the in-between
ADDIS ABABA
ETHIOPIA

research & design report
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graduation studio dwelling - global housing
technical university delft // june 29th, 2016
The graduation studio Global Housing: Cross-cultural Methods and Positions / Addis Ababa engages with pressing dwelling issues in developing territories, as well as with the increasing cross-cultural character of contemporary architectural practice. Around half the population of the developing world is living and working in cities, a number that keeps increasing due to the rapid urbanisation of the past decades. The housing shortage following from this urbanisation has resulted in 830 million people living in informal settlements, better known as slums1. Addis Ababa, Ethiopia, is one of these cities that is rapidly growing and evolving. Ethiopia’s urbanization of the past decades has proposed many opportunities for economic growth, but has also resulted in an enormous shortage in decent affordable housing in cities. The same way it has happened, and is still happening, in many other countries in the Global South. By investigating this problem and designing housing systems to accomodate the urban poor in the developing territory of Addis Ababa, the results of the studio contribute to the creation of more inclusive, vivid and resilient urban territories.

In the first semester of the graduation year, a collective knowledge base has been established within the studio by executing an extensive group research about Addis Ababa’s history, development and identity, in combination with literature studies on various themes related to the process of urbanization in the developing world.

Analysis and a personal interpretation of this collective research has highlighted three themes: the *community lifestyle*, *mixity* and the *appropriation of space*. The fact that these themes are recurring throughout the entire research period, has helped in framing the large amount of information that has been acquired and has led to an understanding of the fundamental aspects of Ethiopian culture.
1886 - 1936 // INITIAL SETTLEMENT

1936 - 1941 // ITALIAN OCCUPATION

1941 - 1974 // REIGN OF HAILE SELASSI

1974 - 1991 // DERGE REGIME

1991 - today // MODERN TIME
INITIAL SETTLEMENT

At the moment of its foundation in 1886, the Addis Ababa's layout expressed the traditional system of hierarchy of the ruling class and its society. As in the previous capitals of Ethiopia, the principal men of state and of the nobility began to settle around the Gebbi, the palace of the king. The residences of the noblemen, usually built on top of the hills, were surrounded by several huts forming an enclosure, or compound, whose size varied according to the importance and power of the dignitary living in. These clustered neighbourhoods were called Sefers.

The layout of the Addis Ababa of today can be traced back to these early settlement patterns of the city. The Sefers have evolved into distinct sectors, that come with a sense of belonging and identity to their inhabitants. Over the course of time, new Sefers based on an assembly of people with a certain profession or ethnicity have emerged in addition to the original Sefers of nobility.
appropriaing space

Most of the dwellings in the early Addis Ababa were humble huts resembling the traditional ‘tukul’. The huts were dark, as the opening at the entrance was not enough to get the daylight in. As a result, the land in the vicinity of each dwelling was occupied for carrying out domestic activities, which allowed social interactions.

The living around rather than inside dwellings is a traditional aspect of the Ethiopian way of life. A way of life that emerged out of necessity due to a lack of space and/or light within the dwellings, but at the same time introduces favourable aspects. An interesting ‘privacy gradient’ is formed by this pattern of inhabitation, that promotes social interaction and creates a level collectivity within a community.
mixity

In general, the space around buildings often promoted social interaction. The drawing below shows the house of a dignitary, where usually the administration of justice was carried out. It was a simple wooden construction with an open veranda, and people were occupying the space in a very informal way.

The mixity of people and functions within communities has been a distinctive feature of traditional Ethiopian society. The ‘privacy gradient’ can also be recognized in the floor plans of Ras palaces of the time, of which a few examples are depicted on the next page. Almost without exception they featured a surrounding veranda, which could be used for multiple purposes.
mixity

As the permanence of this settlement was uncertain for the first decades, infrastructure was not developed and connections between the camps were not more than footpaths. In contrast to a consciously planned city Addis was literally a city without streets.

With the further growth of the city the dots of the first camps were connected and a net of streets was formed. Here, new and modern urban functions, like shops, hotels, cinemas, administration, workshops, etc. emerged. In between these linear connections with modern features - the street liners - some large areas with mainly traditional building structures developed - the in-fills. This pattern of settlement remains characteristic for the urban tissue of Addis Ababa.

Looking at the street liners it can be observed that the linear space along the large streets in Addis Ababa has a purely functional use. Looking at the in-fills one finds the opposite: streets are extensions of private space. Here “housing is a verb”. A high degree of mixity can be achieved, which results in appositive social responsibility and security.

Despite the precarious living conditions of its inhabitants the urban tissue of Addis seems to have obvious advantages: mixity of commercial and residential areas, high- and low-income groups, building typologies and spaces are enabled.

These patterns and qualities together form a city model that can overcome the centric city models introduced by colonialism and modernism and establish a non-hierarchical, non-segregated, non-functionalist city that can grow endlessly without changing its appropriateness to cater to the majority of its inhabitants - the urban poor.

fragments from: 'the indigenous urban tissue of addis ababa - a city model for the future growth of african metropolis' - prof. jörg baumeister & prof. nikolaus knebel - african perspectives 2009
indigenous settlement pattern

street liners

in-fill
During the Italian Occupation of Ethiopia (1936-1941), a series of masterplans was created that superimposed a formal grid system on the organic layout of the city and promoted a strong form of segregation within the city layout.

First and foremost, the Italian master plan should physically manifest social and political divisions through zoning. In fact, the ruling guideline for planning was that of race. A clear separation was to be made between native and Italian quarters. The natives were not only set apart from the centre of the city, but they were sorted out into regular sub-quarters according to their ethnicities and religions.

Not only the indigenous were separated. Also the occupiers, the Italian, were divided. High-ranking officials were placed in the east, were the INCIS (Istituto Nazionale per Case degli Impiegati dello Stato) built luxurious housing, the Kazanchis. The working class Italians, which were needed for planned large scale infrastructure and economy improvement, were accommodated to the south-east of Addis Ababa.

By the time the fourth plan finally materialised in 1939, Ethiopians as well as Italians had been building whatever they needed instead of respecting the prohibition imposed by the Italian governments. They were living in a “disorganized, undisciplined jumble toward the centre of town”. In spite of great plans, Italian and indigenous people were still living in a tangle of shacks and tukul.

In the end, the grand Italian vision of total order never became reality, because of the time it took for the definitive master plan to be approved in combination with the relatively short period of occupation. Although the period of Italian occupation did leave its marks on Addis Ababa, in the form of an improved infrastructure, several larger scale building projects and city areas, the fact that Ethiopia never has truly been colonized is noticeable in the absence of a centralized city plan and the indigenous organic form and mixity of functions and people that has remained until today.
After the Italians were defeated, emperor Haile Selassie came into power, which beginning of the large-scale modernization of Addis Ababa. The emperor consulted European city planners, of which eventually only the frenchman De Marien wo considerable influence on the current layout of Addis Ababa. De Marien’s masterplan guided the construction boom of the late 1950’s and early 1960’s. In this period, a number of modern public buildings was constructed: the Africa Hall, Addis Ababa City Hall, Jubilee Palace (now the National palace) and a Hilton Hotel. Along the monumental Churchill Avenue, the Ethiopian National Theatre (completed in 1955), the Commercial Bank of Ethiopia, Ethiopian Television and Radio Building were built. They all possessed a very sculpture quality in their construction, and were modern landmarks along the Addis Ababa street that was inspired by the Champs-Elysees.

The emperors quest for making Addis Ababa a city of modern allure and his lack to focus on the dwelling construction sector resulted in an enormous housing shortage. In the 15 years after the italian liberation there was no stringent planned public guidance over housing development. Distribution of houses and land was executed without permits. Based on various informal living arrangements, it was common practice among tenants to share their rented spaces with needy individuals or households. At the end of the period only one quarter of the housing units had municipal permits, and unauthorized proliferation of low standard houses accelerated during Hailé Selassié government as never before. The combined impact of the dominance of land ownership by so few and the abject poverty of so many, left the majority of families without sufficient capital to build even simple homes.

Despite the many modern modern buildings constructed, this period in the history of Addis Ababa amplified the density and disorganization, and with that the mixity of the city.
Urban developments in Addis Ababa until during the reign of Haile Selassie

Addis Ababa analysis - Global Housing Graduation Studio 2015-2016 - Phase 2
The militant and communist Derg Regime that overthrew Haile Selassie in 1974 and controlled the country until 1991, changed the distribution of land drastically. In the pre-revolutionary land tenure system, about 95% of privately-owned land was in hands of only 5% of the population, and so the power was owned by a very small group of the population. During the Derg Regime, all the informal houses that had been built in the previous period were now recognized, reorganized and redistributed. The 'Kebele', administrative and territorial sub-centres, that were implemented in this period are still in operation in Ethiopia nowadays.
Due to the overcrowding of urban areas and the Derg’s reforms, the housing shortage further increased during this period, which became characterized by a strong densification of the existing housing sector. The redistribution of dwellings in the Derg Regime led to the compound structure of Kebele housing of today. Within a compound, original houses are often surrounded by self-built dwellings, leading to the formation of communities with up to 20 families sharing a courtyard and amenities.
appropriating space

During the regime, low-income households began to build temporary and small housing units which would be transformed with changing family structure and tenure form. First, a household obtained a plot of land and material to construct. One or two rooms are then added and developed incrementally in a number of stages. These units were also used to subdivide the given room and make extensions by using materials that suited the local climate and the dweller’s economic capacity. Gerji is one of these, located in a peripheral area near the airport. It was built in 1986 as an emergency settlement to house displaced inhabitants after their previous settlement area had been claimed by the airport. Since their occupation in 1987, dwellers have modified the houses in order to meet with the climatic and socio-cultural requirements. These needs have been accommodated by internal subdivisions and extension of rooms through several phases until they now cover up to 85% of the 80-130 m². Today, there are almost two times as many residents in the area and each household managed to extend the house by an average figure of 21 m² as planned.
In addition to the densification of existing areas, self-build projects were established towards the periphery of the city. The examples of the Gerji and Kolfe areas pictured below show how the cores are extended with rooms that are used for various purposes, like subletting and business. Over time, mixed functions have grown out of the pure residential function, such as informal shops and bars in front of many houses to generate income.
The Ethiopian government’s Grand Housing Program attempts to diminish the housing shortage. By demolishing the cities self-built “informal” settlements and relocating people in new condominium blocks the density of the city is greatly increased. In 7 years, over 1.000.000 Condominium blocks have been built and are in use.

In the initial condominium schemes, like the project in Gerji featured in these pages, housing a mixture of income groups was attempted by creating various apartment sizes within one block.
The newer condominium schemes feature a segregation of target income groups. A down-payment system is used to denominate the scheme, namely 10/90, 20/80 and 40/60. In comparison to the first generation of condominiums, this new scheme separates the different target groups. Each scheme is arranged in its own buildings other than mixed in the same one. Generally, 20/80 and 40/60 are placed more closely, while the 10/90 scheme is relatively separated. The different schemes aim for buyers at different income levels and at the same time the flat size, qualities and construction costs vary. This lack of mixity results in monotony and a fear of ghetto.
The Yeka Abado Condominium project is one of the latest large-scale developments. In this project, the 10/90, 20/80 and 40/60 schemes are segregated in different buildings and clusters. Large open spaces in between the condominium resemble the European modernist plans of the start of the 20th century.
A field trip to Ethiopia, including a tour through the country, site survey in Addis Ababa and lectures and workshops at guest university EiABC have formed the basis for the ‘Addis Ababa Book of Patterns’. Based on Christopher Alexander’s A Pattern Language, the patterns of inhabitation in Addis Ababa are documented around the themes of income generation, social spaces, boundaries and building techniques.

Addis Ababa finds itself in between times, in the midst of it’s transition from an informal city based on rural settlement patterns to a dense and urban city full of economic growth and large scale developments.

Investigating the patterns of inhabitations of the current Addis Ababa has shown how much the three themes resulting from the historical research are still a vital part of the Ethiopian way of life.

3 Christopher Alexander, Sara Ishikawa, and Murray Silverstein. 1977. A Pattern Language: Towns, Buildings, Construction. OUP USA
In Addis Ababa’s informal settlements social ties, neighbourship and sense of community are endorsed by the large amount of families living on little square meters and the resulting sharing of spaces. The presence of socio-economic structures like Iquib, Idir, Shimgilina/Mehal Sefari show the importance of social networks in Ethiopian society. These social structures are said to support accountability and tolerance, but also transparency, dialogue, and possibly friendship among members. Especially lower-income households can benefit from this community-based lifestyle. The very tight social support system in informal housing neighbourhoods helps people to cope with daily life.

The centering of dwellings around multi-purpose shared courtyards is a distinctive and always recurring feature of these neighbourhoods. The courtyards are connected to the street and therefore blend together the collective with the public domain.
better a close neighbour than a distant relative

Iquib
The Iquib is an association started up by a small group which loans money in a rotational order. This system also enables the poor to celebrate important life events, such as weddings, but also enables them to start up a shop or build a house.

Idir
Idir is an association which saves money to create a fund meant for emergencies, such as funerals. It can be started up in a village, at work, or between friends and family. The Idir is a long-term association. In time of need, they are required to help the troubled family, and in case of a funeral, attend the funeral.

Shimgilina / Mehal Sefari
Mehal Sefari was/is a neutral institution without political affiliation which negotiates in disputes between persons, groups, or government. Shimgilina is still an active civic structure to this very day and negotiates in disputes in marriages, but also in more complex political disputes.

Debaits
The Debaits social structure is the sharing of tools. They can be described as agricultural work groups.

Mahaber
Mahaber is a religious civic society, which promotes mutual support, social & spiritual life, and it negotiates in small-scale conflicts, which makes it comparable to the Shimgilina civic society.
impressions: 
courtyards and community life in informal settlements
In Addis Ababa, defining territory is an important and recurring theme throughout the city. Although the life of low-income families is centered around the collective and the public realm, people highly value preserving privacy within their dwelling. In the informal settlements, this is indicated by the large amount of closed curtains and metal sheet enclosures.
The inhabitants of the indigenous settlements make maximal use of the space in between the private of their own dwellings. In addition to the shared use of courtyards, the collective and the public domain blend together in the streets that are appropriated in all sorts of ways: from practicing business to hanging laundry or meeting with friends. In this, the street is not only a *place of transit*, but is appropriated and activated by being used for personal activities as well.
impressions: appropriation of space in informal settlements
In the new condominium housing schemes, the spaces between buildings are often wide and undesigned, courtyards are absent and the connection to the street is lost. Because of the large amount of empty space that is hard to appropriate, there is less interaction between the inhabitants. Dwellers are defining their territory, in order to create a 'place of one's own'. The anonymity resulting from the wide layout results in the need for borders, which are created in the form of metal bars in front of windows and compounds surrounded by walls with barbed wire.
impressions: the lost in-between space
The indigenous settlements of Addis Ababa are characterized by their high degree of mixity. 35% of the Addis Ababa economy is made up of the *informal sector*[^4], which can be subdivided in the categories of trading, producing, transporting, providing services and subletting. Dwellings and social spaces are combined and mixed with business, creating opportunities and activity.

The condominium developments fail to cater for these informal ways of income generation. Often commercial spaces are reserved on the ground floor, but they are formal and very expensive. Dwelling-street connections are minimal. The spontaneous, multi-use identity that characterizes the lower-income neighbourhoods of Addis Ababa is therefore unable to emerge in the condominium complexes.

As in the many cities of the Global South experiencing large economic growth, a middle class is emerging in Addis Ababa. The rich want to differentiate from the poor: higher-income families go to live in compounded and “safe” suburban areas and commute every day to the centre. At the same time, inhabitants of informal settlements are relocated from the city centre to condominium developments in the periphery. By the gentrification of downtown city centre that will now be reserved for high-value commercial real estate and luxury apartments the historical mixity of Addis Ababa, that used to make it the safest city in Africa, is being lost.
impressions: mixity in informal settlements
To accommodate for the rapid urbanization and population growth, the Integrated Housing Development Program established by the Ethiopian government has since 2004, gradually been replacing the cities self-built “informal” settlements. The large-scale and highly cost-efficient condominium housing scheme greatly increases the housing supply and simultaneously stimulates the economy by creating employment in the construction sector. However, the scheme fails to reflect the identity of Ethiopian (low-income) households in terms of the strong sense of community and the need for habitable open spaces that cater for a mix of functions and people.

In the quest for keeping building costs low, both the identity of the city as well as the people living in it are forgotten. In the condominium housing scheme the polyvalent, collective buffer between the private and the public domains is missing, resulting in a lost in-between space.
Answering to the demand for making Addis Ababa a modern and urban city, while maintaining its historical identity, this thesis is aimed at creating a dwelling system that challenges the density and efficiency in construction of the condominium scheme, while accommodating the cultural qualities of a community-centered lifestyle, appropriation of space and mixity.
ELABORATION

perspectives on

addis ababa
PRECEDENTS

POSITION

TECHNICAL RESEARCH

SITE SURVEY
After having formulated the problem statement and research question for the design, the general collective research has been complemented with design specific literature research towards the social and spatial aspects of the chosen design direction. Throughout time, numerous studies have been conducted about creating a meaningful and active in-between space in urban settings; many of these reflecting on the problems posed by the wide and open layout of modern cities. In scale and morphology, the condominium schemes remind of the modernist approach to mass housing in Europe and Northern America of the first half of the 20th century. Stressing the importance of the human scale in urban planning, the ideas of Jane Jacobs, Chermayeff & Alexander and Jan Gehl have directly influenced the layout and organisation of this thesis design.

Additionally, Herman Hertzbergers notion of polyvalence, opposing the functionalist approach common in post-war western architecture has become one of the key elements in the concept of catering for mixity and endorsing various forms of income generation. In the creation of more inclusive, vivid and resilient urban territories in the Global South, the urban poor have to be provided with a designed living environment. In order to activate this environment and its inhabitants, Hertzbergers notion of polyvalence is an essential aspect. In this, collective interpretations of individual living patterns are abandoned: “What we need is a diversity of space in which the different functions can be sublimated to become archetypical forms, which make individual interpretation of the communal living-pattern possible by virtue of their ability to accommodate and absorb, and indeed to induce every desired function and alteration there of.” The architecture of urban dwelling should be an active agent in enhancing the identity of its users, and therefore being able to “be put to different uses without having to undergo changes itself”.

Studies about privacy zoning have helped me to test the synchronisation of the attributes of the different types of collective spaces and their readability, to create a clear sequence of levels of privacy that generates the sense of ownership and belonging needed to establish a safe community.


Herman Hertzberger, Lessons for students, 147

Herman Hertzberger, Lessons for students, 148


Harmen van der Wal and Machiel van Dorst, 2014. “Privacy scripting en de leesbaarheid van ruimtes.” De Architect 5
A reference within the theme of mass housing for developing countries that particularly has been of great inspiration to me is Raj Rewal's CIDCO housing in Mumbai. Creating a variety in communal spaces and a hierarchy of streets and clusters to complement the value of the dwellings themselves like in this design, has been a starting point for the design of this thesis.
The issue of density is pressing in creating affordable housing. An investigation towards this subject has been established by creating a design for a dwelling neighbourhood through *typology transfer*. Characteristics of precedents from different architects, times and locations are combined and transferred to a design site in Addis Ababa. The four original case studies included:

**Poblado Entrevías** - Saenz de Oiza, de Alvear & Sierra  
1956-1960 // Madrid, Spain

**Fleet Road** - Neave Brown  
1966 - 1975 // London, United Kingdom

**Caja de Agua** - Junta Nacional de la Vivienda  
1961 - 1967 // Lima, Peru

**House type 11-JD** - P. Jeanneret  
1966 // Chandigarh, India

In this *density challenge* the possibilities in achieving very high densities, while still taking in account the needs of individual dwellers and communities, have been explored. Eventually, the feasibility of the design, achieved through the use of a highly systemized approach, has made it a strong project. Several design principles as well as the system approach have formed an input for the eventual thesis design.
**design principles**
COMMUNITY OPEN SPACE
SPACE FOR THE CITY
COMMUNAL GARDENS

FUNCTIONS
- Dwelling
- Dwelling with possible commercial
- Commercial with dwelling on top
- Education and religion

HIERARCHY OF PUBLIC SPACES
- Space for the city
- Community open space
- Communal gardens
POBLADO ENTREVIAS 1:5 CONFIGURATION

COMMUNITY OPEN SPACE

FLEET ROAD HEIGHTS CONFIGURATION

1- STORY  2- STORY  3- STORY  4- STORY  5- STORY  6- STORY
The housing shortage in the emerging cities of the Global South has been posing architects the question of what is the best way to solve the issue of slums for decades. The vast amount of problems apparent in slums is evident. However, throughout the past fifty years, lots of books and articles addressing 'the architecture of slums' and paying attention to the positive aspects of slum dwelling have been published as well. The idea that it is the very aspect of people building their own environment that provokes positive aspects in low-income neighbourhoods has led to a large amount of initiatives in self-build projects in the past and is still apparent in the discourse of today.

The vast amount of problems in slums is evident. The usually insecure legal status of their inhabitants, the lack of urban infrastructure, unhealthy and unsafe living environments make them a pressing issue that need to be addressed. However, throughout the past fifty years, lots of books and articles addressing 'the architecture of slums' and paying attention to the positive aspects of slum dwelling has been published as well. These positive aspects have led architects in trying to find a solution to the slum problem, alternative for the eviction or relocation to peripheral high-rise developments of slum dwellers. Already in the 1950's, the Bidonville Mahiedinne Grid, presented at CIAM, promoted architects to "provide the basic and indispensable structural elements which can afford to these people the possibility to give new expression to their own traditional conceptions", rather than imposing modern high-rise structures on them, merely suited to the western way of life. Gaining fame in the 1960's, John Turner saw complete autonomy of inhabitants as the answer to solving the slum problem: "The man who would be free must build his own life. The existential value of the barriada is the product of three freedoms: the freedom of community self-selection, the freedom to budget one's own resources, and the freedom to shape one's own environment." In several publications he advocates the solution self-build projects, in which the builders, as members of a family and a local community, find self-discovery and personal growth in the responsibilities and activities of home-building and improving his living environment. In the Netherlands, the architect Habraken supported the notion that being able to construct ones environment is essential in establishing a 'natural relationship' between the dweller and his house, stating that "The residents of the mass housing city are unable to possess their habitat. They are forced to reside in an environment that is not part of themselves. To unify oneself with this environment they have to change who they are". These visions, and many others alike, have led to a large amount of initiatives of self-build projects, enacted in for example South America in the 1960's, eventually even becoming the prevalent housing policy that was sponsored by the United Nations and the World Bank from the 1970's.

The idea that it is the very aspect of people creating their own environment that provokes positive aspects in low-income neighbourhoods is still apparent in the discourse of today. Patrick Wakely & Elizabeth Riley make a case for incremental housing by interpreting slums "settlements of hope, in the process of building their cities through their own endeavours and ingenuity", characterised by "flexible, responsive, and affordable housing processes that enable families to extend and improve their dwellings over time".

In 1993, it was concluded that the World Bank slum-upgrading and sites-and-services projects had largely failed to have visible impact on the housing crisis in the Third World. Programmatic disassociation of housing provision from employment creation, in combination with the need of sites-and-services schemes to be located in the peripheries, cause the approach fail in solving the problem of slums. The slum-upgrading projects of the first hour focused on the provision-
and improvement of the informal settlements ‘hardware’, in the form of for example infrastructure and water supply. ‘The case for incremental housing’\textsuperscript{21} argue that the main problem in in the failure of these sites-and- services projects of the last century was the lack of attention given to the development of community, the engagement of the inhabitants in local governance and their legal entitlement to the land they are living on. Improving these aspects, the way towards slum dwellers building the cities of the future should be paved.

Even though certain positive aspects to slum dwelling are apparent, nowadays still too much emphasis is put on the positive aspects supposedly resulting from the self-built character. In The Architectural Review, Dan Hancox aptly articulates this overevaluation of informal settlements by introducing the term ‘slum porn’ for the “dressing up [...] the story of how people are forced to live in, and adapt to, the desperate situations that global capitalism, poor planning and rapid urbanisation impose upon them.”\textsuperscript{22} Self-help schemes might provide people with security of tenure and a basic infrastructure, the inevitable use of low-quality materials and the lack of well-designed public spaces and maintenance of the installed infrastructure leaves people eventually living in a new slum, which is only further removed from the city centre.

The rural-urban migration, prevalent throughout the Global South and creating new and densified slum areas in its big cities requires a quick response to the enormous demand for decent affordable housing and infrastructure. It is clear that relocating people in condominium apartment blocks more often than not completely ignore the historical city structure as well as the patterns of inhabitation that people are accustomed to. The main problem of mass relocations of slum dwellers is failing to address the essential question of social criteria. Establishing a socially inclusive city can be considered one of the most essential tasks of the government of these emerging countries. It is precisely this social aspect where the role of architecture can, and has to, be of meaning.

Much of the literature dedicated to promoting self-build developments, stresses the argument of the forced passivity of the users in mass-produced housing blocks. Good dwelling architecture, especially in developing countries, enables it’s users to activate it and use it in the way they seem fit. Enabling users to appropriate their living environment does not however, mean abolishing architecture all together. To create safe and liveable cities in the developing economies of the Global South it is, first and foremost, important to create a liveable in-between space, by designing it carefully. In order to do this, dwellings as well as other structures that take up the space and thereby create the leftover space in between, have to be designed themselves.

\begin{itemize}
  \item[18] Wakely and Riley, Cities without slums, 148
  \item[19] Wakely and Riley, Cities without slums, 2
  \item[21] Wakely and Riley, Cities without slums
\end{itemize}
Kirkos area is located right in the center of the city. Currently, the area consists of informal settlements, with a density of only 150 units per hectare. Over the past years of urban renewal, the inhabitants of Kirkos have opposed their relocation to condominium developments, which makes them known for their resilience. The wide range of commercial activities that is carried out in the area gives Kirkos its vibrant character, which has become a vital part of the *immaterial heritage* of Addis Ababa.
In its central location, Kirkos is surrounded by major recent infrastructure developments, among which the ring road and the elevated rail line. Several landmarks are located close to the area, like the historical train station that dates back to the time of the Italian occupation, the Addis Ababa stadium and Meskel Square. All this makes Kirkos area a prime real estate location for new developments. The master plan that has been created for this part of the city contains additional infrastructure, a big city park and plots for large-scale developments.

In these plans for redevelopment of the area, gentrification and the loss of the informal commercial character of the area are imminent. An alternative design approach is needed to prevent this scenario from happening, which makes Kirkos area very suitable case study for the design assignment that has been formulated for this thesis.
DESIGN

future

addis ababa
CONCEPT

THE PUBLIC IN-BETWEEN

THE COLLECTIVE IN-BETWEEN

THE PRIVATE DOMAIN

TECHNICAL DESIGN
a sequence of in-between spaces

The dwellings that are to be realised in affordable housing for the urban poor and middle-class are small, making it necessary for life to take place around rather than inside the houses. To create safe and pleasant living environments in the developing economies of the Global South it is therefore, first and foremost, important to design a liveable in-between space.

In the context of Addis Ababa, it is precisely this in-between space where the three essential themes of community life, mixity and the appropriation of space can flourish. To accommodate the emerging of such a meaningful in-between space, the design is focused on creating a sequence of ‘privacy domains’. The gradual transition between the domains, ranging from the highly urban outside border of the neighbourhood to the very private within the dwelling itself, enables inhabitants to identify themselves with all the different groups they belong to: from feeling like an individual, to being a part of a family, a neighbour, a community member and a citizen.
public domain  

private domain
levels of urbanism

All of the domains belonging to these different identities require certain characteristics, to accommodate different functions and activities. The outside border of the neighbourhood provides the urban character that is needed in this central location of the city, containing formal commercial units and being of a more organised and refined character than the informal commercial street that is lying behind it. This domain provides places for more informal commercial activities, preserving the important part of the immaterial heritage of Addis Ababa culture, and in particular the Kirkos area where the project is located. The pedestrian courtyards formed by the apartment clusters in the centre of the neighbourhood are focussed on creating a community feeling for the inhabitants of that cluster.

In this layout, the character of the border is a variable. In the scenario that the project would be repeated in a different location of a less central and urban character, it can be imagined that the border would be of a more permeable character, or be absent all together.

Contrary to the condominium neighbourhoods where the in-between is an over-dimensioned space where nothing really happens, in this design all the corners, alleys and shared spaces on a human scale promote a sense of belonging and ownership. Moreover, a density of 300 dwellings per hectare is achieved, which is far above the condominium benchmark. This makes this approach suitable for the inner parts of the city, preserving a “right to the city” for the low-income families currently living in Kirkos.
the public

in-between
urban border
The urban border contains a commercial plinth of two stories facing the outside of the neighbourhood. This plinth provides the urban character and facilities suitable for this public domain of a modern city centre. The design does not imply how the units should be used. By creating polyvalent spaces that can be easily combined or used separately, different purposes can be accommodated ranging from office or retail spaces to café’s and restaurants.

The standardized *border block* with a ground floor layout of commercial units on one side and dwelling units on the other, are combined with the *joint block*. The joint blocks not only close the border by connecting the border blocks, but simultaneously form a connection between the inside and outside of the border, as they can be entered from both sided. The units in the joint blocks are set up in a slightly larger scale, making them suitable to house facilities for the neighbourhood like daycare, community centers or launderama’s.
informal commercial street
informal business - the transition zones

The informal commercial street provides a place for the spontaneous, informal and chaotic commercial activities characteristic for Addis Ababa and Kirkos to take place. Moving these activities from the urban realm inside the neighbourhood, the two identities can exist simultaneously without disadvantaging one another. The informal commercial street is accessible to motorized destination traffic, but can easily be closed off for market days or public events. Additionally, the broad sidewalks facilitate appropriation by dwelling businesses and street vendors.

The dwellings located on the informal commercial street are provided with veranda’s with bamboo screens, that form a transition zone to between the private and the public realm. Moreover, they provide a place to display merchandise or create a coffee terrace.

Because of the location next to the large park and many downtown facilities, the design purposely does not contain a lot of large scale public facilities with assigned functions. One of the key aspects of the design are the small scale and polyvalence, avoiding to dictate how spaces should be used. The users themselves are to appropriate the spaces, both indoors and outdoors, provoking a livelihood and ever changing character that will be able to suit the requirements of the time.
impression of the informal commercial street
access street
parking & accessibility
By avoiding ongoing streets throughout the neighbourhood, motorized traffic is limited to destination traffic. The access streets in the centre of the neighbourhood house parking strips and connect the pedestrian accessible dwelling clusters to the public road. Desolate parking lots are avoided by creating parking buildings and parking under open spaces. Making use of the topography and the resulting platforms on which the dwelling clusters are situated, a sufficient parking ratio is realised in an affordable way.
TOTAL PARKING SPOTS 190
PARKING RATIO 0.21
the collective
in-between
creating communities

The most vital part of the design is formed by the organisation and connection of a series of collective spaces. Dwelling blocks are clustered to enclose the community courtyard. Subsequently, within the blocks all dwellings entrances are situated on a collective outside space that is shared with a limited number of families. These shared terraces on various levels, connected through an exterior vertical circulation system, provide space to carry out domestic activities and amplify close bonds between neighbours.

Between clusters, the exact size and shape of the different areas can differ. The principle of the sequence of spaces however, is always comparable. The organisation of spaces mirrors the informal settlement’s courtyards and appropriated streets. The continuation of the terraces over multiple levels however, greatly increases the density of the scheme. The ‘fencing off’ of a part of the open space for private use, common practice in the condominium scheme, is prevented by avoiding dead ends in the circulation system and sharing entrance areas with multiple families. In this way, a collective domain is created that endorses social networks and creates a sense of belonging.
community courtyard
definition of spaces

To deal with the typography of the landscape, the dwelling clusters are put on platforms. However, the platforms are formed in such a way that they do introduce a surplus value by contributing in the definition of the in-between spaces. In the example of a dwelling cluster depicted on the next page, this definition of spaces becomes clear.

Within a dwelling cluster, all blocks are entered from the community courtyard. Depending on the composition of the cluster, the courtyard is shared by 80 - 90 households. In image a the area to which one enters the community courtyard is highlighted. This space is shared by all dwellers of the cluster, as they all have to pass through it going to their dwelling. This area can feature some greenery, but always leaves enough space for larger community activities, like putting up tents for idir events.

In the area highlighted in image b the height difference introduces an extra level in the hierarchy of privacy domains. While accessible to everyone who wants to enter, this area is never directly connected to the public domain and therefore belongs more to the people living in the blocks that are accessed from it. Depending on the composition of the cluster, this part of the courtyard is shared by 20 - 40 households.
impression of the community courtyard
shared terraces
borders & safety

The next level in the sequence of privacy domains is the shared *in-between* space, materialising in the form of terraces that are shared by 2 - 4 households. All dwellings are entered from one of these terraces. Image *a* shows how in this way the terraces form the transition zone between the collective and the private realm.

As opposed to the courtyard itself, the shared terraces on the ground floor can be closed off. In addition to providing a sense of safety for the owners, these terraces contribute therefore in making the cluster less permeable from the outside by introducing more *borders*. Image *b* on the next page already gives a glimpse of how this system of shared terraces is continued on the higher floors.
circulation system

The way in which the shared terraces on the upper levels are connected becomes visible in the diagram below. The diagram shows the three block variations that make up the cluster, as well as the border block. This organisation of the shared spaces is designed in such a way that there is no central stairwell. Instead, the vertical circulation system becomes part of a routing that is wrapping around the buildings. In this way, the circulation system contributes to and becomes part of a meaningful in-between space.

The sequence of images on the next page zooms in on one of the cluster blocks, to elaborate on the way that dwellings are connected with the circulation system. Connected to the larger terraces are maisonette type dwellings, connected to the galleries are apartments. The next chapter will further elaborate on these dwelling types.
impression of the shared terraces
dwellings
The prevailing dwelling type throughout the design is the maisonette. The maisonette type introduces several advantages. Firstly, by creating dwellings that cover two stories, but have a smaller footprint, the number of dwellings that have a direct relationship to the street is maximised. Additionally, less galleries are needed and six-story buildings can be realised that still stay within the maximum walk-up distance of four floors. Secondly, the segregation that emerges within the dwelling layout due to the division over various levels continues the principle of privacy zoning even within the dwelling. Finally, and most importantly, this segregation facilitates the combination with small businesses or subletting, supporting informal forms of income generation.

To increase density and accommodate for the needs of more user groups, the apartment type is introduced to complement the maisonette type in the design.
**TYPE**

*apartment*

*private space*

*maisonette*
To create a safe and vivid living environment, the design aims to accommodate dwellings that answer to the needs of a wide variety of people. Therefore, the two main dwelling types are further subdivided in different sizes. The diagram below shows that the sizes are dispersed over the dwelling blocks, creating a mixity of people not only within the entire plan, but also within the communities in it and even between neighbours.
private space

TYPE
- apartment
  - XS
  - S
  - M

SIZE
- XS
- S
- M
- L
- XL

maisonette
accommodating different contexts

To further react to the location of the dwellings within the blocks, the main size variations are further subdivided in various layouts. The floor plans of these layouts are depicted on these pages.
Maisonette 1 (M)
2 bedrooms
48 m2

Maisonette 2 (M-L)
maisonette
a. 48 m2
b. 60 m2

Maisonette 3 (M)
2 bedrooms
50 m2

Maisonette 4 (M-L)
3 bedrooms
a. 52 m2
b. 60 m2

Maisonette 5 (L-XL)
2 bedrooms
a. 64 m2
b. 60 m2
c. 75 m2

Maisonette 6 (XL)
3 bedrooms
80 m2
The drawings below show how the different floor plans work together with the shared, collective, and public in-between spaces that have been explained in the previous chapters.
defining criteria

In order to formulate the criteria by which the technical solutions for the design were chosen, the current solution of the condominium scheme introduced by the Integrated Housing Development Program has been taken as a benchmark. Within this scheme, there are certain characteristics that are positive and should therefore be preserved in creating a new design. These characteristics include the low construction costs, the high construction speed and the creation of jobs for the local building sector and unskilled workers, through on-site production units that can employ local inhabitants.

Despite these positive aspects of the building method of the condominium scheme, there are a number of problems that have to be improved. In addition to the social problems that the scheme introduces, the overemphasis on keeping the costs low results in a use of materials and building techniques that do not reach an acceptable level of sustainability, durability and quality of living for the users.
left page
1. building materials on site
2. systematised approach to building improving construction speed
3. on-site production center

right page
4. lack of durability of materials
5. lack of durability of materials
6. undesigned leftover space
7. lack of quality of built environment
accountability of choices

The matrix that is depicted on the next page shows how the design choices concerning building methods and materials are related to the six established criteria that resulted from the analysis of the current situation. Complementary, the current situation is added for comparison.

For the various parts of the building process, the different criteria are assigned different importance. For the load bearing structure, the most important part is reaching a high quality and durability. The material chosen for the infill, the interior walls and top floor ceilings, are more focused on building fast and keeping costs low. The skin is where the biggest improvement compared to the condominium scheme is accomplished. The inner sheet of the facades are, like the infill, made up of agrostone panels. These panels are a sustainable and light-weight building material composed of local industrial waste. They are fire- and mold-resistant high insulation value. To improve the acoustical quality and weather resistance of the facade, the agrostone panels are complemented with an outer sheet of ferrocement panels. This outer layer of cement can vary in color and pattern, introducing an aesthetical preciousness and a sense of belonging for the various clusters.

<table>
<thead>
<tr>
<th>STRUCTURE</th>
<th>SKIN</th>
<th>INFILL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONCRETE</td>
<td>FERRO CEMENT</td>
<td>AGROSTONE</td>
</tr>
<tr>
<td>in situ columns</td>
<td>molded panels</td>
<td>wall panels</td>
</tr>
<tr>
<td>beams in situ</td>
<td>+ AGROSTONE</td>
<td></td>
</tr>
<tr>
<td>slabs</td>
<td>corrugated roof sheets</td>
<td></td>
</tr>
<tr>
<td>STEEL support</td>
<td>AGROSTONE</td>
<td></td>
</tr>
<tr>
<td>system roof &amp;</td>
<td>wall panels</td>
<td></td>
</tr>
<tr>
<td>facade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONCRETE</td>
<td>BAMBOO</td>
<td></td>
</tr>
<tr>
<td>plastered hollow</td>
<td>corrugated roof sheets</td>
<td></td>
</tr>
<tr>
<td>concrete blocks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEEL</td>
<td>AGROSTONE</td>
<td></td>
</tr>
<tr>
<td>corrugated roof</td>
<td>wall panels</td>
<td></td>
</tr>
<tr>
<td>sheets</td>
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</tr>
<tr>
<td>AGROSTONE</td>
<td></td>
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</tr>
<tr>
<td>wall panels &amp;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>doors</td>
<td></td>
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</tbody>
</table>

- **LOW-COST**: All materials are cost-effective and environmentally friendly.
- **CONSTRUCTION SPEED**: Materials are quick to install and easy to work with.
- **JOB CREATION**: Job creation is facilitated through the use of local materials and labor.
- **SUSTAINABILITY**: Materials are sustainable and contribute to a healthy environment.
- **DURABILITY**: Materials are durable and long-lasting.
- **QUALITY**: Materials meet high-quality standards and ensure a lasting, safe building.
on-site production

The project contributes to the local economy and construction sector, by selecting building materials that require minimal transport, locally available from sufficient resources and provide jobs for unskilled labourers.

Costly elements, like stairs, are standardised for mass production. The high degree of repetition in the construction system reduces expenses in both material supplies and labour. For all other elements, an on-site production unit in which the building elements are produced is established.

Construction will be phased cluster by cluster. First, the load bearing structure will be erected, by a building team consisting of skilled builders. Subsequently, a second building team consisting of more unskilled labourers can move from building to building to install the facade and in-fill.
While the maisonette typology and the more complex circulation system proposed are more costly than the current solutions executed in the condominium schemes, they introduce such a surplus value that the additional investment will repay itself in durability and social sustainability.

Moreover, the variety in dwelling variations and the complexity in outside spaces is actually made up of a very straightforward construction system, creating three basic typologies. The building method of a concrete column and slab structure is familiar to local contractors.
All kitchens and bathrooms are situated directly on shafts that are placed directly above each other, minimizing the amount of pipes needed. Moreover, the shafts are placed in such a way that together with shear walls they provide stability for the buildings.
standardisation & customisation

To make the project feasible, the design is based on a systemized approach of four basic dwelling blocks that are repeated. These standardized blocks however, should be able to react to their specific context.

A facade system is created, that with a limited number of elements accommodates a large variety in use. The sizes of the elements are matched and the exact grid system of the structure has been adjusted to fit these sizes, creating endless possibilities for assembly, based on solar orientation, proximity to other buildings, privacy requirements, possible commercial use or specific dwelling layout.

The outer sheet of ferrocement can be executed in various textures and colors, creating identity for the different clusters. While the textured and finished exterior of the blocks is clearly not meant to customize: only a white plaster is applied in the covered spaces of shared terraces and the ‘transition zones’. Users are invited to appropriate and customize these spaces, transforming the circulation around the buildings in a scenic routing that is different going around every corner and providing for the individual identity of the inhabitants.
door

2600 x 915

window
[possibly replace bottom panel]

2600 x 915
2600 x 610

agrostone

2600 x 1220
2600 x 915
2600 x 610
2600 x 305

ferrocement

2650 x 900
2650 x 600
2650 x 300
2600 x 100 x 330

facade elements
building order

1. Load bearing concrete structure is constructed by first team of builders
2. Steel roof structure is placed on top of the load bearing structure
3. Corrugated bamboo sheets are attached to the steel roof structure
4. Iron steel strips form the support system for the outer facade sheet
5. Wooden slats mark the location and support the elements of the inner facade sheet
6. Agrostone panels are attached to the wooden slats
7. Ferrocement are connected to the concrete structure and correct deviations in size of the facade elements
8. Ferrocement facade panels are put into place
9. Windows are attached to the ferrocement U-panels
10. Window sills and finishes are put into place.
With the chosen materials and building methods a comfortable indoor climate is created, greatly improving the quality of living for the inhabitants of Addis Ababa.

In the condominium developments, the use of hollow concrete block walls with stucco plaster poses the problem of moisture penetrating walls in case of heavy rainfall. This problem is obviated by the use of the rainscreen principle, in the form of ferrocement panels, with a ventilated cavity and insulating agrostone panels.

By placing the windows recessed in the facade, no shading on the north and south side of the building is needed. The narrow, high windows on the east and west side of the building need less shading already. Therefore, only on the west side additional shading is needed, executed in the form of bamboo screens.
All dwellings have multiple facades, enabling cross ventilation. Additionally, the advantage of two-storey dwellings is exploited by placing windows in the upstairs hallway, creating an upward air flow. A ventilated roof prevents the top floor dwellings from overheating.

The thermal mass of solid concrete floors combined with the upward air flow of hot air is creating cooler living spaces by day and warm bedrooms at night. Therefore, no additional heating is necessary.


grey water reuse

Excess rain water and grey water from households are collected and stored in the adjacent city park, where grey water is first purified by a vertical flow constructed wetland system. The water can then be reused for cleaning streets and irrigating greenery in the city, as well as for the flushing of toilets. Black water is discharged to the sewerage separately. This system is ambitious, but low-tech and therefore feasible. Other plots surrounding the park can also be connected.
infiltration trench
vertical flow
constructed wetlands
retention basin
plaster
agrostone panel
wooden batten
steel H-profile
ferrocement panel
ferrocement U-panel
steel / bamboo folding screen

1:10
horizontal section - detail 1
By clearly establishing the essential elements of the collective research and focussing all design concepts and subsequent research on the three central themes of community life, mixity and appropriation of space, this thesis has become a coherent story from the first general research to the design of the detail.

The design provides the image, resilience and density required for this downtown location of an emerging urban city. At the same time, it is preserving the right to the city of the urban poor and the immaterial heritage of Kirkos area. The provided polyvalent spaces, both inside and outside, are highly suitable to combine with informal businesses and ask for appropriation. Introducing collective spaces, from communal courtyards to intimate shared terraces, the Ethiopian customs and patterns of inhabitation are truly accommodated for.

From the urban plan to the detail of the facade, a rational basis of repeating elements paves the way for an endless variety in use, creating an inclusive and lively community that flourishes in the in-between.
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