TUDelft

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:
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c) Argumentation of choice of the studio:

I always feel dwelling is a topic that is most related to people, in comparison to other building types (which in all senses will be more public orientated, rather than domestic). The words "dwelling" and "people", in this context, refer to "home" and "family". This most intimate relation between architecture and people is mainly the reason I chose to do my graduation project with the Chair of Dwelling.

The site for Global Housing this year, Addis Ababa, is offering a challenge situation of urgent housing needs under limited resources and infrastructures. It requires a down-to-earth design approach, bringing the whole graduation project to a more realistic position, rather than purely paperwork. And also, most obviously, it is something good to do, as architecture is not only for the rich, but should be for all.

C - Graduation Project

Co-habitable densification:
towards the collective welfare between original and new dwellers

C.1 _Goal

a) Problem Statement:
The problems mentioned hereinafter are mainly in regards to three aspects, of the city Addis Ababa, of the site Gerji, and of the Integrated Housing Development Program (IHDP, as the prevailing housing solution for the tensions between the previous two).

- General Problem:
  Ethiopia, with 84% of its population still live in rural areas, is one of the least urbanized countries in the world. Its capital Addis Ababa hosts nearly 4 million people, 1/5 of the country's urban population. [1] The number keeps on increasing rapidly with a population growth rate of 2.9%, contributed by 1.21% natural increase and 1.7% migration[2]. All these factors have led to a resultant housing shortage. Currently, 80% of the urban residents of Addis live in informal housings, while 25% of them are in an overcrowded situation.[3] The topic of urban densification thus has been brought to the table.

  However, Addis Ababa was "never planned to be a city"[4], therefore also not built in that way. Lacking urban construction that normally came with European colonization, the city now still faces a challenge of building basic infrastructures like water supply, sanitation, transport, drainage, and health facilities.[5] 25% of the rubbish generated is dumped on the street, drainage channels or vacant plots.[6] And 28.6% of the households experience frequent disruption of water supply, while 23.9% of them have no access to toilet facilities.[7]

  To solve the problems of the housing shortage and insufficient infrastructures, the Municipality of Addis Ababa carried out an urban renewal program in 2003, which is consisted of two major plans. The first one focuses on the redevelopment of high densified city center, replacing previous slum areas with commercial or office development. And the second is about relocating involved residents from the city center to outskirts while also housing urban poor and newcomers, by the Integrated Housing Development Program (IHDP), where condominium housing plays an important role.[8] "The move-out" and "The move-in" are the primarily affected groups during this process (sometimes they are the same group of people).

  "The moved-out", as residents affected by urban upgrading projects, are often offered with two options depends on their financial capacities: either to purchase a guaranteed condominium unit or to be relocated to other low-rent Kebele housings.[9] Nonetheless, the condominium is only affordable to about 20% of the

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[1] World Bank. "Rural population (% of total population) – Ethiopia" (2019).

[2] AK Bihon, "Housing for the Poor in Addis Ababa," (2006).

[3] Mulatu Wubneh, "Addis Ababa, Ethiopia – Africa's Diplomatic Capital," *Cities* 35 (2013/12/01/ 2013).

[4] Jenni Marsh, "Skyscrapers, Trains and Roads: How Addis Ababa Came to Look Like a Chinese City," *CNN* 2018.

[5] Sascha Delz, "Ethiopia's Low-Cost Housing Program – How Concepts of Individual Home-Ownership and Housing Blocks Still Walk Abroad," in *No Cost Housing Conference, Zurich, Switzerland, June 30 - July 1, 2016* (ETH Zürich, 2016).

[6] Bihon.

[7] .

[8] Wubneh.

[9] Yonas Alemayehu Soressa and Iman Mahmoud Hassen, "Chapter Three: Inner-City Dwellers and Their Places in the Context of Addis Ababa's Urban Renewal," (2018).

people living in Addis,[10] and the rental option of Kebele housing will eventually disappear if all the inner-city informal areas are cleared as the city plan suggests.[11]

For the ones move into condominium housings, although it succeeds in providing a large number of housing units within a short time period, the practice over ten years has also shown that it failed to meet the initial expectation of improving the dwellers' living standard. The problems occurred are mainly on three aspects: the substandard construction[12]; the resold or illegally leased units with exorbitant price[13]; and other social and economic related problems, like residents being dislocated from their jobs and original communities; children have to relocate to a different school; rising living and transportation cost while home production activities are weakened as well as safety concerns.[14] Tensions between old and new dwellers also come up. The new dwellers often find it hard to join the surrounding community.[15]In some cases, they are even been seen as invaders. [16]

- Specific Problem:
  Zooming into the site of Gerji (Bole sub-city woreda 14), it has an inner-city location which is close by the newly refurbished Bole International Airport, connected to the ring road by a four-lane street. The existing houses on the site were built in the 1980s by Federal Housing Corporation, consist of 319 single-floor households with 3 typologies. There is a clear need for redevelopment, under the pressure of overall urban densification.

  The specific problems observed during the site visit could be grouped into two interrelated categories: public space and domestic space, taking the self-built fences as splitting points.

  For the public space in Gerji, in terms of the urban fabric, the current internal streets are evenly distributed, intersecting with the outer streets in an identical way regardless of their completely different characteristics. These crude street intersections allow accessibility for all and increase the publicity of the inner part of the site, resulting in the lack of privacy and a more practical burglary problem. The major public spaces within the site are as well poorly defined. The streets are too wide, lacking layers and shades. (This is partly because the inhabitants tend to park inside their own yards in consideration of preventing burglary.) The unfavorable factors aforementioned, have led to the results of fence construction and the unwillingness of staying in public space thus eventually weakened the social interaction.

  Inside the fences, the specific problems for domestic space are less visible than the ones for public space, as the dwellers have solved most of them by building extensions during almost four decades of dwelling, although often with substandard quality. Most of the extensions have an outdoor toilet and a larger kitchen that meets the need of cooking traditional Ethiopian food. This reveals the same kind of neglection of the old lifestyle in the original low-cost housing units with condominium housings, which suggests the dwellers can easily adapt to a modern

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[10] Wubneh.
[11] Soressa and Hassen.
[12] Homes are often transferred to prospective owners with only 80–90% of the work completed, with home owners to do the finishing work.
[13] For the poor to own property, unfair
[14] Wubneh.
[15] Soressa and Hassen.
[16] Alazar G Ejigu, "Socio-Spatial Tensions and Interactions: An Ethnography of the Condominium Housing of Addis Ababa, Ethiopia," 97 (2012).

way of living. The extensions sometimes also consist of bedrooms for the overcrowded houses. It took space from the courtyards and a service back alley from the original scheme, which in a sense is the appropriation of public space.

- Conclusion
  To conclude, the general problem is: <u>The increasing housing backlog in Addis Ababa leads to an as well on-going and fast-pace urban densification, which is taking the construction of condominium housings as its main approach. However, this approach has been proved failing to provide an integrated housing solution for both the needs of original and new inhabitants, either improving their life qualities as the initial intention should be.</u> It is a crude product on perusing of merely speed and low-cost, with neglection to many other aspects, which has resulted in the series of problems above-mentioned, especially the loss of community and the generation of spatial and social segregation.

  Contextualize the general problem to Gerji, as a representative case in this background. The specific problem there is to find <u>an alternative solution of densification, which should be able to solve the current deficiencies on the site (problems of now), meanwhile avoiding the mistakes condominium housing has made and meet the expectations from the city level (problems of future).</u> The thing to stress here is the rebuild of community among the locals and new inhabitants.

b) Research Question:

- General research question:
  How to achieve collective welfare between the locals and new inhabitants, by creating a co-habitable community under the context of urban densification and infrastructure upgrade?

  Sub-questions:
  1. What are the common and conflicting concerns of old and new inhabitants?
  2. To what extent the site should be densified?
  3. What are the essential infrastructures that are needed for a good quality of life, and how to build them?

c) Design Assignment:

Gerji sits on a larger residential area to the southeast of the city center, with Korean Hospital, Good News Church and a middle school to the north. and the planned Adwa park to the south. According to the masterplan of Addis Ababa in 2017[17], the site is proposed with mostly high-density mixed residence (R-3) on the southern border and medium density mixed residence (R-2) for the rest. The former requires a Floor area ratio (FAR) from 5 to unlimited, and a high limitation of 70m, while the latter is much lower with 0.5 to 3.5 for FAR, and 35m for height limitation.

Under these preconditions, the design is looking for an integrated housing project which meets the city-wise deification need, without neglecting the (physical and mental) needs of its inhabitants. Both the old and new dwellers should be included in the considerations, being provided with proper low-cost dwellings, which could improve their life qualities and allow them to home with. Based on that, the next goal is to encourage social interaction by architectural approach, thereby to generate a new happy community, and eventually develop a way of "co-habitable densification".

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[17] Land Use Map and Building Height Map proposed by Addis Ababa City Planning Project Office, 2017

C.2 _ Process

a) Method description：

- Research Method
  Among the three fundamental elements of any research project: context, method, and theory,[18] context will drive my work. Thus, my research on developing a way of co-habitable densification in Addis Ababa will be a context led research.

  Context" is used to describe what the subject of research is, how it is located (where the idea of "location" has an open meaning) and what its boundaries are.[19] In my research, the "context" is much about the housing (as well as the life inside) situations of Addis Ababa, which will address the housing shortage and solution of the city, and the lifestyle and aspirations of the people. I am looking for both the typical and unique situation, in particular around the area of my site "Gerji".

  When the "context" comes to the housing shortage, its boundary is of different scale, from city-wise to site-wise. The exact number of housing shortage among the whole city could be calculated with the help of several databases, which will give an idea of the pressing background. And the current housing capacity of "Gerji" could be roughly calculated through google earth satellite image (the informal extensions could cause confusion). Its future maximum and minimum capacity are also described in the Land Use Map and Building Height Map proposed by Addis Ababa City Planning Project Office in 2017. Yet, the question of to which extent "Gerji" should contribute to the overall housing blueprint, still leaves unsolved, as it is also affected by other social-economic factors that need further research.

  The "context" of housing solution, has a time-wise boundary. It is about the self-initialed traditional housings back in the history, meanwhile the up to date government-led condominium solution. To understand the traditional houses, (in terms of spatial configuration, materialization or construction), and the lifestyle behind it, typology study could be included. It works also to learn from the current three generations of condominium housings. How architecturally they succeed in the cost and speed while failing the other goal of providing a better life for its dwellers.

  As for the people-related "context", in my case, the boundary will be limited in and around the site of "Gerji". It is about observing and interviewing, to understand their lifestyle and aspirations, thereby to offer a guideline or direction of the design, where architectural ethnography could play a role.

  My own research approach would be as well mainly based on these two methods, as they seem to work well within my three "sub-contexts", and form a good combination of subjective (architectural ethnography) and objective (typology) approaches. The former is expected to help with understanding as well as defining the problem and needs, while the latter could look back to the previous practices, therefore, giving a glimpse of the possible solutions.

- Design Method

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[18]Ray Lucas, *Research Methods for Architecture* (London: Laurence King Publishing, 2016), https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=1234834 https://public.ebookcentral.proquest.com/choice/publicfullrecord.aspx?p=4536971, 1 online resource (208 pages) : illustrations (chiefly color).
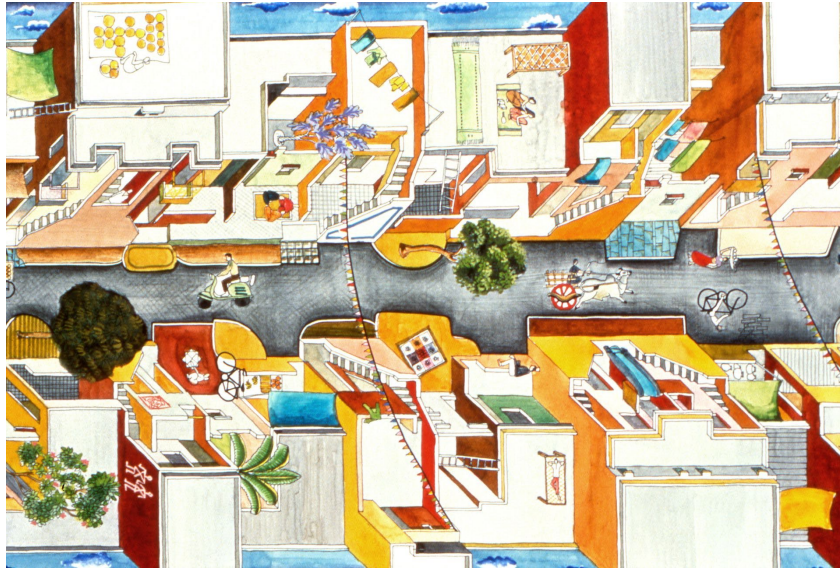[19] *Short.*

The design will use a variety of methods, initialed with the study of previous projects and related theories, then carried on by writing, mapping, sketching, digital and physical modeling.

b) Literature and general practical preference:

Case Study:
- Aranya Low-cost Housing, Balkrishna Doshi

Aranya Township is a site and services project in India, designed by the renowned architect Balkrishna Doshi in the 1980s. The thing fascinates me about this project is the awareness of physical construction as "house" and its essence of being "homes where a happy community lives", as the architect states: "building homes is about creating a sense of belonging, about participatory involvement and about the expression of aspirations, relationships and desires."[20]
A tie between social activities and physical structure is built by adding shared landings, tiny balconies, and open terraces, as well as the steps and ledges of the underlying plinth.[21] In addition to that, it is also about time and temporality, the architect's role of being an initiator instead of a dictator.

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[20] "Revisit: Aranya Low-Cost Housing, Indore, Balkrishna Doshi," The Architectural Review, 2019, https://www.architectural-review.com/buildings/revisit-aranya-low-cost-housing-indore-balkrishna-doshi/10044061.article.
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C.3 _ Relevance

The graduation project itself is looking for a solution specifically for Gerji, but meantime could be easily adapted to other sites (especially the FHC owned one with same original plot size), by means of constructing a structured design system from large urban scale to intimate domestic scale, and varieties of options corresponding to each level. As a case in the overall housing challenges of the developing countries, this project could be an example of using a simple or universal solution to create varieties and efficiency. The relation between space and people, as well as different groups of people, will be tackled, which could help bring a positive social impact.

C.4 _ Time planning

	Week		Progress	Note
Q1	1	1.1	- Design Research and Projective Mapping	
	2	1.2	• Hard data	
	3	1.3	• Soft data;	
	4	1.4	• Spatial Mapping	
	5	1.5	• Housing	
	6	1.6		
	7	1.7		

	8	1.8		
	8	1.9	- Addis Ababa workshop	
	9	1.10	- Site selection & documentation	
Q2	10	2.1		
	11	2.2	- Define problem statement and research	
	12	2.3	questions	
			- Initial design hypothesis	
	13	2.4	P1 PRESENTATION	03-12-2020
	14	2.5	- Preparation of Pechakucha presentation (first	
	15	2.6	version)	
			- Preliminary project	
	16	/	- Develop an urban strategy and architecture	
	17	/	approach	
			- Improvement of Pechakucha based on feedback	
			- Graduation plan	
	18	2.7	- Preparation of drawings, model and slides for P2	
			• Master plan 1:1000 / 1:500	
			• Program	
			• Draft Design 1:200 (plans, sections & elevations)	
	19	2.8	P2 PRESENTATION	14-01-2020
	20	2.9	/	
	21	2.10		
	22	/		
Q3	23	3.1	- Investigation of technological aspects	
	24	3.2	• System drawings (draft)	
	25	3.3	• Details 1:25 / 1:10 (draft)	
	26	3.4	- Finalizing master plan 1:1000 (draft)	
	27	3.5	- Developing selected area 1:500 (draft)	
	28	3.6	- Developing building prototype 1: 200 / 1:100 (draft)	
	29	3.7	- Preparation of drawings, model and slides for P3	
	30	3.8	P3 PRESENTATION	Tba.
	31	3.9	- Improvement of building technology parts based	
	32	3.10	on feedback	
			- Roughly cost calculation	
Q4	33	4.1	- Finalizing design on the selected area and building	
	34	4.2	prototype	
			- Cost calculation	
	35	4.3	Preparation of materials for P4	
	36	4.4	- Drawings:	
			• Master plan 1：1000 (improved)	
			• Plan & Section of selected area 1:500	
			• Street elevations 1:500	
			• Plan, Section & Elevation of building prototype 1:200 / 1:100	
			• Details 1:10	
			• Analysis & Renders	
			- Models:	
			• Site model 1:1000 (improved)	
			• Building prototype model 1:100 / 1:200	
			- Presentation slides	
	37	4.5	P4 PRESENTATION	Tba.

38	4.6	-	Improvement of P4 delivered materials		
39	4.7	-	Completion of drawings and booklet		
40	4.8	•	Detail model 1:50/1:20		
41	4.9	-	Preparation of slides for P5		
42	4.10	P5 PRESENTATION		Tba	

C.5 – List of References

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