RECLAIMING THE RIVER

A NEW VISION TOWARDS BORDER VACUUMS

RESEARCH & DESIGN BOOK

Slums Along the Bantyketu River, Addis Ababa, Ethiopia

The grand building in the distance is the Sheraton Hotel, one of the most deluxe spots in Addis as a contrast. It is rather representative to show the imbalance of urbanization in Addis Ababa.

CONTENTS

1 RESEARCH

1.1 INTRO

Ethiopia is now suffering from pressing housing issues resulted from the urban sprawl and rural-urban migration trend, which offers a great example to study the balance between density and quality in social dwelling.

The Global Housing Graduation Studio works on this environment trying to link the harsh reality of african boom with cross-cultural methods deriving from western discipline.

The unique social context also provides a wide range of possibilities in the definition of urban life, making it a real challenge for architects to take positions.

A continuous shift between local-based qualities and international rules of developments and economy was the field in which we worked for one year.

Meanwhile, I see some parallel situations in some cities in China, This drives me to reflect on the existing practices and results, which may provide valuable experiences for the future reference.

1.2 PROBLEM STATEMENT

1.2.1 UNMET DEMANDS FOR AFFORDABLE HOUSING

One of the most crucial problems in Addis is the unmet demands for affordable housing.

An up-to-95% humanity increase led to the rapid urbanization or even over-urbanization, which bring the city to poverty and unemployment. Meanwhile, due to the rare supply of housing by the government, the housing shortage directly resulted in the self-built informal settlements – slums.

It was estimated that more than 90% of Addis Ababa's inhabitants lived in slum areas. These slums bring a number of problems, such as overcrowding, poor living and sanitation condition, inadequate access to safe water and lack of public space and community facilities.

In view of this, the government tried to improve the situation by seeking for a new strategy – condominiums. It features in new constructions in an empty space or a cleared –up slum area.

This new system does have its positive points, such as creating jobs in construction, increasing affordability with cross-subsidy scheme and creating new communities.

However, as a homogeneous solution, it again leads to new problems. The empty open space in-between blocks is in nonhuman scale and it also neglects the customs and native ways of living. A new strategy for affordable housing is in high demand in Addis.

Addis Ababa - A Slum City

1.2.1 UNMET DEMANDS FOR AFFORDABLE HOUSING

SLUMS - REASON

95% Humanity increase in developing countries

Rapid urbanization (scale and velocity)

Overurbanization: reproduction of poverty,no supply of jobs

Housing shortage: Goverment rarely supply more than 20% new house

Slum emerge: people turn to self-built shanties,informal rentals or sidewalks

More than 90% of Addis Ababa's inhabitants live in slum areas.

--- Un-habitat(2012)

1.2.1 UNMET DEMANDS FOR AFFORDABLE HOUSING

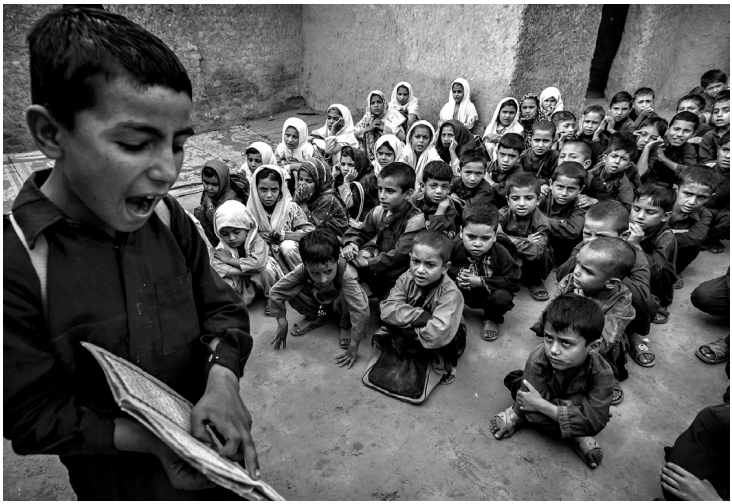
SLUMS - PROBLEM

- Overcrowding
- Poor living condition
- Poor sanitation
- Inadequate access to safe water
- Insecurity of tenure
- lack of public space and community facilities

CURRENT STRATEGY - CONDOMINIUMS ?

Inadequate Access to Safe Water

No Waste Disposal

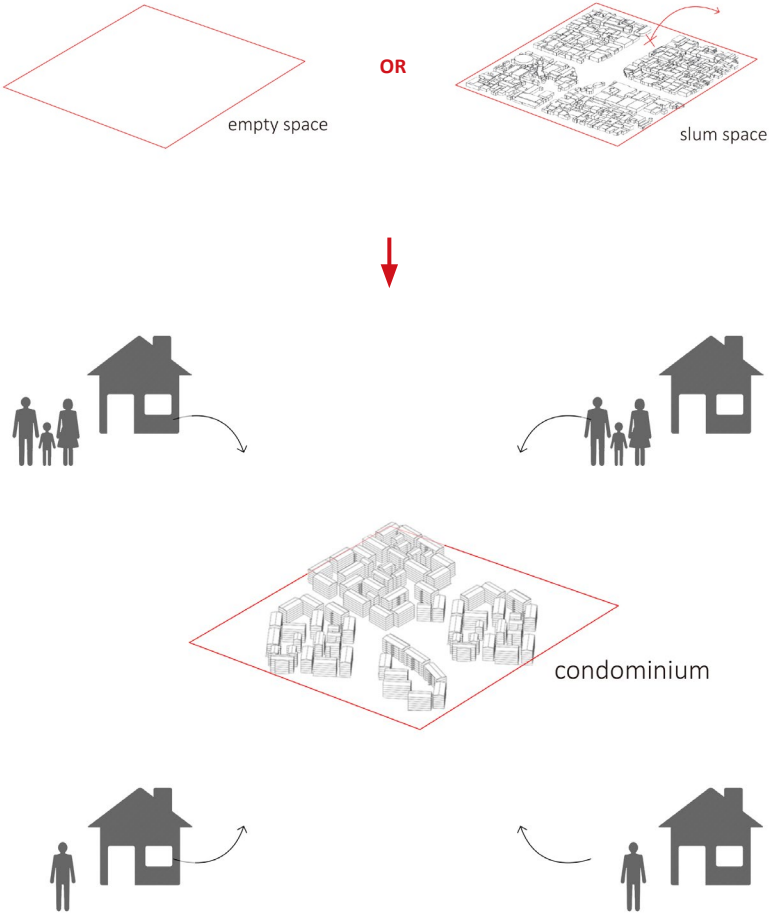


Lack of Public Space and Community Facilities

1.2.1 UNMET DEMANDS FOR AFFORDABLE HOUSING

CURRENT STRATEGY - CONDOMINIUMS

- Large scale, sustainable solution
- Creates jobs in construction
- Cross-subsidy scheme increase affordability
- Equal chances due to lottery system
- Possibility of creating new community


empty space
OR
slum space
condominium

1.2.1 UNMET DEMANDS FOR AFFORDABLE HOUSING

CONDOMINIUMS - PROBLEM

- Homogeneous solution nationally
- Nonhuman scale of empty open space
- Neglect customs and native ways of use
- Residents not engaged

The Empty Open Space In-Between Blocks in Nonhuman Scale

1.2.2 UNDERDEVELOPED RIVER BANKS

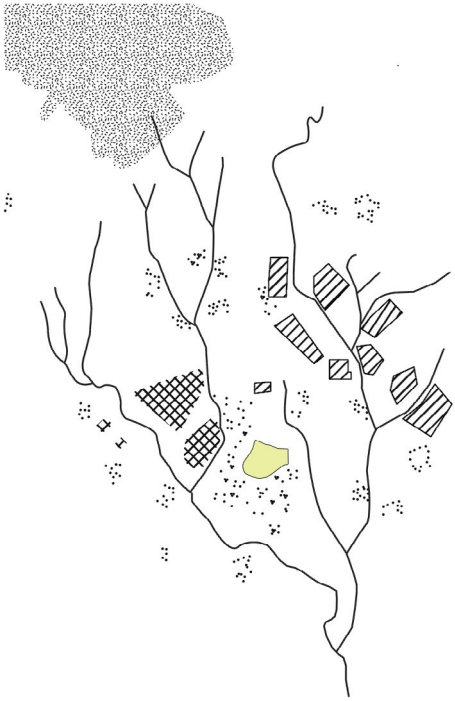
Another problematic element that aroused my attention is the river, which used to be one of the important triggers of urban transformation in Addis.

The rivers run across the whole city, and to a certain extent, affect the urban profiles as rivers were the direct source of food and water in the early years.

However, with the rapid paces of urbanization, rivers are no longer the irreplaceable source of food and water. Rather, they gradually become an underdeveloped urban grey zone instead of exerting their advantages.

Meanwhile, there are a large number of slums that locate along the rivers in Addis. With sewage and trash all over the area, the living condition there can be even worse compared with slums in other areas.

Riverine Domestic Dump



1880s

1.2.2 UNDERDEVELOPED RIVER BANKS

One Of The Important Elements Of Urban Transformation in Addis - River

1890s

1900-1920

'BORDERS TEND TO FORM VACUUMS OF USE ADJOINING THEM.'

JANE JACOBS

This is a typical case of 'the curse of border vacuum'. On the one hand, the rivers run across the entire city, forming a massive border that hinders the communication between two sides. With fewer users, fewer purposes and destinations, the rivers and their perimeters become a deserted and negative border vacuum, and further evolve into a domestic dump for the residents in the surrounding neighbourhoods. On the other hand, the stench and polluted water have further intensified the border effect along the rivers, which sets up a vicious circle.

the Curse of Border Vacuum

1.2.3 FRACTURED URBAN INFRASTRUCTURE

The border effect along rivers reveals the third problem, a severe fracture of urban infrastructure layers.

The river valley is left uncovered by urban traffic network and inaccessibility means declining.

Riverine Areas Excluded from Modernization

1.2.3 FRACTURED URBAN INFRASTRUCTURE

Meanwhile, water system is another key link in urban infrastructure.

While Addis is now still suffering from the shortage of water supply, poor water management strategies, including incomplete sewage treatment and flood control, aggravate the water crisis and riverine ecological stress.

Empty Gallons on Queue for Water on the Mount Entoto in Addis Ababa, January 5,2014.

1.3 RESEARCH QUESTION

HOW TO RECLAIM THE UNDERDEVELOPED RIVER BANKS AS A NEW STRATEGY FOR THE MASSIVE HOUSING DEMANDS AND A NEW SENSE OF THE SOCIAL IDENTITY IN ADDIS?

HOW TO BREAK THE NEGATIVE BORDER TO ACHIEVE THE CONTINUITY AND SYNERGY BETWEEN DIFFERENT URBAN LAYERS?

1.4 STATE OF THE ART

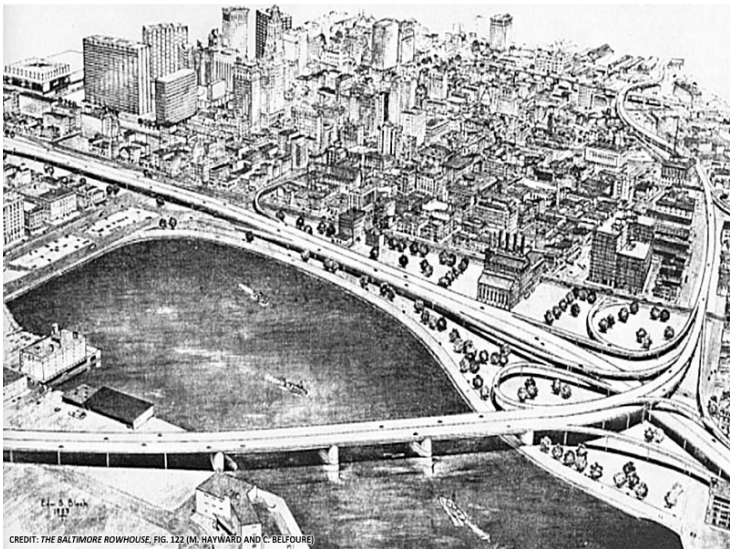
1.4.1 THEORETIC REFERENCE - THE CURSE OF BORDER VACUUM

In her book, *The Death and Life of Great American Cities*, Jane Jacobs argues how 'a single massive or stretched-out use of territory' becomes a disaster for the development of surrounding areas.

The potential objects of city borders ranges from railroad tracks, waterfronts, campuses, expressways, large parking areas and city parks.

She suggests that borders tend to form vacuums of use adjoining them. These borders apt to form dead end for users and become barriers. The oversimplification of use on a large scale results in the chain effect of simplification in the adjoining territory and further leads to fewer users with fewer purposes and destinations. These adjoining territory, called by Jacobs as border vacuum, will end up deserted and declining.

Similar cases can be found worldwide and it is exactly the situation of the river valley in Addis.



CREDIT: *THE BALTIMORE ROWHOUSE*, FIG. 122 (M. HAYWARD AND C. BELFOURE)

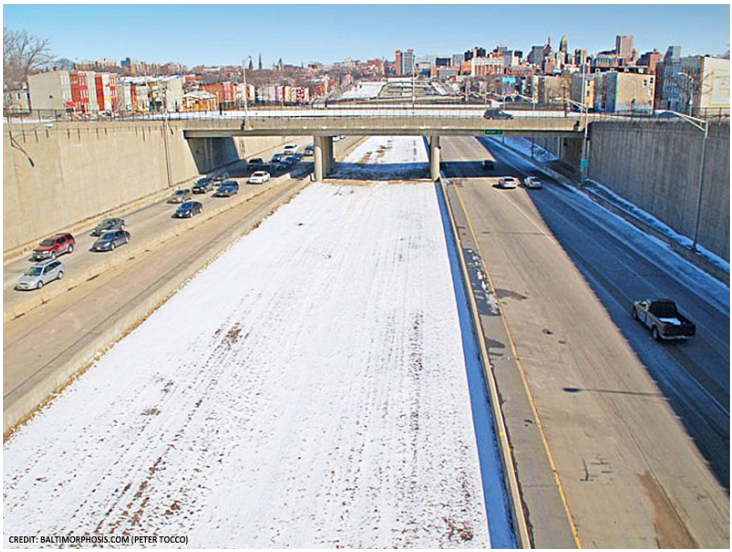
1.4.1 THEORETIC REFERENCE - THE CURSE OF BORDER VACUUM

The key for solution is to recognize pros and cons of borders to foster strengths and circumvent weaknesses rather than to disdain certain urban functions or to minimize their value.

Jacobs then offers two strategies.

One is to encourage much greater use of their perimeters by increasing both physical and visual accessibility, such as placing public uses at strategic point on perimeters or opening up as scenes to attract public view and interest.

Another solution relies on extraordinarily strong counter-forces close by. Diversified and lively city constitution is particularly important near borders to confine the vacuum to a small zone.


CREDIT: BALTIMORPHOSIS.COM (PETER TOCCO)

1.4.1 THEORETIC REFERENCE - INNER CITY RIVERSIDE DEVELOPMENT & LAND USE TRANSFORMATION: IN THE CONTEXT OF ADDIS ABABA

The main objective of this study is to investigate the physical and spatial transformation of settlements along with existing activities currently taking place along riverside areas within the city. It also identifies different parameters and develops basic principles as well as guidelines for future river-edge development strategy.

Four areas along the Bantyketu river within the inner city, currently undergoing urban renewal program, are selected for investigation.

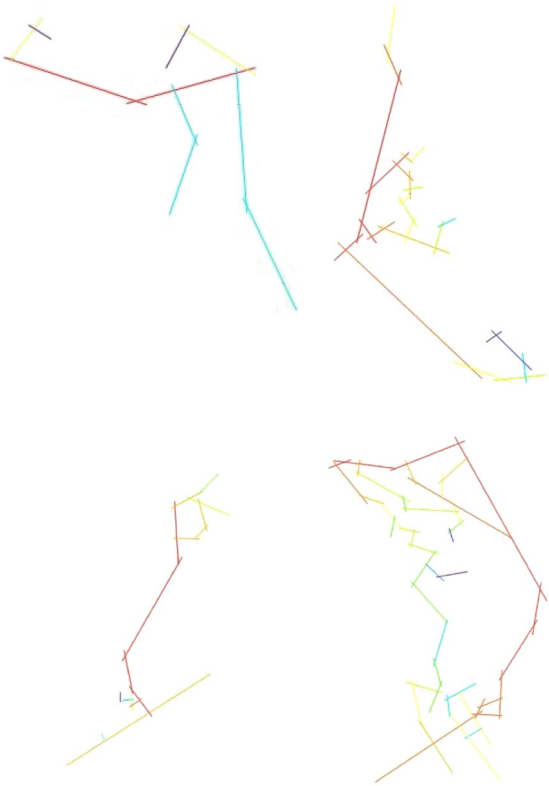
The study found out that, there are significant numbers of built-up structures added, extended and transformed between 1995 and 2002 mainly to accommodate shelter mostly for informal inhabitants.

Inner city riverside areas of Addis Ababa are characterized as 'lost' spaces of the city which do not promote social values and harmonic interaction between people and their natural surroundings. Moreover, these spaces are least accessible and poorly utilized which has resulted in attracting informal activities and informal settlements.

1.4.1 THEORETIC REFERENCE - INNER CITY RIVERSIDE DEVELOPMENT & LAND USE TRANSFORMATION: IN THE CONTEXT OF ADDIS ABABA

The major challenges of inner city riverside areas:
• lack of proper delineation of the green buffer zone area along river-edge
• absence of access leading towards the river
• absence of security of tenure
• lack of sense of land belongingness along the river-edges
• connection of untreated sewers directly to the river along with unauthorized solid waste disposals which are main cause of river water pollution
• absence of communal spaces used as recreational and related activities
• informal and authorized settlements

In general, the main causes of the challenges are pertaining to **ACCESSIBILITY, PROVISION OF INFRASTRUCTURE, GREEN OPEN SPACES, LAND TENURE AND PROGRAMS**. Basic principles and guideline strategies are forwarded for these summarized urban elements, which provides crucial reference for my design. The following excerpt gives more details.


HIGHLY INTEGRATED ACCESS
LESS INTEGRATED ACCESS

1.4.1 THEORETIC REFERENCE - INNER CITY RIVERSIDE DEVELOPMENT & LAND USE TRANSFORMATION: IN THE CONTEXT OF ADDIS ABABA

Road Network:

Access roads within riverside areas should be highly integrated in order to foster and maximize river-front movements, which will in turn also maximize social and economic activities within the movement corridors.

• The visibility of the river as well as public accessibility will also increase with the introduction of integrated access routes.

• Topographic character and slope should be considered while introducing access routes within riverside areas in order to minimize the cut-and fill.

1.4.1 THEORETIC REFERENCE - INNER CITY RIVERSIDE DEVELOPMENT & LAND USE TRANSFORMATION: IN THE CONTEXT OF ADDIS ABABA

Waste Disposal Systems:

One of major challenges of inner city of Addis Ababa in particular riverside areas is the connection of sewers and untreated storm waters directly to the river.

• Preventing measures and mechanisms of direct sewer line connection should be implemented.

• Using the topographic potential of river-side areas will be advantageous to install sewage lines.

1.4.1 THEORETIC REFERENCE - INNER CITY RIVERSIDE DEVELOPMENT & LAND USE TRANSFORMATION: IN THE CONTEXT OF ADDIS ABABA

Green Open Spaces:

In recent years receding of public spaces in the city is observed. The arrangements of public spaces in the city are not only dispersed throughout, but also function as disperse. To sustain productive and healthy environment, Addis has to consider reviving the natural setting without hindering ecologically friendly development strategies. Land use utilization of riverside areas should incorporate ecological and environmental aspects aside from housing, social service and commercial activities. The buffer zone will act as major urban green infrastructure along river-edge areas which will enhance the ecosystem and ecology of the area.

Communal Open Spaces:

Constructive green programs like community recreational open space, children play ground, etc. could be incorporated along the buffer zone area to activate and increase the usability of the space. The inserted green activities and programs along the buffer zone will in turn reduce mistreatment of the area and will also bring accountability regarding its protection and will bring sense of belongingness among the settlers.

Urban Agriculture:

One of positive green programs both as food security and urban green coverage is the existence of agricultural fields within the city. Existing trends of communal based gardens and agriculture should be promoted along the river-edge.

1.4.1 THEORETIC REFERENCE - INNER CITY RIVERSIDE DEVELOPMENT & LAND USE TRANSFORMATION: IN THE CONTEXT OF ADDIS ABABA

• The green buffer zone along river-edge areas should be implemented as part of the regulation of the master plan with a minimum offset distance of 15 meter from the edge of the river on both sides.

• The buffer zone should not act as a preservation area or closed park, but rather the buffer zone area should structure communal and public spaces of the city.

• A network of public green space should be connected along the river corridors of the city.

• Urban agriculture should be promoted especially along flood plains and should be allocated along river-edge by integrating it with the green buffer zone.

1.4.1 THEORETIC REFERENCE - INNER CITY RIVERSIDE DEVELOPMENT & LAND USE TRANSFORMATION: IN THE CONTEXT OF ADDIS ABABA

Programs / Activities:

Land or space without proper program would lead to lack of belongingness and might bring degrading of the area. So river-edge areas should be assigned for a specific or multi-functional activities which are suitable and constructive.

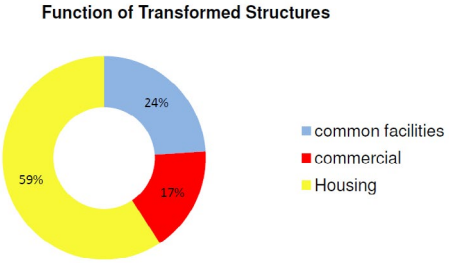
• Income generating activities should be incorporated along buffer zones, open communal spaces.

• Housing design schemes should also incorporate income generating means for the low income groups.

• Mixed activities of social, commercial and residential should be integrated along riverside areas.

Function of Transformed units	Color code	Case 1	Case 2	Case 3	Case 4	Total /average/
Housing		14/35	27/37	9/26	24/27	74/125 (59.2%)
Commercial		8/35	3/37	8/26	2/27	21/125 (16.8%)
Common facilities		13/35	7/37	9/26	1/27	30/125 (24%)

Table 4.2_ summary of function of the transformed unit's



Summary of Function of Transformed Built Up Structures

1.4.2 CASE STUDY - RESUSCITATING THE FEZ RIVER

A similar case is the Oued Fes (Fez River) in Moricco. It was the city's spine and integral to its urbanism.

Over the course of centuries, the city's dependence on the river to support a growing population and a flourishing leather tanning industry severely impacted water quality. By the 1950s the river had degenerated into a sewage channel and was renamed Oued Boukrareb (Trash River). Portions of the river were paved over consequently allowing vehicular access to disrupt the world's most comprehensive pedestrian network.

The river was obscured further in 2004 through ad hoc construction and again in 2007 extending further vehicular access into the medina. Today, residents, tourists, and workers in the medina think the river is either a blight or don't even know that it exists.

Three Target Plots for Reconstruction

1.4.2 CASE STUDY - RESUSCITATING THE FEZ RIVER

The goal with resuscitating the Fez River is to enhance regional water quality while addressing the lack of open public space, overpopulation, and an aging infrastructure within the Medina of Fez, the historic city.

This includes proposals for restructuring tannery operations and securing the local leather industry, enhancing health standards, and improving the general environmental quality of the Medina.

The project converts riverbanks into pedestrian pathways, connects these pathways back to the city fabric, and finally converts the urban voids along the riverbanks into public spaces that are lacking in the Medina of Fez.

SITE 2 - Public Square Transformed from Vacant Urban Space

1.4.2 CASE STUDY - RESUSCITATING THE FEZ RIVER

"Taking into consideration problems that plague the Medina of Fez such as the lack of open public space, overpopulation, and an aging infrastructure, the project is a strategic plan that addresses not only the ecology of the river but also the social and economic concerns of the city."

EXISTING CONDITION

PITS RESTORATION + PATH REMEDIATION WITH INDIAN MUSTARD + BUILDINGS REHABILITATION AND EXTENTION

BOARDWALK OVER PATHS + PLANTING OF PITS + PLACEMENT OF SEATING SYSTEM INSIDE PITS

SITE 3 - Phased Remediation Using Tannery Pits

1.4.2 CASE STUDY - VALENCIA'S GREEN RIVER

In 1957, Valencia experienced a devastating flood which directly led to a plan re-routing the Turia River to the western outskirts.

The remnants of the old riverbed became a chance to create the landscape network which is today's Jardín del Turia.

The plan created a framework for the riverbed and divided it into 18 zones. Currently, all but one of the zones has been developed. The resulting design establishes a monumental five-mile green swath within a dense and diverse urban fabric, including the historic center of the city, and has an average span of 600 feet, from bank to bank.

1957 Flood in Valencia

1.4.2 CASE STUDY - VALENCIA'S GREEN RIVER

The park comprises over 450 acres and is characterized by bike paths, event spaces, active recreation fields, fountains, and many notable structures, such as the Alameda Bridge by Santiago Calatrava.

Each of the sections has its own distinct design style, ranging from Ricardo Bofill's formal gardens with modern touches, built in 1986; and Calatrava's biomorphic City of Arts and Sciences, completed in 1998; to the sinuous landforms of Header Park by Eduardo de Miguel Rabones, Blake Muñoz Criado, and Vicente Corell Farinós, completed in 2004.

The final zone connecting the park to the Mediterranean Sea and the city's marina district.

Re-routing the City's River

1.4.2 CASE STUDY - VALENCIA'S GREEN RIVER

In my trip to Valencia on this spring break, I was really impressed by this massive green belt integrated fully into the urban fabric.

Walking through this huge urban park, you can enjoy both a peaceful mind and a green social life.

However, my experience there also raised concerns about the safety issues at night due to the time spread imbalance among users. A public green space is not enough. New ‘primary functions’ should be added with time balanced potential users, such as dwelling or office.

Birdview of the Transformed River Valley

1.4.2 CASE STUDY - SIEDLUNG HALEN VS PEDREGULHO HOUSING COMPLEX

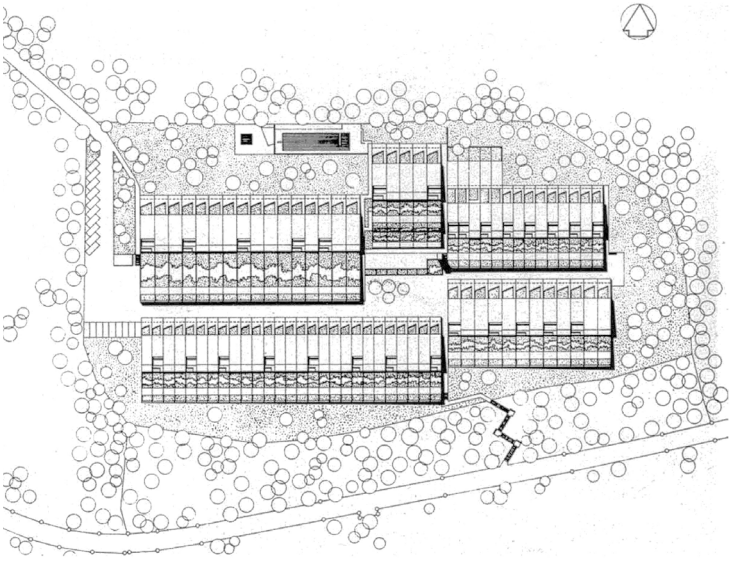
These two projects are similar in that they both address the issue of mass housing on a hilly green site, but differ in the specific strategies.

1.4.2 CASE STUDY - SIEDLUNG HALEN VS PEDREGULHO HOUSING COMPLEX

Siedlung Halen features a row-house complex.

Through a flexible organization of relatively rigid blocks, the complex integrated well with the landscape and creates rich spatial properties.

Taking advantage of the topography, the roof of the lower buildings become the garden for the upper ones.

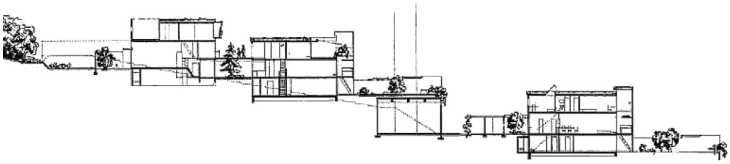


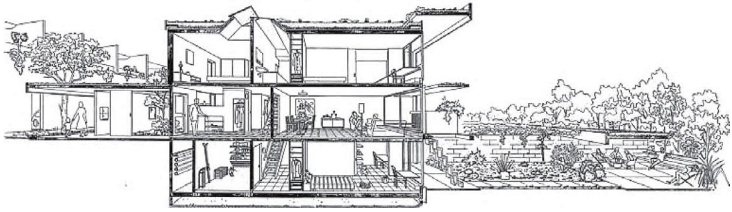
1.4.2 CASE STUDY - SIEDLUNG HALEN VS PEDREGULHO HOUSING COMPLEX

The most important feature lays on ‘a high degree of spatial definition’ for public and private realms. From the street through the communal garden to the private courtyard and terrace, it offers a gradient sequence from public to private zones and a unique rhythm both in plans and sections.

Each zone has its explicit boundary and a clear target user. This principle of avoiding ambiguity in the occupation of public space is a key precept of low-rise design and help to improve spatial efficiency.

Similar characters can also be found in Fleet Road in London, while Siedlung Halen applies these strategies to a more complicated topography.





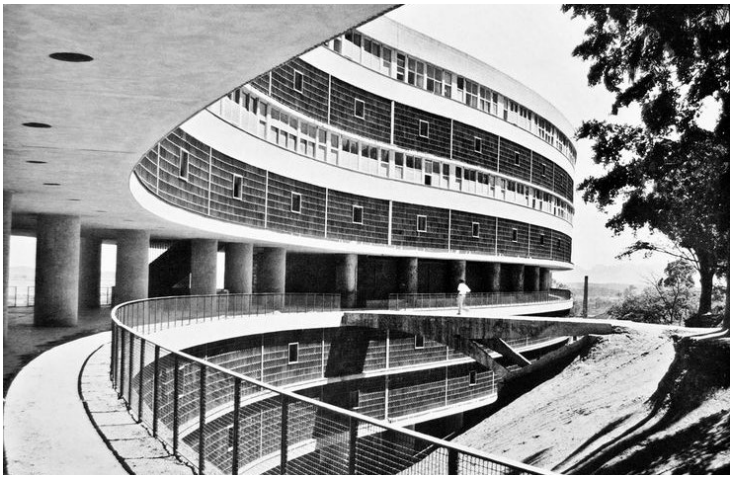
1.4.2 CASE STUDY - SIEDLUNG HALEN VS PEDREGULHO HOUSING COMPLEX

However, with its physical separation guaranteed by the woods, the context is in Siedlung Halen relatively simple with fewer urban elements to address.

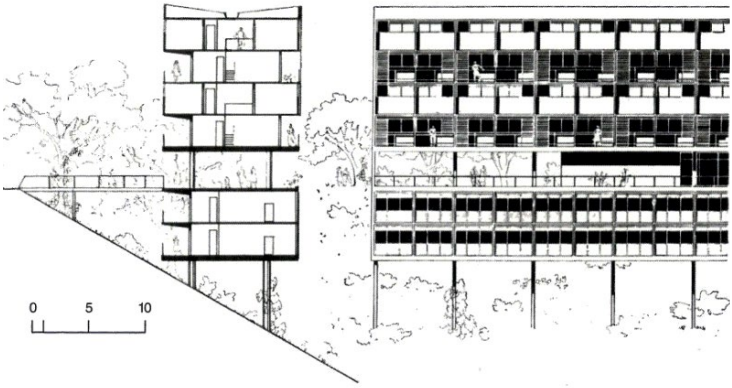
1.4.2 CASE STUDY - SIEDLUNG HALEN VS PEDREGULHO HOUSING COMPLEX

On the contrary, the main residential block in the Pedregulho Housing Complex gives another example showing how a single building harmonizes with topography and other urban tissues.

This long curvy slab is lifted above the steep slope with two walkways leading to the higher and lower level respectively. It actually creates a intermediate level in the middle as a transitional point between the city and building. This intermediate level also acts as the communal gathering space for the settlers.



View from the Intermediate Level



BLOCO A: CORTE E VISTA PARCIAL
BLOCK A: CROSS-SECTION AND PARTIAL VIEW

Section & Elevation

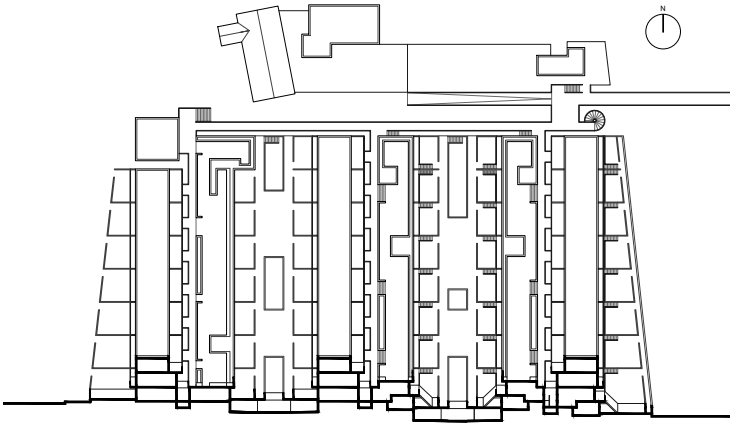
1.4.2 CASE STUDY - FLEET ROAD

Fleet road sets a typological example for high-density low-rise housing in inner-city. The key characters of Fleet road can be summarized as three points:

TRADITIONAL STREET

Three alleys form a two-level vertical walkway system and are directly connected with the urban street network, which in turn achieves a continuity with the site instead of rejecting the rest of the city.

Meanwhile, these streets help to evoke the rich network of social relationships that exists in the street community and the balance between public and private that it provides, which is a continuity from the past and the experience and expectations of users.



Section & Plan

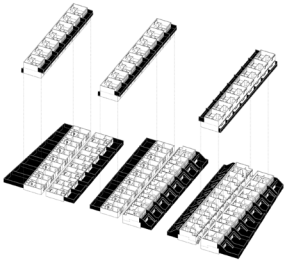
1.4.2 CASE STUDY - FLEET ROAD

DEFINED OPEN SPACE

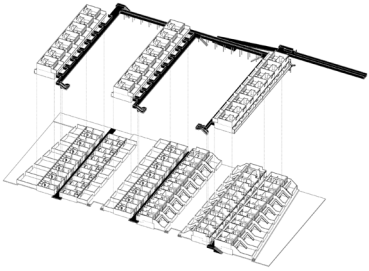
Each dwelling had its own private open-to-sky external space: for the upper maisonettes, a paved terrace; for the ground-level maisonettes, both a balcony and a garden; and for the groundlevel flats, a garden. In addition there were five communal gardens, in each case for use by a defined and controlled group of users.

PUBLIC & PRIVATE

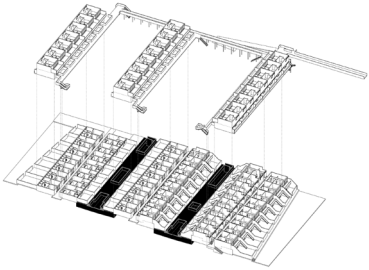
The most important feature lays on a high degree of spatial definition for public and private realms. From the street through the communal garden to the private courtyard and terrace, it offers a gradient sequence from public to private zones and a unique rhythm both in plans and sections.



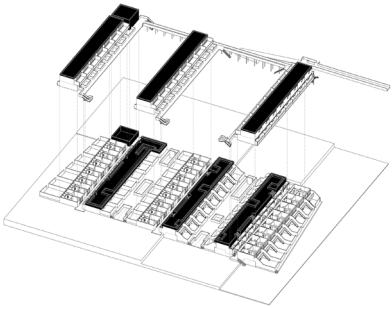
TERRACE & COURTYARD



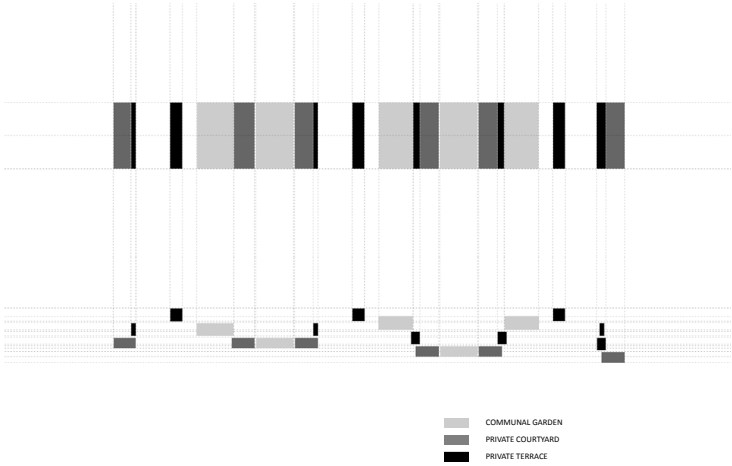
TRADITIONAL "STREETS" -
VERTICAL WALKWAY SYSTEM



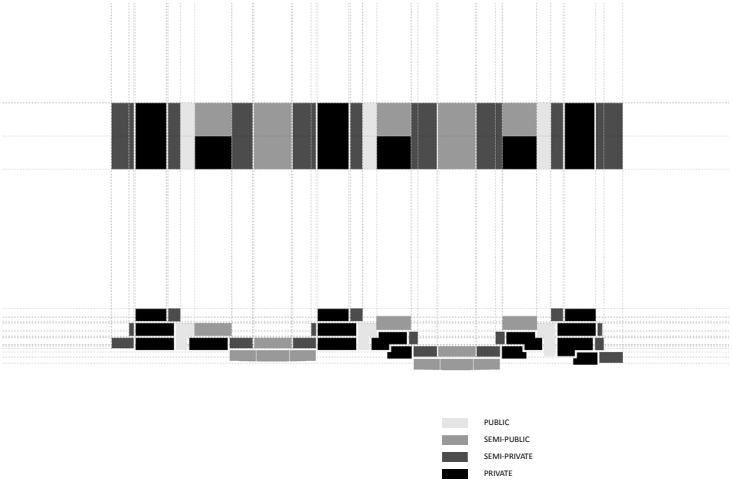
UNDERGROUND PARKING &
COMMUNAL GARDEN I



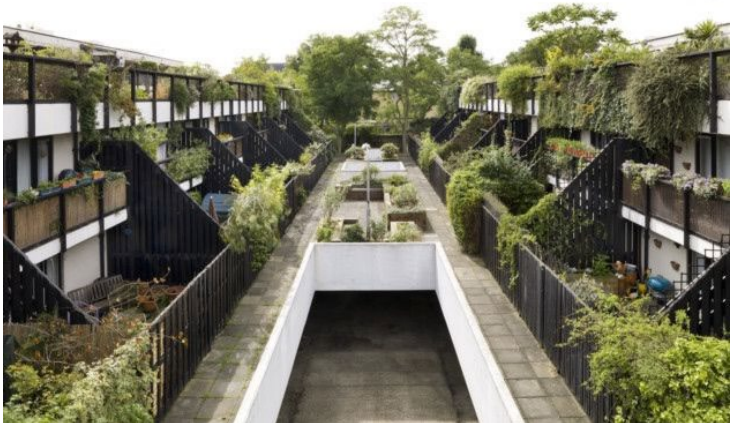
ROOF COMMUNAL GARDEN II &
OTHER FACILITIES



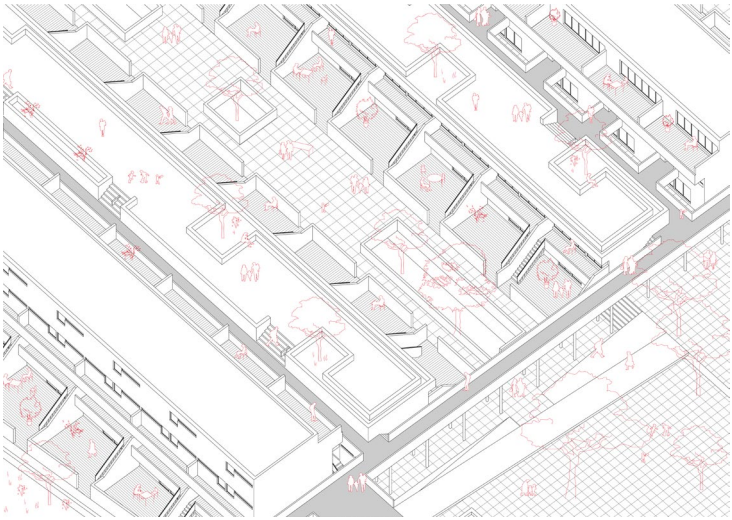
DEFINED OPEN SPACE / Rhythm from Section to Plan



PUBLIC & PRIVATE / Rhythm from Section to Plan



View from the Communal Garden



Recast Traditional Quality

1.4.2 CASE STUDY - PONTE VECCHIO

Ponte Vecchio Bridge - “Old Bridge” in Italian - is the most famous bridge in Florence and undoubtedly one of the city’s most illustrious landmarks.

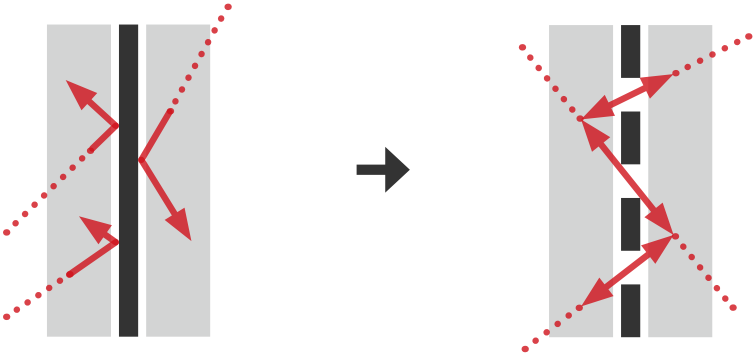
The bridge spans the narrowest point of the Arno River. As a matter of fact, it is not merely a common bridge but also a distinctive public commercial walkway with numerous overhanging shops, whose glittering treasures delight the visitors’ gaze as they pass by. It is a good example showing how urban functions and public activities perfectly combined with infrastructure.

Ponte Vecchio Over the Arno, Florence

2 CONCEPT

2.1 FROM GAP TO SEAM

THE CONCEPT IS TO ACT AS THE '**STITCHES**'
BETWEEN THE EXISTING **GAP** TO TRANSFORM IT
INTO A **SEAM**.



STEP 1 CONNECT

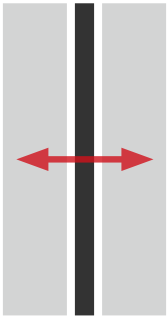
TO BREAK THE MASSIVE BORDER

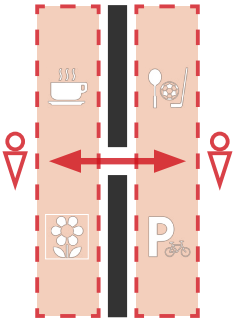
STEP 2 ACTIVATE

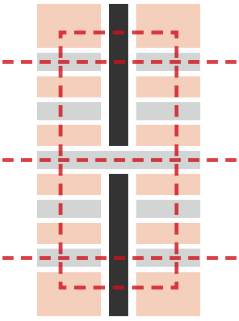
BY CREATING NEW LIVING/PUBLIC SPACES

STEP 3 INTEGRATE

WITH THE URBAN INFRASTRUCTURE NETWORK



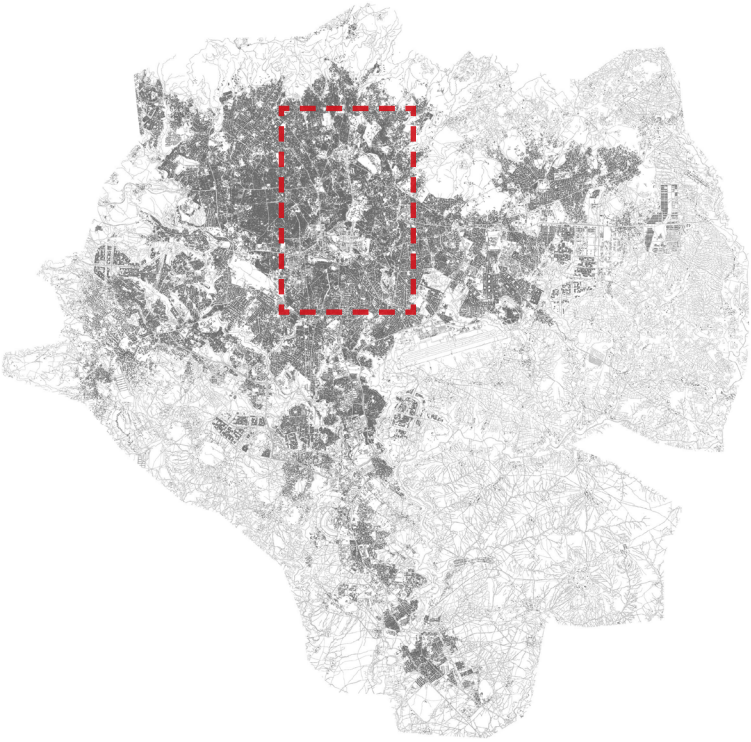




2.2 URBAN GREEN CORRIDOR

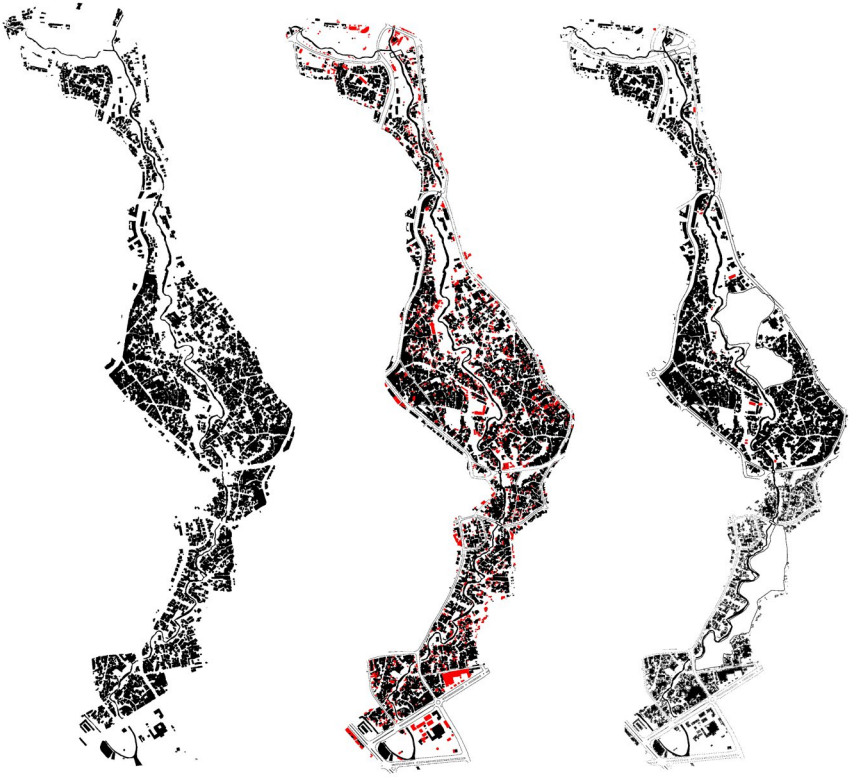
CLEANING-UP

There are seven major and medium rivers within Addis Ababa along with their 75 seasonal tributaries draining the city southwards. The Addis government has now taken measures cleaning up the rivers in downtown areas.



CLEANING-UP

Take the Bantyketu river as an example, a series of morphological reduction shows this process from 1995 to 2011.



MORPHOLOGY IN 1995 MORPHOLOGY IN 2002 MORPHOLOGY IN 2011

LEGAL FRAMEWORK - BUFFER ZONE

'According to the master plan of the city (2002), a distance of 10-15m (in the inner city) and 100-150m (in expansion areas) from both sides of the river should be reserved as a buffer zone. The buffer zone is expected to develop as urban green corridor. '

2.2 URBAN GREEN CORRIDOR

BANTYKETU

The Bantyketu river, as a main river that running across the inner/ main center of the city, and in turn, subjected to the massive ongoing urban renewal/upgrading program, is picked as the study object here.

2.2 URBAN GREEN CORRIDOR

Kechenie Medhanealem Orthodox Cemetery

Ethio-Korea Park

Africa Park

Meskel Square

BANTYKETU - BOND

From the map, it acts as a bond that links several parks, squares and urban agricultural experimental fields, including the Africa Park, Meskel Square and European Union Peacock Park.

Agricultural Field

European Union Peacock Park

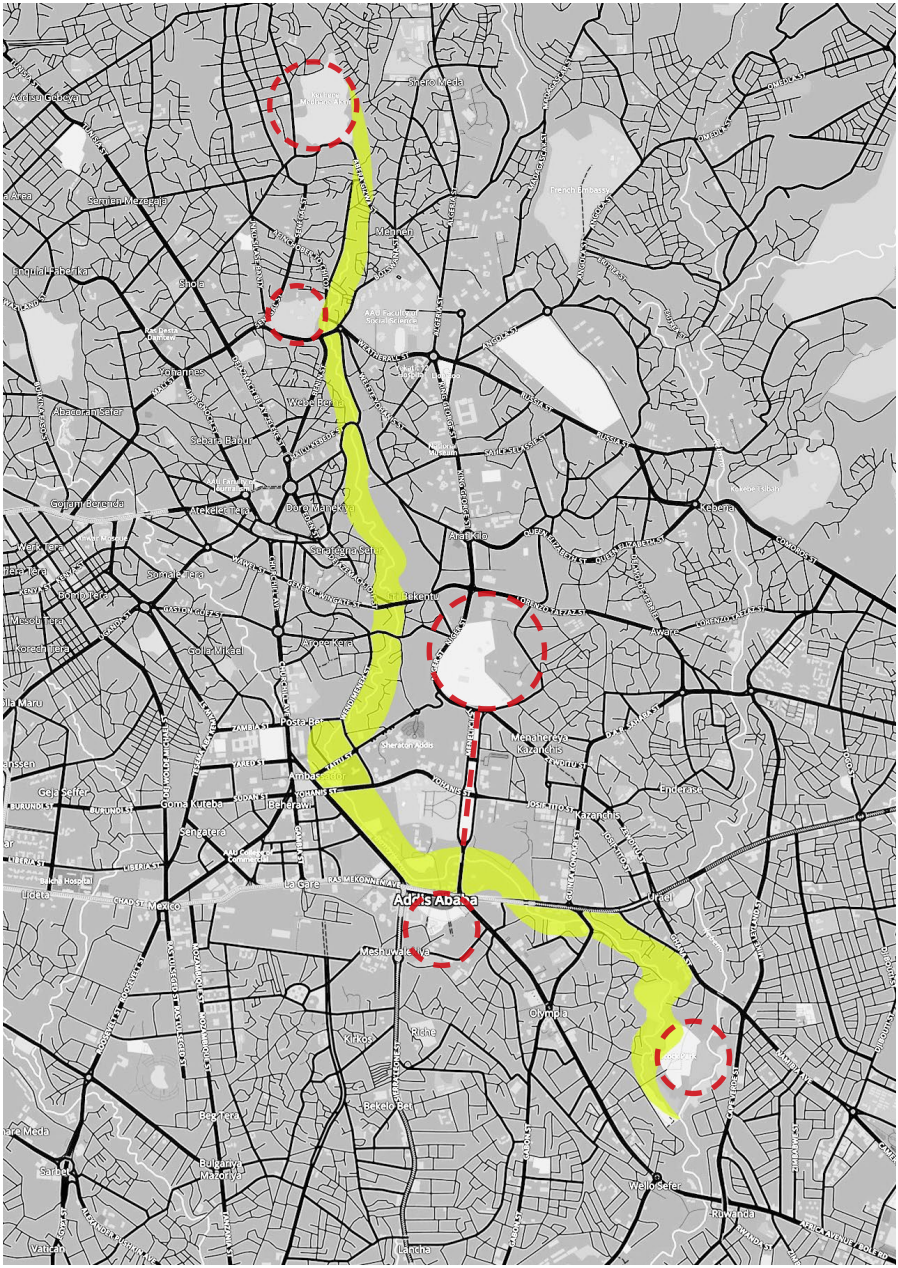
2.2 URBAN GREEN CORRIDOR

BANTYKETU - A LINEAR CITY PARK

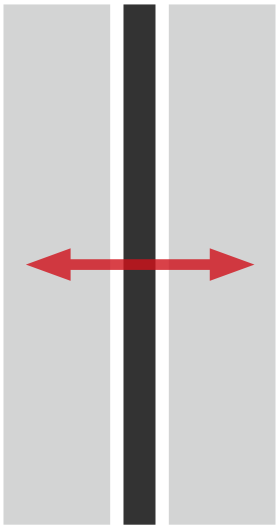
The idea is to extend the riverbank buffer zone to the whole urban grey zone and to link the existing urban green space together.

This riverine green corridor helps to stablize the ecological climate along the river system and to exert its environmental advantages to the whole city as green infrastructure.

Moreover, a unique type of linear city public space is created, which may add more content to the urban identity of Addis.



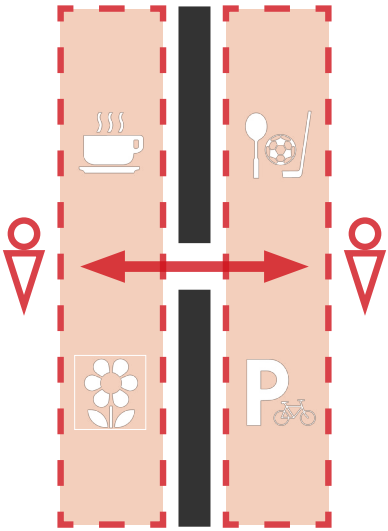
2.2 URBAN GREEN CORRIDOR



STEP 1 CONNECT

Creating direct pedestrian connections between dead ends to increase riverside accessibility and complete the road network.

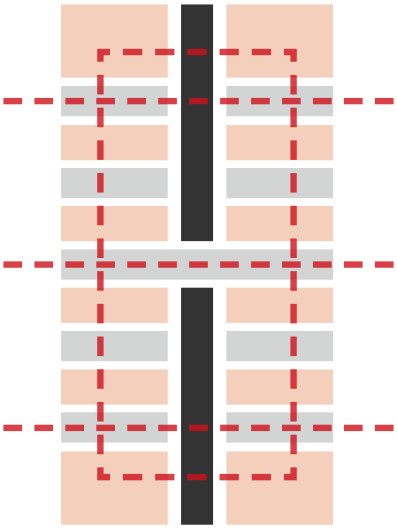
2.2 URBAN GREEN CORRIDOR



STEP 2 ACTIVATE

Introducing living and social activities at strategic points on perimeters, the waterfront areas will be charged with more users and destinations.

2.2 URBAN GREEN CORRIDOR



STEP 3 INTEGRATE

The last step is to integrate the scheme with the specific context and reinterpreting the socio-spatial pattern of Addis.

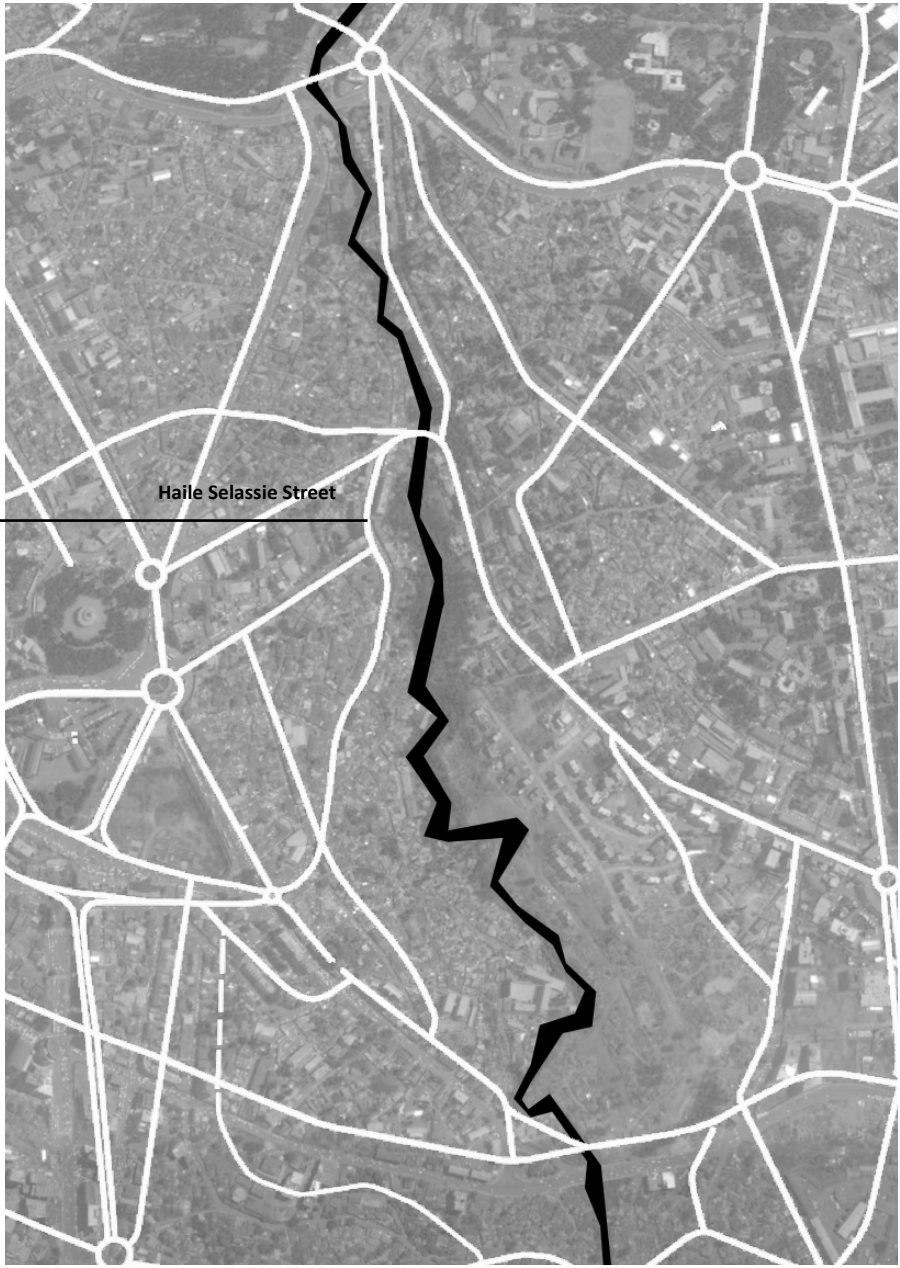
To further my research, I pick up the part of riverbanks in the Piazza area. Piazza, locating in the **HEART** of Addis, is an old neighborhood with a wealth of **HISTORICAL ATTRACTIONS, NATIVE FEATURES AND COLLECTIVE MEMORY**.

2.2 URBAN GREEN CORRIDOR

2.3 SITE

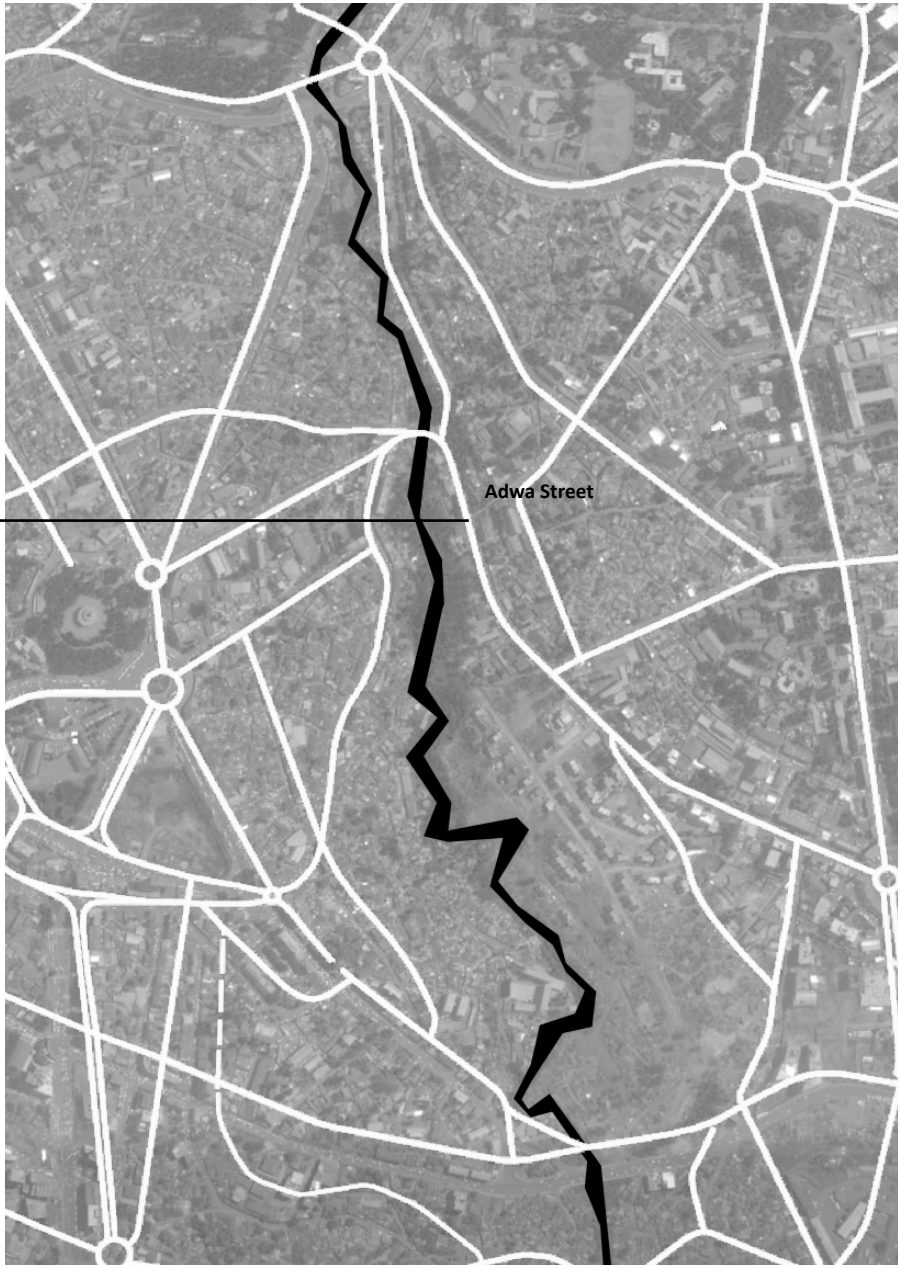
PIAZZA - OLD COMMERCIAL DISTRICT

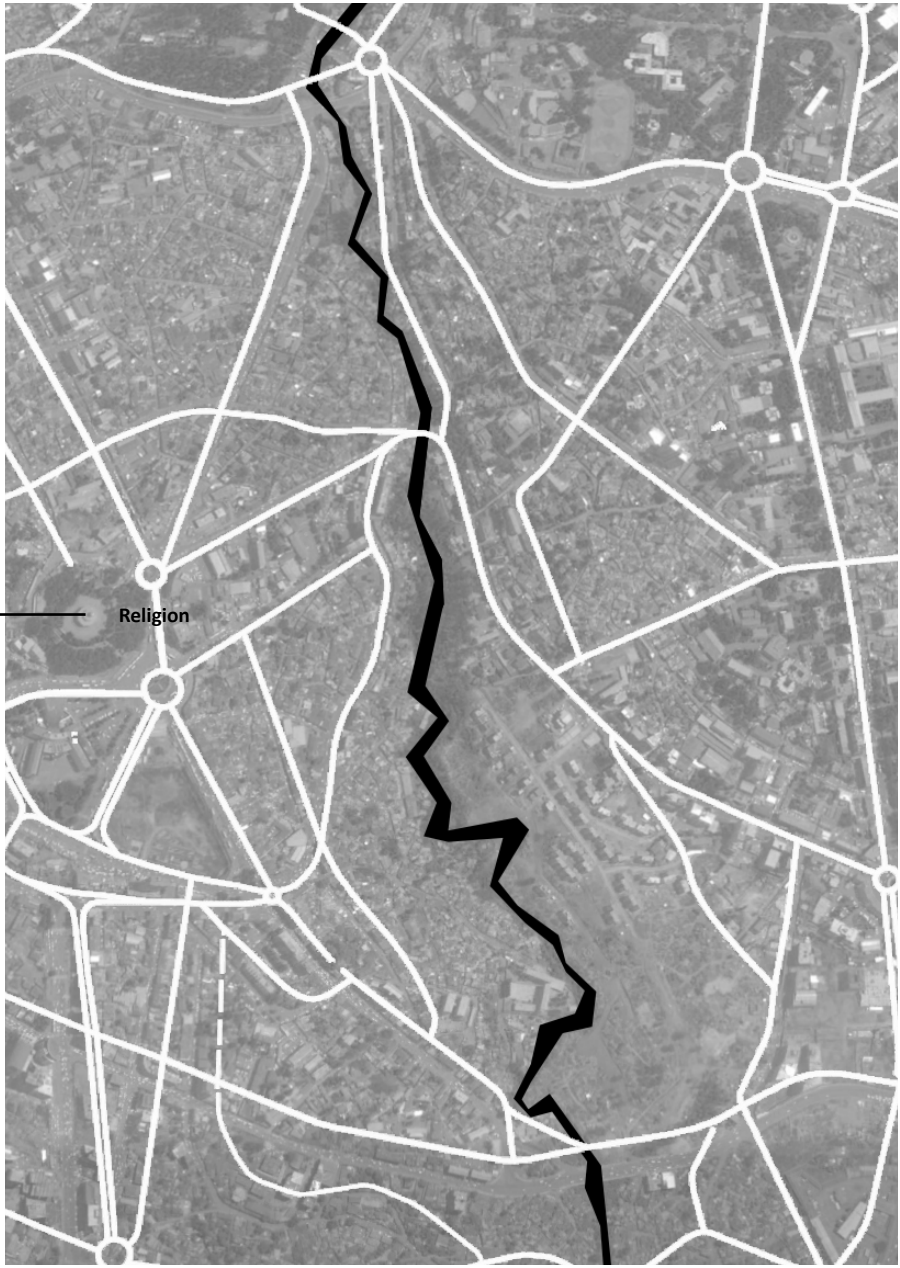
The Haile Selassie and Adwa Streets are two important gatherings of the native elements with the old but well-known restaurants, cafes, cinema halls, playhouse, jewellery shops and many more in an Italian styles as a legacy of the Italian Occupation (1936 -41 G.C.).


Haile Selassie Street

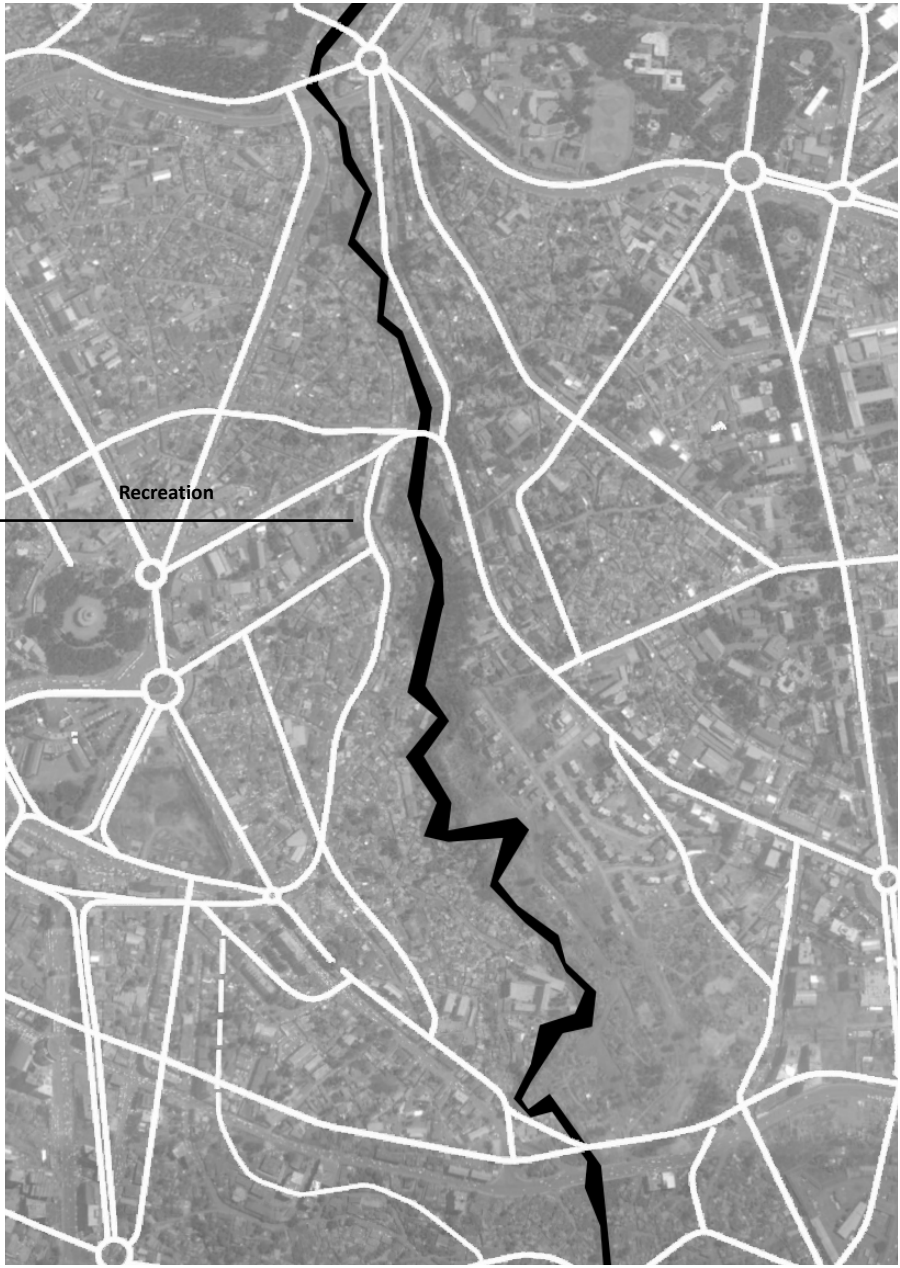
PIAZZA - OLD COMMERCIAL DISTRICT

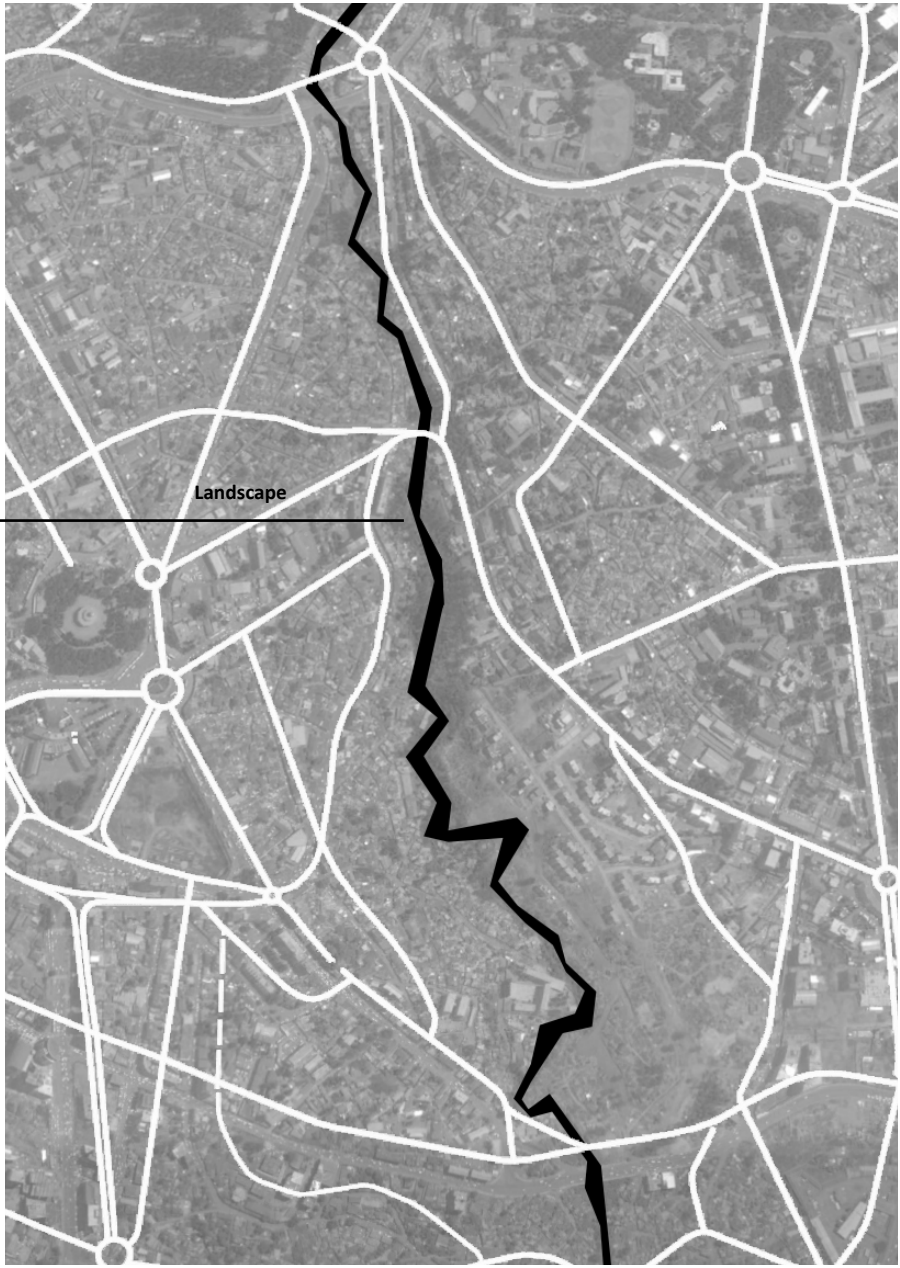
Therefore, the social identity of Piazza is a mixture of many aspects, from religion, recreation to landscape and income generation.

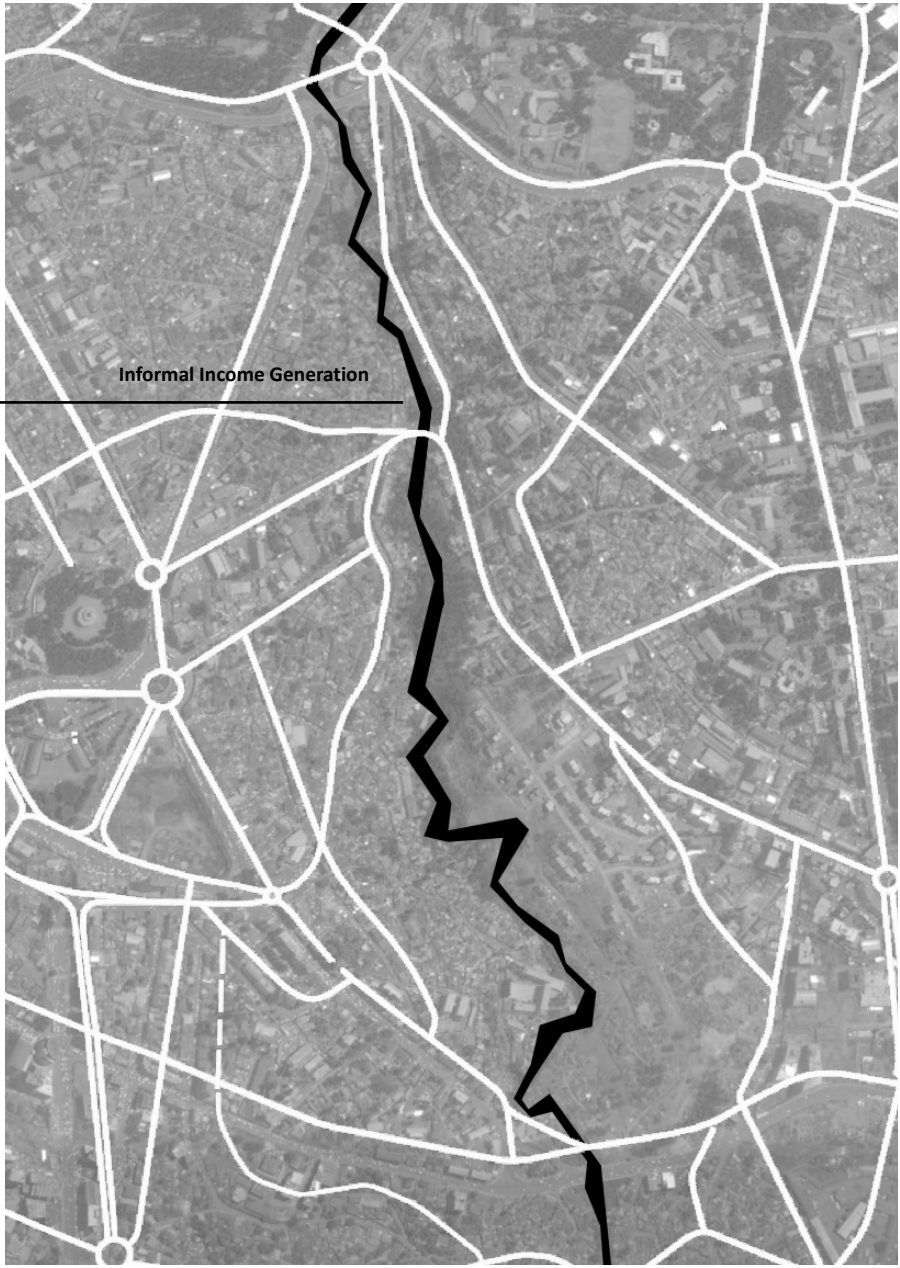

Adwa Street

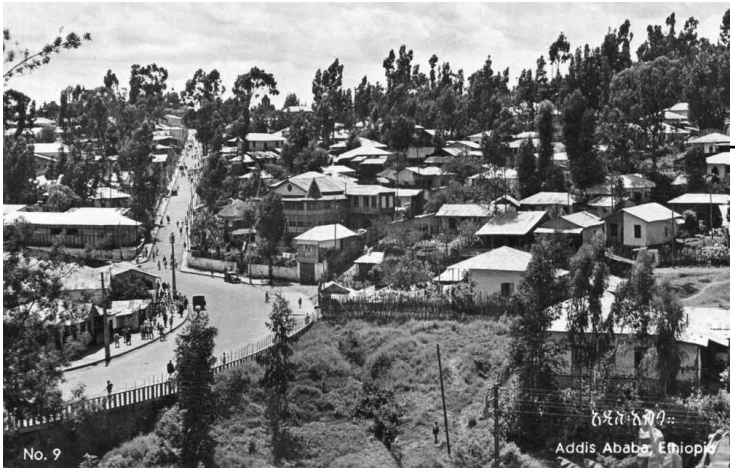

Religion


Made Coffee & Pizza
Made Coffee & Pizza

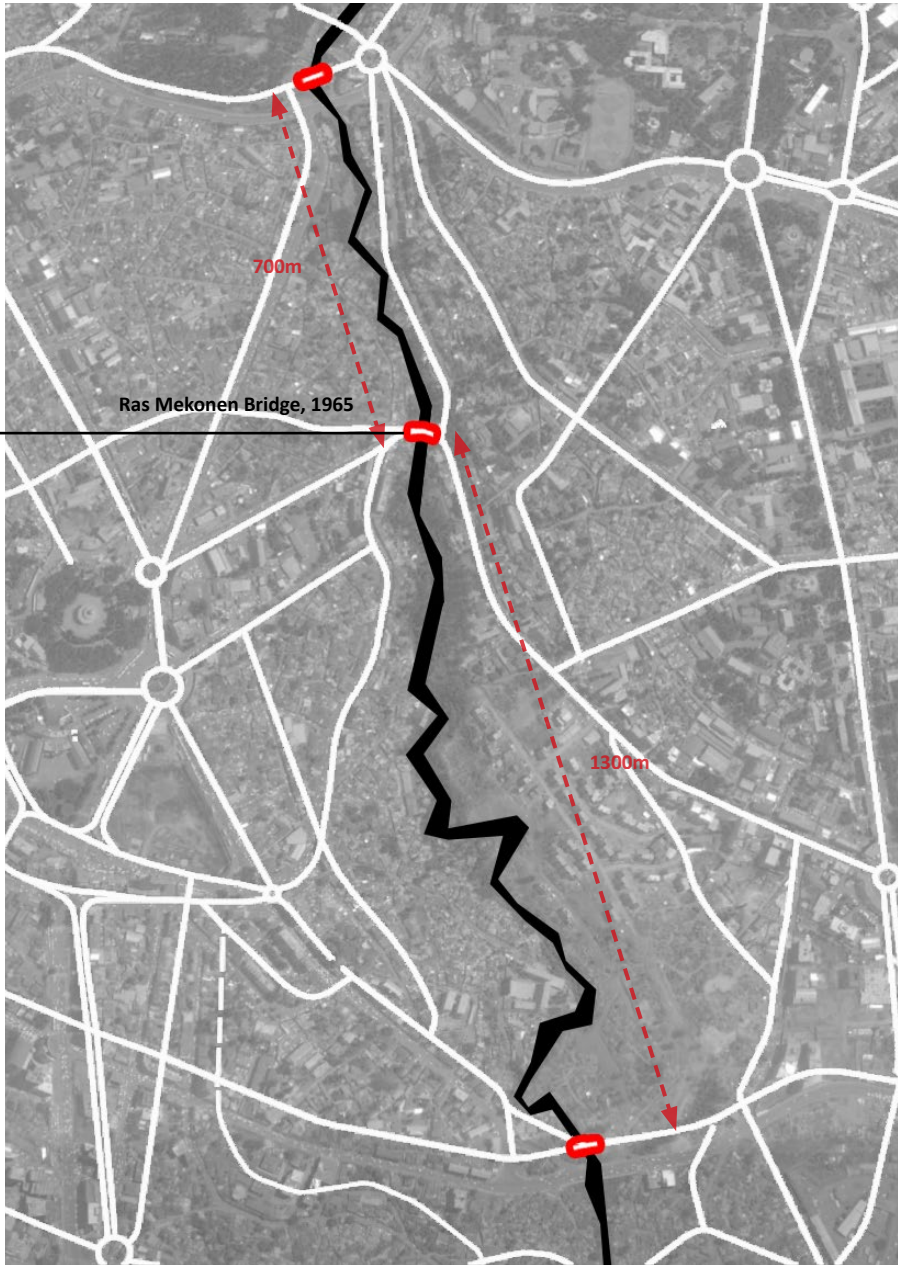

Recreation

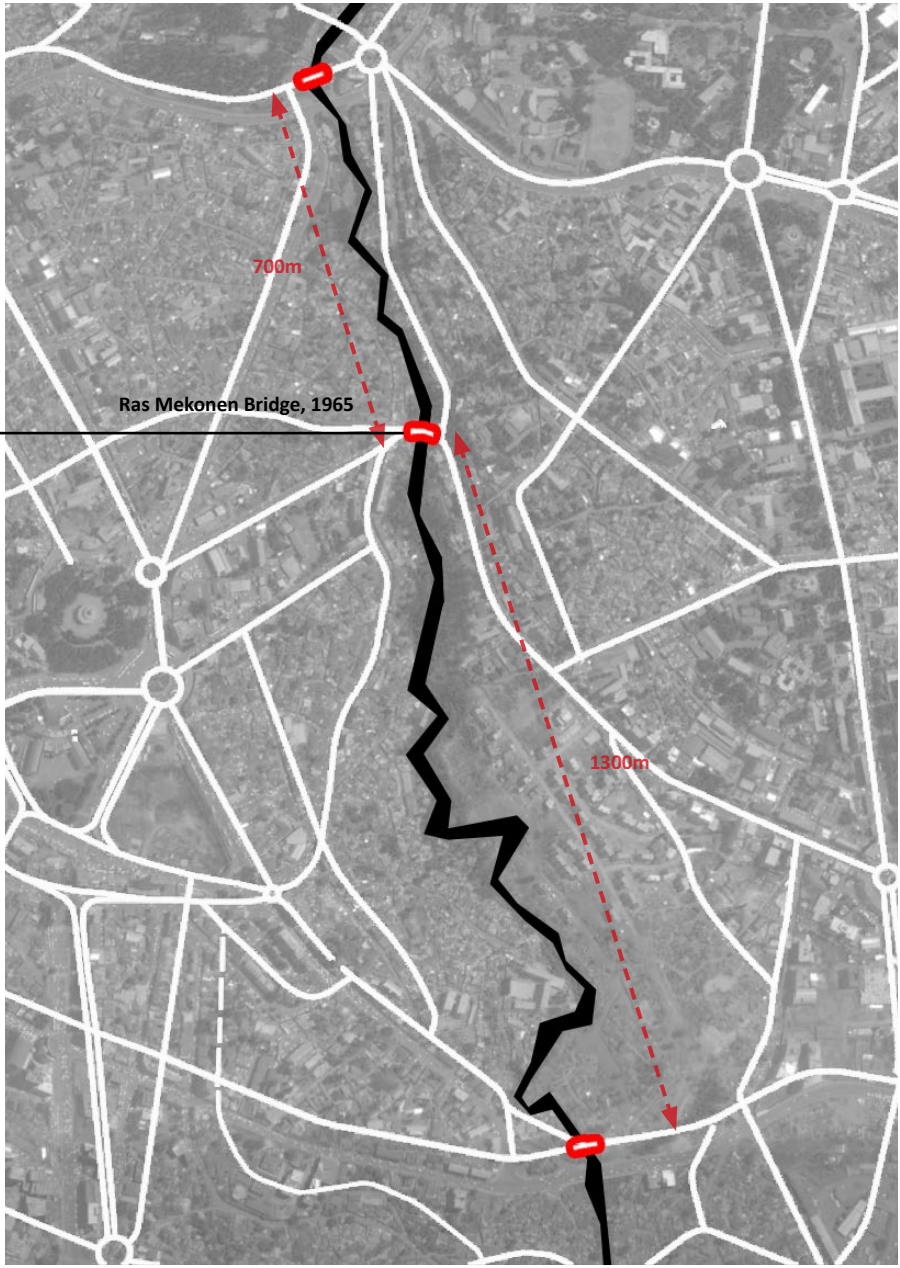

Landscape


Informal Income Generation

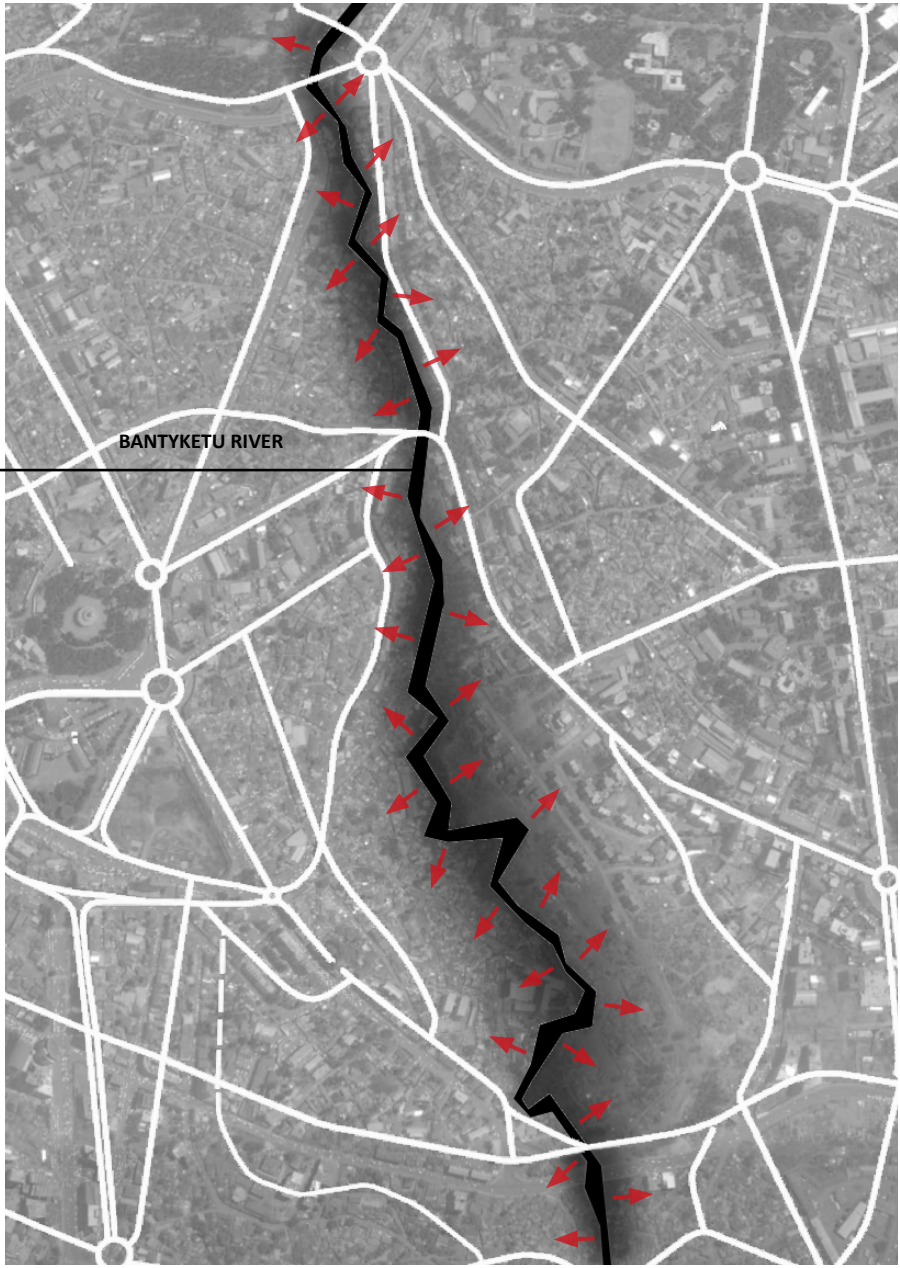


in over two thousand meters there are only three bridges for connection, the same situation as decades ago.

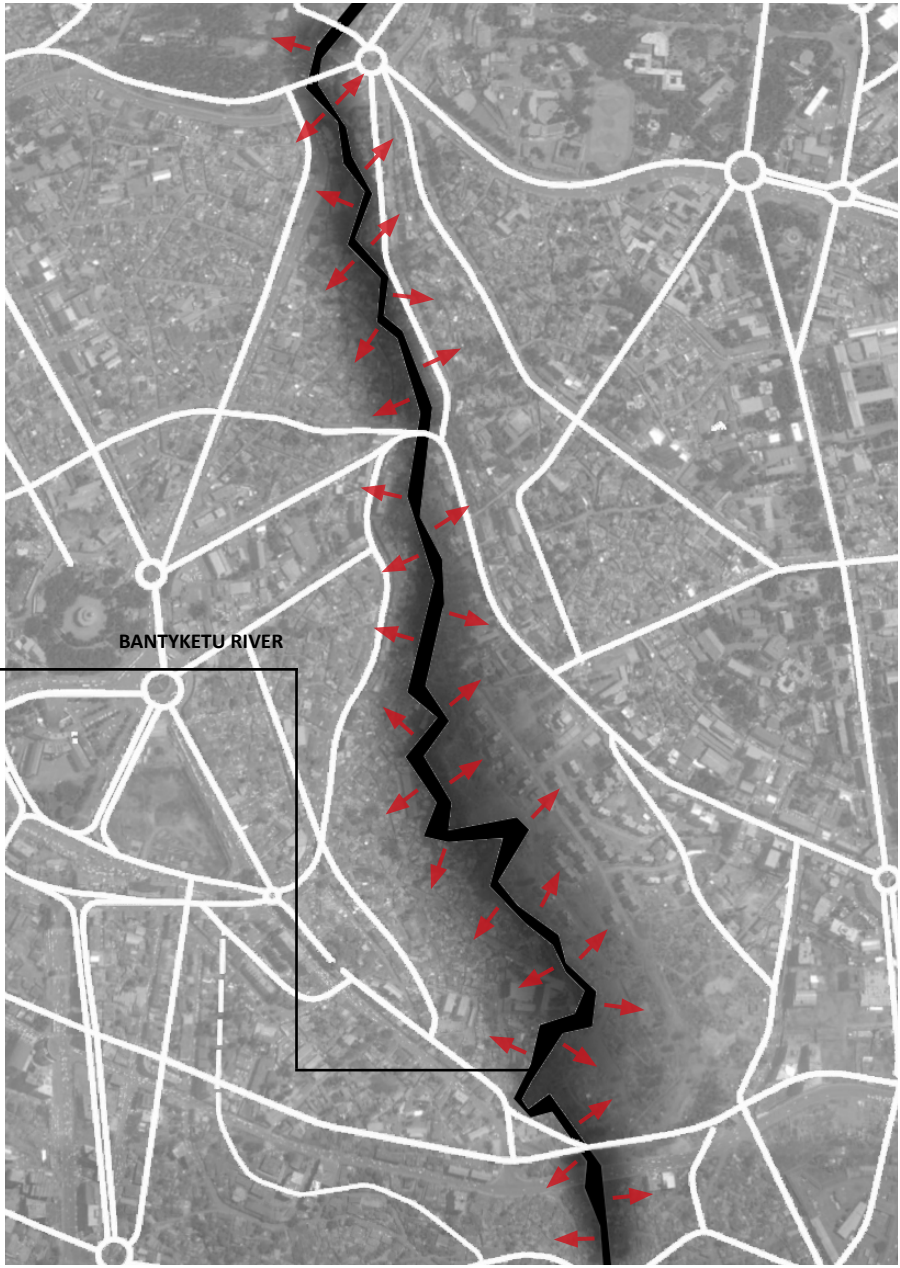

700m
Ras Mekonen Bridge, 1965
1300m


700m
Ras Mekonen Bridge, 1965
1300m

The lack of connection then resulted in the decline of the surrounding areas along the river as mentioned before.

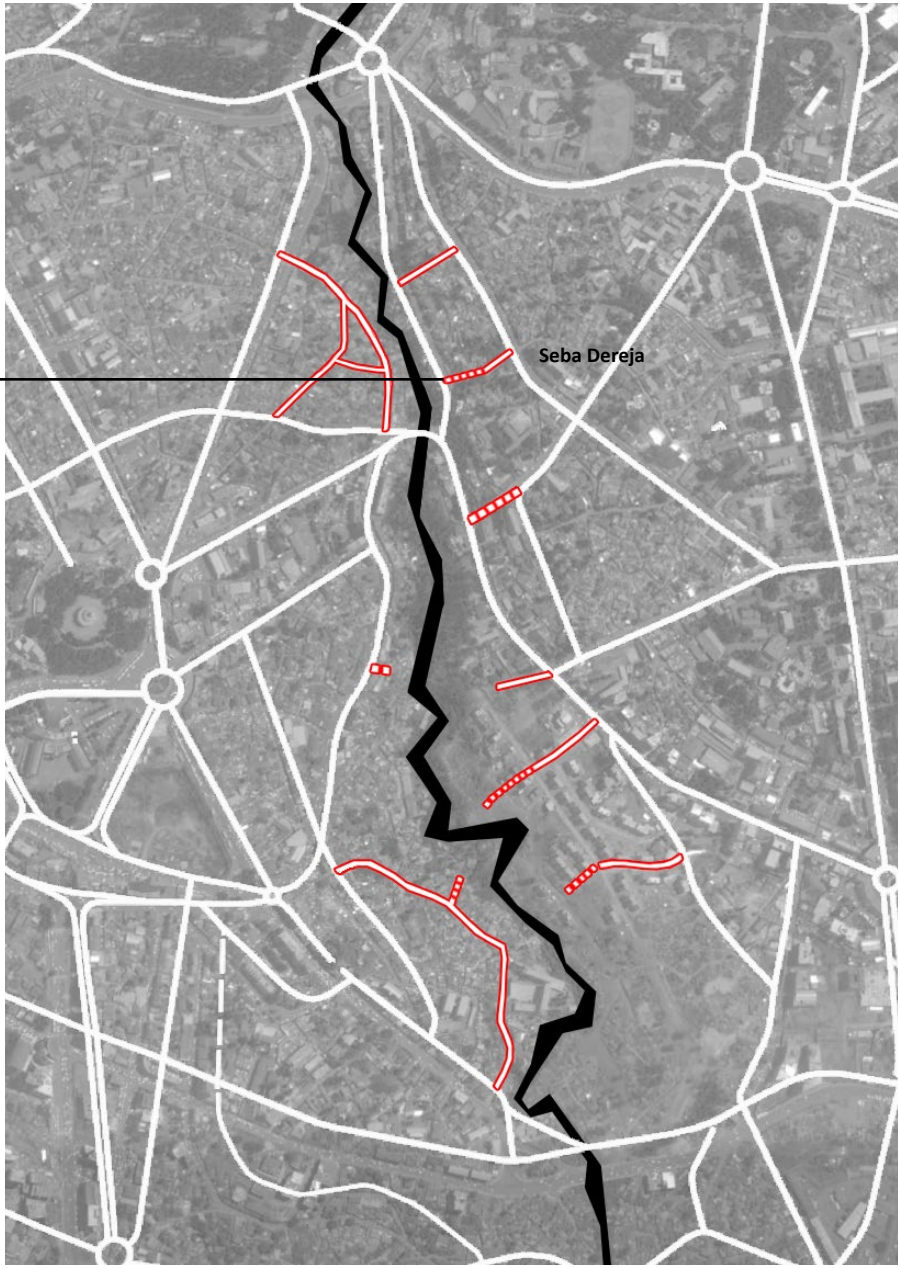


2.3 SITE - BANTYKETU RIVER

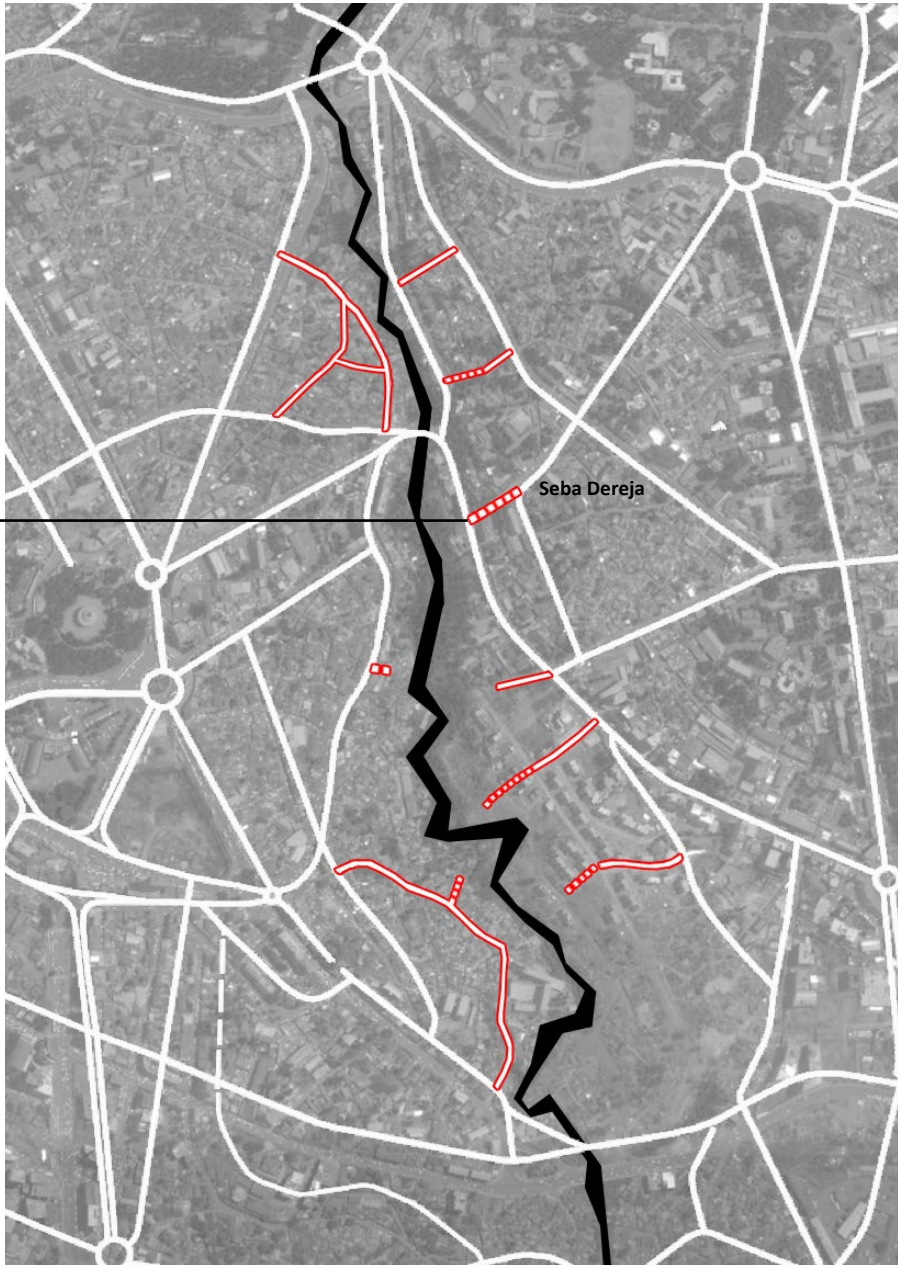


2.3 SITE - BANTYKETU RIVER

Furthermore, this long barrier creates many dead ends in the urban fabric. The example shown here is Seba Dereja, the big steps for pedestrians.

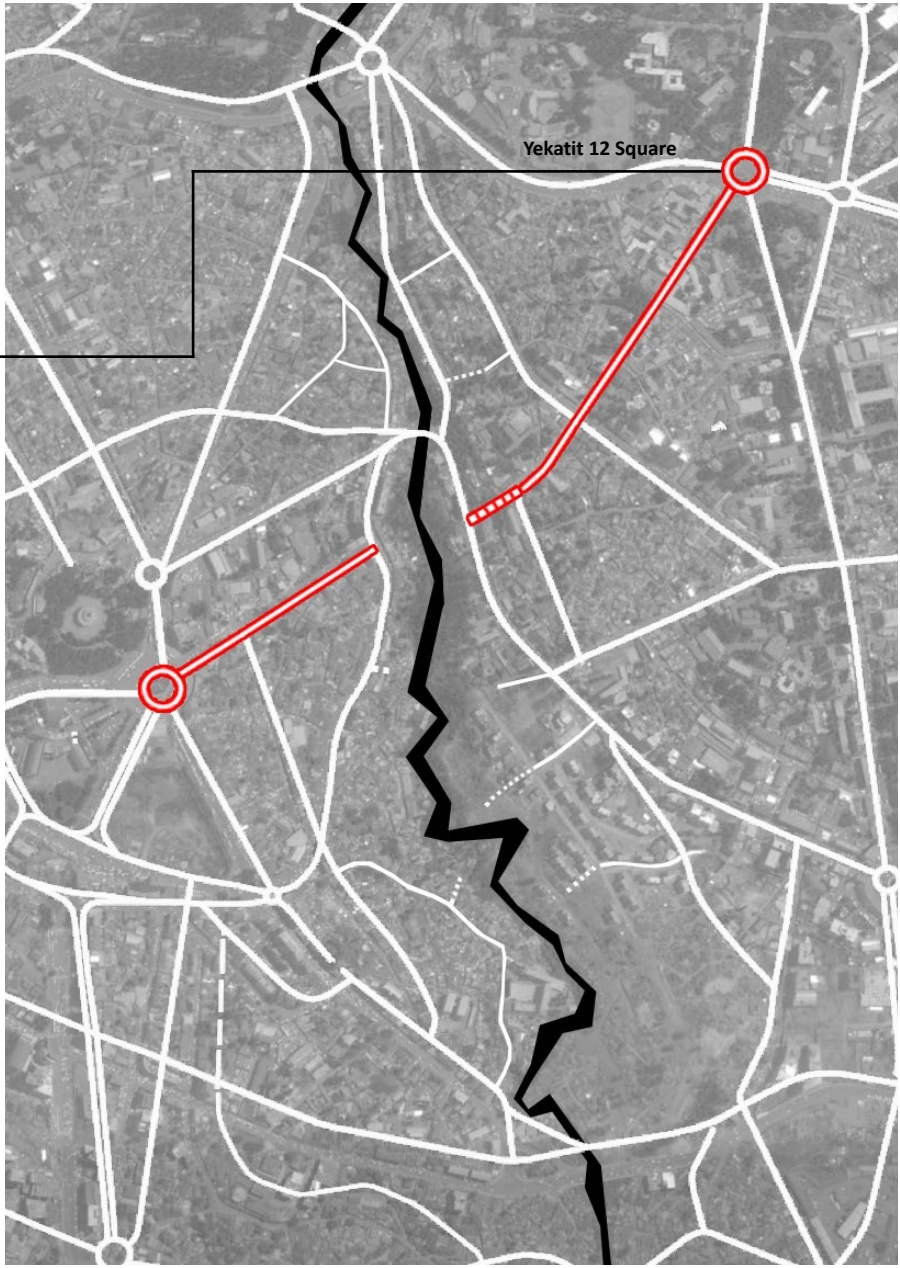


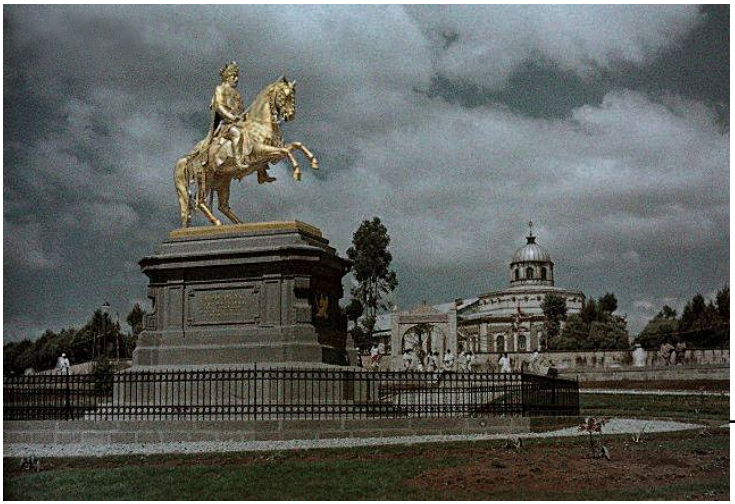
2.3 SITE - DEAD ENDS

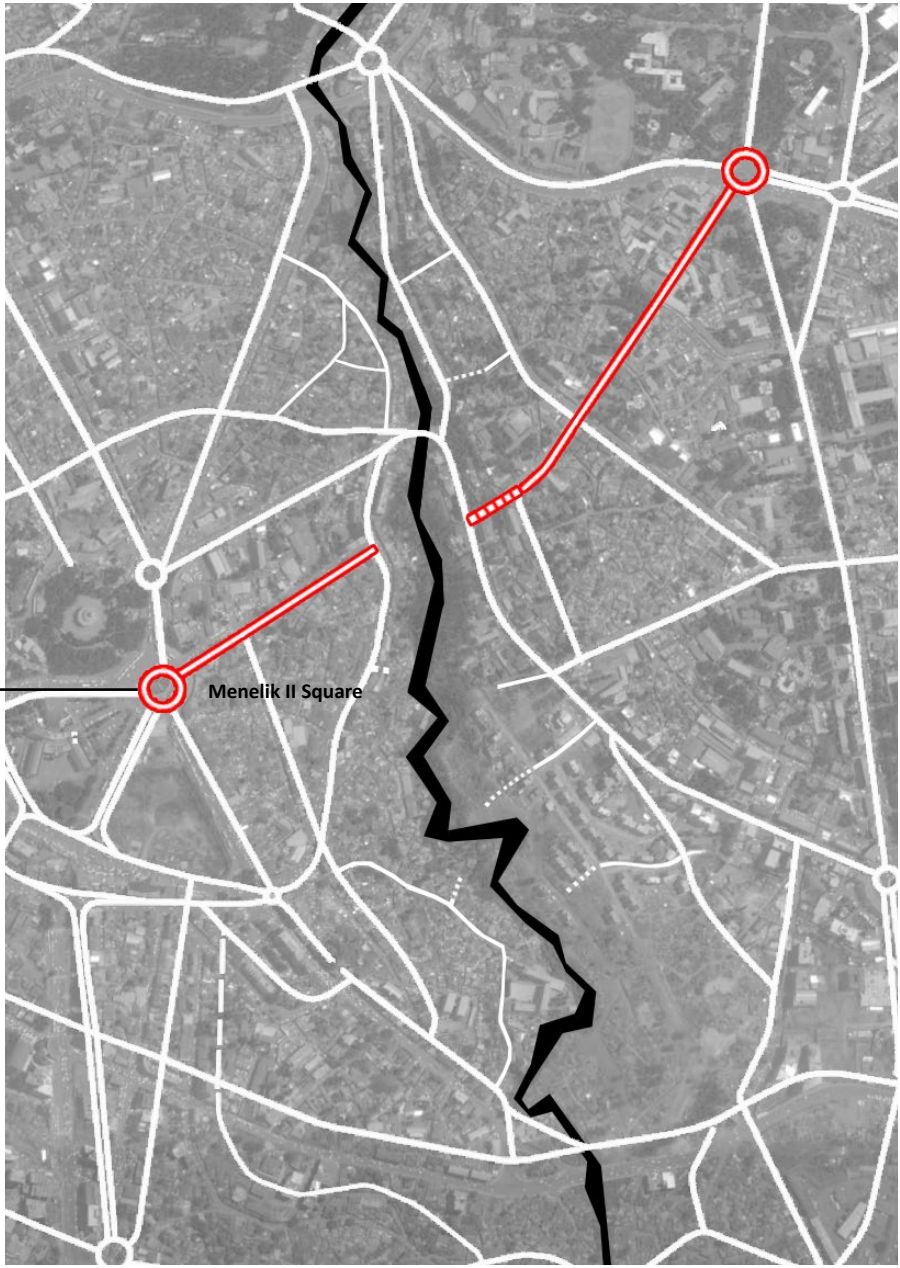


2.3 SITE - DEAD ENDS

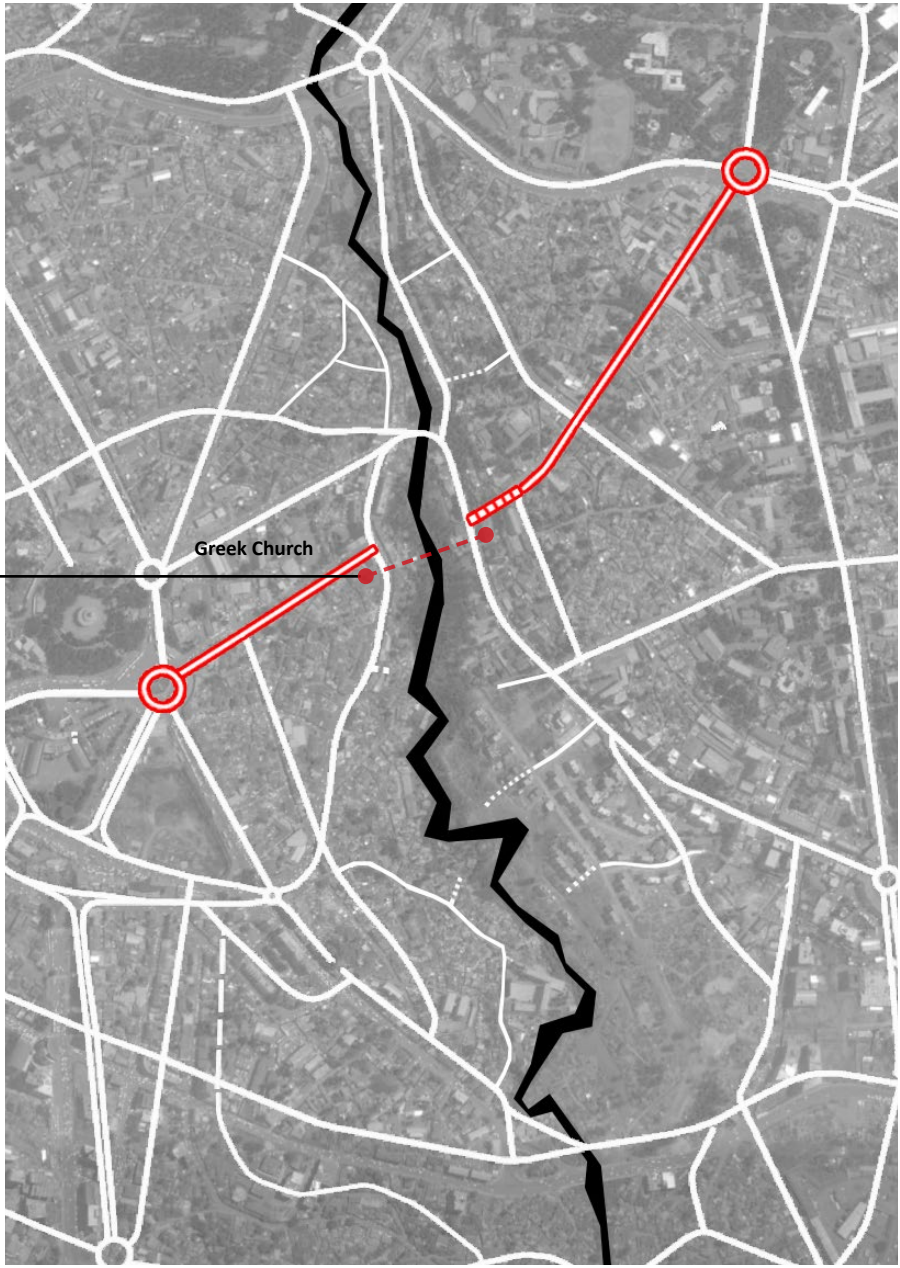
The last but crucial point is the axes in the site. The first one is the axis from the Menelik II Square to the Yekatit 12 Square, which seems to miss a part in the middle because of the border.

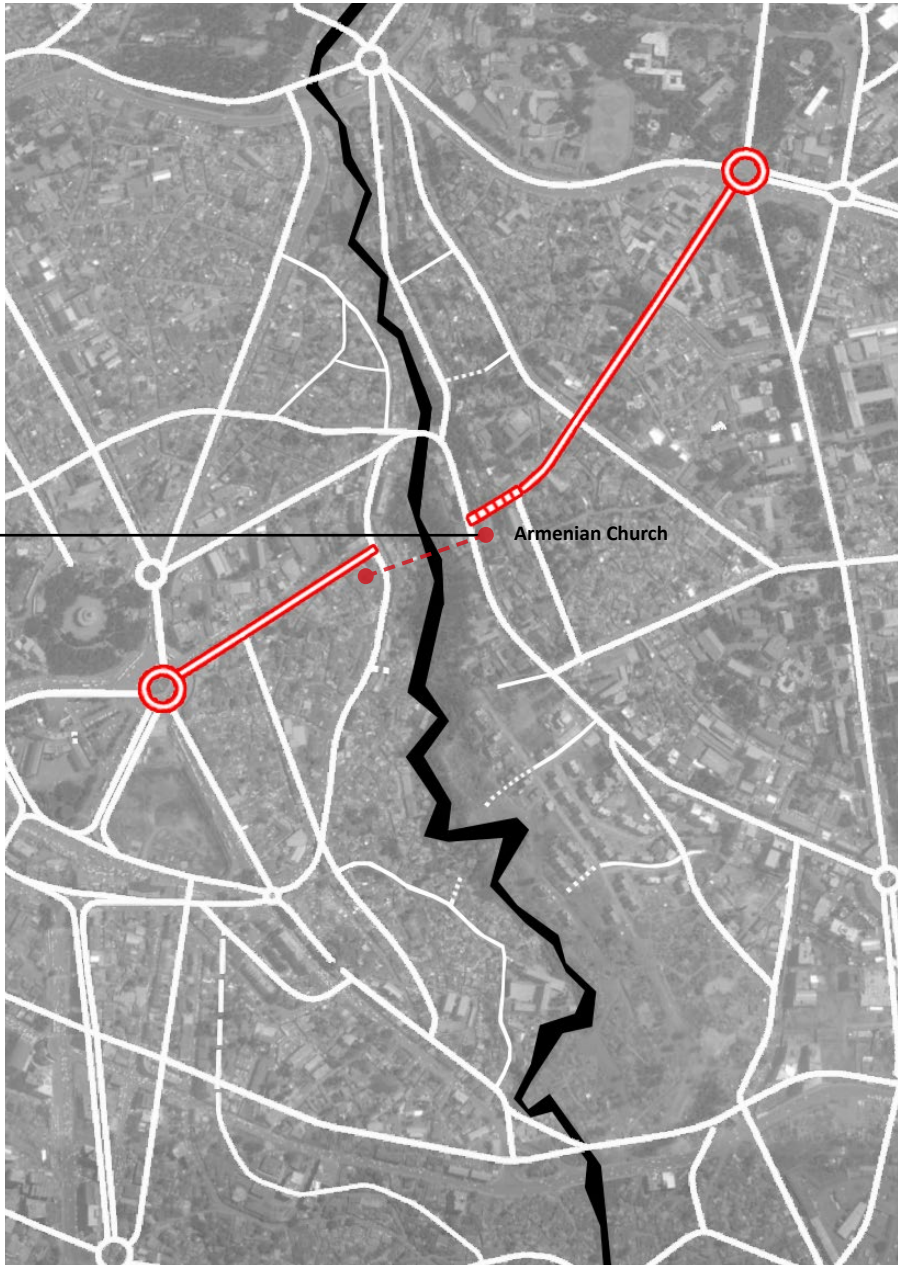

Yekatit 12 Square



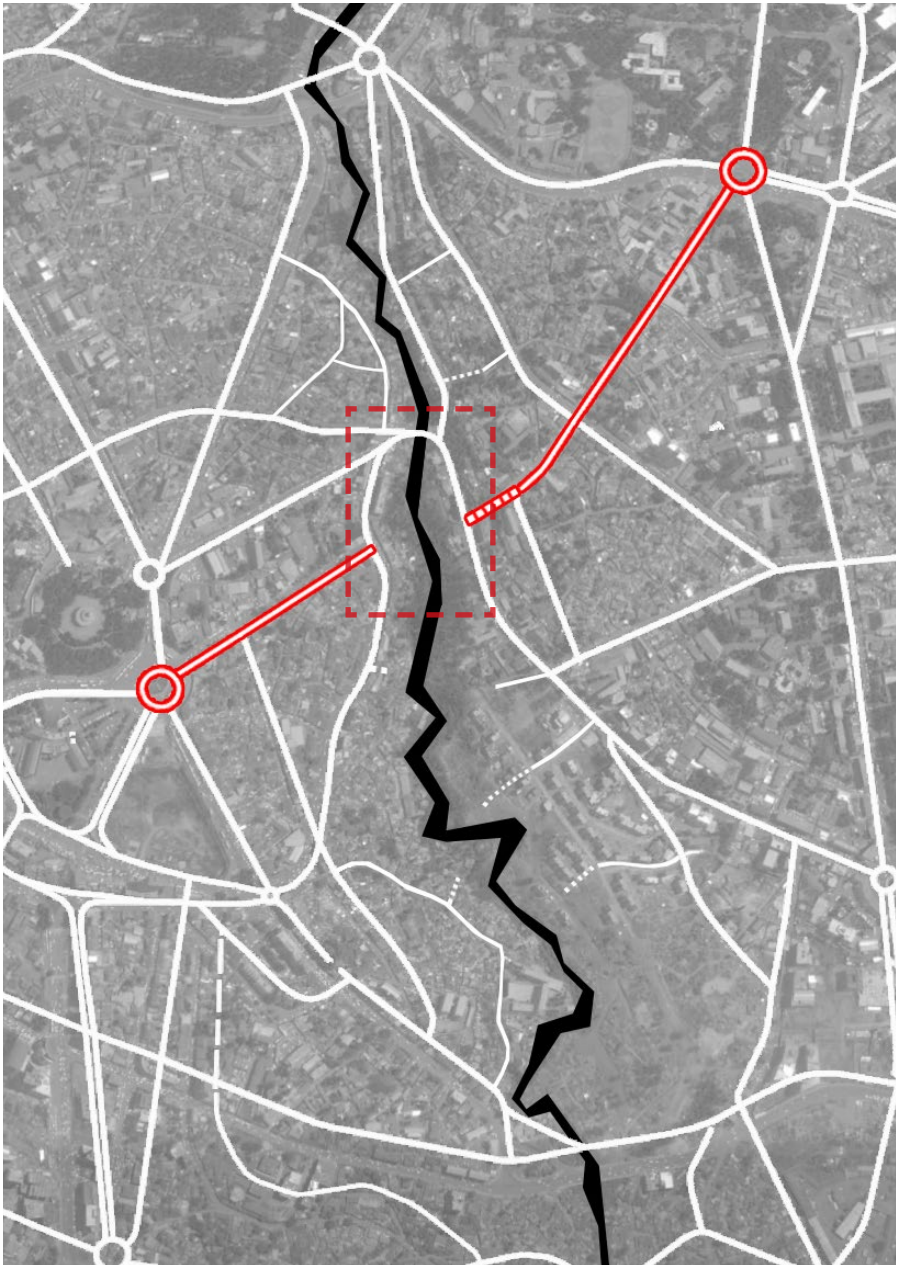

Menelik II Square

Another potential axis is between two important churches in Piazza, the Greek Church and the Armenian Church.


Greek Church


Armenian Church

Here, the part of Bantyketu river banks in the middle of axis from Menelik II square to Yekatit 12 square is seen as a typical example to illustrate with its unique context.

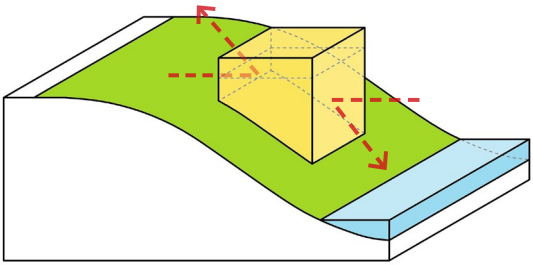


3 STRATEGY

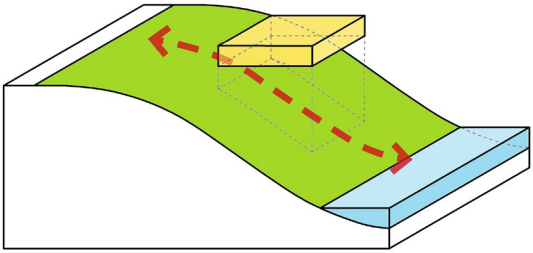
3.1 IN-BETWEEN LAYER:
A CONTINUOUS URBAN INTERFACE

3.1.1 A NEW BARRIER

Considering the particular topography condition in the sloping riverbank, a most common solution actually adds a new barrier on the site and block both the physical and eye contact.

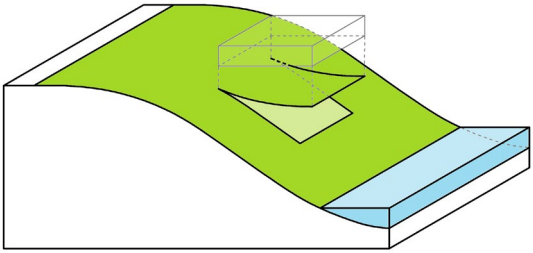


3.1.2 CUT OUT THE LOWER PART TO ENSURE A CONTINUOUS URBAN INTERFACE

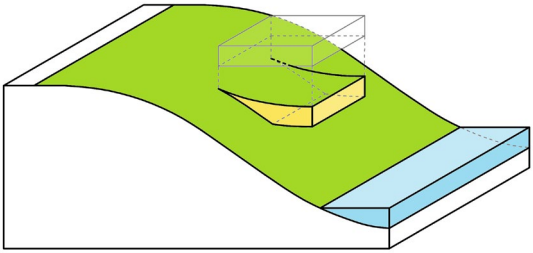


3.1.3 LIFT UP PART OF THE SLOPING SURFACE TO CREATE A PLATFORM FOR ACTIVITIES

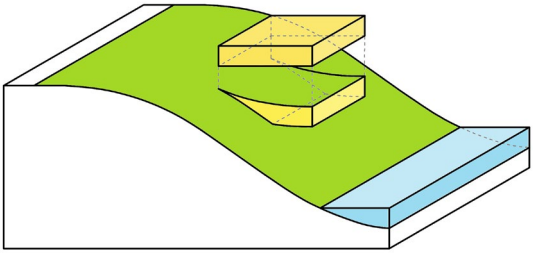
Slopes also hinder the occurrence of activities.



3.1.4 INSERT BOTTOM VOLUMES FOR CLOSER CONTACT WITH THE RIVER



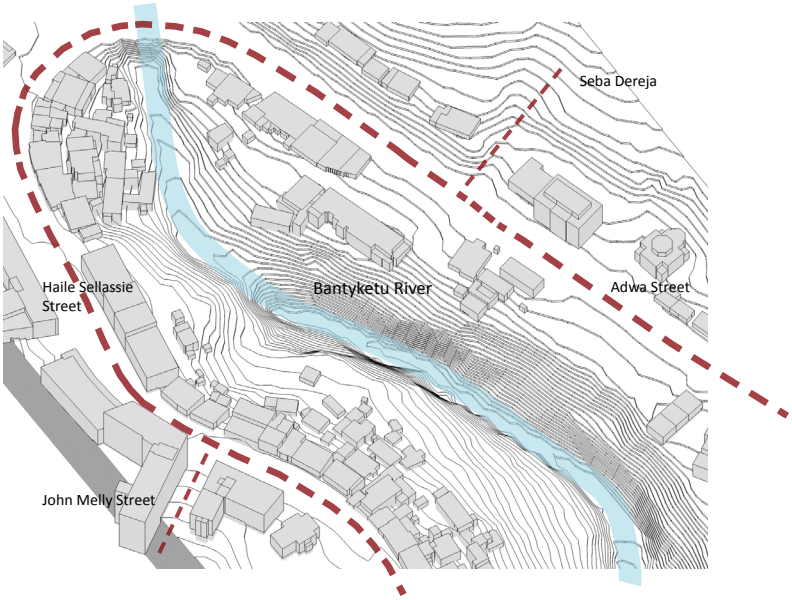
3.1.5 THE BOTTOM VOLUMES ACT AS A BASE FOR THE FLOATING ONES



3.2 GENERATION PROCESS

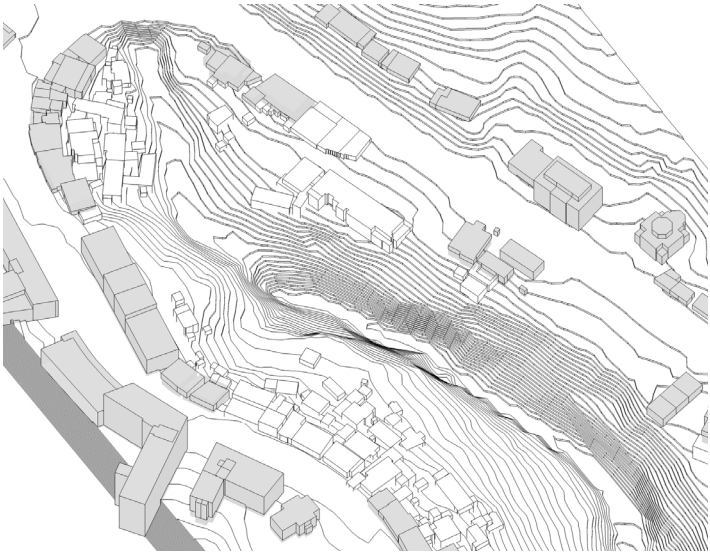
3.2.1 CURRENT SITUATION

How to apply this strategy to the specific site?


Seba Dereja
Haile Sellassie Street
Bantyketu River
Adwa Street
John Melly Street

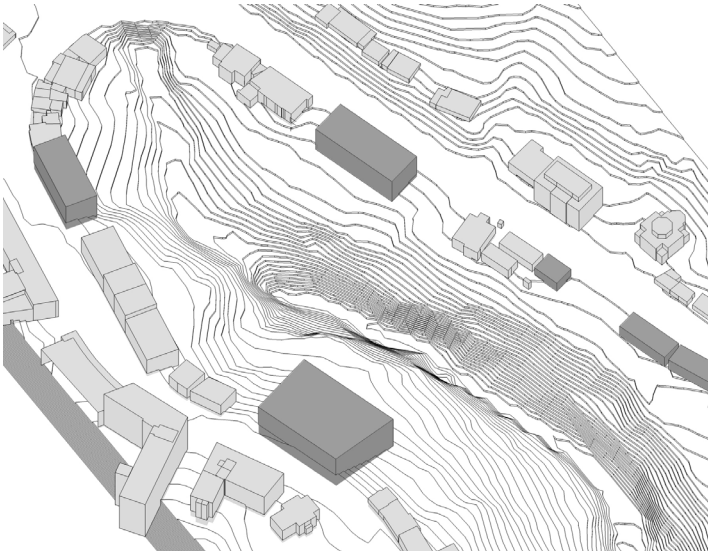
3.2.2 BUILDINGS ALONG THE MAIN STREETS ARE TO BE KEPT

The idea is to keep the important buildings along the main streets in order not to ruin the existing urban profile. These buildings are also the carriers of the collective memory, old traditions, local features and social identity.

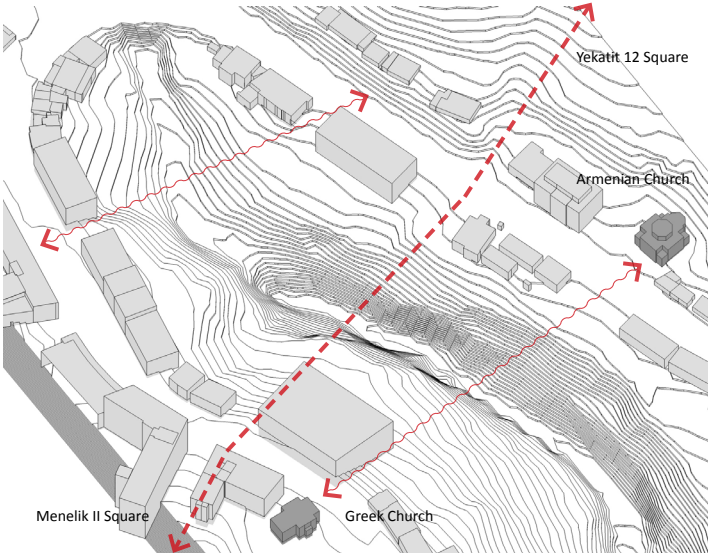


3.2.3 BUILDINGS ADDED FOR A COMPLETE STREET PROFILE

Several new buildings are added accordingly to guarantee a complete street profile.

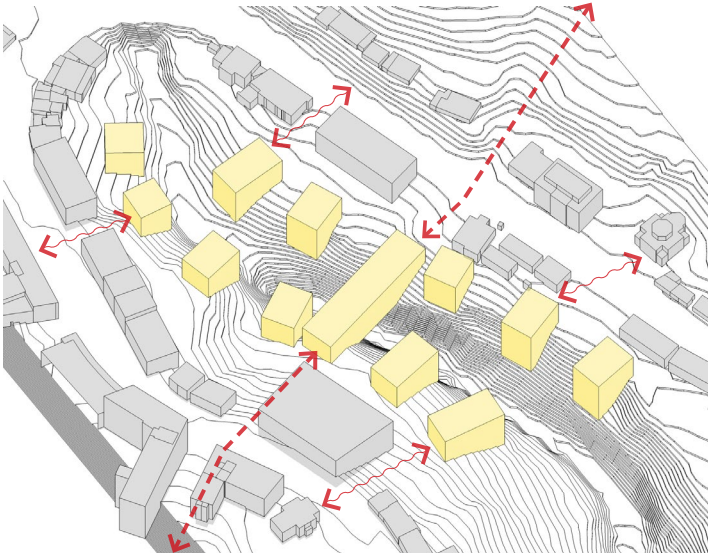


3.2.4 AXES ON THE SITE

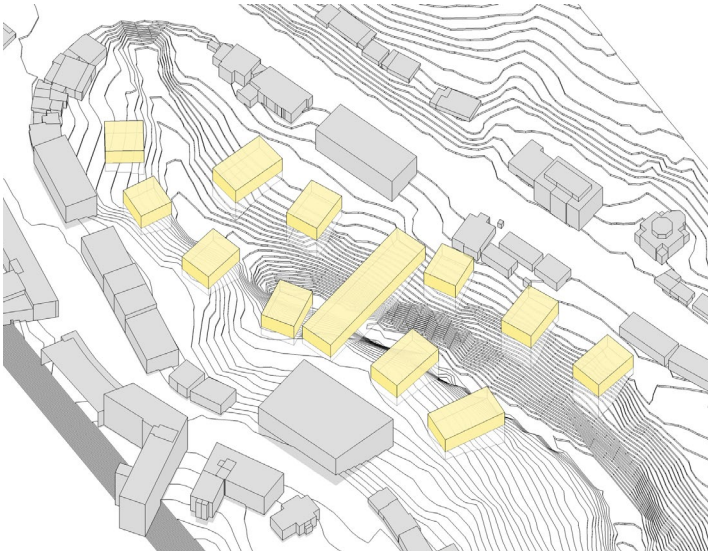

Yekatit 12 Square
Armenian Church
Menelik II Square
Greek Church

3.2.5 NEW BARRIERS TO THE SITE

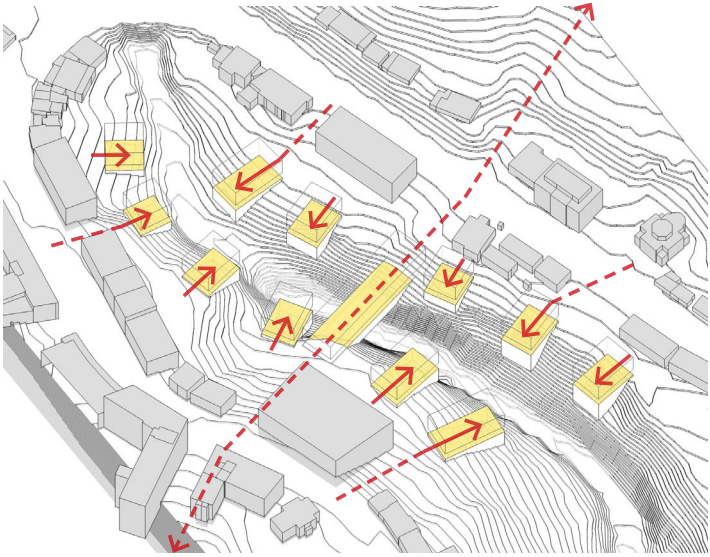
As mentioned before, the result of a common practice block these dialogue relationships.



3.2.6 CUT OUT THE BOTTOM PART TO MAINTAIN A CONTINUOUS URBAN INTERFACE



3.2.7 AN EXTENSION OF URBAN FRINGE ACCORDING TO THE AXES AND TOPOGRAPHY

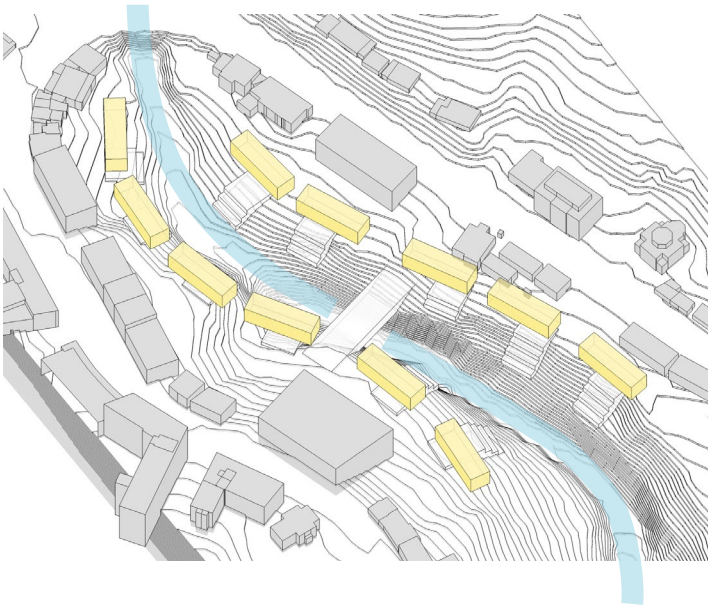


3.2.8 ADAPT THE LOWER VOLUMES TO THE SITE IN A CASCADE

To make it in a more human-friendly scale, especially at the waterfronts. This also helps to provide more terraces in varied heights and a good view of the river scenery.

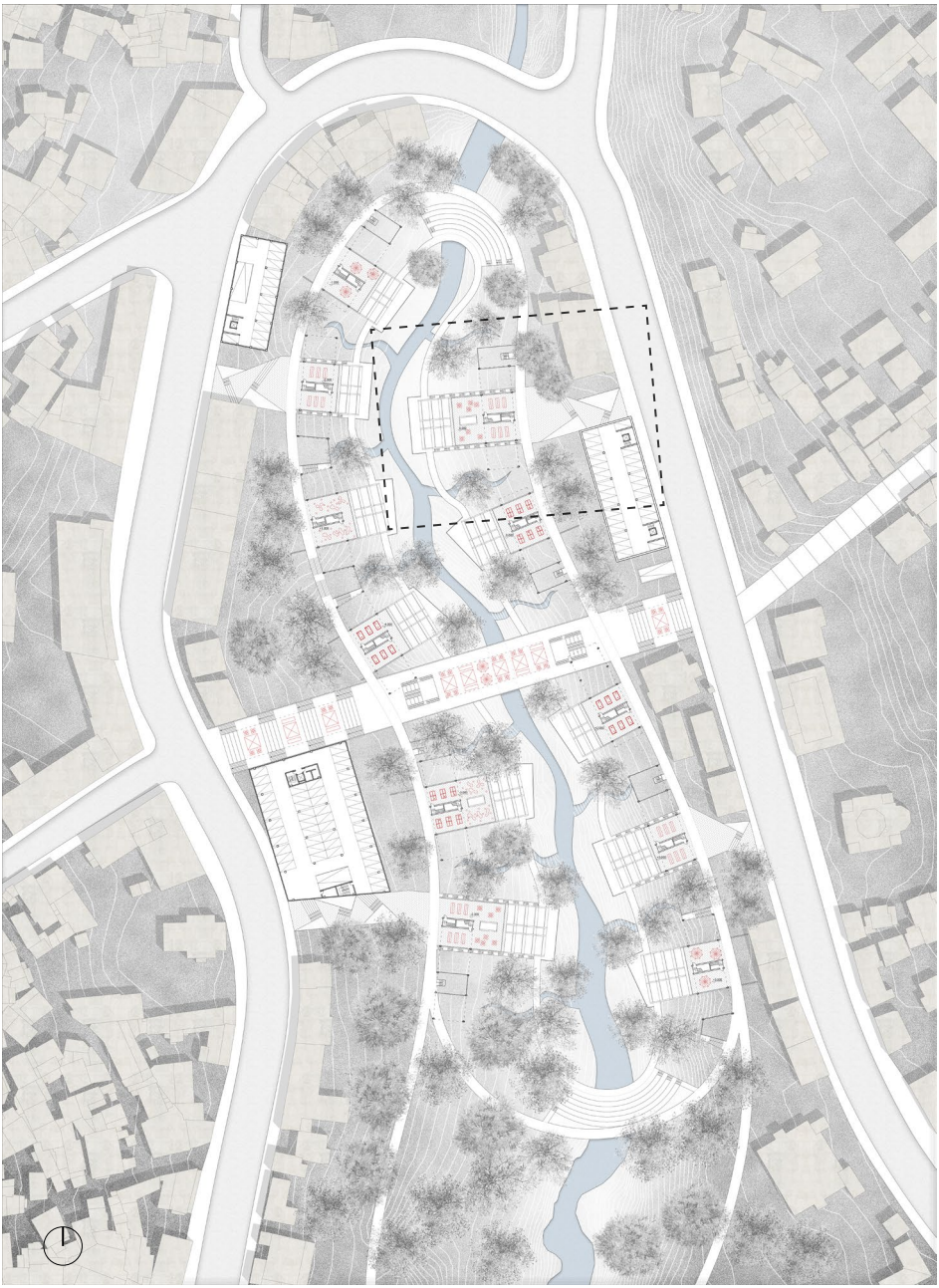
3.2.9 ADJUST THE UPPER VOLUMES PARALLEL TO THE RIVER

For a maximum facade area facing the river.



3.3 MASTER PLANNING

From the master planning for the neighbourhood, It is clear that there are three layers in this system. The first one is the entrance level, namely the continuous in-between layer. It includes a vertical pedestrian system integrated with the existing urban network and the platforms for informal commerce, sports and social gathering etc.



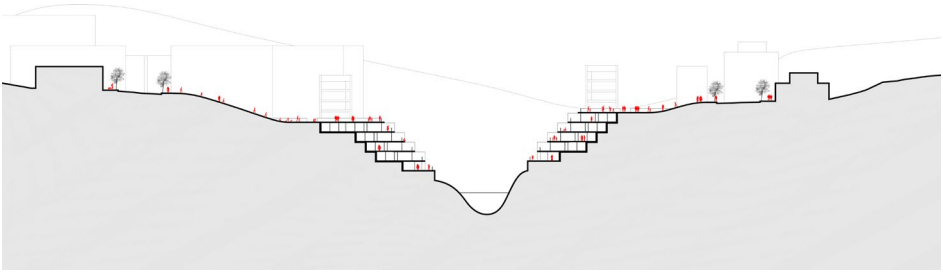
ENTRANCE LEVEL / PLAN

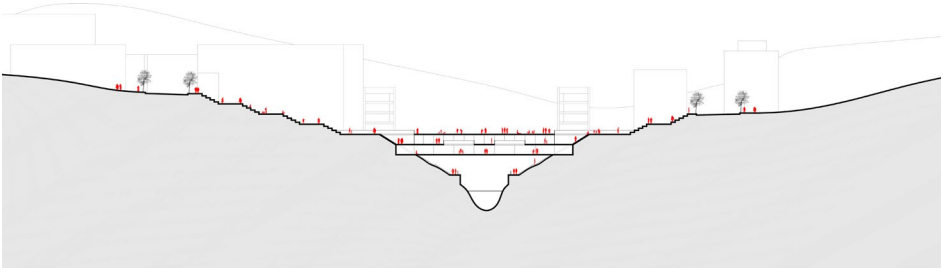
The second layer is the buildings designed perpendicular to the contour lines. With large private terraces, spacious layout and added construction costs due to the complicated topographic condition, these dwellings are mainly targeted at middle class.

LOWER LEVEL / PLAN

In this way, the bottom part also offer a strong base for the third layer, that is the affordable housing floating above. They are designed parallel to the river for every unit to enjoy good views.

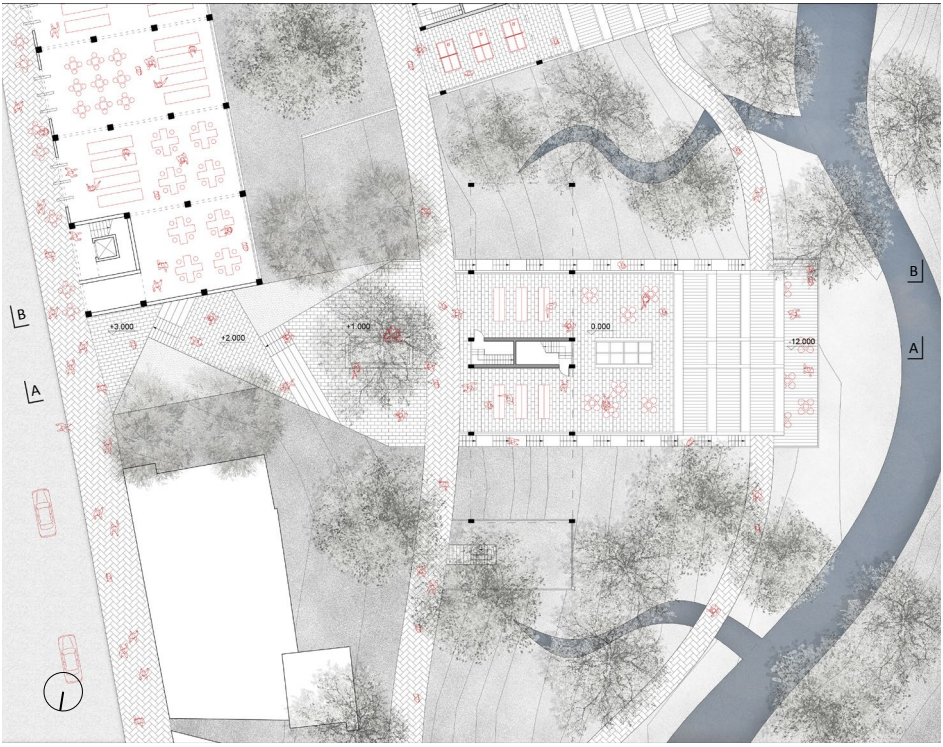
UPPER LEVEL / PLAN



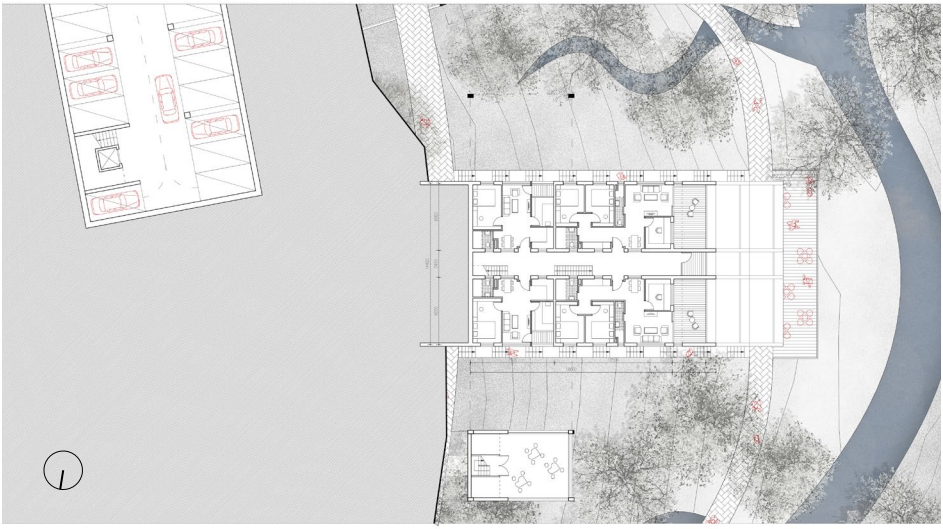


3.4 TYPICAL UNIT

A building near one of the six main openings is chosen as the basic ‘DNA’ in the typology. The series of plans show how it deals with issues such as parking, landscape, circulation and spatial hierarchy.

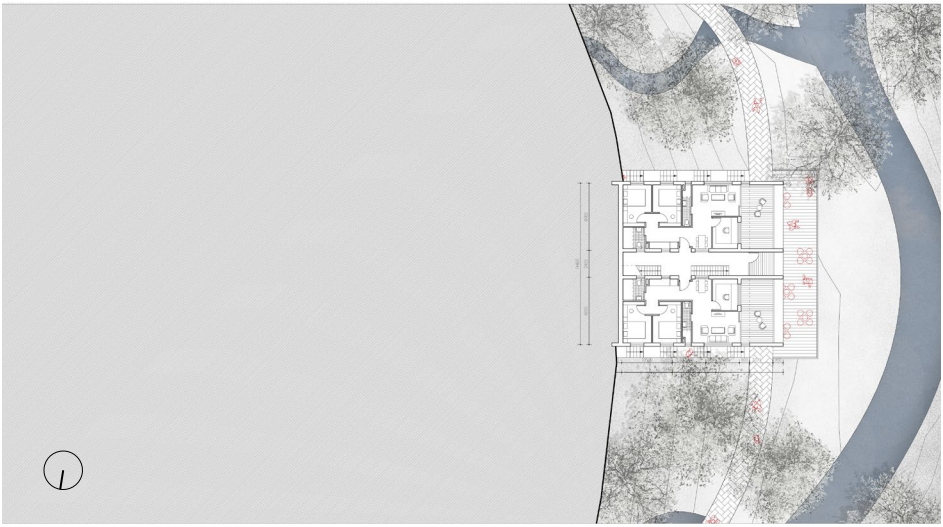


LEVEL + 0.000M / PLAN

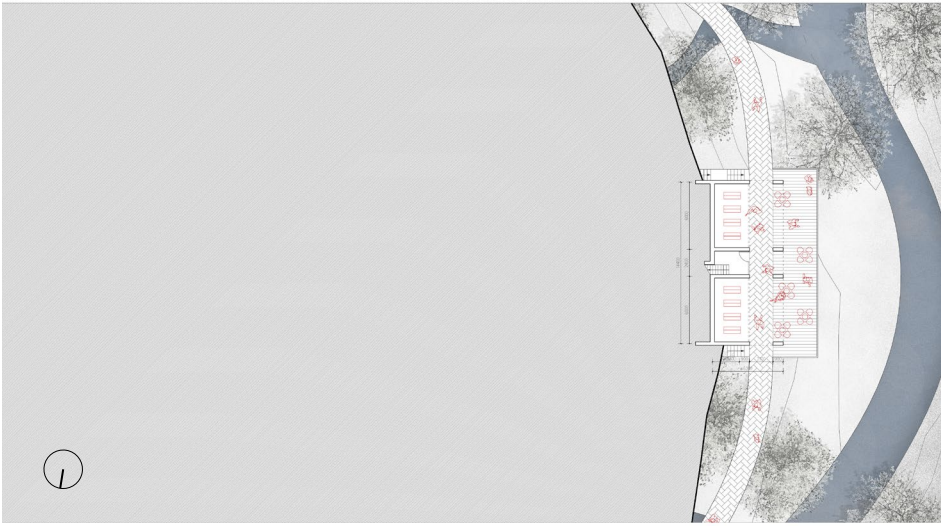


LEVEL - 3.000M / PLAN

LEVEL - 6.000M / PLAN

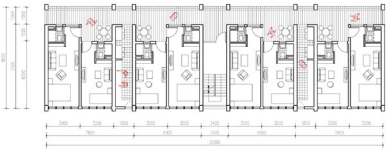


LEVEL - 9.000M / PLAN

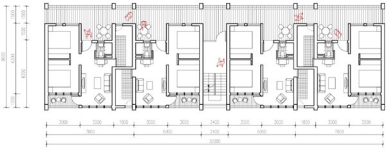


LEVEL - 12.000M / PLAN

The upper levels are mainly designed as compact small units sharing cooking facilities and communal outdoor space, which is an interpretation of the traditional living pattern in Addis. Through varied combination, it develops flexible layouts. Small units can also be combined into bigger private apartments to cater for varied households.



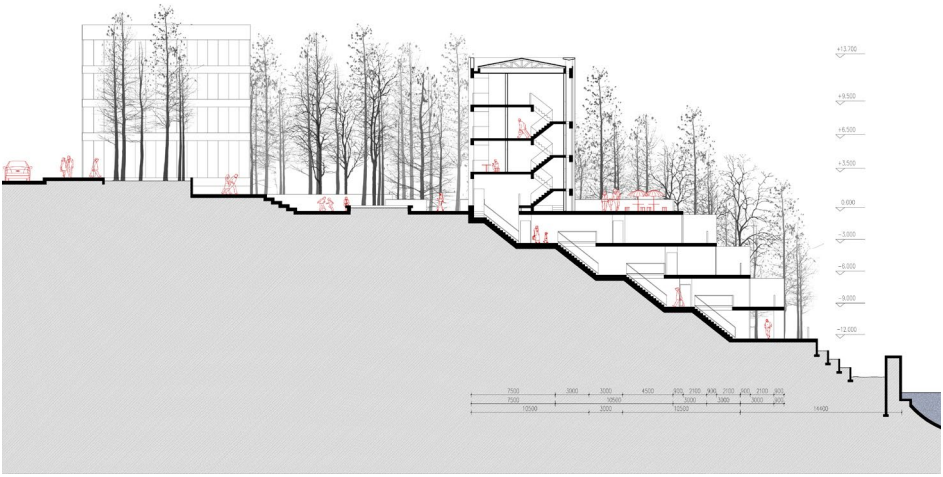
LEVEL + 9.500M / PLAN



LEVEL + 6.500M / PLAN

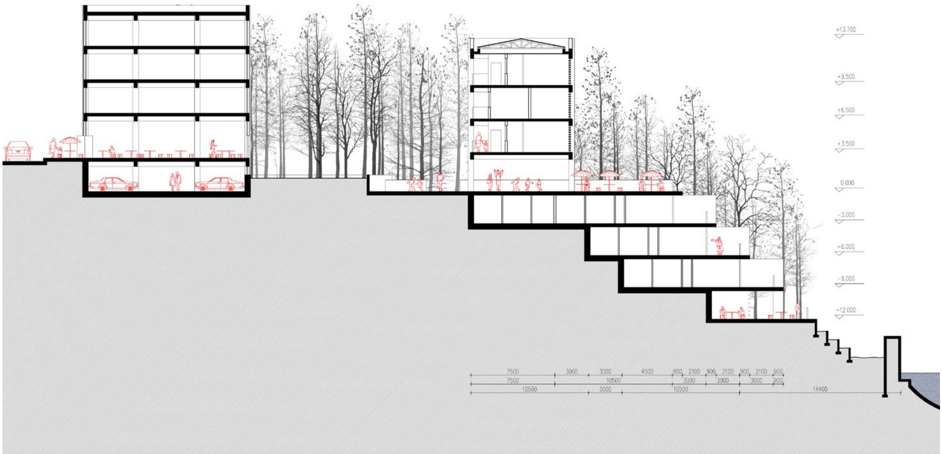
LEVEL + 3.500M / PLAN

The two sections show how it transit from the busy commercial street to the green buffer zone, the building and then to the river.

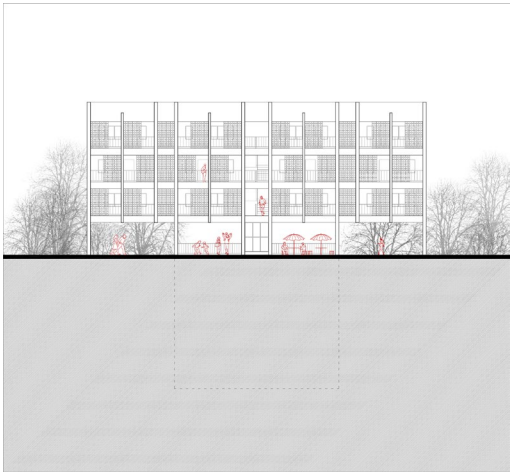

+13.700
+9.500
+6.500
+3.500
0.000
-3.000
-6.000
-9.000
-12.000
7500
3000
3000
4500
600
2100
600
2100
600
2100
600
7500
10500
3000
3000
3000
600
12500
3000
12500
14400

SECTION A - A

Parking is placed semi-underground due to the topographic advantage. The west facade facing the river is designed more open than the east one facing the street.


+13.700
+9.500
+6.500
+3.500
0.000
-3.000
-6.000
-9.000
-12.000
7500 3000 3000 4500 900 2100 900 2100 900 2100 900
7500 10500 3000 3000 3000 900
10500 3000 10500 14400

SECTION B - B



EAST ELEVATION / FACING THE STREET

WEST ELEVATION / FACING THE RIVER

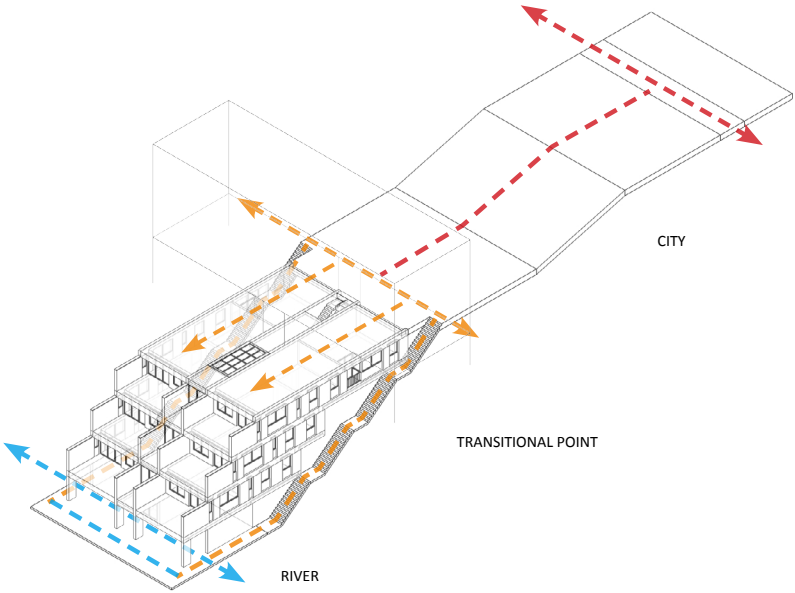
The density is around 262 units per hectare with a gross number of 340 units. 5% of commercial uses and 5% of cultural uses are also implemented in the proposal.

INDEX

SITE AREA	**13000M2**
BUILT AREA:	5400M2
PUBLIC OPEN:	7600M2
PUBLIC TERRACE:	540 M2
COMMUNAL TERRACE:	2870 M2
PRIVATE TERRACE:	1432 M2
PARKING:	500
CONSTRUCTION AREA	**15710M2**
COMMERCIAL:	540M2
CULTURAL & EDUCATION:	540M2
STORAGE:	252M2
1 BEDROOM DWELLING:	4536M2
2 BEDROOM DWELLING:	2052M2
3 BEDROOM DWELLING:	4290M2
OTHERS:	3000M2
FAR	**1.21**
DWELLING	**340 UNITS**
1 BEDROOM DWELLING:	224 UNITS
2 BEDROOM DWELLING:	50 UNITS
3 BEDROOM DWELLING:	66 UNITS
DWELLING DENSITY	**262 UNITS / HECTARE**

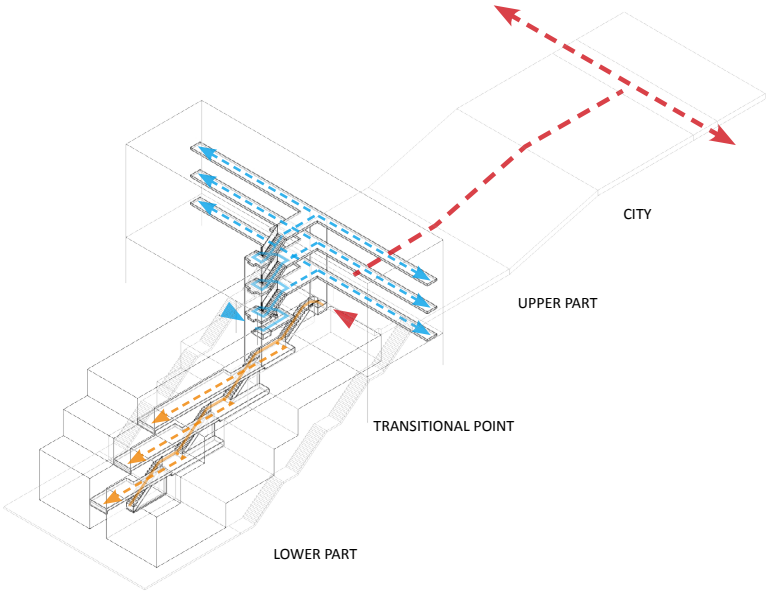
EXTERNAL CIRCULATION

From the schemes of external and internal circulation, we can see how the in-between layer acts as the crucial transitional point both in the sense of different urban spaces and living spaces.


CITY
TRANSITIONAL POINT
RIVER

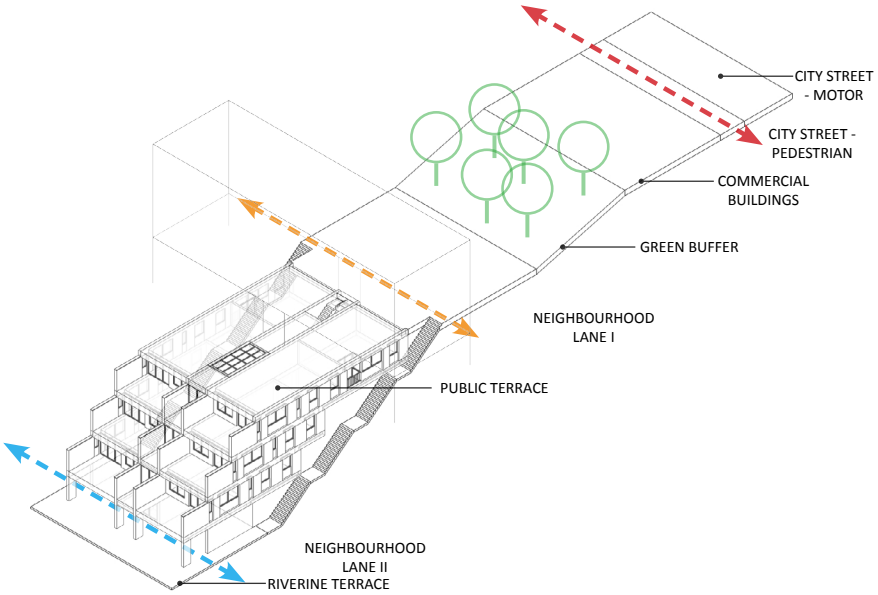
INTERNAL CIRCULATION

From the schemes of external and internal circulation, we can see how the in-between layer acts as the crucial transitional point both in the sense of different urban spaces and living spaces.


CITY
UPPER PART
TRANSITIONAL POINT
LOWER PART

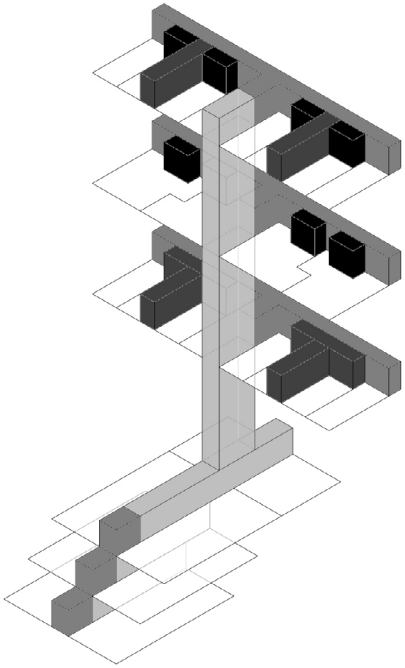
SPATIAL SEQUENCE

The hierarchy for public space is also clearly defined in a gradient sequence from public to private. So are the communal and private open space.


CITY STREET
- MOTOR
CITY STREET -
PEDESTRIAN
COMMERCIAL
BUILDINGS
GREEN BUFFER
NEIGHBOURHOOD
LANE I
PUBLIC TERRACE
NEIGHBOURHOOD
LANE II
RIVERINE TERRACE

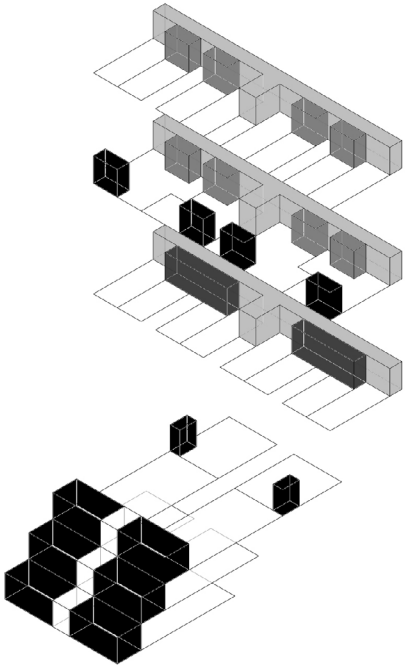
COMMUNAL SPACE

So are the communal and private open space.


WHOLE BUILDING
WHOLE FLOOR
CLUSTER
SMALLER CLUSTER

OUTDOOR SPACE

So are the communal and private open space.



WHOLE FLOOR

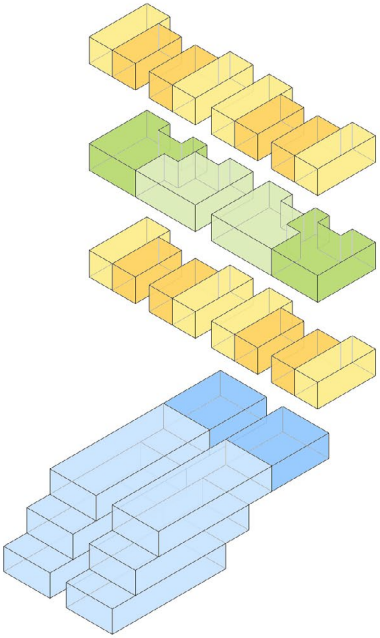
CLUSTER

SMALLER CLUSTER

PRIVATE

HOUSING TYPE

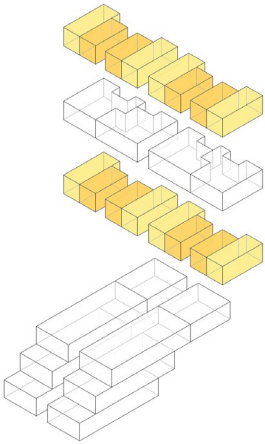
For the housing type, there are mainly six different layouts for a mixture of varied households and social groups.

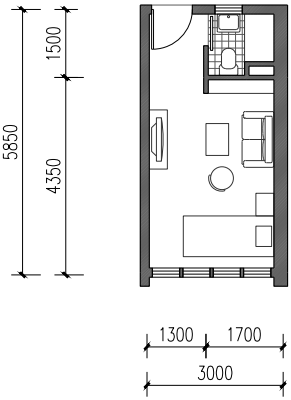


HOUSING TYPE A / B

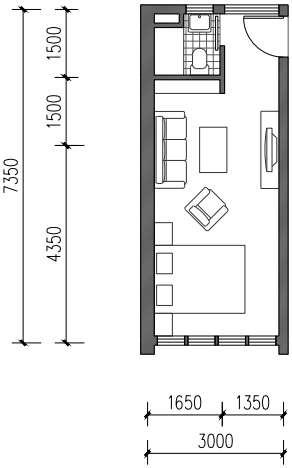
The two one-bedroom apartment is mainly for a single person.
Kitchen facilities are shared by four units.

ONE-BEDROOM APARTMENT





TYPE A 18M^2
112 UNITS

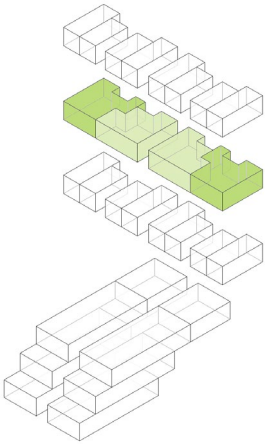


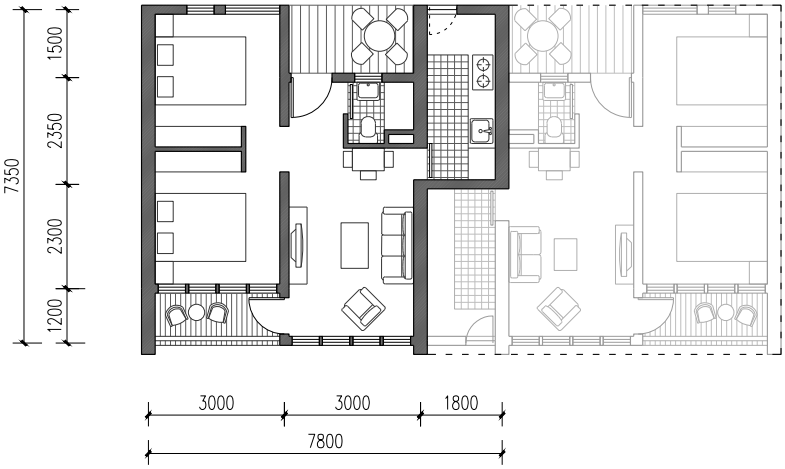
TYPE B 22.5M^2
112 UNITS

HOUSING TYPE C / D / E

Three two-bedroom apartment is for a couple or a small family with balconies.

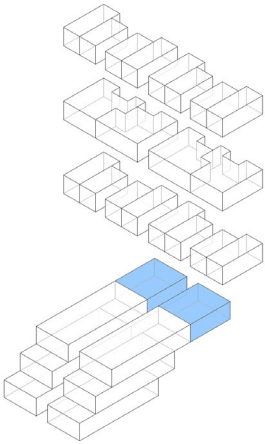
TWO-BEDROOM APARTMENT

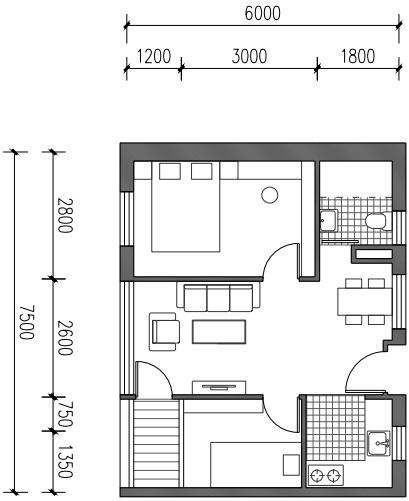




TYPE C-1 37.4M^2+3.6M^2 Terrace
22 UNITS

TYPE C-2 37.4M^2+3.6M^2 Terrace
22 UNITS



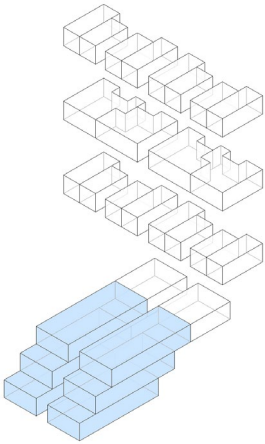


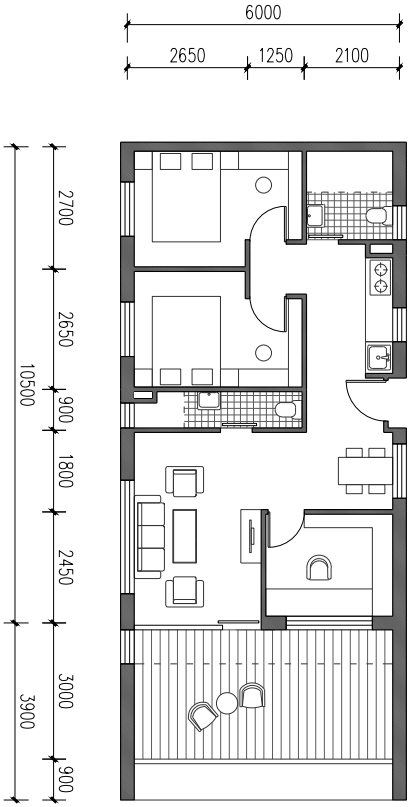
TYPE D 42.5M^2+2.5M^2 Terrace
6 UNITS

HOUSING TYPE F

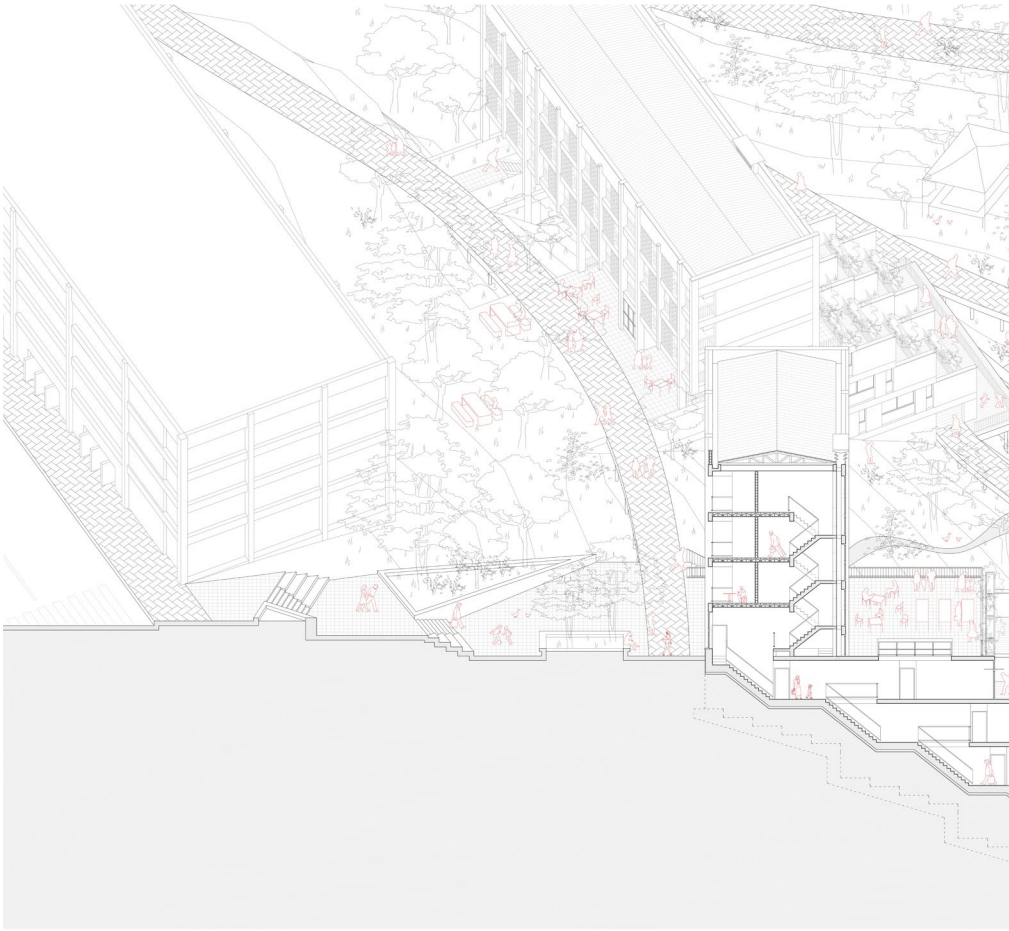
Three-bedroom apartment is for a big family with a spacious river-facing terrace.

THREE-BEDROOM APARTMENT



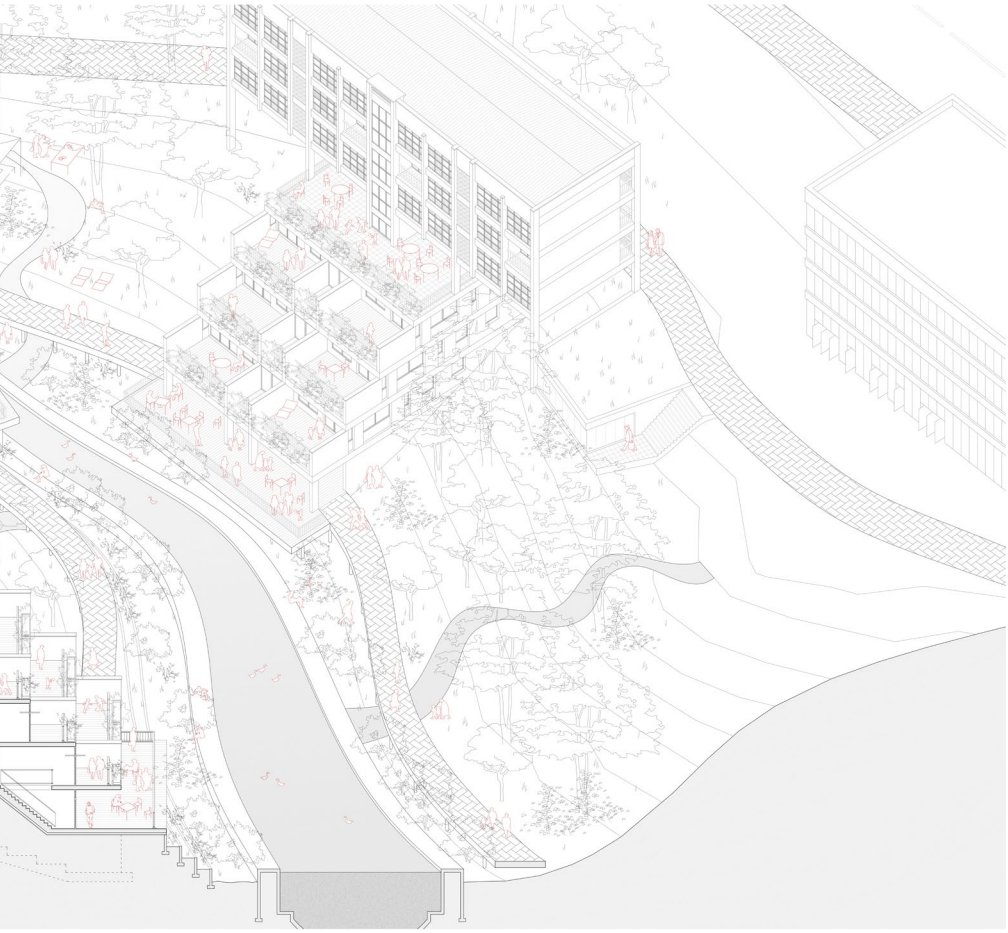


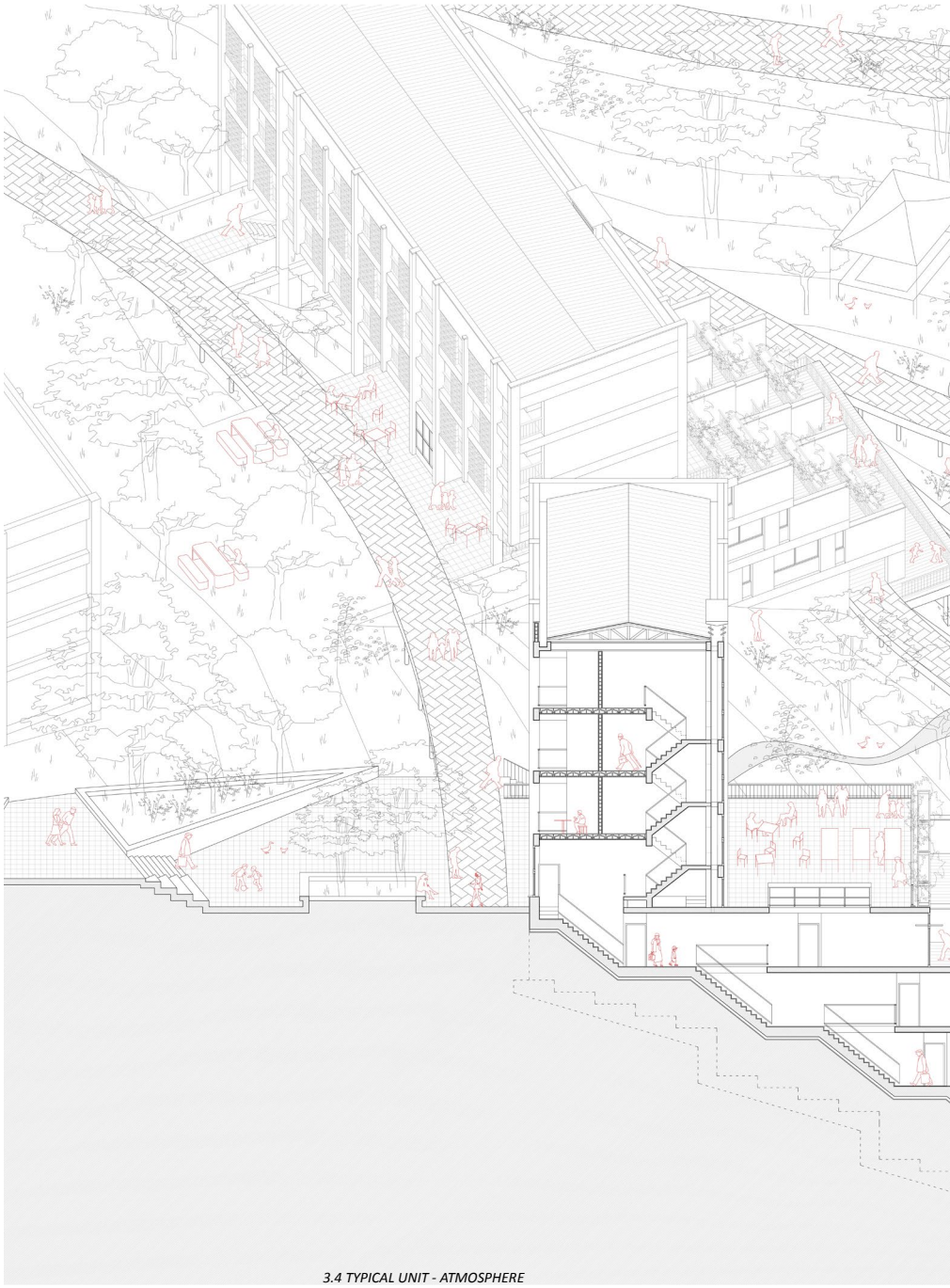
TYPE E 65M^2+12M^2 Terrace
6 UNITS



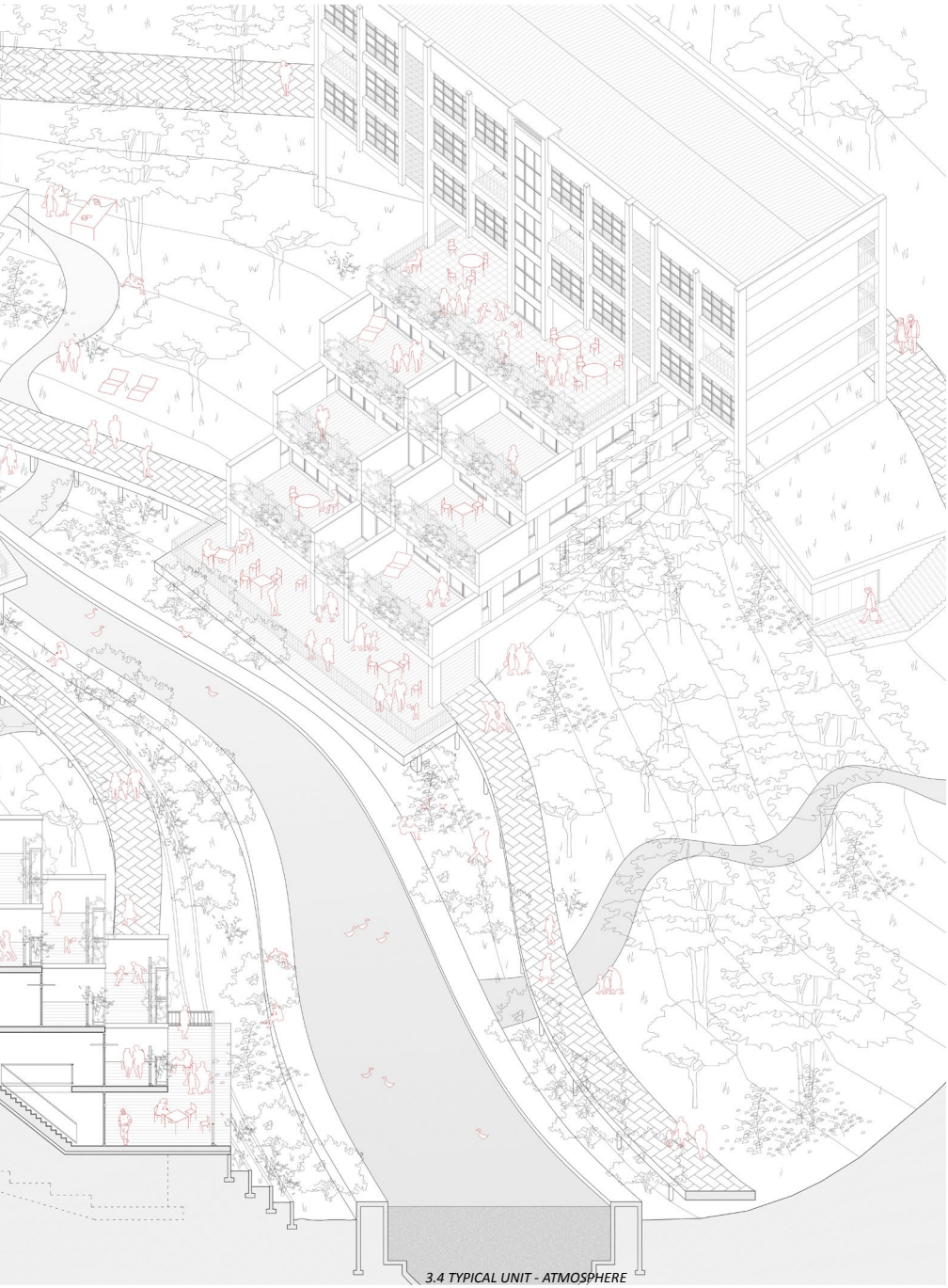
ATMOSPHERE / SECTIONED AXONOMETRY

The axonometric view is sectioned through the vertical core. It shows my design intention, that is a living and city space that enriches people.





3.4 TYPICAL UNIT - ATMOSPHERE



3.4 TYPICAL UNIT - ATMOSPHERE

EUCALYPTUS TRUSS

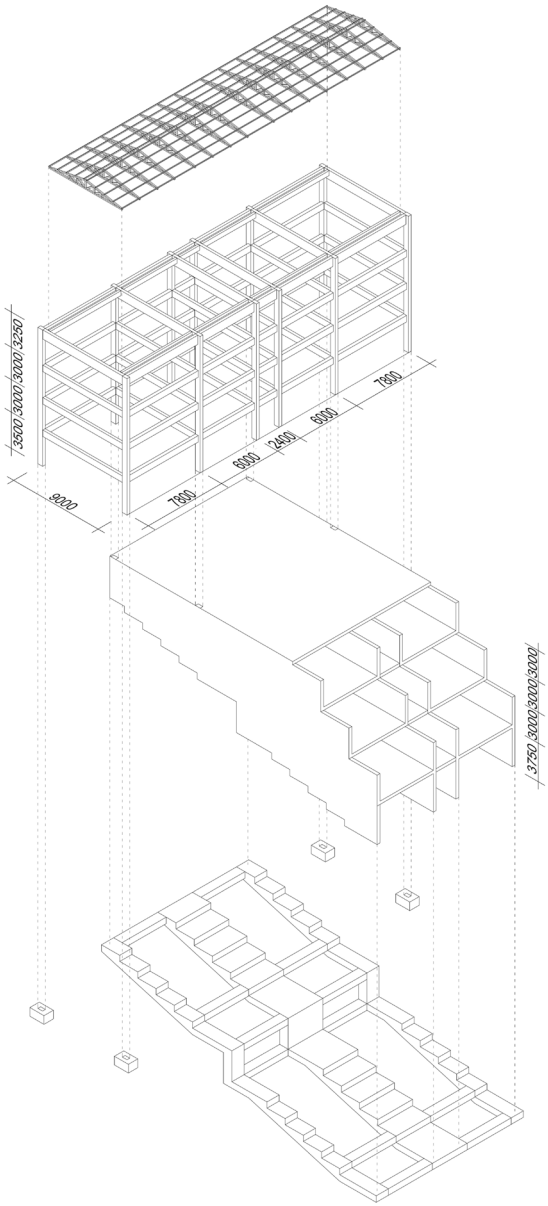
CONCRETE FRAME STRUCTURE

CONCRETE STRUCTURAL WALLS

STRUCTURE

The structural system consists of stepped foundation, concrete structural walls and frame structure above, both cast insitu.

STEPPED FOUNDATION

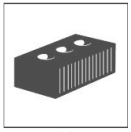

3500/3000/3000/3250/
9000
7800
6000
2400
6000
7800
3750/3000/3000/3000/

LOW-TECH POINTS:

ENERGY SOURCE:
SOLAR ENERGY

RAINWATER
COLLECTION

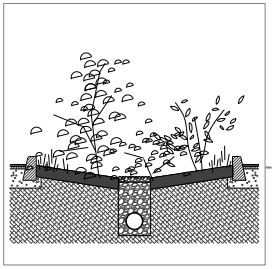
MECHANISM
REDUCTION



NATURAL, LOCAL
MATERIALS

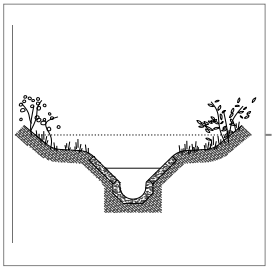
GREENING

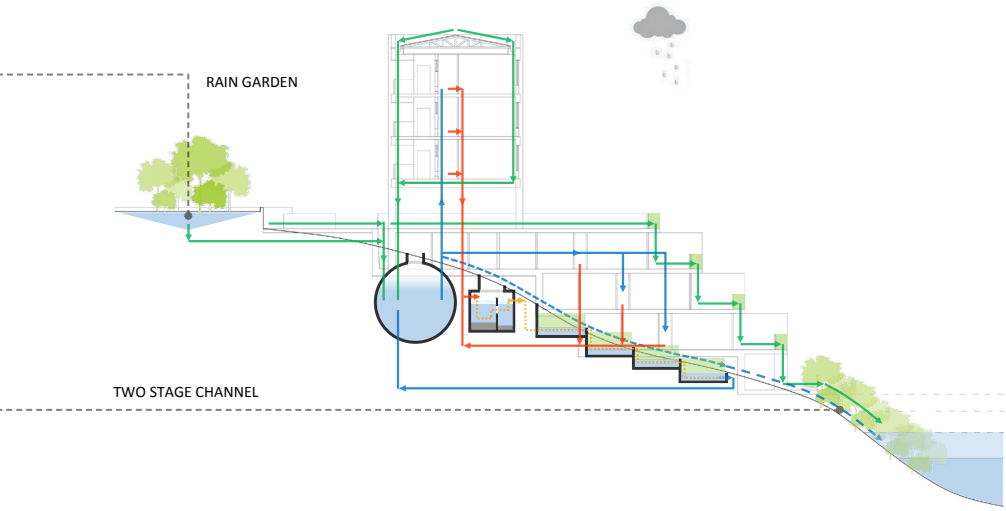
ARTIFICIAL LIGHTING
REDUCTION

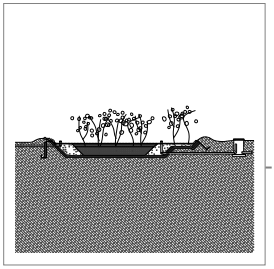


CLIMATE - WATER MANAGEMENT / RAINY SEASON

In rainy season, the rainwater collected from the roof, the rain garden and the upper terrace are stored in the underground tank to be used for flushing the toilets. While the black water from the toilet is treated by the septic tank, horizontal subsurface flow wetland and then comes to the storage tank for reuse. The overflow will be conveyed to the river through two-stage channels.

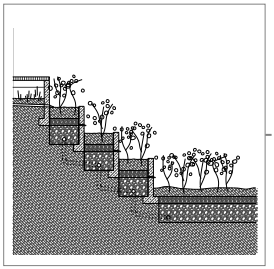


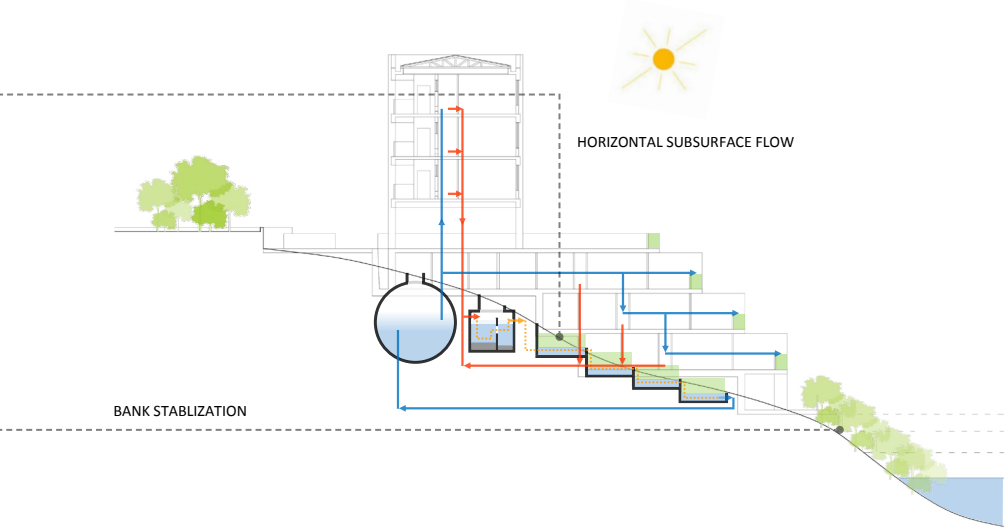

RAIN GARDEN
TWO STAGE CHANNEL



CLIMATE - WATER MANAGEMENT / DRY SEASON

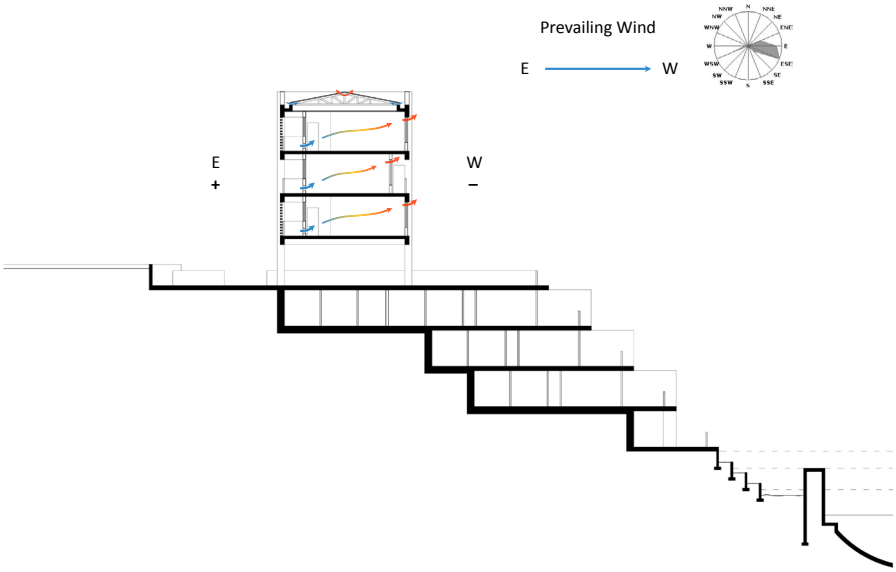
In dry season, it mainly rely on the reuse of treated sewage to flush the toilets and irrigating plants. As the water level goes down, the exposed river valley with greening can be used as public open space.




HORIZONTAL SUBSURFACE FLOW
BANK STABLIZATION

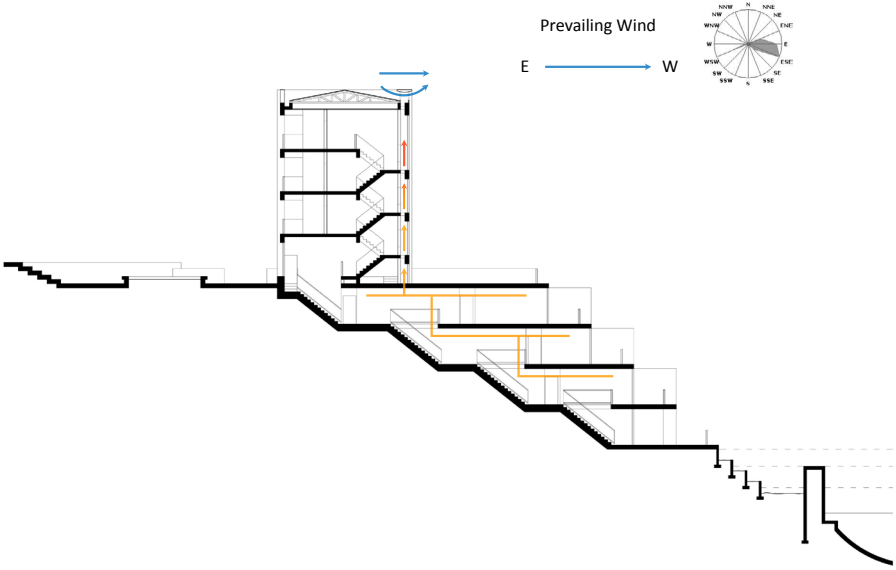
CLIMATE - VENTILATION / UPPER FLOORS

For ventilation, the upper floors rely on the cross ventilation. There is also a ridge vent to prevent the metal sheet roof from overheating.


Prevailing Wind
E
W
E
+
W
–

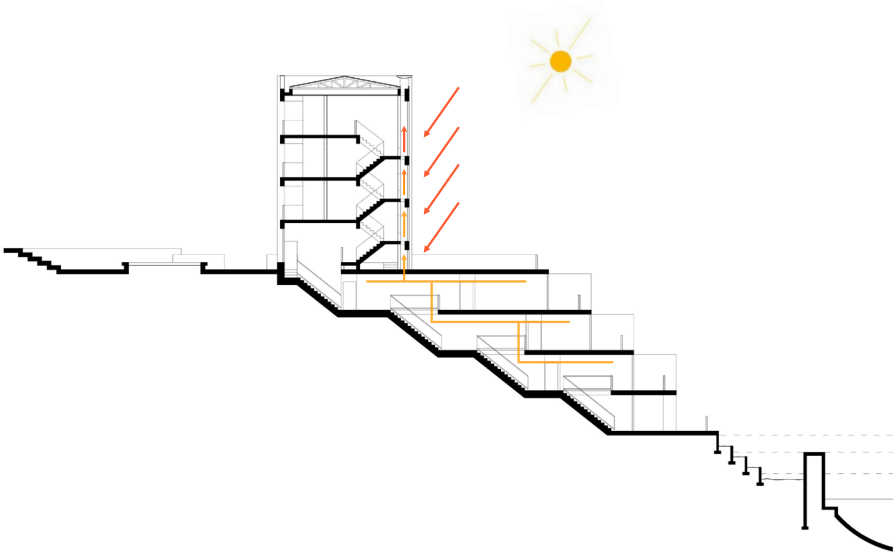
CLIMATE - VENTILATION / LOWER FLOORS

The ventilation for the lower part relies on the wind tower in the staircase. When it is windy, the venturi effect will help to suck out the hot air and bring fresh air in from windows in the north and south facades.


Prevailing Wind
E
W
N
NNE
NE
ENE
E
ESE
SE
SSE
S
SSW
SW
WSW
W
WNW
NW
NNW

CLIMATE - VENTILATION / LOWER FLOORS

When it is windless but sunny, the stack effect will help.



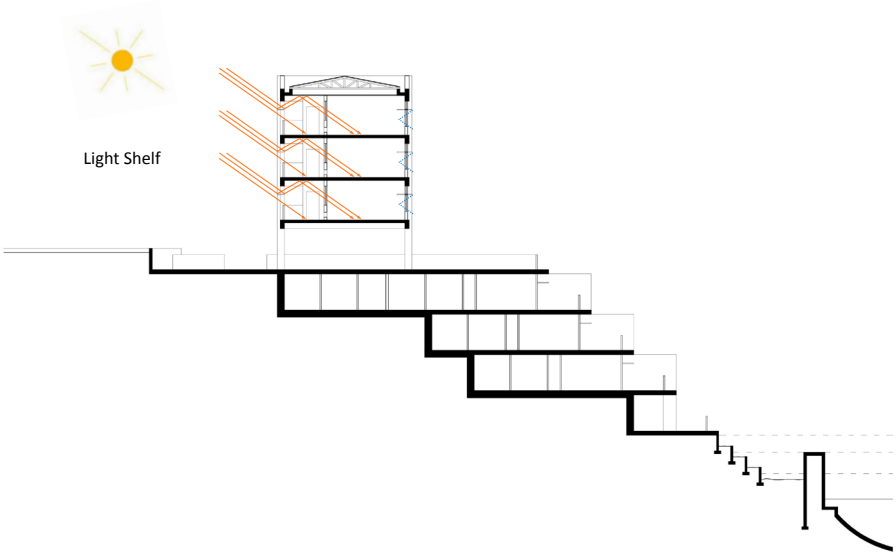
CLIMATE - VENTILATION / LOWER FLOORS

While in windless nights, the thermal mass will keep the system working.

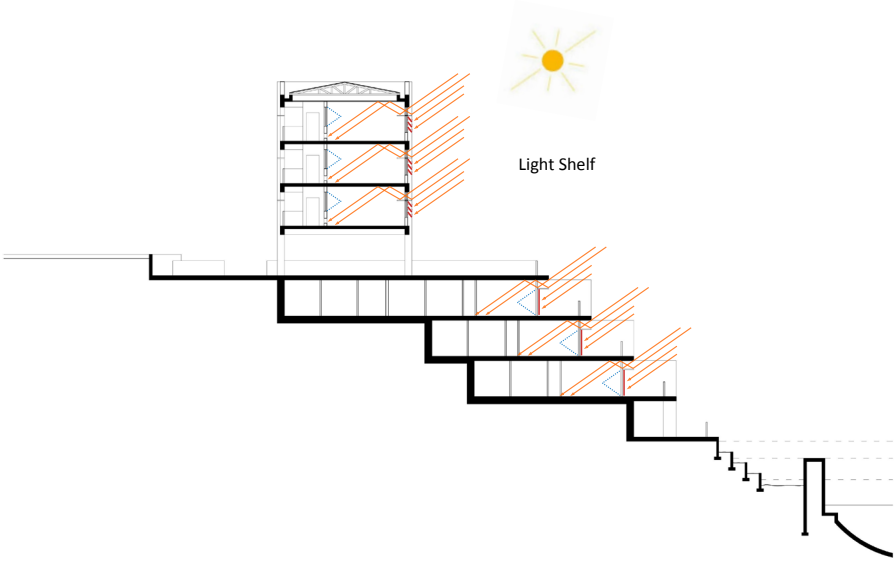

Thermal Mass

CLIMATE - DAYLIGHTING & SHADING / MORNING

For daylighting and shading, light shelf is used to bringing light deeper into the room.

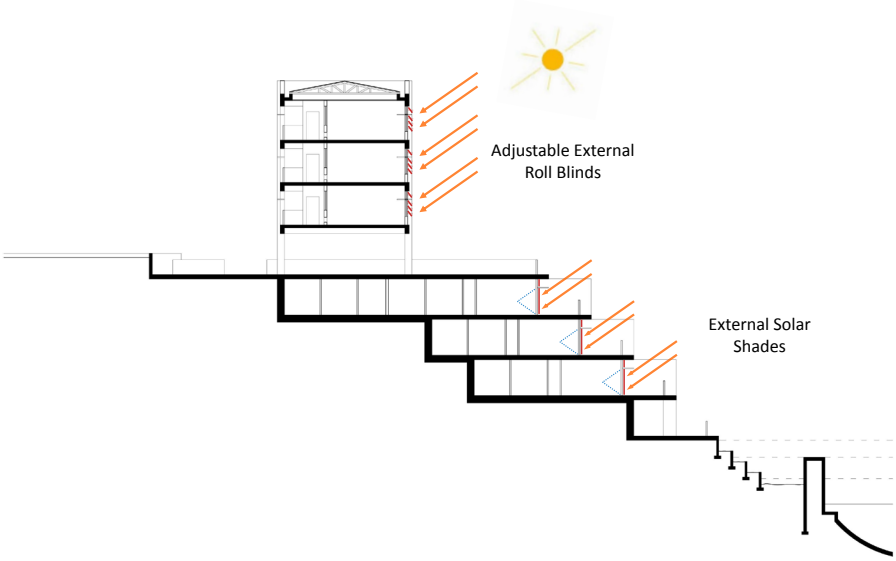

Light Shelf

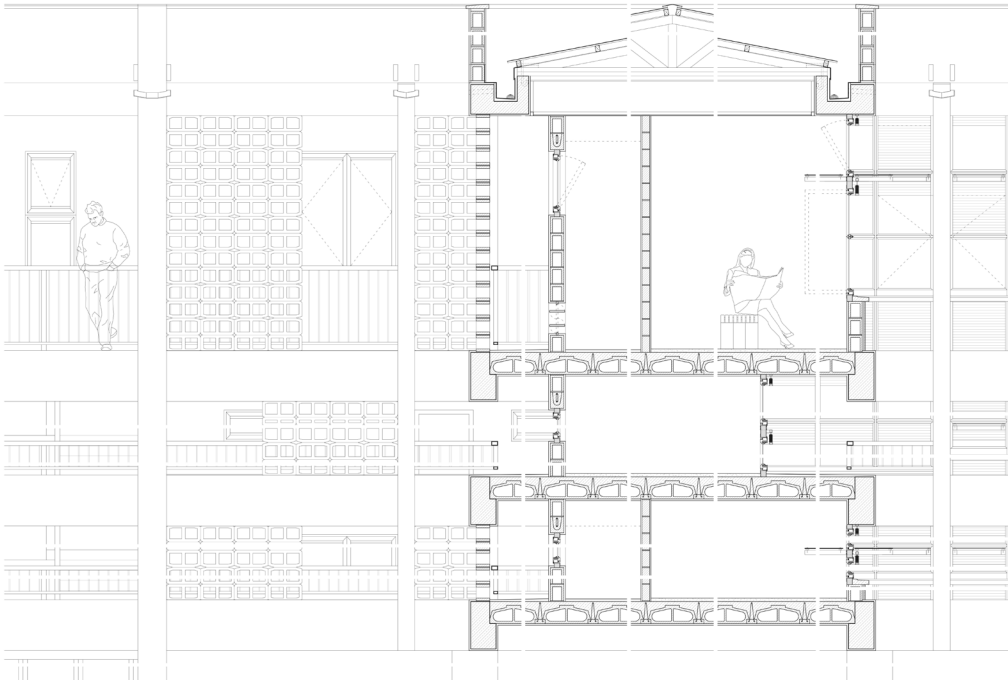
CLIMATE - DAYLIGHTING & SHADING / AFTERNOON

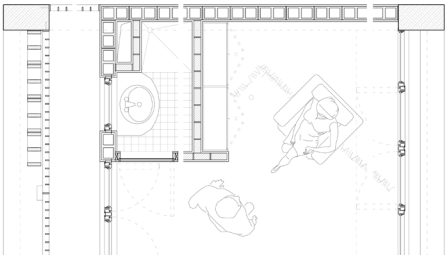

Light Shelf

CLIMATE - SHADING

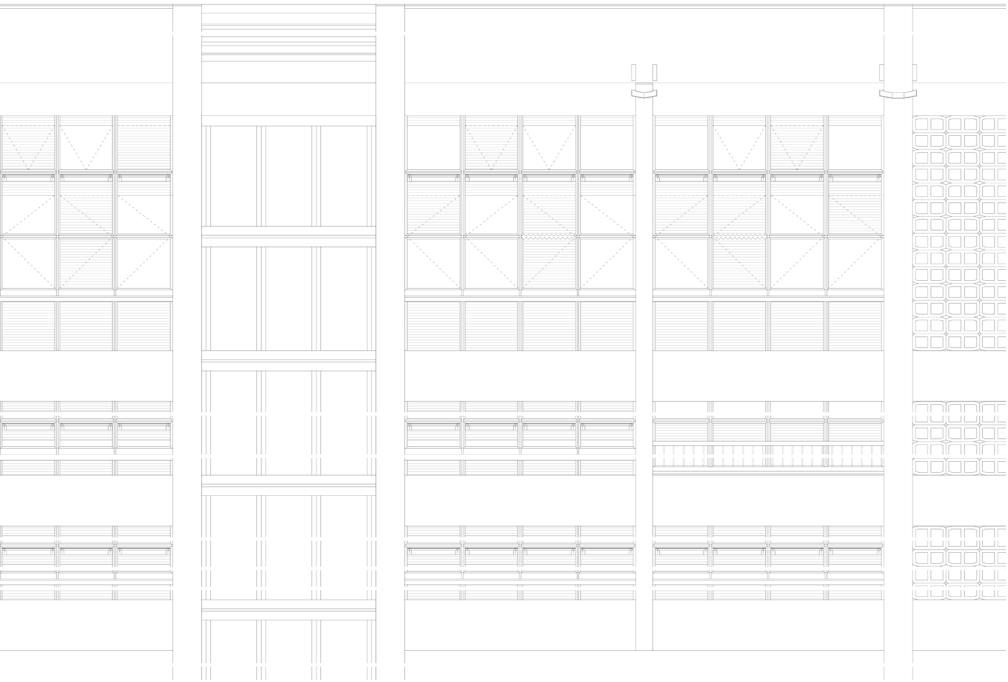
Combined with adjustable external roll blinds and solar shades, it ensures a effective shading system and unblocked views.


Adjustable External
Roll Blinds
External Solar
Shades



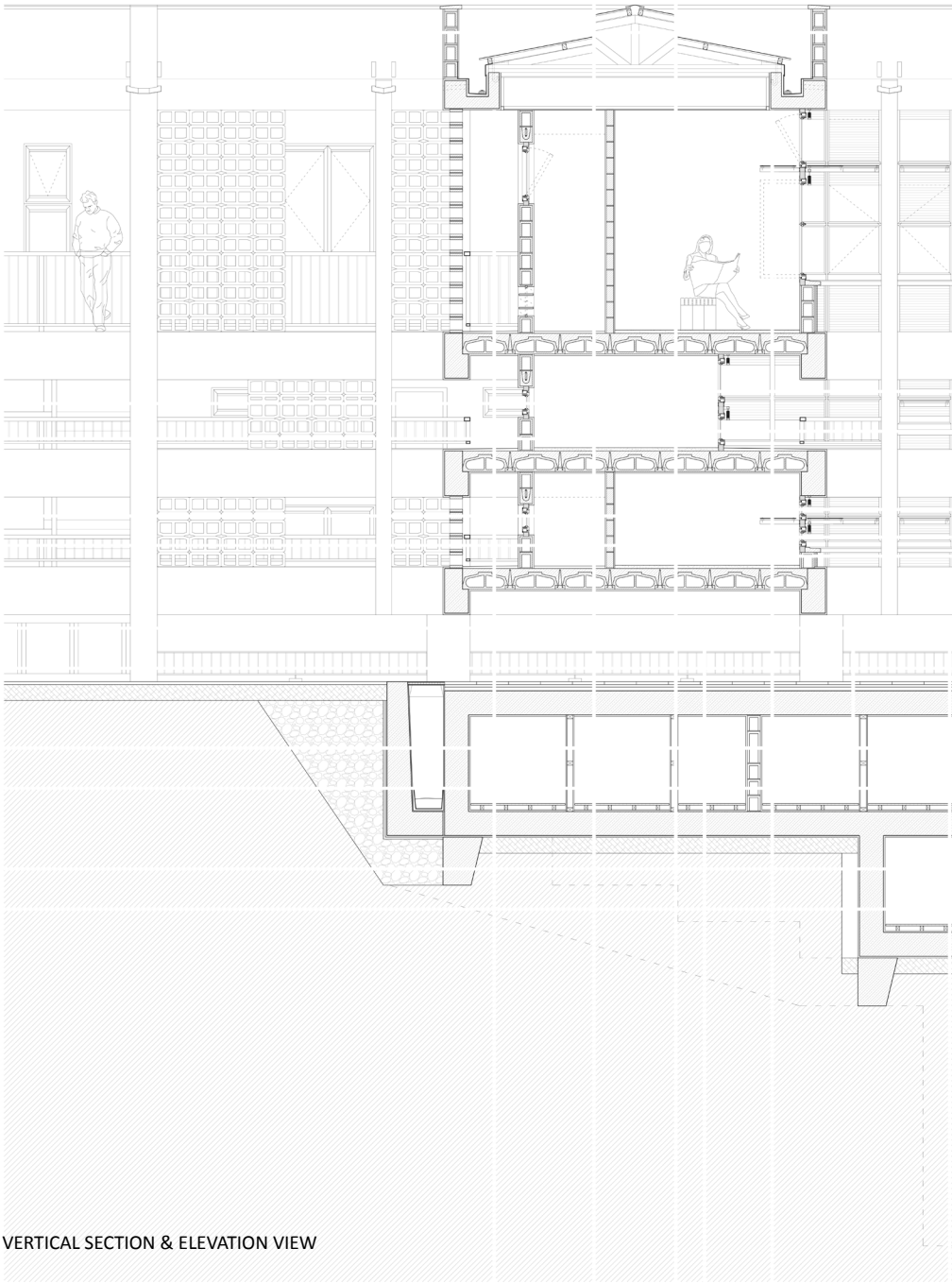


HORIZONTAL SECTION

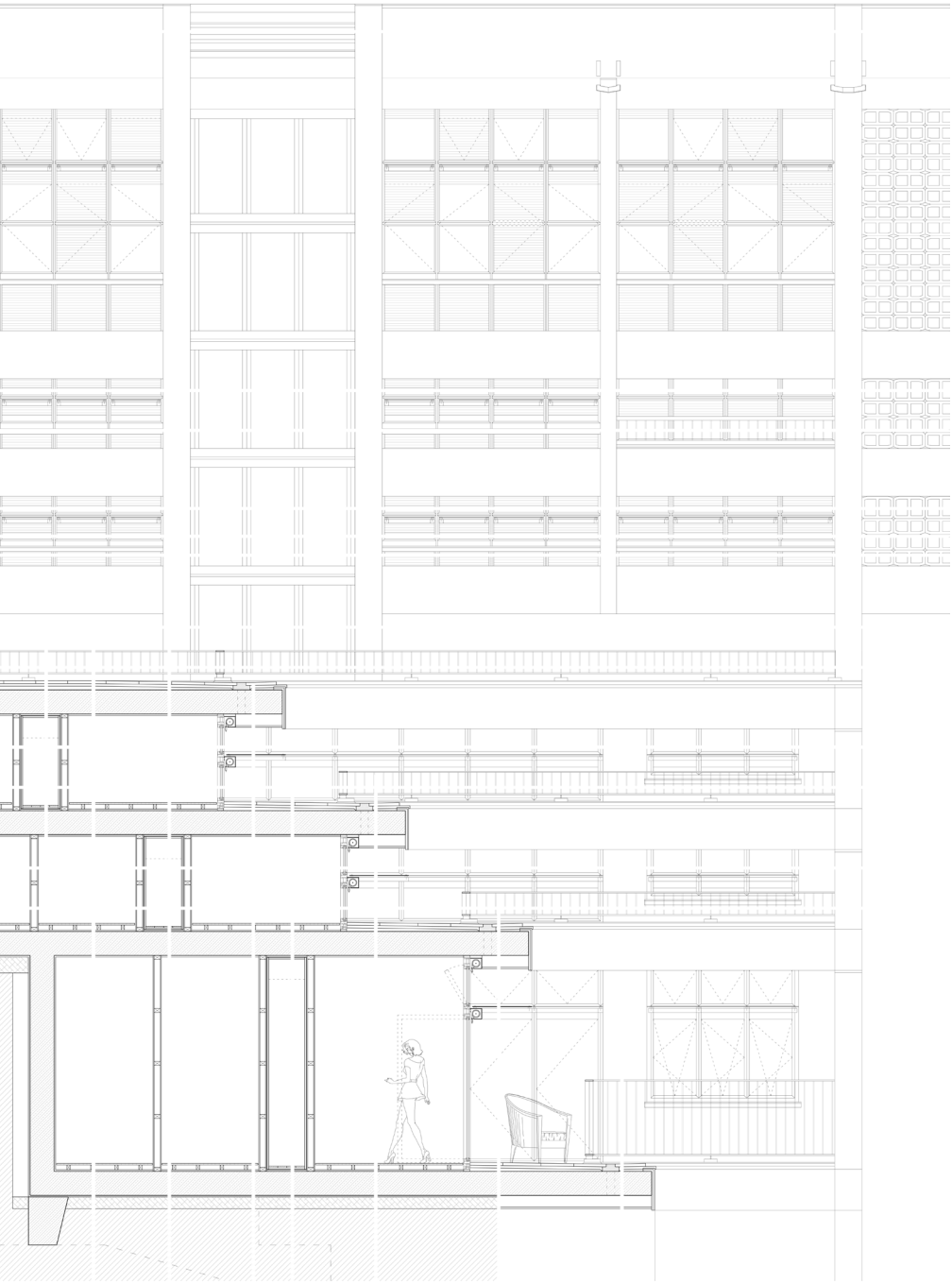


DETAILING

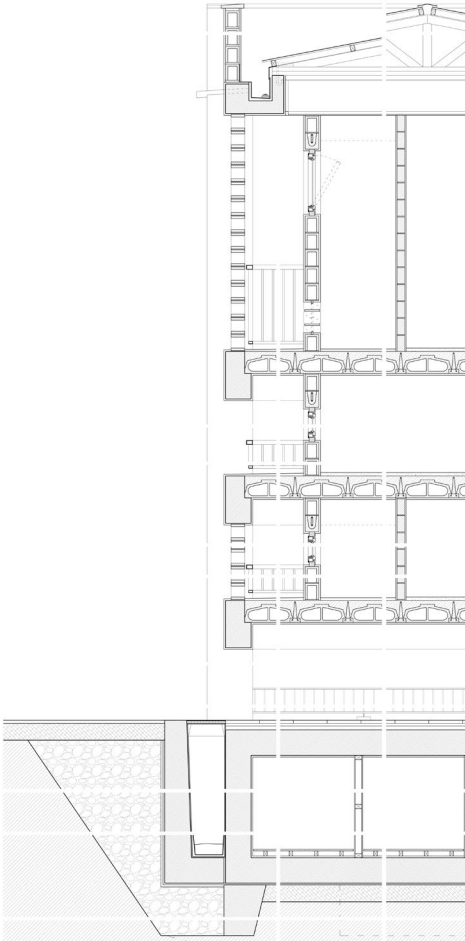
For the material, local materials such as HCB, metal sheet and bamboo are used to reduce the construction cost and time.

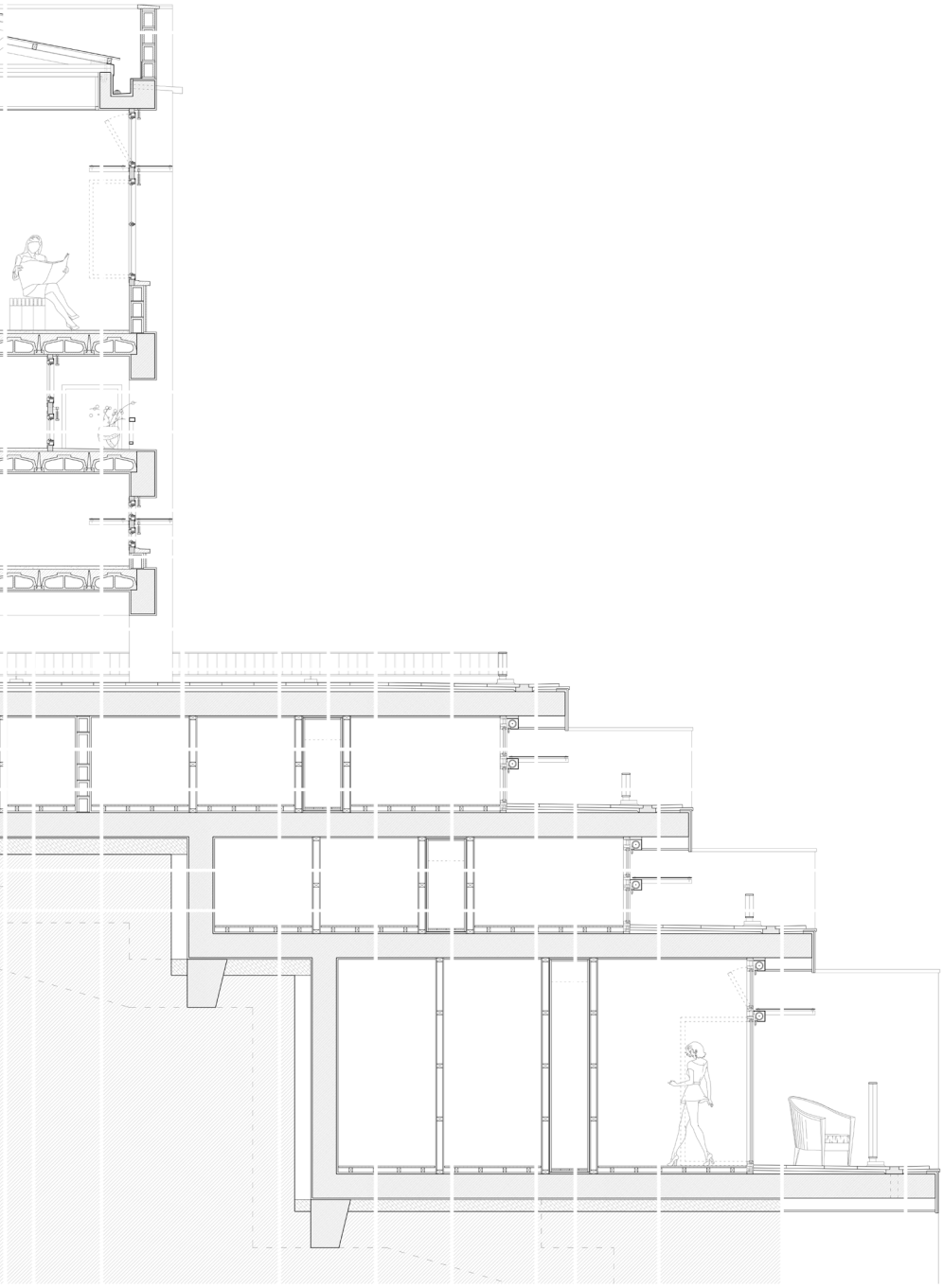


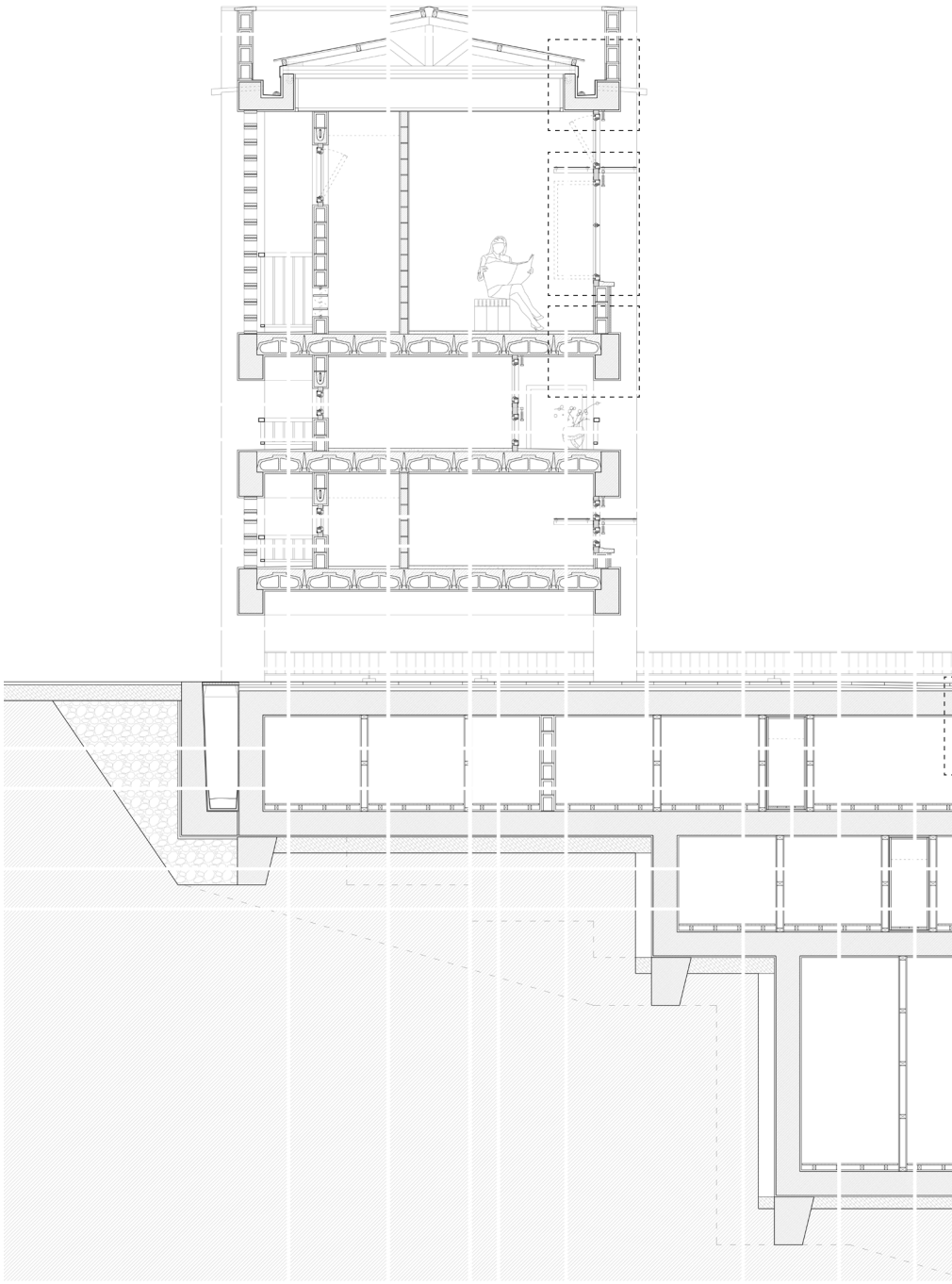
VERTICAL SECTION & ELEVATION VIEW



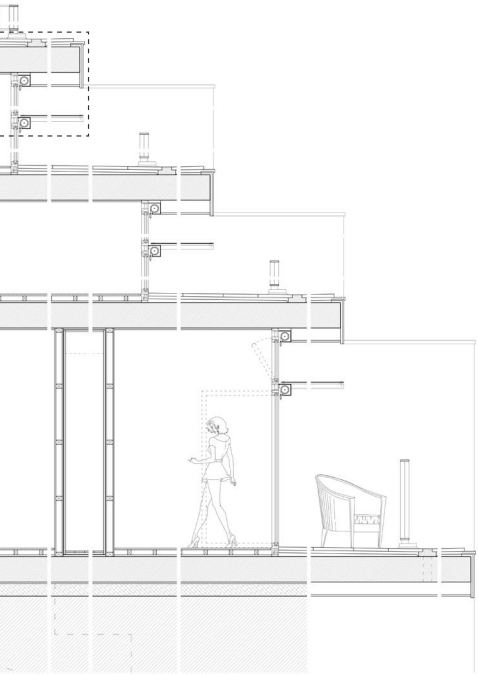
3.4 TYPICAL UNIT - BT

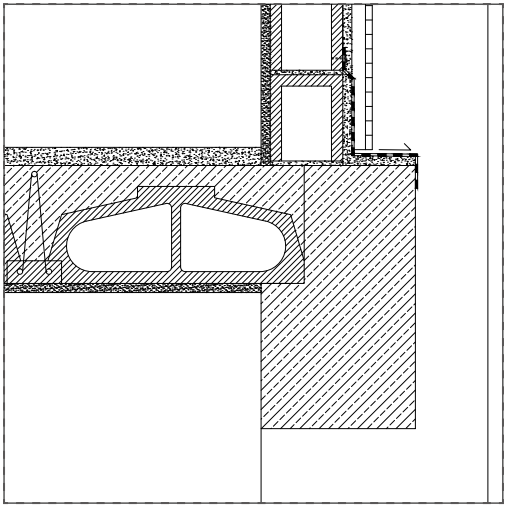




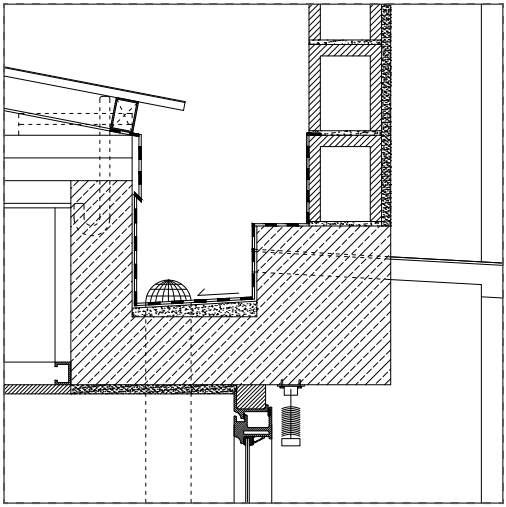


3.4 TYPICAL UNIT - BT

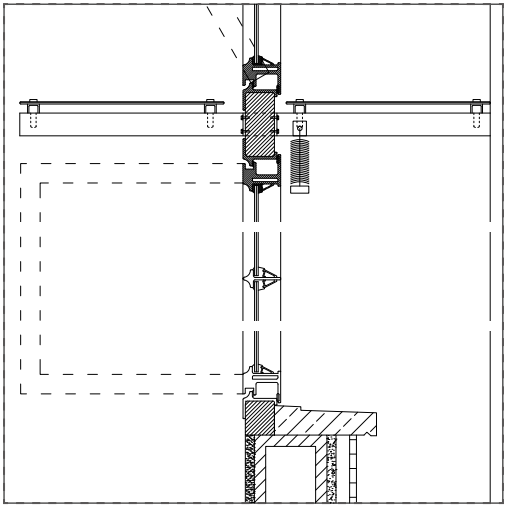




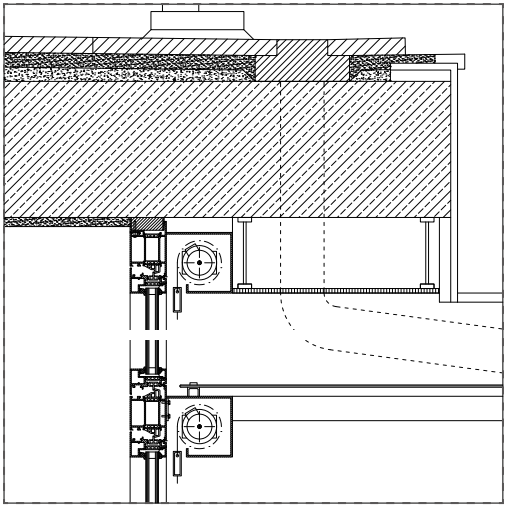
VER. DETAIL



VER. DETAIL



VER. DETAIL



VER. DETAIL

4 REFLECTION

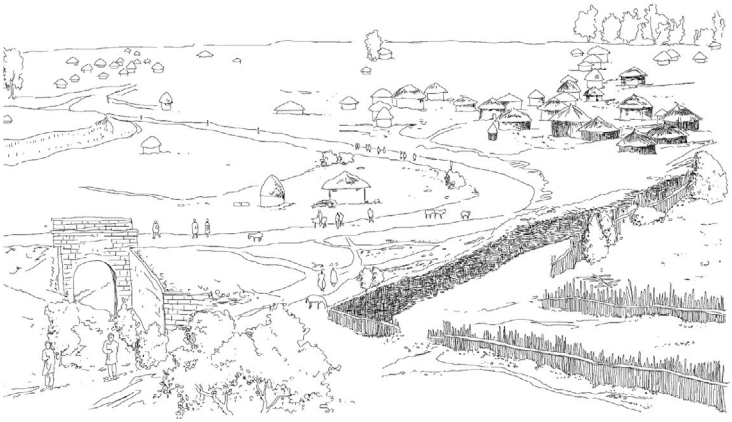
4.1 INTERWEAVING OF RESEARCH & DESIGN

My concern for the river valley starts from the first phase of group research, when we were trying to explore the urban transformation process of Addis Ababa through mapping. My group focused on the early formation period of the city, namely from 1886 - 1936. From a series of map in this phase, I see the river as the main trigger for the urban transformation process of Addis. It greatly contributed to the current urban profile and was a key urban tissue.

However, during my field trip in Merkato district, I found a abrupt fracture of infrastructure in the riverine area right in the city center. The river was a complete sewage line with dirty water directly poured in from the market. This triggered me to rethink about the relation between the river and city.

A comparison between the existing situation and the one after the intervention may give a better insight on how my design responds to the issues found in my research.

When I look back, I find my design, in turn, helps me to further my insights of previous research. As the topographic conditions can be much more complicated in reality, a thorough study on specific site of river valley is crucial, including the soil texture, ground water level, flood line and etc. As a theory-based practice and a practice-based theory, this circulation between research and design will never end.

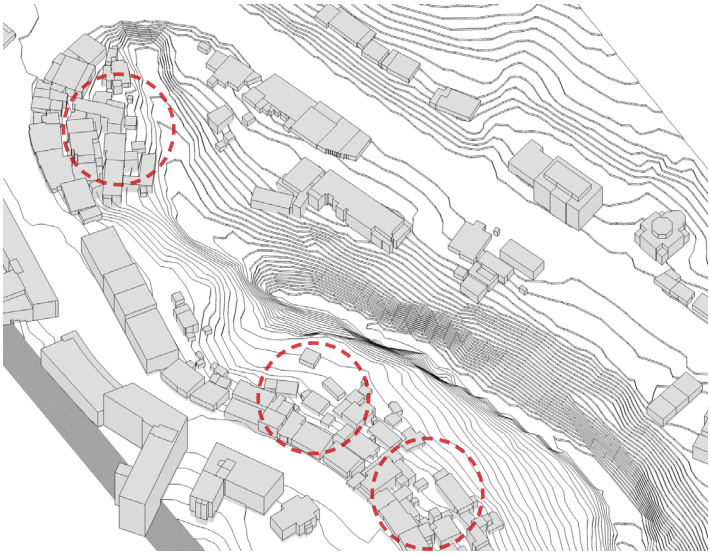


Ras Mekonnen bridge in the 1900s

4.2 BEFORE - AFTER

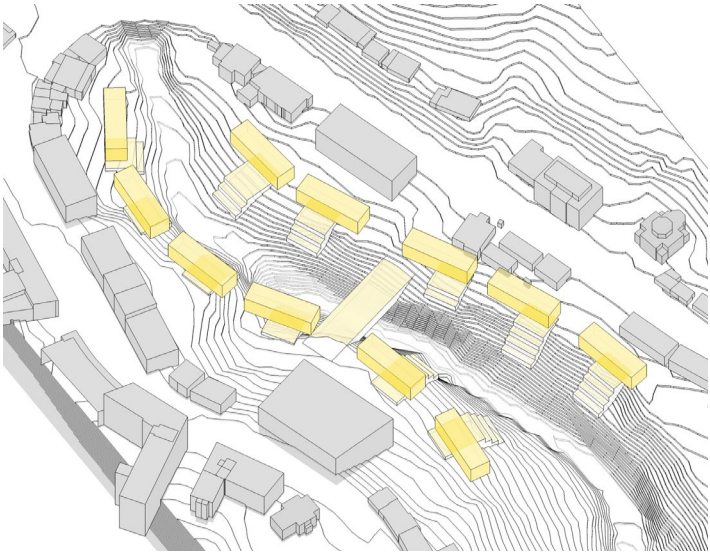
4.2.1 DENSITY

BEFORE - APPROXIMATELY 5 UNITS / HECTARE
First is the increase of density. Before, the density is rather sparse if calculated as the whole site, approximately only 5 to 10 units per hectare as a deserted land. They are all self-built slums.



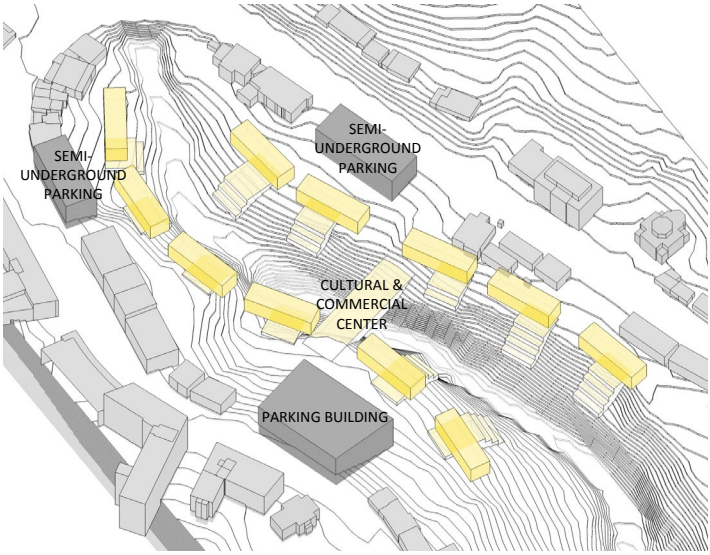
4.2.1 DENSITY

AFTER - 262 UNITS / HECTARE
The density is greatly raised to 262 units per hectare with different housing types for different families.



4.2.1 DENSITY

AFTER - FUNCTION DISTRIBUTION
Meanwhile, parking and cultural needs are also addressed in the design.

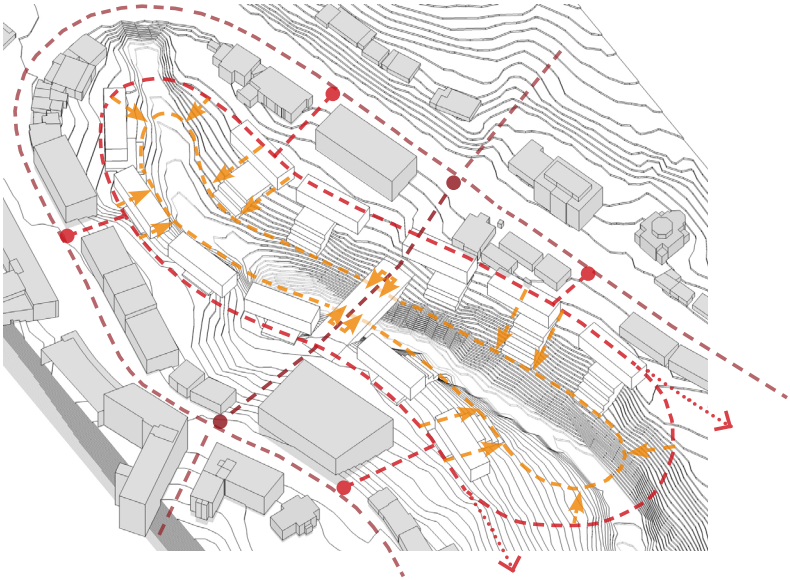

SEMI-
UNDERGROUND
PARKING
SEMI-
UNDERGROUND
PARKING
CULTURAL &
COMMERCIAL
CENTER
PARKING BUILDING

4.2.2 INFRASTRUCTURE

BEFORE - DEAD ENDS
Second is the optimization of infrastructure. Before there are only dead ends blocked by the river.

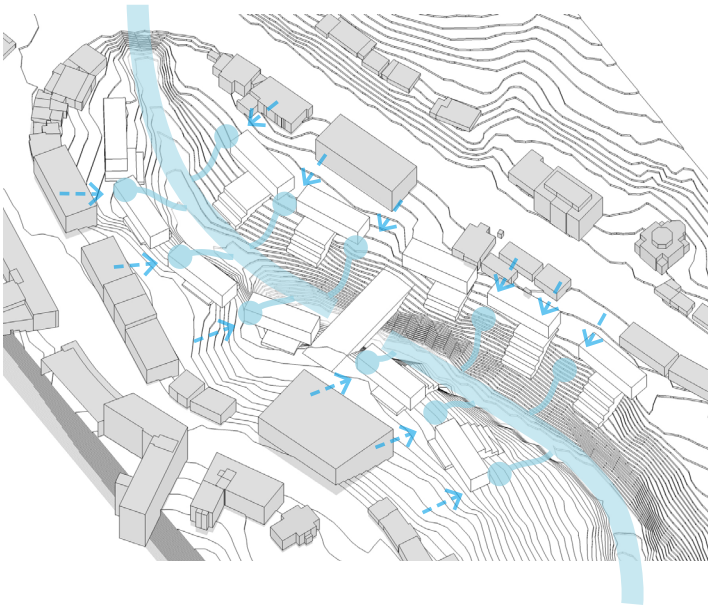
4.2.2 INFRASTRUCTURE

AFTER - COMPLETE PEDESTRIAN SYSTEM INTEGRATED INTO URBAN FABRIC
The dead ends are now integrated with the new vertical pedestrian system.



4.2.2 INFRASTRUCTURE

AFTER - A SUSTAINABLE SEWAGE TREATMENT & RAINWATER COLLECTION SYSTEM
Helping to relieve the water crisis in Addis.



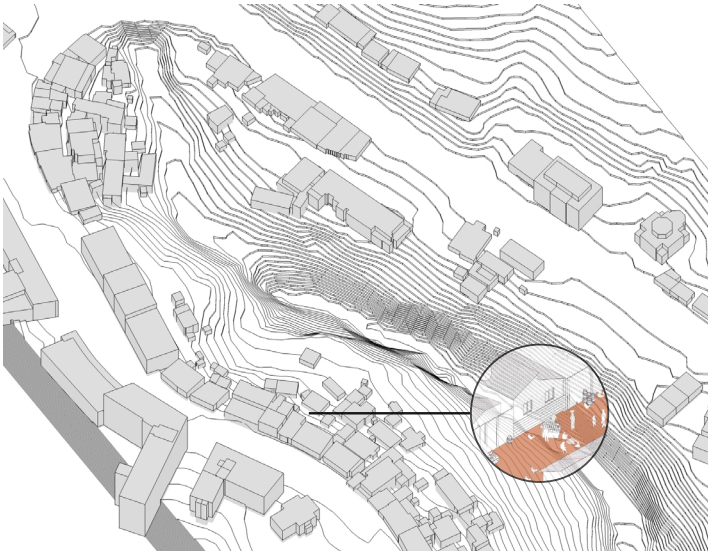
4.2.2 INFRASTRUCTURE

AFTER - GREEN BELT & BOTANICAL GARDENS

4.2.3 HIERARCHY

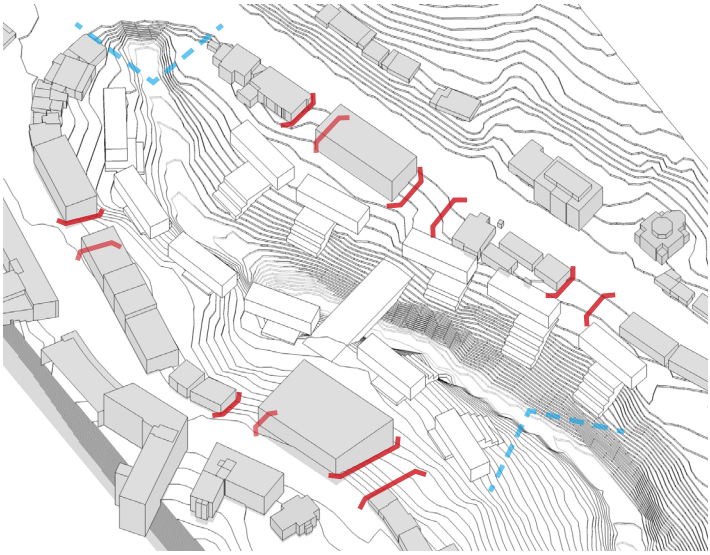
BEFORE - SINGLE LAYER OF PUBLIC SPACE CARRY ALMOST ALL KINDS OF ACTIVITIES IN A CHAOS

Next is the definition of hierarchy of urban spaces. Before, a common situation is that one public space carry almost all kinds of activities, which leads to a chaotic state.



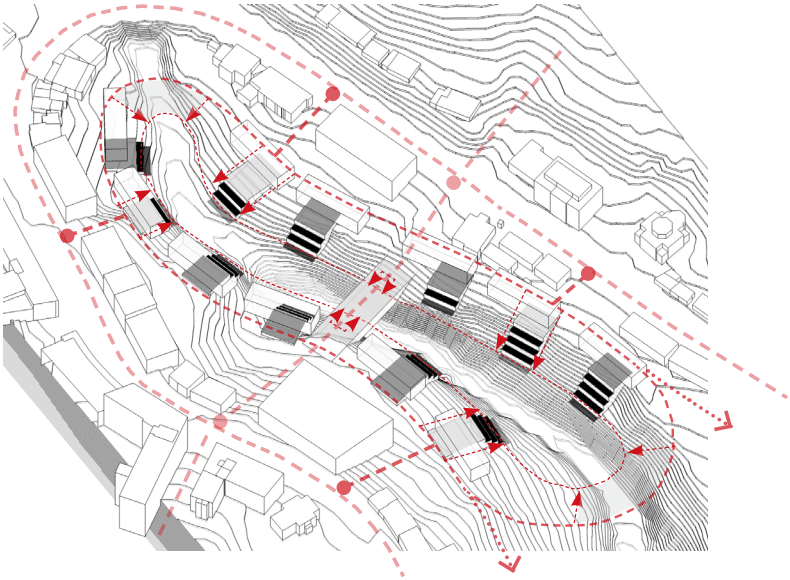
4.2.3 HIERARCHY

AFTER - HIGH ACCESSIBILITY BOTH PHYSICALLY & VISUALLY
Instead of being isolated and introverted, the site is well connected with the city through openings on the street interface.



4.2.3 HIERARCHY

AFTER - PLATFORMS & STREETS IN A CLEAR GRADIENT FROM PUBLIC TO PRIVATE AS THE HEIGHT DECREASES
By creating platforms in a clear gradient from public to private as the height decreases, each space is used by a certain and controlled group, which increases the spatial efficiency.



4.2.4 IDENTITY - PLACEMAKING

BEFORE - DESERTED URBAN GREY ZONE WITH TRASH AND STENCH
The last one is the reinterpretation of social identity by place-making. Before it is just a deserted urban grey zone with trash and stench.

4.2.4 IDENTITY - PLACEMAKING

AFTER - WATERFRONT TERRACE / PERSPECTIVE
Now the river bank is filled with users and activities.

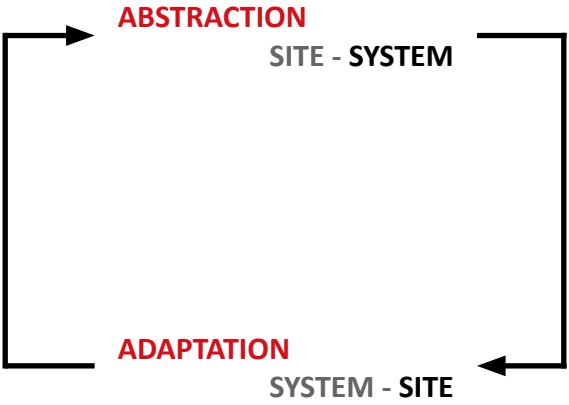
AFTER - ENTRANCE VIEW / PERSPECTIVE
On Haile Selassie Street

AFTER - PUBLIC PEDESTRIAN AXIS / PERSPECTIVE
Cultural & Commercial Center

AFTER - PEDESTRIAN LANE I / PERSPECTIVE
Living in the middle of the city and the nature.

AFTER - RELIGIOUS VISUAL AXIS / PERSPECTIVE
The religious visual axis provide a new scene of the old buildings.

4.3 ON A WIDER SOCIAL CONTEXT

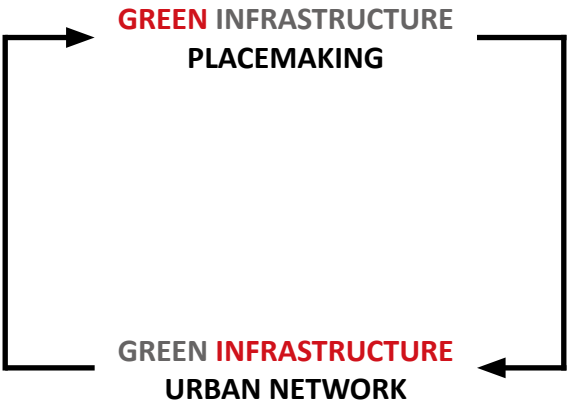

ABSTRACTION
SITE - SYSTEM
ADAPTATION
SYSTEM - SITE

To sum up, I would like to stress three points in my design. One is the abstraction and adaptation process. It is a circle of system and site, of generocity and specificity. Apart from the design for a specific site,

THE 'STITCH' CONCEPT

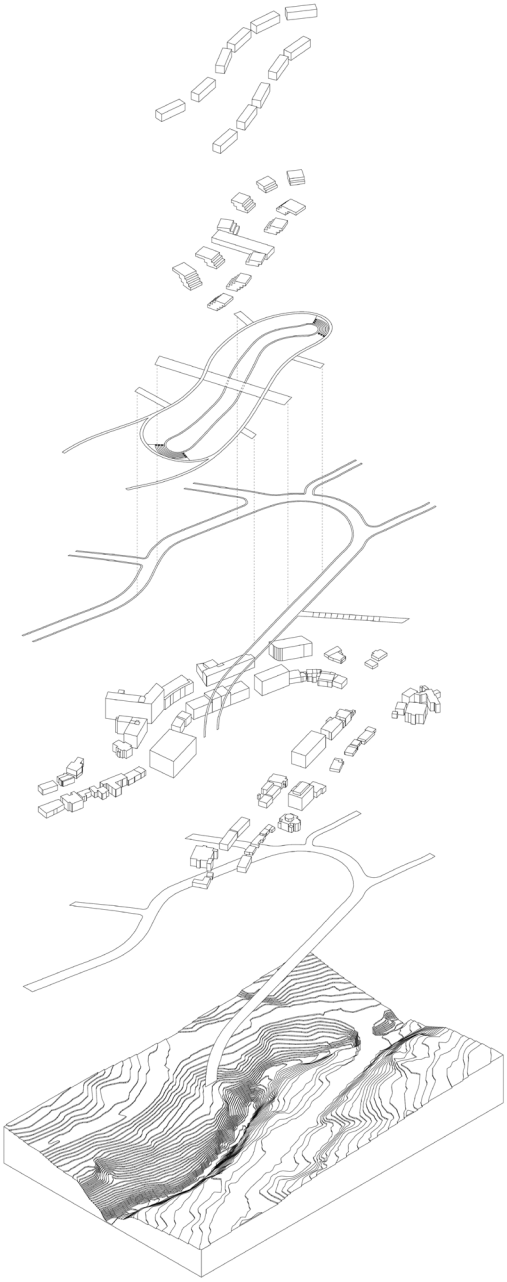
may be adapted to other similar circumstances along the rivers in Addis with its flexibility. They are positioned as a mixed housing complex targeted for the relocation of slums along the river and also the middle class. Different social groups are mixed in the neighbourhood while preserving their unique lifestyles at the same time.


Addis Ababa
Addis Gebeya
Semien Mezagaga
Shola
Abadarin Sefer
Gotam Beyenda
Mekdela Tera
Sebatbet Bihibir
Wolo Sefer
Bole
Kebena
Gulele
Arada
Kirkos
Yeka
Nifas Silk
Lideta
Akaki
Addis Ketema
Kolfe Keranio
Gofa Mifleal
Sarbet
Bulbula Mezoriya
Wello Sefer
Ruwanda
Vatican
Legdha


GREEN INFRASTRUCTURE
PLACEMAKING
GREEN INFRASTRUCTURE
URBAN NETWORK

INTERWEAVING OF URBAN LAYERS

Another point is what green infrastructure can do in both place making and the completion of urban network. It is a case demonstrating the interweaving of urban layer. On the one hand, initiatively introducing the users and activities to the renovated site helps to activate the site and turn the urban grey fringe into **PLACE**, which **EXPANDS THE CITY IN AN INNOVATIVE WAY**. On the other hand, rivers, as an important component of **GREEN INFRASTRUCTURE**, will again play an active role in environmental and social benefits. The renovated urban layer integrates into the existing urban fabric and further **COMPLETES THE URBAN INFRASTRUCTURE NETWORK**, which can be a crucial link for social identity.



AFFORDABLE HOUSING

MIDDLE-CLASS DWELLINGS

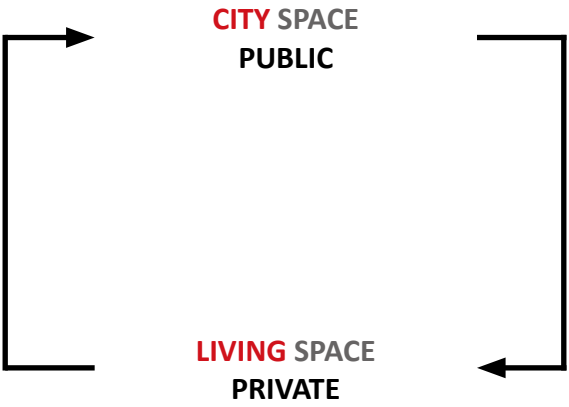
PEDESTRIAN - INTERVENTION

PEDESTRIAN - EXISTING

ADJUSTED SURROUNDING BUILDINGS

MOTOR TRAFFIC

TOPOGRAPHY


CITY SPACE
PUBLIC
LIVING SPACE
PRIVATE

CITY SPACE & LIVING SPACE

Many urban development plan nowadays provide a lot of compact point buildings, with huge structures intrude massively into the urban fabric. They may tower up high and create impenetrable, insurmountable walls in the middle of the city space as real barriers. Considering the traditional living and social contact pattern, my design is quite the opposite by providing possibilities for making contact with the outside space and the urban environment, which gives the feeling of LIVING IN THE MIDDLE OF THE CITY. City space and living space **INTERMESH RATHER THAN CONTRADICT**. Privacy does not mean shutting the city off and fencing oneself in. Each living world is inseparable from the others, they are open for each other and give people the feeling of openness and free. The in-between layer guarantee **THE CONTINUOUSNESS BOTH IN CITY SPACE AND URBAN LIFE**. It is accessible to a lot of people, and privacy for living is still ensured by soft borders such as greening and a clear definition of spatial hierarchy.

BIBLIOGRAPHY

ABABA, ADDIS. "ETHIOPIA: ADDIS ABABA URBAN PROFILE." (2008).

Jacobs, Jane. The death and life of great American cities. Random House LLC, 1961.

Mamo, Zegeye. Designing the 'Informal': Spatial design strategies for the emerging urbanization around water bodies in Ethiopia. 2015

Marc, Angélil, and Dirk Hebel. Cities of Change: Addis Ababa. Birkhäuser, 2010.

Munir, Younis. Inner City Riverside Development and Land use Transformation: in the context of Addis Ababa. Diss. aau, 2012.

Sherwood, Roger. Modern housing prototypes. Harvard University Press, 1981.

Swenarton, Mark. "Developing a new format for urban housing: Neave Brown and the design of Camden's Fleet Road estate." The Journal of Architecture 17.6 (2012): 973-1007.

GLOBAL HOUSING
GRADUATION STUDIO *2015 -16*

HUIYI QIAN 4402987