



Architecture & Dwelling

TU DELFT | FACULTY OF ARCHITECTURE AND THE BUILT ENVIRONMENT
DEPARTMENT OF ARCHITECTURE | CHAIR OF ARCHITECTURE & DWELLING

GRADUATION PLAN

Master of Architecture, Urbanism & Building Sciences

A - Personal information

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B - Studio

a) Name/theme of the studio:

**Global Housing Graduation Studio:
Addis Ababa Living Lab**

b) Tutors:

Design and Research Tutors:

Dr. Nelson Mota

Ir. Harald Mooij (

Building Technology Tutor:

Ir. Frank Schnater

c) Argumentation of choice of the studio:

The reason I choose this studio is that it provides me with a chance to relate architecture design closely to individual lives since dwelling is where different groups interact. The variation situations of public and private realms with the changing borders and territories in dwelling design make it challenging for me. It intends to give a solution for the affordable housing scheme which can meet the needs for median income or below, which attracts me a lot that I could have the chance to design an inclusive community under a unique cultural context, which should be practical as well as meaningful for a better Addis Ababa living environment. Also, I like to include people, activities into architecture research since the studio tends to use visual ethnography, participatory design, also typologies study as methods, which inspire me a lot.

C - Graduation Project

From Home to Home

Towards an inclusive, mixed and updatable community

C.1 _ Goal

In this section, you should identify the project location (in our case Addis Ababa, Ethiopia) and answer, as clearly as possible, three questions:

a) Problem Statement

Introduction

Ethiopia's population will increase sharply in the future and the center of this demographic boom is the capital city Addis Ababa. The migrants from the surrounding rural areas contribute most to this demographic change¹, which took accounts for 37% of the population of Addis Ababa. This situation overloaded the infrastructures to a huge degree, from housing shortage, land decrease for agriculture to traffic congestion and poor sanitation². With the urbanization rate around only 20%, more than 88 million people live in rural areas³, which means that there would be more influx of people from rural to urbanized city in the following decades. As the migrant city, inhabitants in Addis Ababa from rural areas settled down as mainly low-income groups, seek for better living conditions, such as better jobs and education opportunities. In consequence, burdens on the insufficient infrastructure will get even worse.

Meanwhile, 45 percent of the population, mainly the rural migrants, survive below the poverty line and 80 percent of urban inhabitants live in destitute environments, known as "kebele house" or slums⁴. Addis Ababa is made up of the "informal sector"⁵ mainly by self-initiated construction, and according to the GTZ (Deutsche Gesellschaft für Technische Zusammenarbeit), 80% of the population is living crowdedly at an average density of 2.6 persons per room, 5.4 m² floor area per person, which has already exceeded the bearable limit (the average occupancy rate is 6.5 m² per person)⁶. Lower-income settlements are facing the danger of being displaced and relocated during this urban development.

General Problem

Different master plans have been introduced to Addis Ababa since the mid-1900s to solve the housing shortage during the rapid urbanization. However, these plans all share the feature as modern planning by dividing the city into separate districts, which ended up in social segregation⁷. Mixed-use neighborhoods are gradually taken place by a one-goal, large scale projects such as the GHP. These resolutions are hard to address the needs of different users. However, the mixed residential structure has been the characteristic of the indigenous settlement in Addis

¹ Marc Angélil and Dirk Hebel, *Cities of change–Addis Ababa: Transformation strategies for urban territories in the 21st century* (Birkhäuser, 2016). P55

² Angélil and Hebel, *Cities of change–Addis Ababa: Transformation strategies for urban territories in the 21st century*.p55

³ "Rural Population (% of Total Population) | Data," Worldbank.org, 2018, Retrieved from <https://data.worldbank.org/indicator/SP.RUR.TOTL.ZS?view=chart> on 23rd Dec 2019.

⁴ UN Habitat, "Situation analysis of informal settlements in Addis Ababa," *Cities without slums: Sub-regional program for Eastern and Southern Africa* (2007).

⁵ Dachanew Getachew and Ken de Cooman. (2013). Addis Ababa: New Flower? An inverted Utopia. Addis Ababa

⁶ Demissachew Shiferaw, "Self-initiated transformations of public-provided dwellings in Addis Ababa, Ethiopia," *Cities* 15, no. 6 (1998).

⁷ Angélil and Hebel, *Cities of change–Addis Ababa: Transformation strategies for urban territories in the 21st century*.P141

Ababa centuries ago since the city was developed naturally around the king's palace and the camps in an enclosure compound, whose size was defined by the amount of power. The normal citizens then settled down around in a radial pattern, resulting in the city structure that urban poor and rich settled side by side⁸. Under the new housing scheme, this traditional way of Ethiopian living is gradually vanishing.

Low-income take account of over 80% of the urban population⁹ and the situation will be worse as the rural migration continues increasing in the coming years. The general problem is that the Addis Ababa lacks a coherent strategy for mixed-income groups housing, which can properly settle down the rural immigrants as urban poor. It also overlooked the importance of public space as fundamental for social and economic activities, resulting in failing to meet generally the social and cultural needs of the poor and a continuation of the noncoincidence between the lifestyles of different income groups and the housing's physical form. People's lifestyles do not easily adapt well to the built environment and the living quality won't be improved if changed easily¹⁰. For example, most inhabitants have income generation with minor enterprises that closely depended on the relationship with the public realm on the ground floor. Because of this, most condominiums in the GHP with higher floors fail to address the possibility to attract street customers. Most of them consist of dark hallways and there is less connection between exterior and interior. The loss of social spaces and connections which are significant for the low-income groups are the main problem in the residential high-rise buildings in the inner city today. The modernist housing typology is questioned for its poor social and functional support and it brings about the economic challenges for low-income groups¹¹. Mixed Neighborhoods, which involve complicated social ties and special combinations of different income groups, are damaged by the standard, rigid planning methods¹².

Specific Problems

The research site Gerji is sixteen kilometers away from the city Centre, one of the relocation sites chosen by government planners. It is in the southeast of the city near the Bolle international airport. The site is near the Bole airport and city ring road with a good connection to the city center and surrounding commercials. A Korean hospital and a university are adjacent to the site on the northwest. The existing housing project was constructed from the 1980s under the management of FHC with 319 plots and an average density at 143 p/ha. The residences got the subsidized houses here due to their contributions to the army¹³.

There are two main income groups living in the site now, 90% of them are middle-income groups and the rest are low-income groups. The different lifestyles of them were observed during the field trip that middle-income works out in the other part of the city and commute with private cars. Most of the housework is done by the servants. They have relatively larger houses and private extensions. However, low-income groups only live crowdedly in small studio types without decent jobs. The living environment of them is impoverished with poor sanitation. The specific problem is that different lifestyles of different income groups were not properly addressed. For example, the habitual horizontal expansion of middle-income people

⁸ Felix Heisel, "Housing Typologies: A Case Study in Addis Ababa," in *Building Ethiopia: Sustainability and Innovation in Architecture and Design. 1* (AAU; EiABC, 2012). P1

⁹ Habitat, "Situation analysis of informal settlements in Addis Ababa." P25

¹⁰ James Holston, *The modernist city: An anthropological critique of Brasilia* (University of Chicago Press, 1989).

¹¹ Alazar G Ejigu, "Socio-spatial tensions and interactions: An ethnography of the condominium housing of Addis Ababa, Ethiopia," *Sustainable Cities* 97 (2012).

¹² Angéilil and Hebel, *Cities of change-Addis Ababa: Transformation strategies for urban territories in the 21st century*. P141

¹³ Interviews

occupied much outdoor space which can be a significant support to low-income groups with activities such as income generation. In other words, planners didn't take lifestyles into consideration or took the assumption that lifestyles can be adapted to the environment¹⁴.

Typologically, though the original house was equipped with a modern kitchen at the beginning, almost all the households transform it into a bedroom to create a traditional kitchen in the backyard. The house is set back from the streets to create parking or small garden space in the front, without any space for the domestic income generation activities. With the rapid population growth and densification, the lack of living and working spaces made residences find it hard to consider the original buildings as home which promoted huge community transformations. The one-story, suburban neighborhoods no longer satisfy the huge city densification. The specific problem is that the original Infrastructure, which could connect different territories and income groups, are overloaded by the growth densification.

What's more, the ownership of the houses is held by FHC, so all the families only rent the house from the government, which makes them feel a lack of instability. As a result, all the extensions are made by cheap and temporary materials without much organization which is detrimental to the community.

b) Research Question

To solve the problem of rapid urbanization and population booming from the rural areas that how these migrants can settle down properly to benefit the city's development, I started with these research questions.

How can an inclusive community offer affordable housing for people from different income groups, sharing different lifestyles within the context of urban densification and Ethiopian culture?

Sub.

A. To what degree the borders and territories of the public and private realm could be divided and mixed?

B. In which ways different income groups define places as "Home"?

C. How existing urban fabric work as a container for social interactions and what are the existing patterns of collective activities?

c) Design Assignment

Learning from the experience and weakness of the existing projects, I propose a design that could pay sufficient attention to the differences within income groups such as the family size, age group, religious background. As a designer, I should understand and integrate the life of the urban poor which have a complex web of social networks and make them live harmoniously with the affluent neighbors. As an inclusive community, a culture of community where all residents have equal rights to community space should be created according to the book "Right to the City"¹⁵. There should be the equal right to appropriate, the right to participate, the right to diversity, among which participation is the most important¹⁶. By encouraging diversity, respect for different cultures can be promoted. By appropriation, residents

¹⁴ Ejigu, "Socio-spatial tensions and interactions: An ethnography of the condominium housing of Addis Ababa, Ethiopia." p100

¹⁵ Henri Lefebvre, "The right to the city," *Writings on cities* 63181 (1996).

¹⁶ Mark Purcell, "Possible worlds: Henri Lefebvre and the right to the city," *Journal of urban affairs* 36, no. 1 (2014).

could feel significant connections to their communities, and residents can shape outcomes for the communities and a sense of belonging by participating.

One way to determine if residences have better participation in mixed-income housing projects is to examine the infrastructure in place since infrastructure that can be shared by different groups can become communal. For example, markets and other commercial spaces are where different social groups meet and integration strategy should not conflict with participation.

The design should propose a certain typology that can keep open spaces in the community for collectives' activities and social interaction, especially for low-income groups. Based on the analysis of the function of existing extensions which are mainly the traditional kitchen and storage which occupied shared open spaces, I propose a traditional service core for the kitchen that can organize the social daily life for low-income groups horizontally. The service core can be the center of collective activities and create a porous border connected to the other functional volumes. The traditional core could also implement with the water collections for each cluster and use environmentally technologies to reduce waste and improve climatic conditions. Designs should also consider incremental development strategies and a more direct partnership with the community, which brings interactions for different groups during the process of updatability.

C.2 _ Process

In this section, you should identify the methods and processes that you'll use in your graduation project, as follows:

a) **Method description;**

In the research stage, the design project is about daily life related to a specific site in the city with a unique context. To fully understand the living pattern of different income groups and the traditional way of living, qualitative methods rather than quantities should be adopted. I start the research based on the site survey through a process of fieldwork, interpretation, and representation among different income groups. As the "Fieldwork" is about "lived interactions, participatory experience and embodied knowledge", it emphasized the social production of art, blurred boundaries between high and low art forms¹⁷. During the fieldwork, I chose the methods as interviewing, photographing, video shooting and architectural drawings. As we interviewed the family members, we also used sketches and photography to record the surrounding environments. Cognitive mapping is another method I chose, which can help is represent how persons perceive the relationships between space and place. It also helps in understanding the social and physical features of the physical and built environment¹⁸. As a method, it has been used to geographically record a person's memories and perspectives of a place and has been advocated within art education as a critical tool for understanding spatial literacy, sense of place, and the built and social environment¹⁹. To represent the life patterns of Gerji, we analyzed and interpreted the data involves systematically searching, arranging, and categorizing all collected materials to understand patterns, themes in relation to the research questions. Mapping the infrastructure structure and social networks help explore spatial typologies that can adapt to new development, which could be a basis for future design.

In the design stage, I use hand sketch, digital mapping and draft model making to develop the initial design proposal. The design process with key decisions

¹⁷ K Freedman, "The social reconstruction of art education: Teaching visual culture," *Making schooling multicultural: Campus and classroom* (1996).

¹⁸ Kevin Lynch, *The image of the city*, vol. 11 (MIT press, 1960).

¹⁹ June King McFee and Rogena Degge, "Art, culture, and environment: A catalyst for teaching. Dubuque, IA: Kendall," (Hunt Publishing, 1980).

will be supported also by parallel literature design and digital model making with rendering, the physical model will be methods to represent the design results.

b) Literature and general practical preference;

Literature

- Alexander, Christopher. *A Pattern Language: Towns, Buildings, Construction*. Oxford university press, 1977.
- Angéllil, Marc, and Dirk Hebel. *Cities of Change—Addis Ababa: Transformation Strategies for Urban Territories in the 21st Century*. Birkhäuser, 2016.
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- Bhatt, Vikram, and W Rybczynski. "How the Other Half Builds." *Time-saver Standards in Urban Design*. McGraw-Hill, New York 1, no. 1 (2003).
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- Chermayeff, Serge, and Christopher Alexander. *Community and Privacy: Toward a New Architecture of Humanism*. Doubleday, 1963.
- Edwards, Brian, Magda Sibley, Peter Land, and Mohamad Hakmi. *Courtyard Housing: Past, Present, and Future*. Taylor & Francis, 2006.
- Ejigu, Alazar G. "Socio-Spatial Tensions and Interactions: An Ethnography of the Condominium Housing of Addis Ababa, Ethiopia." *Sustainable Cities* 97 (2012).
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- Jacobs, Jane. "1993, the Death and Life of Great American Cities, Modern Library Ed." Random House, New York, 1961.
- Lefebvre, Henri. "The Right to the City." *Writings on cities* 63181 (1996).
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- Momoyo Kaijima, Laurent Stalder, and Yū Iseki. *Architectural Ethnography Japan* TOTO Publishing, 2018.
- Pfeifer, Günter, and Per Brauneck. *Courtyard Houses: A Housing Typology*. Walter de Gruyter, 2007. *Row Houses: A Housing Typology*. Walter de Gruyter, 2007. *Town Houses: A Housing Typology*. Walter de Gruyter, 2012.
- Purcell, Mark. "Possible Worlds: Henri Lefebvre and the Right to the City." *Journal of urban affairs* 36, no. 1 (2014): 141-54.
- Rudofsky, Bernard. *Architecture without Architects: A Short Introduction to Non-Pedigreed Architecture*. UNM Press, 1987.
- Sanoff, Henry. *Community Participation Methods in Design and Planning*. John Wiley & Sons, 1999.
- Sennett, Richard. *Building and Dwelling: Ethics for the City*. Farrar, Straus and Giroux, 2018.
- Shiferaw, Demissachew. "Self-Initiated Transformations of Public-Provided Dwellings in Addis Ababa, Ethiopia." *Cities* 15, no. 6 (1998): 437-48.
- Tipple, Graham, and Kenneth G Tipple. *Housing the Poor in the Developing World*. Routledge, 2003.
- Turner, JF. "C;(1976) Housing by People." *Towards Autonomy in Building Environments*. London. Marion myers.

Practical Precedents:

1. CIDCO Public Housing, Navi Mumbai
<http://www.pkdas.com/cidco-public-housing-navi-mumbai-project-8-1-35.php>
2. Aranya Low-Cost Housing, Indore, India, by Balkrishna Doshi's
<https://www.cca.qc.ca/en/articles/issues/12/what-you-can-do-with-the-city/58317/balkrishna-doshis-aranya>
3. RHIZOME
A growing horizontal stem of affordable housing in Menen, Addis Ababa by Paolo Turconi, Arianna Fornasiero
<https://divisare.com/projects/373479-paolo-turconi-arianna-fornasiero-rhizome>
4. Anna Heringer by Desi
<https://divisare.com/projects/127081-anna-heringer-kurt-hoerbst-team-rudrapur-b-k-s-inan-desi>

The reason that I chose these kinds of literature and precedents is that they include the knowledge about affordable housing, mixed-income strategy, community design methods to urban planning in the Global South, they also offer inspirations about how to design under specific cultural contexts and how to integrate design with the local materials and lifestyles. Taking these as references would help a lot in the through the design process.

C.3 _ Relevance

Ethiopia is going through rapid urbanization and population growth in the recent two decades with lots of migrants from the rural areas, resulting in a dramatic housing shortage. The rural migrants settled down as low-income groups to seek for better job and education opportunities. However, large scale and standard planning methods have been applied which ignored the traditional way of living and social segregation among different income groups. The same situation happens also in many other developing countries in the Global South, where affordable houses are demanded. By exploring an affordable housing scheme for mixed-income groups, this project is trying to find a way to create an inclusive community where different income groups can cohabit and have equal rights to participation, diversity, and appropriation. Residents could feel significant connections to their communities, and residents can shape outcomes for the communities and a sense of belonging by participating. The design will research how different income groups define places as home and to what degree private and public realm could be mixed to create coherent living quality for all income groups. World widely, mixed neighborhoods which involve complicated social ties and special combination of different income groups, are damaged by the standard, rigid planning methods, resulting in larger social segregation as well. This project can contribute to rebuilding an inclusive and resilient urban form.

C.4 _ Time planning

Ms3 Design Research

Week1.1-1.7

- The research output of the architectural graphic novel in Rotterdam.
- Literature study of Richard Sennett's Building and Dwelling: Ethics for the City
- Soft data research about Ethiopia's politics, history, religious and arts

Week 1.8

- Final Presentation and discussion of the outcome: Design Research and Projective Mapping.

Week 1.9- 2.1

- Field Trip in Addis Ababa

Week 2.2-2.3

-Formalize the problem statement and research questions
Design hypothesis with initial strategy.

Week 2.4

-P1 presentations and feedback

Week 2.5-2.7

-Reflection on P1
-Elaboration of individual preliminary design (Urban strategy/ Typology/
Materialization
-Development of urban strategy design
-Literature Research

Week 2.8

-P2 presentation and feedback

Week 2.9-2.10

-Consultations for P2 retake (if necessary)

Week 3.1-3.4

-P2 retake (if necessary)
-Reflection on P2
-Elaboration of the individual design and literature research
-Technical design
-Comparative analysis and design proposal
-Development of dwelling floor plans, sections, and precedents studies.

Week 3.5-3.6

-Finalize dwelling floor plans
-Detail drawings 1:20 1:5
-Architectural ethnography for the future vision
-Complete 3D-model

Week 3.7-3.8

-Preparation for P3
-P3 presentation

Week 3.9-4.1

-Reflection on P3
-Improvements of plans/sections/elevations 1:100 1:50
-Adjustment for urban plans
-Finalize the BT details
- Assemble research booklet

Week 4.2-4.3

-Finalize research booklet
-Finalize architectural drawings

Week 4.4-4.5

-Preparation for P4 presentation
-P4 presentation

Msc4 phase 3 – preparation final presentation

Week 4.6-4.10

- Build the final physical model
- Prepare for final posters and presentation
- P5 Presentations

C.5 – List of References

Bibliography

- Angélil, Marc, and Dirk Hebel. *Cities of Change–Addis Ababa: Transformation Strategies for Urban Territories in the 21st Century*. Birkhäuser, 2016.
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