

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 Alexander Hewitson 4924843

B - Studio

a) Addis Ababa Living Lab

Global Housing Graduation Studio: Addis Ababa Living Lab

b) Tutors:

Design and Research Tutors: Dr. Nelson Mota Ir. Harald Mooij

Building Technology Tutor: Ir. Stephan Verkuijlen

Delegate of the Board of Examiners: Prof.dr.ir Hans Wamelink

c) Argumentation of choice of the studio:

Since I began my architectural education I have been interested in both socially-minded architecture and the architecture of housing. I attempted to cover both these areas in my bachelor's thesis project at the University of Bath – a home for people living with dementia entitled Dignity + Domesticity. Having participated in studios and design projects covering a diverse range of topics during my master I wished to return to these topics of social architecture and housing for my graduation project. Since my education has been in the UK, Germany and the Netherlands, most lectures and design assignments have focused on issues concerning the Global North (especially Europe and the US). My choice of the Addis Ababa Living Lab studio was strongly motivated by my desire to study the issues concerning architecture, and particularly dwelling, in the Global South. The most rapidly developing economies in the world¹, and the most rapidly urbanizing cities² are all in the Global South. This means not only that these rapidly developing economies will likely experience significant growth in the construction sector, but also that many of the urban challenges facing architects in the future will occur in these countries. Ethiopia is a prime example of a country whose economy is developing rapidly and with a high rate of urbanisation. Additionally, the country and its capital, Addis Ababa, naturally have their own specific challenges. To this end, I chose the Addis Ababa Living Lab as my graduation studio in order to learn about these general and specific challenges and to attempt to tackle some of them through my research and design.

¹ "The fastest-growing and shrinking economies in 2018," *The Economist*, January 5, 2018, https://www.economist.com/graphic-detail/2018/01/05/the-fastest-growing-and-shrinking-economies-in-2018.

² David Pilling, "African cities surge to top of global growth league," *Financial Times*, September 11, 2018, https://www.ft.com/content/9d457d54-b272-11e8-8d14-6f049d06439c.

C - Graduation Project Radical Vernacular — A New Ethiopian Urbanity

C.I _ Goal

a) Problem Statement

a) i. General Problem

Addis Ababa is a city which is experiencing a huge population boom: the city's population almost doubled from 2.38 million in 2000 to 4.59 million in 2019, and is expected to rise to 8.94 million in 2035³. This has resulted in an acute shortage of adequate housing. Moreover, the overwhelming majority of the city's housing can be classified as "slum"⁴. An estimated 40% of Addis Ababa's residents live in 'kebele' housing (owned by the state and managed on a local level by kebele administrations)⁵, attracted by extremely low rents (often lower than 10 Ethiopian Birr (ETB) per month⁶). However, neither the state landlord nor the tenants are financially able to maintain, let alone upgrade, the dwellings, leading to deterioration⁷.

The general problem is that the demand for housing severely outweighs the supply, and as such many people live in housing that is, for various reasons, unsuitable.

a) ii. Site

Addis Ababa's urban structure developed as a result of various masterplans initiated by different governments since its formation in 1886. Each masterplan has added to the rich tapestry that makes up the city's urban fabric, and has resulted in the formation of a "collage of overlapping 'cities' "8. Due to this complex urban structure, Addis Ababa has developed to become polycentric: although a historical centre exists in the Arada district around Mercato and Piassa, numerous sub-centres of varying sizes can be seen throughout the city. Furthermore, the explosive growth experienced in Addis Ababa has meant that areas which could formerly be considered suburban are now located within, or at the edges of, the inner city.

One such area is Gerji. Within the area of Gerji the Federal Housing Corporation (FHC) owns a site of roughly 12.5ha consisting of single-storey, primarily single-family dwellings. The largest visible demographic is mid-income households, although some low-income households reside in informal or semi-formal extensions within the site. This site is intended to be developed by the FHC in accordance with the city's masterplan, which designates the site to be "mixed residential" with the majority of the site having a Floor Area Ratio (FAR) of 0.5, and a maximum building height of 35m. The boundary of the site at the main road to the south-west should have an FAR of 3.5 to 4.5 and a maximum building height of 70m⁹.

³ "Addis Ababa, Ethiopia Population 1950-2019", MacroTrends, accessed November 21, 2019, https://www.macrotrends.net/cities/20921/addis-ababa/population.

⁴ Elias Yitbarek Alemayehu et al, "New Perspectives on Urban Transformation in Addis Ababa", in *The transformation of Addis Ababa*, ed. Elias Yitbarek Alemayehu and Laura Stark (Newcastle upon Tyne: Cambridge Scholars Publishing, 2018), 2.

⁵ Alemayehu et al, "New Perspectives on Urban Transformation in Addis Ababa", 8.

⁶ Yonas Alemayehu Soressa and Imam Mahmoud Hassen, "Inner-City Dwellers and Their Places in the Context of Addis Ababa's Urban Renewal", in *The transformation of Addis Ababa*, ed. Elias Yitbarek Alemayehu and Laura Stark (Newcastle upon Tyne: Cambridge Scholars Publishing, 2018), 99.

⁷ Soressa & Hassen, "Inner-City Dwellers and Their Places in the Context of Addis Ababa's Urban Renewal", 99.

⁸ Elias Yitbarek Alemayehu, "Addis Ababa: A Collage of Cities," in *The transformation of Addis Ababa*, ed. Elias Yitbarek Alemayehu and Laura Stark (Newcastle upon Tyne: Cambridge Scholars Publishing, 2018), 23.

⁹ Addis Ababa City Planning Project Office, "Building Height Plan of Addis Ababa (Final Draft)" (Addis Ababa: Addis Ababa City Planning Project Office, 2017).

The site, which was originally developed in the 1980s has a notably suburban, residential atmosphere, in part due to the FHC's prohibition of commercial activity on the plots. This is at odds with the surrounding area, which has a rich mix of commercial, industrial and residential activity, and the differences between the site and the surrounding area have resulted in a hard, clearly visible border. The site is bordered by main roads, giving opportunities for the incorporation of commercial activity at the edges of the site. To the south-west of the site is Adwa Park, which the current development does not address.

The specific problem is that the site's density and usage no longer address the surrounding conditions and its contemporary position within the wider city, and that the FHC's ownership of the site has not permitted organic development.

a) iii. Morphology

In his reflection on Naples, Walter Benjamin writes "As porous as this stone is the architecture. Building and action interpenetrate in the courtyards, arcades, and stairways. In everything they preserve the scope to become a theatre of new, unforeseen constellations. The stamp of the definitive is avoided." Here Benjamin celebrates the ability of Neapolitan people to constantly adapt and change the built environment which they inhabit, creating an ever changing and dynamic city. This can also be seen in Addis Ababa, where dwellings are frequently adapted by residents to allow for changes in lifestyle, and to make the designed spaces appropriate for inhabitation.

The Integrated Housing Development Program (IHDP) was initiated in 2005 as a continuation of the Addis Ababa Grand Housing Program (AAGHP) in an attempt to address the city's severe housing shortage. The proposed solution was condominium blocks, the demographics of which are mixed – originally intended as replacement dwellings for low-income residents displaced from demolished kebele houses, they are also attractive to midincome groups, due to the lack of available housing in the city. Thus, low-income groups remain in traditional kebele housing, choosing to rent out their condominium apartments to mid-income tenants as a reliable source of income.

The condominium apartments provide sanitary, modern housing, but do not necessarily address the specific and various needs of the inhabitants. Common problems include lack of accessibility for less-abled residents (elevators are often designed but not installed), poor build quality, and a failure to address the living patterns of the intended residents. Moreover, they allow little flexibility for expansion or adaptation, meaning there is less opportunity for residents to add value (financial or living quality) to their homes.

The specific problem is that the high-rise, high-density solutions to the acute housing shortage advocated and practised by the municipality, whilst alleviating some problems with existing kebele and informal dwellings, do not adequately address the needs and desires of Addis Ababa's residents, and do not allow for adaptation and expansion to meet the needs of residents.

a) iv. Identity

The rapid development of Addis Ababa and its explosive growth in population has created a city which arguably lacks a distinctive style. In recent years the construction of high-rise buildings, such as the currently under-construction Commercial Bank of Ethiopia

¹⁰ Walter Benjamin, "Naples", in Reflections: Essays, Aphorisms, Autobiographical Writings, ed. Peter Demetz, trans. Edmund Jephcott (New York / London: Harcourt Brace Jovanovich, 1978), 165-166.

headquarters (which upon completion is expected to be East Africa's tallest building¹¹), have resulted in the certain areas of the city being compared to Dubai¹²: a pejorative comparison insinuating that the city has no character of its own.

The condominium developments of the IHDP are broadly context-less, and due to their inhuman scale do not have a positive impact on the lived experience of the city. Originally designed by the German Technical Cooperation (GTZ)¹³, the design of the blocks, though varied, bears little relation to either the context of Addis Ababa or the wider context of Ethiopia, in which a wide range of vernacular and historical architectural styles exist.

Furthermore, little attention is given to placemaking within the developments of the IHDP. Richard Sennett notes "It's possible to give a space character by punctuating it just as one would a piece of writing." ¹⁴. Such punctuation is noticeably absent in the condominium developments – the spaces around the condominiums are (presumably due to budgetary restraints) left undeveloped following the completion of the apartments, and the buildings themselves do not offer any visual clues to aid in placemaking.

The specific problem is that contemporary development in Addis Ababa does not address the context of the city or the wider country, and as such the city is rapidly losing its character.

b) Research Question

Considering these general and specific problems it is vital to conduct thorough and systematic research in order to develop a proposed solution. Research will address the following problem:

How could the density and living standards afforded by IHDP condominium blocks be matched by different forms of development which...

- a) Acknowledge the context of the site, the city and the country?
- b) Immediately and appropriately accommodate the various and different living patterns of residents?
- c) Provide opportunities for residents to expand or adapt their dwellings as their household incomes and expectations change over time?
- d) Create a strong neighbourhood identity?

c) Design Assignment

The design assignment seeks to address the problems noted above and is drawn from the research conducted. The site is an area in Gerji owned by the FHC and currently occupied by single-storey houses.

The site function should reflect the current reality of the area as a sub-centre of Addis Ababa, and diversity and adaptability of function should be encouraged as a step towards resilience. In particular, the site edges that border main roads should be occupied by

¹³ Sascha Delz, "Ethiopia's Low-Cost Housing Program - How Concepts of Individual Home-Ownership and Housing Blocks Still Walk Abroad," ETH Zürich, Accessed November 23, 2019. https://ethz.ch/content/dam/ethz/special-interest/conference-websites-dam/no-cost-housing-dam/documents/Delz_160530_Low-No-Cost Housing Conference_Paper_Sascha Delz.pdf.

¹¹ Tom Gardner, "'This Is Dubai Now': Nobel-Winning PM's Plan to Transform Addis Ababa." *The Guardian*, October 16, 2019, https://www.theguardian.com/cities/2019/oct/16/this-is-dubai-now-nobel-winning-pms-plan-to-transform-addis-ababa.

¹² Gardner, "This Is Dubai Now"

¹⁴ Richard Sennettt, Building and Dwelling: Ethics for the City (London: Penguin books, 2019), 212.

commercial functions, at least at ground floor level, and the design should address the entrance to Adwa Park to the south-west.

Existing buildings should be replaced with feasible low- and mid-rise, mid-density dwellings to be occupied by the existing low- and mid-income residents, as well as new residents in these income brackets. The density should match that of local condominium developments.

Dwellings should immediately and appropriately accommodate the different and various living patterns of low- and mid-income households in Addis Ababa, whilst allowing for future expansion and adaptations of dwellings as household incomes and expectations change over time.

Dwellings and dwelling clusters should be designed in a way that is mindful of context, not only the immediate context of Gerji, but also the context of Addis Ababa and Ethiopia as a whole, reflecting the demographic make-up and changes experienced in the city.

Material choice should be informed by local customs and expertise, as well as availability of resources, and choices should be made that prioritise the use of local labour and techniques, to aid social sustainability, ongoing maintenance and placemaking.

The scheme will be designed in a way that is appropriate, feasible using the current technologies and with the current level of development in Addis Ababa, informed by local customs and traditions, contextual and of its place, and conscious of the lifestyles and desires of local residents. Nonetheless the design should be contemporary and striking. The proposal will draw on vernacular styles and methods, and will adapt them in a radical way to develop a new Ethiopian urbanity.

C.2 _ Process

a) Method description;

The first research carried out for this project was background research into the historical and contemporary conditions found in Ethiopia, and in Addis Ababa in particular. This focused on four main topics – 'Hard Data' (empirical, quantitative data), 'Soft Data' (divided into the topics of history, religion, politics, art and culture), 'Spatial Mapping', and 'Housing'. This general research was vital in gaining an understanding of Addis Ababa, a city with which the studio group was mostly unfamiliar prior to the commencement of the course.

A study trip to Addis Ababa was organised, which included site visits and the opportunity to engage in a workshop with students from EiABC (Ethiopian Institute of Architecture, Building Construction and City Development). Ethnographic research was carried out during this trip, focusing on the living patterns of people in Addis Ababa, especially those living in and around the chosen site of Gerji. Interviews were carried out with the aid of students from EiABC (who were able to assist with translation) concerning the daily life of residents. It was important to understand how living practices impacted on dwellings and urban spaces, and vice versa, so photographs and field sketches (including measured plans) of important spaces were made. Interviews included questions pertaining to participatory design – rather than conduct full participatory design exercises (which would have been time consuming and would restricted the time spent on ethnographic research) there were simple questions concerning the design of dwellings and urban spaces included in the interviews. Further work concerning living habits was undertaken with the aim of producing an architectural graphic novel about a separate site in Addis Ababa (also in the area of Gerji), which provided useful additional information.

Simultaneously, traditional site analysis was undertaken on location. Due to the scarcity of easily accessible information available about the built environment in Gerji, it was felt necessary to make detailed about the site and its context, noting building heights, programmes and uses, materials, densities and sub-divisions, and roads. This was then supplemented with additional information including local climate, greenery, and local points of interest that could be found in literature.

Fourthly, research into vernacular architecture and traditional construction materials and techniques was carried out. This was undertaken not only in Addis Ababa, but also during excursions and trips to other cities and rural areas in Ethiopia. Due to the project's title *Radical Vernacular* it is vital to have a thorough understanding of the traditional architecture, and how and why it developed. The earth-based construction material Chika, popular throughout Ethiopia, is of particular interest due to its low cost and resilience, and a possible further piece of research-based design will see the construction at 1:1 of a Chika wall section.

Design methods will include the use of certain 'rules', developed in response to issues seen on site in Addis Ababa. These will include, for example, an avoidance of elevators, due to the common practice of omitting the installation of designed elevators due to budgetary constraints. The design will be developed at all scales simultaneously, as construction details should be as important as masterplans and all scales in between. Most importantly, the design will address issues brought up by residents in the interviews.

- b) Literature and general practical preference;
- b) i. General Reference Literature
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- Alexander, Christopher, Sara Ishikawa, and Murray Silverstein. A Pattern Language. New York: Oxford University Press, 1977.
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- Kaijima, Momoyo, Laurent Stalder, and Yu Iseki. *Architectural Ethnography*. Tokyo: TOTO Publishing, 2018.
- Rybczynski, Witold, Vikram Bhatt, Mohammad Alghamdi, Ali Bahammam, Marcia Niskier, Bhushan Pathare, Amirali Pirani, Rajinder Puri, Nitin Raje, and Patrick Reid. *How the Other Half Builds*. Montreal: Centre for Minimum Cost Housing, 1984.
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Weldemariam, Samuel Sahle. "Success of high-rise residential condominium housing

development program in meeting its objectives and its liveablity in Addis Ababa: A case of Bole sub city." *Journal of Georgraphy and Regional Planning* 10, no. 5 (May 2017): 92-109. https://doi.org/10.5897/JGRP2016.0595.

b) ii. Reference Projects

Quinta Monroy Incremental Housing, Chile. Elemental, 2004.

This housing project by Chilean firm Elemental is a precedent for incremental housing, where the architect has designed a basic unit, or nucleus. Director Alejandro Aravena reportedly argued that the money assigned to the project did not allow for the building of a complete, "good" house, so rather than designing a whole "bad" house, the firm designed "half a good house" which could then be expanded and adapted as the inhabitants financial circumstances improve.

Donnybrook Quarter, London. Peter Barber Architects, 2006.

Peter Barber Architects designed this low-rise, high-density housing scheme in London as a counterpoint to the usual high-rise developments seen in the city. The scheme focusses on the street and public space, aiming to create a community of residents.

Gando Teachers' Housing, Burkina Faso. Kéré Architecture, 2004.

Making use of traditional materials, this scheme interprets the vernacular architecture of the region and adapts it in an innovative and climate-responsive way. Barrel-vaulted roofs with alternating roof heights allow ventilation into the dwellings, and the simple design of the units enables various configurations of houses.

SOS Children's Village, Djibouti. Urko Sanchez Architects, 2014.

Designed as safe space for children, this project provides 15 houses for families in a walled compound in Tadjoura, Djibouti. The project references the traditional North African medina but is constructed of modern materials. Narrow streets and close proximity of buildings provide shade, and the varied placement of the near-identical units creates the illusion of variety whilst minimising design and construction costs.

Traditional Chika Houses, Ethiopia.

Vernacular dwellings seen in Northern Ethiopia (both in rural and urban locations) are often constructed of *chika*, an earth-based material applied over a low-cost timber (often now Eucalyptus) frame. Whereas modern concrete buildings seen in Addis Ababa are often showing serious signs of damage after only a few decades, the traditional chika buildings are able to survive much longer. Not only are repairs cheap and easily applied, but the material is long-lasting, if applied properly. Chika-built monasteries on the islands close to the city of Bahir Dar have reportedly been standing for over 400 years without repair work being necessary.

C.3 Relevance

Although my project is specific to the site in Gerji, Addis Ababa, the problems which the project is intended to address are common to many rapidly urbanising and developing cities in the Global South, and indeed could be seen to be relevant to some cases in the Global North.

The general problem that the project addresses is that the demand for housing in Addis Ababa severely outweighs the supply, and as such many people live in housing that is, for

various reasons, unsuitable. This situation is common to many developing countries, as rapid urbanisation entices people to cities, but the housing stock can not be increased at the same rate as rural-urban migration.

The first site-specific problem is that the site's density and usage no longer address the surrounding conditions and its contemporary position within the wider city, and that the FHC's ownership of the site has not permitted organic development. The lack of density that can be seen in the Gerji site is not an isolated case, and this challenge exists in many other areas of Addis Ababa, and indeed in many developing cities (though not all – there are of course cities such as Dhaka where the reverse is true). Again due to the rate of urbanisation, the density at which housing was built in many cities is not appropriate for the contemporary urban conditions.

The second specific problem is that the high-rise, high-density solutions to the acute housing shortage advocated and practised by the municipality, whilst alleviating some problems with existing kebele and informal dwellings, do not adequately address the needs and desires of Addis Ababa's residents, and do not allow for adaptation and expansion to meet the needs of residents. This challenge has existed for decades, and the effects can be seen in the Modern responses to urbanisation in many developed cities, where high-rise, high-density solutions to housing problems created new slums (for example the Smithsons' *Robin Hood Gardens* in London or *Le Vele di Scampia* in Naples). However, as can be seen in Addis Ababa, the response to housing shortages are still similar to the responses implemented in the mid-20th century, and the effects may well be the same. This project intends to show that a similar density can be achieved through low-rise development which may not be fraught with the social issues that have long plagued high-rise residential schemes.

Finally, the third specific problem is that contemporary development in Addis Ababa does not address the context of the city or the wider country, and as such the city is rapidly losing its character. This is a problem of globalisation and can be seen in developed and developing economies across the globe – cities which once had a distinct and unique character now have the same shops, businesses and fashions, and "landmark buildings" by the same starchitects. Though the specific solutions would clearly be different for each city, by using Addis Ababa as an example, this project aims to show that contemporary buildings can still have something to say about the city in which they are built.

C.4 Time planning

Wk01 02.09:	Studio introduction. Site visit for graphic novel – Rotterdam.
Wk02 09.09:	Research booklet – "Soft Data". Graphic novel – storyline.
Wk03 16.09:	Research booklet – Politics in Ethiopia. Graphic novel – storyline.
Wk04 23.09:	Research booklet – Politics in Ethiopia. Graphic novel – drawings.
Wk05 30.09:	Research booklet – Politics in Ethiopia. Graphic novel – drawings.
Wk06 07.10:	Research booklet – Politics in Ethiopia. Graphic novel – drawings.
Wk07 14.10:	Research booklet – Politics in Ethiopia. Graphic novel – drawings.
Wk08 21.10:	Finalise graphic novel and Soft Data research booklet.
Wk09 28.10:	Study trip – Addis Ababa & Gondar
WkI0 04.11:	Workshop – Addis Ababa

- Wk I I I I I I: Study trip Addis Ababa, Bahir Dar, Lalibela
- Wk12 18.11: Consolidate material from study trip.
- Wk13 25.11: PI Prepare outline drawings and written Thesis Statement.
- Wk14 02.12: PI Presentation
- WkI5 09.12: P2 Prepare Thesis Statement video.
- Wk16 16.12: Urban strategy and concept. Dwelling units.
- Wk17 23.12: Holiday
- Wk18 30.12: Holiday
- Wk19 06.01: P2 finalise drawings and model. Prepare presentation.
- Wk20 13.01: P2 Presentation
- Wk21 20.01: Evaluate P2 comments. Make any necessary urgent changes.
- Wk22 27.01: P3 Finalise urban strategy (1:1000 scale) and construction phasing.
- Wk23 03.02: Holiday (P2 retake if necessary)
- Wk24 10.02: Dwelling units. Make working models (1:100) and drawings.
- Wk25 17.02: Dwelling units. Consider building technology (BT) aspects.
- Wk26 24.02: Dwelling units. Working models and drawings, incorporating BT aspects.
- Wk27 02.03: Dwelling units and urban strategy. Site model (1:1000).
- Wk28 09.03: P3 Presentation model (1:100 or 1:50).
- Wk29 16.03: P3 Drawings (plans, sections, elevations, details) and visual materials.
- Wk30 23.03: P3 Finalise drawings and model. Prepare presentation.
- Wk31 30.03: **P3 Presentation (tbc)**
- Wk32 06.04: Evaluate P3 comments and revise design as necessary.
- Wk33 13.04: Design development (all scales). Working models and drawings.
- Wk34 20.04: Design development (all scales). Working models and drawings.
- Wk35 27.04: Design development (all scales). Begin presentation and site models.
- Wk36 04.05: P4 Presentation models as necessary or continued design development.
- Wk37 11.05: P4 Drawings (plans, sections, elevations, details, axo) and visual materials.

Wk38 18.05: P4 – Finalise drawings and models. Prepare presentation.

Wk39 25.05: P4 Presentation (tbc)

Wk40 01.06: P5 – Presentation models.

Wk41 08.06: P5 – Drawings (plans, sections, elevations, details, axo) and visual materials.

Wk42 15.06: P5 – Finish and print (if necessary) final presentation.

Wk43 22.06: **P5 Presentation (tbc)**

C.5 _ Bibliography

- Addis Ababa City Planning Project Office. "Building Height Plan of Addis Ababa (Final Draft)". Addis Ababa: Addis Ababa City Planning Project Office, 2017.
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