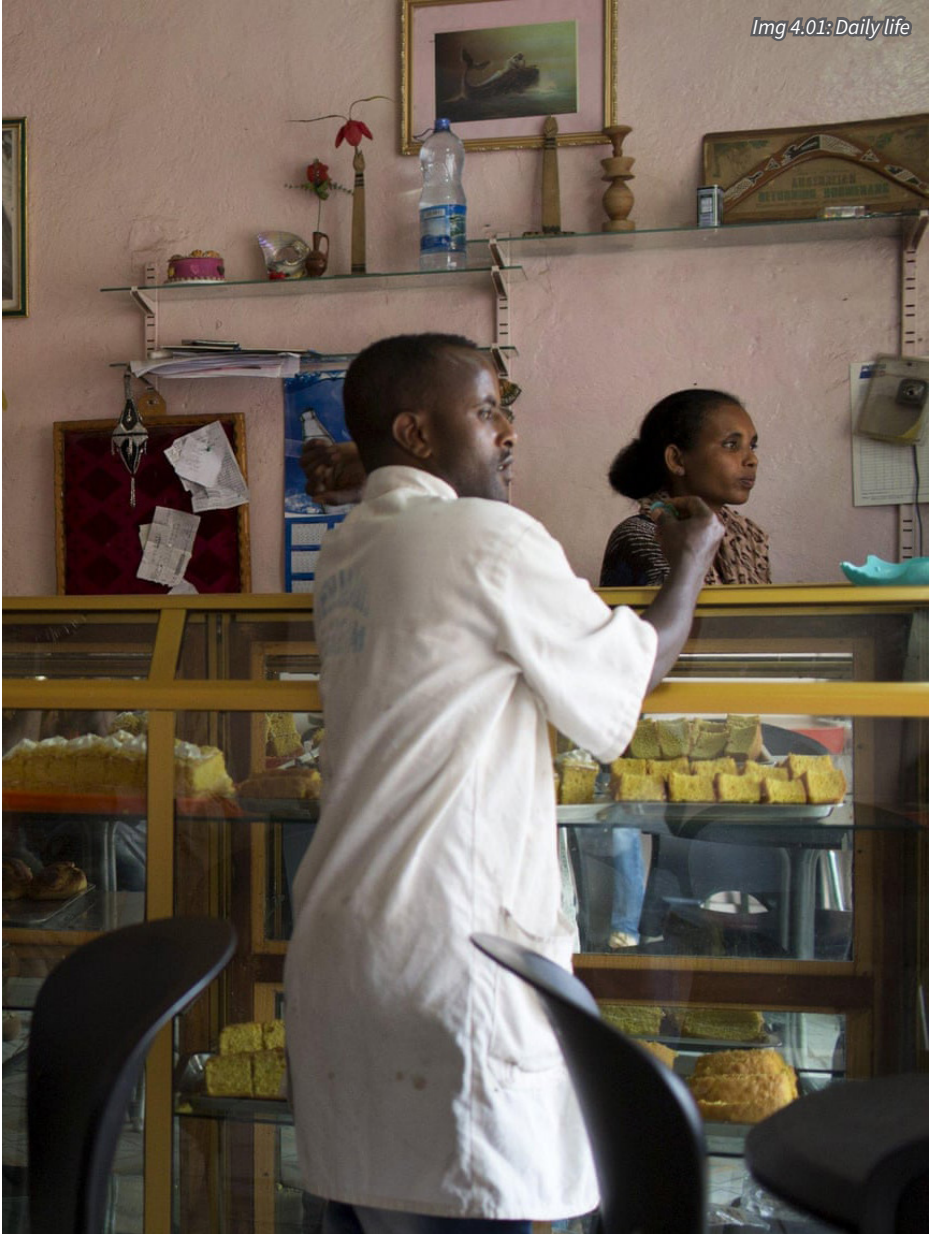
Hopkins, 2019. Univeristy SAIS China-Africa Research Initiative

Chinese investment in Ethiopia in millions of dollars

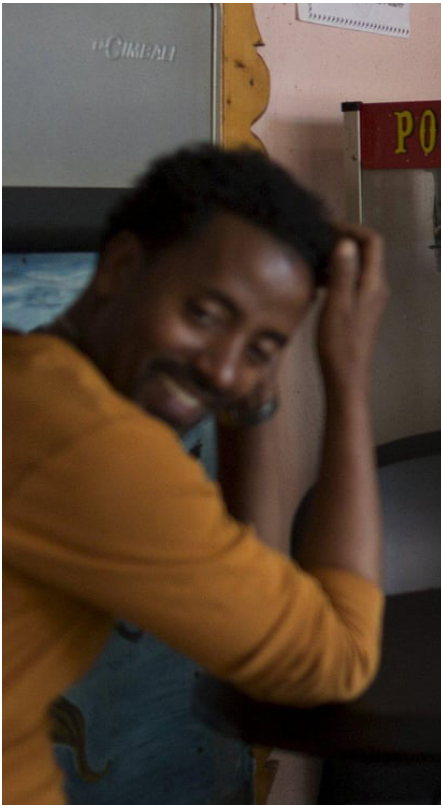


Hopkins, 2019. Univeristy SAIS China-Africa Research Initiative

Img 4.01: Daily life



4. LIVING CONDITIONS

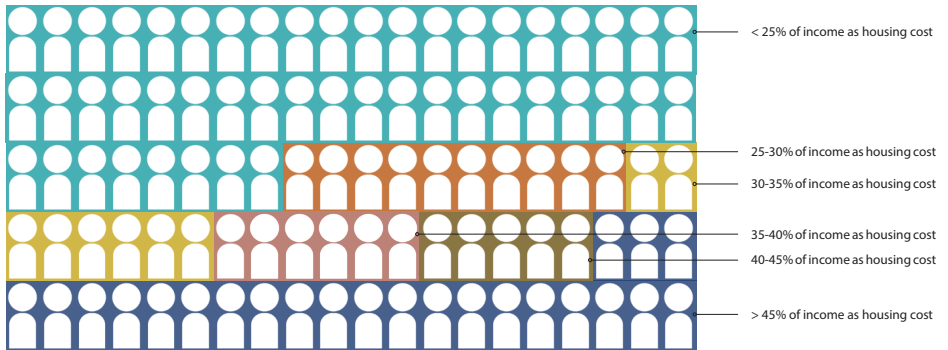


Modern Ethiopia is a multicultural country with a broad range of lifestyles, ranging from rural farmers to urban professionals. The nation is home to hundreds of cultures and ethnic groups, each with their own unique practices. Modern Ethiopia is like most other nations, in that its people experience both wealth, poverty, and a comfortable point between the two. The majority of its population is still rural and may measure their wealth in livestock more than currency. These communities tend to be strongly family oriented, meeting to enjoy meals and discussion with each other. At the same time, growing industry in cities like Addis Ababa have encouraged urbanization and the lifestyle shifts that accompany it. (Traditions of the Ancestors, n.d.)

4.1 Housing cost

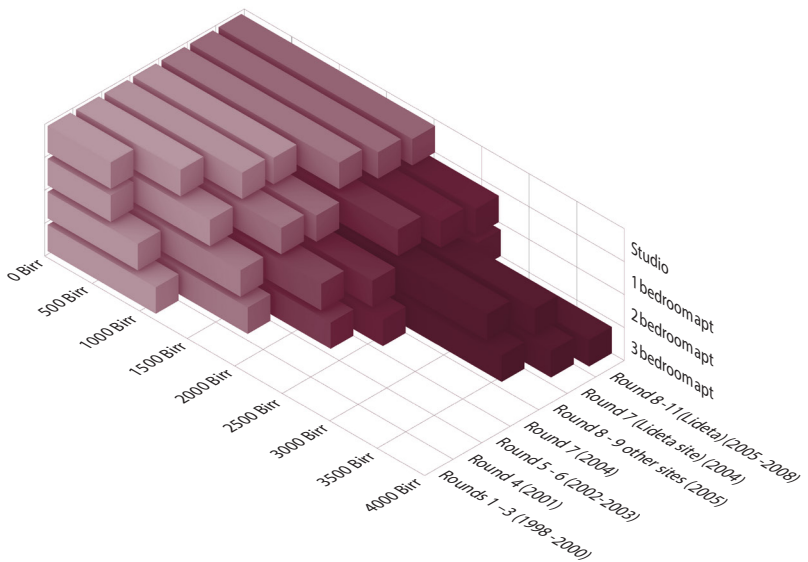
In a housing market like Ethiopia where there are no standards in measuring the affordability of the housing, UN-Habitat (2017) explores the household monthly mortgage expenditure as a proportion of household income has been used to determine affordability. Out of the 992 condominium owners who were surveyed, almost half of the respondents pays less than 25% of their income on housing cost. It means that of all the condominium owners (regardless of their) On the other hand, 41.3% of the respondents spend more than 30% of their income on mortgage. Given the prevalence of low incomes and depressed wages in the context of developing countries, even spending 30% of income on housing, let alone a higher share, is not sustainable. From the survey 44% households are of the opinion that the condominium housing schemes are unaffordable. This point is further illustrated by the rise of monthly mortgage payments for different types of condominium housings. In the Low Cost Housing program (LCH), a predecessor of the Grand Housing program, condominium projects gradually increase the monthly mortgage unit prices.

Housing affordability measured by share of housing costs in housing income



(UN-Habitat., 2017)

Condominium housing unit monthly mortgage payments



(UN-Habitat., 2017)

4.2 Construction materials

The prevalence of construction materials in each region are based primarily on the accessibility in the direct surrounding and the climate in which the building is constructed.

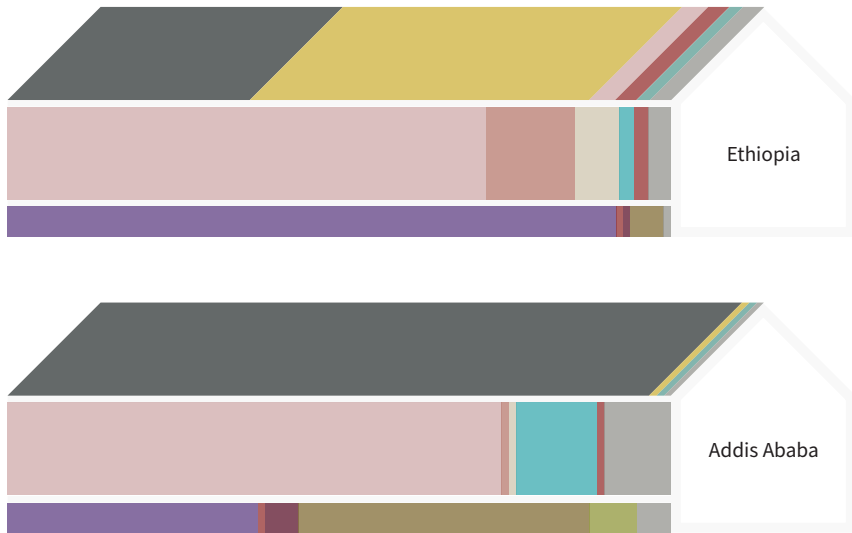
The primary roof construction material in Ethiopia, especially in rural area, are predominantly constructed in thatch. 37 % of all roofs in Ethiopia are constructed with corrugated iron sheets. Looking at Addis Ababa the share of corrugated iron sheets as roof spiked to around 98%. Other notable materials are plastic roofing (shera) used mostly in the Somali region; wood and mud roofing; and the combination of bamboo and reed. (Central Statistical Agency, 2007)

For wall constructions, the combination of eucalyptus wood and mud forming the traditional "chika" walls account for 73.6% of the building material of all the residential buildings in Ethiopia. Wood and mud wall construction is especially common in central- and western Ethiopian region like Amhara, Oromiya, Benishangul Gumuz, SNNP, Gambella, Harar, and Addis Ababa, where the houses of more than 65 percent of the total regional population have walls constructed with these materials. Wood and thatch for wall-building material are predominantly used in eastern regions like Somali and Afar. Another material used in large part of Addis Ababa is the plastered hollow block construction in the condominiums projects, accounting for 13% of the construction materials. Other building materials used less frequently are stone and cement, unplastered hollow block, brick, corrugated iron, and mud

brick. Many areas use a combination of the materials mentioned for wall building material.

Mud is the most prevalent as a floor material throughout Ethiopia, with a share of 92% of the total floor construction. Addis Ababa is one of the few places where a significant amount of cement floors (almost 40%) are used.

Share of construction material in Addis Abba and Ethiopia



- Plastic/Shera
- Corrugated iron sheet
- Thatch
- Plastered hollow blocks
- Stone & mud
- Wood & mud (chika)
- Wood & thatch
- Bamboo & reed
- Cement & brick tile
- Cement screed
- Wood planks
- Mud
- Other

(Central Statistical Agency, 2007)

4.3 Access to public services

According to Unicef's report: "Progress on household drinking water, sanitation and hygiene 2000-2017. Special focus on inequalities" Ethiopia still remains limited access to public services such as drinking water, and improved sewerage and sanitation systems. In 2015 the country met its Millenium Development Goal (MDG) for water supply, increasing substantially the access to protected water sources in rural areas. In 2016, 58.9% of rural population had reached improved water, while the remaining 41.1% still have unimproved systems. In urban centers only 5.9% of the population still do not have access to improved water sources. This does not mean that improved water is synonym of piped water into dwelling.

Likewise, over the last decade the Sub- Saharan country also has made significant progress in terms of sanitation. For instance, in 1990, 92% of the population practiced open defecation which was reduced by 55% in 22 years (2012- 37%) (WHO, UNICEF 2014). In order to improve the standards of life is necessary to reduce as much as possible the unimproved systems which currently represents more than half of the population's living conditions. Doing that, also reduces the risk

of death and diseases by not coming into contact with contaminated elements.

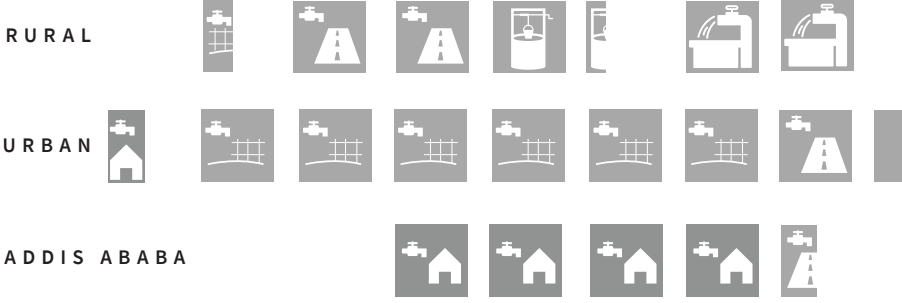
In order to understand the living conditions in rural and urban areas, the graph was made following the JMP (WHO/UNICEF) categories which analyze the trends of drinking water and sanitation facilities. They are divided in 2 main groups: improved and unimproved facilities. Improved drinking water source refers to those systems which are protected from contamination ej: piped household water connection, public standpipe, borehole, protected dug well, protected spring and rainwater collection. On the other hand, improved sanitation includes those that hygienically separates human contact from excreta, and those that are not shared (WHO, 2019).

Img 4.02: Access to clean water

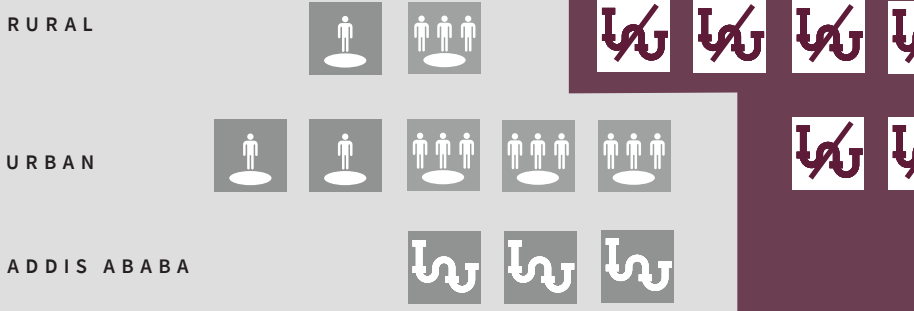


IMPROVED

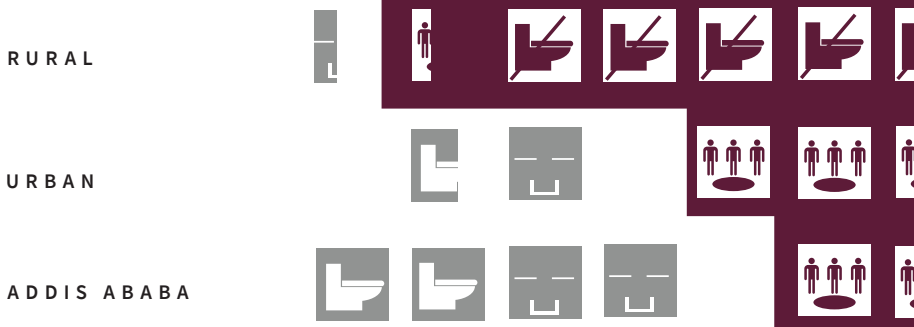
CLEAN WATER



SEWERAGE SYSTEM















TOILET FACILITIES



UNIMPROVED



-  PIPED WATER INTO DWELLING
 -  PIPED WATER INTO YARD/PLOT
 -  PUBLIC TAP
 -  TUBE WELL OR BOREHOLE
 -  PROTECTED WELL OR SPRING
 -  BASIC - LATRINES AND OTH
 -  SEWER
 -  UNIMPROVED
 -  IPL PRIVATE / PRIVATE LATRINE
 -  LIMITED-SHARED LATRINES
 -  UNSANITARY TOILET
 -  OPEN DEFECAION
-  = 10 %

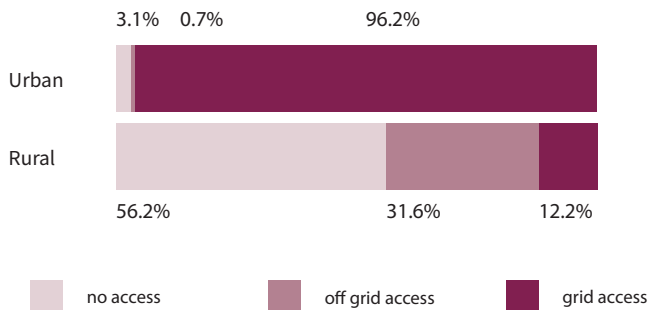
Central Statistical Agency of Ethiopia 2017
 Unicef, WHO 2019
 Abebe Beyene 2015

Energy

In the electricity access there are huge differences to be found between the rural and urban context. In urban areas, more than 96% of the inhabitants have access to grid electricity, although it might not be a reliable access. In the rural area however, only 12 % have grid access. Almost a third of the population still relies on the informal ways of generating electricity like solar lantern, solar home system, solar lighting system, and to a less extend rechargeable batteries, mini-grid and generator. More than half of the rural population doesn't even have any access to electricity at all. Here we can conclude that access to electricity is mainly a rural problem, stemming from the fact that grid access is still unreachable for most of the rural inhabitants.

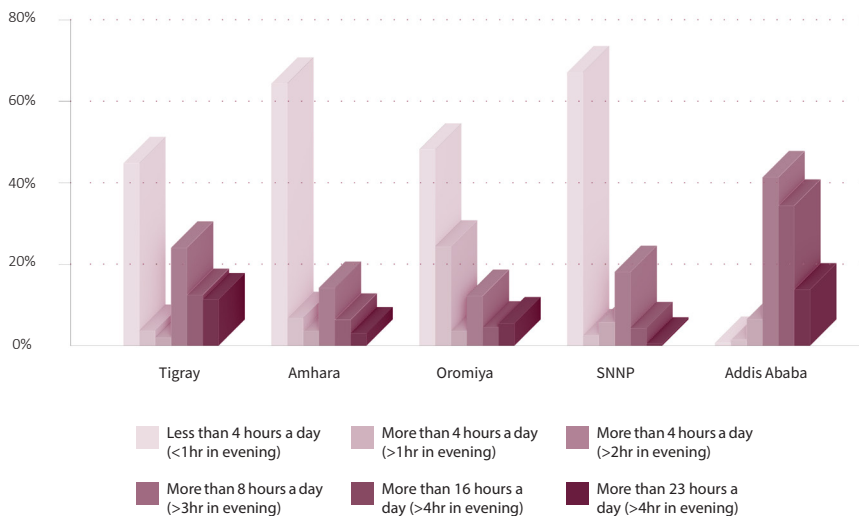
When we divide the electricity access into different tiers, we can showcase the difference in the each regions. In Tigray, Amhara, Oromiya and SNNP, the biggest group have access to electricity for less than four hours a day and less than one in the evening. In Amhara and SNNP it's even the majority. In stark contrast to this is the accessibility in Addis Ababa. Majority of people have at least 8 hours a day access to electricity. (Padam et al, 2018)

Accessibility of electricity ; differences in urban and rural



(Padam et al, 2018)

Accessibility of electricity in different Ethiopian regions, divided in tiers of access



(Padam et al, 2018)

4.4 Education & Literacy rate

‘‘MAKE PRIMARY EDUCATION COMPULSORY AND AVAIL-
ABLE FREE TO ALL; ENSURE THAT SCHOOL DISCIPLINE
CONFIRM TO CHILD’S HUMAN DIGNITY AND PROMOTE AND
ENCOURAGE INTERNATIONAL COOPERATION IN MATTERS
RELATING TO EDUCATION’’

UNCRC - ARTICLE 28

As education is considered a child right, the Ethiopian Government has been improving the quality of education and the coverage along the country over the last decade, despite the lack of number of teachers especially in rural areas where there is 1 teacher per 63 students (case of Somali) (MoE, 2017). In that sense, Government expenditure on education (% of GDP) has increased substantially. For instance, in 2012 reached 5.57% of its GDP, the highest value over the past 31 years (Unesco, 2019), even though worldwide occupies the 91th place from 186 countries.

The graph was made through information provided by the MoE (Ministry of Education) report 2017, which used the census of 2008 as a basis for making projections to 2016-2017. For that reason, the information is not as accurate due to the old data.

The education system is divided in 4 groups: Kindergarden, primary (from 1st to 8th grade), secondary (9th to 12th grade) and tertiary education. In some cases, the number of

enrolments by grade do not correspond to the average population age assigned by grade. It might be because older children or even adults start or continue their education process at later ages.

As it is evident in the graph, the drop-out rate of school after finish primary school is high, especially in rural areas, where teenagers start to generate source of income or they help with household chores (US Department of labor,2018).

An interesting fact is that the number of girls studying in Addis Ababa overlays the number of boys in the primary cycle. It remains constant in the following cycles, except in higher education, where the attendance of males is the double of females.

On the other hand, literacy rate in younger generations is much higher than in the older ones due to the following reasons: years ago, population was even more rural, therefore, priorities were attached to the countryside; meanwhile nowadays, the urbanization growth has forced the population to have access to education somehow.

Img 4.03: Tadesse



ETHIOPIA ADDIS ABABA

PRE- PRIMARY
KINDERGARDEN



PRIMARY
(1 - 8 GRADE)



SECONDARY
(9 - 12 GRADE)



HIGHER EDUGA-
TION (BACHELOR)



Federal Ministry of Education. (2017)

Literacy rate

15 - 24 YEARS



15 YEARS AND
OLDER



65 YEARS AND
OLDER



Unesco. (2019). Education and literacy



Img 4.04: Pupils attend the 1st grade class at Oda Aneso Primary School



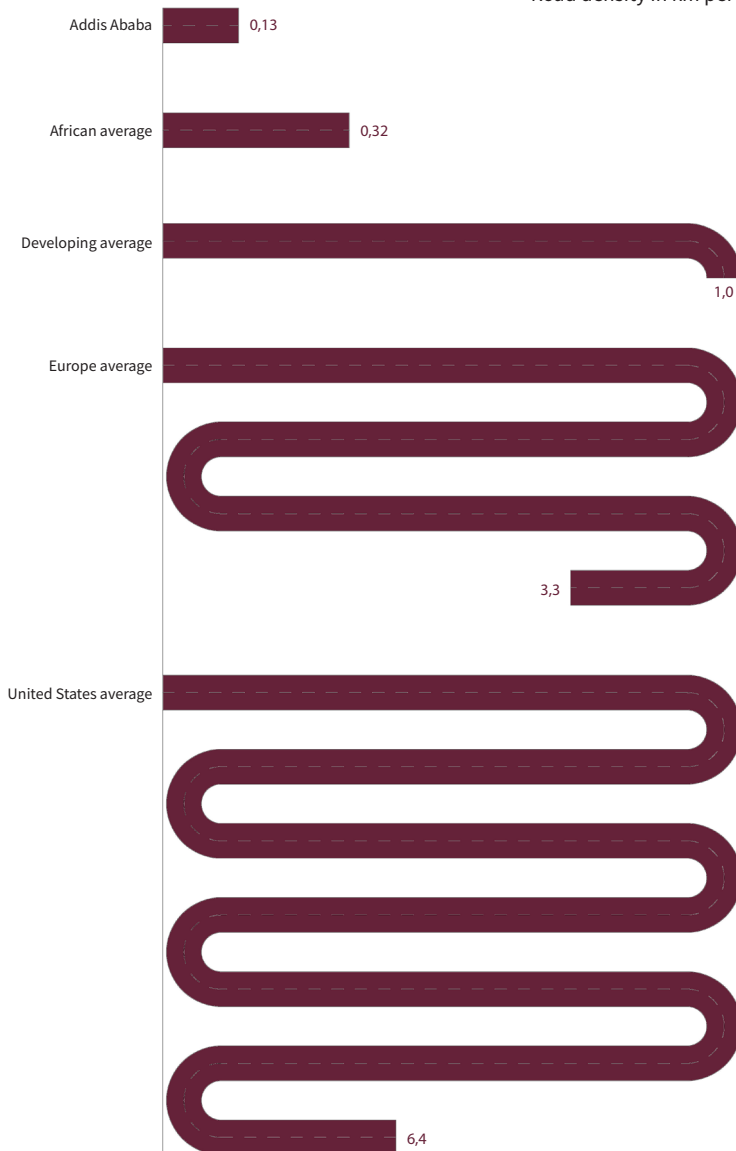
Img 4.05: Community Water Pump, Tigray

4.5 Infrastructure

Infrastructure is the primary condition for economic development. Minalu (2014) studied the road serviceability of Addis Ababa and drew a comparison between the road density in Addis Ababa, Africa, developing countries, Europe and the United States. In the study, the road serviceability is described as a ratio between total lengths of road and the number of population in that region. The unit of this index is km/people. This indicator shows the easily availability of roads for peoples in the region. (Minalu 2014)

In Addis Ababa there are 0,13 km of roads per 1000 inhabitants, which is far below the African average. The developing countries in general, have an average of 1 km per 1000 inhabitants. The European and United states average exceeds by a huge margin, probably due to economic advancement. Even though it is not part of the study of Minalu (2014), we can still draw a comparison between Ethiopia and the Netherlands. According to CIA World Factbook. (n.d. b) there are 139124 km of public roads in the Netherlands. Combining this number with the Dutch population of 17,151,228 from a 2018 estimation, we can get the road serviceability in the Netherlands, which is 8,1 km per 1000 inhabitants.

Road density in km per 1000 inhabitants



(Minalu 2014)

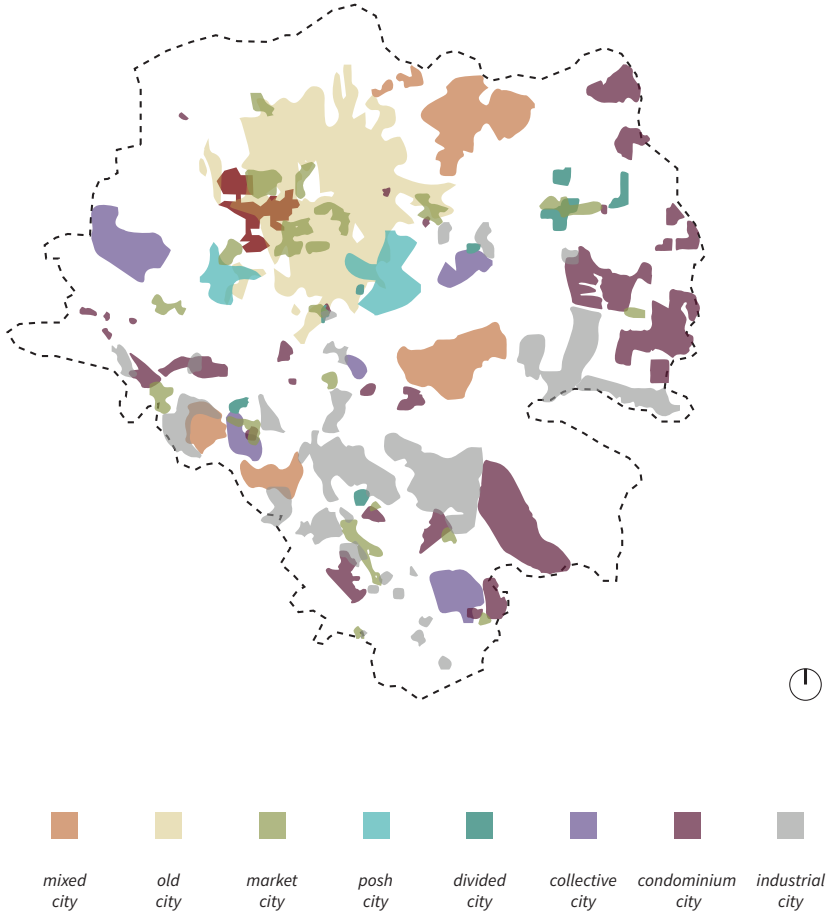
4.6 A Collage of Cities

“A CITY IS IDEALLY VIEWED AS ONE COHERENT ENTITY HAVING VARIOUS FUNCTIONAL ELEMENTS NETWORKED THROUGH AN INFRASTRUCTURE. IN REALITY, HOWEVER, CITIES ARE OFTEN FRAGMENTED AND TO VARYING DEGREES EVEN CHAOTIC”

ELIAS YITBAREK ALEMAYEHU

Unlike many African cities, Addis Ababa emerged without formal planning. Since its humble beginnings as a garrison town, the city has witnessed the preparation of nine master plans, albeit with little implementation. This section describes what urban typologies have arisen as a result of the juxtaposition between the traces of the master plans and the unforeseen happenings on the ground.

E. Alemayehu, in his book, *The Transformation of Addis Ababa: A Multiform African City*, identified nine major urban typologies: the informal city, the old city, the market city, the posh city, the industrial city, the collective/cooperative city, the condominium city, the renewed city and the divided city.



Assembled from: Alemayehu, E. Y., & Stark, L. (Eds.). (2018),
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HARD DATA

2019

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