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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
Daniela Míková
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B - Studio
a) Name / theme of the studio:

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

b) Tutors:
Dr. Nelson Mota (N.J.A.Mota@tudelft.nl)
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c) Argumentation of choice of the studio:

My choice of the Global Housing studio for my graduation project was based on my interest in housing that developed during my Msc1 studio of Experimental Housing in the Netherlands. After analysing patterns and understanding the way people live in a country unlike my homeland revealed many differences already within Europe. Therefore my interest in applying similar approach in a developing country such as Ethiopia was an opportunity to expand my knowledge in this area and experience a new perspective on the topic and set of priorities in a my design process. Moreover, I consider housing as essential architectural discipline that can have a major impact on the quality of people's lives no matter the geographical location and therefore makes a invaluable subject of any graduation project.

C - Graduation Project
Towards Circular Neighbourhood in Kolfe, Addis Ababa

C.1 _ Goal

"The house is the place of central satisfaction which,
depending up on the degree it represents this satisfaction,
changes from a mere building to a home."

E.E. Boesch[1]

Developing countries act today as centres of global production and are also about to become the global drivers of consumption in the near future due to accelerated population growth.[2] This presents a significant number of challenges in the Global South including Addis Ababa, the capital of Ethiopia and home to 30% of the country's urban population.[3] Rapid urbanisation, caused by many migrants from rural areas seeking a livelihood in the urban centres result in the overall housing shortage, rising unemployment and deepening poverty without a strong legal and institutional framework.[4]

The general problem stems from the fact that the low-cost housing provided by the government is unable to accommodate the increasing housing needs of the poor, therefore, the vast majority of dwellings are being constructed and modified through self-help activities.[5] This results in higher densities and overcrowding putting strain on the already overloaded infrastructure exposing people to health and physical risks[6] and an overall low standard of living including insufficient public services, especially clean water and sanitation.[7]

A solution to the urgent need for new urban housing that could translate current social cultures to physical environment is essential to avoid further ghettoisation and provide sufficient accessibility of amenities, infrastructure and employment.[8] Seeking the balance between resiliency and efficiency at a low environmental cost[9] requires adopting modular, adaptive and resilient design principles that would enable affordable quality housing.[10] For instance, the sites and services scheme could provide such a solution combining efficient use of resources and community participation,[11] that can greatly increase the market value[12] of the house and adapt it to users' own needs. Circular strategies are being pursued mainly in Europe, however, are often already present in the informal sector of developing countries.[13]

1   E.E. Boesch, "Action et objet: Deux sources de l'identite du moi," in Identite individuelle et personalization, vol. 2, pp. 23–37, ed. P. Tap (Toulouse: Privat, 1980)

2   Laura Wellesley, "How the Circular Economy Could Help Developing Countries Grow Sustainably," *Ethical Corporation*, May 23, 2019, http://www.ethicalcorp.com/how-circular-economy-could-help-developing-countries-grow-sustainably.

3   Nelson Mota, *From the Kebele to the Condominium. Accommodating Social and Spatial Practices in Ethiopia's Politics of Affordable Housing* (Delft: Delft University of Technology, 2015), 2.

4   Elias Yitbarek Alemayehu, "Addis Ababa: A Collage of Cities", in *The Transformation of Addis Ababa: A Multiform African City*, ed. Elias Yitbarek and Laura Starck (Newcastle upon Tyne: Cambridge Scholars Publishing, 2018), 21-76.

5   Demissachew Shiferaw, "Self-Initiated Transformations of Public-Provided Dwellings in Addis Ababa, Ethiopia." *Cities* 15, no. 6 (1998): 437–48. https://doi.org/10.1016/s0264-2751(98)00039-0.

6   Shiferaw, "Self-Initiated Transformations of Public-Provided Dwellings in Addis Ababa, Ethiopia," 446.

7   "Addis Ababa," *100 Resilient Cities*, April 11, 2019, https://www.100resilientcities.org/cities/addis-ababa/.

8   Nelson Mota, *Banks, Sweat and Shelter in Addis Ababa Sites and Services in Performance* (No Cost Housing Conference, ETH Zürick, 2016), 7.

9   Peer Smets, Jan Bredenoord, Paul van Lindert, "Introduction: Governance, Sustainability and Affordability of Low-income Housing," in *Affordable Housing in the Urban Global South: Seeking Sustainable Solutions,* ed. Jan Bredenoord, Paul van Lindert and Peer Smets (Oxon: Routledge, 2014), 1-14.

10   Wellesley, "How the Circular Economy Could Help Developing Countries Grow Sustainably."

11   Mota, *Banks, Sweat and Shelter in Addis Ababa Sites and Services in Performance,* 7.

12   Shiferaw, "Self-Initiated Transformations of Public-Provided Dwellings in Addis Ababa, Ethiopia," 438.

13   Wellesley, "How the Circular Economy Could Help Developing Countries Grow Sustainably."

Integrating values and principles of circular economy in the built environment would mean translating current positive patterns in a way that would provide a higher living standard.

Due to the informal sector of the economy present in many African cities the resulting 'lateral information and decision network' provides the inhabitants with resources the western countries have long forgotten about.[1] One of such areas can be found in Kolfe Keranio, a district of Addis Ababa, Ethiopia, where a large part of a community of about 500 families[2] was resettled in the 80s into a new 'sites and services scheme' neighbourhood from the area of today's Sheraton hotel in the city centre. Specific problems of this neighbourhood arise from the self-help invariably horizontal extensions system resulting in the lack of urban land and congested internal and external spaces.[3] Moreover, the use of the extensions is mostly residential due to a prohibition of commercial activities by the government preventing the inhabitants from developing other functions in the neighbourhood contradictory to one of the integral patterns of their lifestyle.[4] Furthermore, the potentially beneficial presence of a water source in the form of a river has a minor positive impact due to the pollution and dense informal settlements subjected to regular flooding.

Making the use of traditional materials and technologies as well as looking for alternative building materials that do not need to be imported is necessary along with improving the level of construction technology and know-how of the residents, which are essential for future vertical development while embracing the self-build tradition.[5] Applying circular principles in built environment such as land restoration, resource recovery, sharing infrastructure, promoting compact urban growth or water efficiency and remanufacturing of materials[6] on the neighbourhood level could improve the chances for a long term resilience as well as affordability. However, possible challenges in form of the lack of coordination and support of the formal sector, might require enhanced community participation. Elevating the low standard in the neighbourhood by improving its infrastructure, public spaces, and design approach could impact the social cohesion of the area and impact its surroundings by shortening the proximity of job opportunities and lacking amenities. Many positive circular patterns are already embedded in current lifestyle for generations[7] enabled by the neighbourhood's strongest characteristic, the invisible interdependent social network, raising the following question:

What is the potential of alternative circular design strategies and solutions while integrating present informal social network, patterns and values in low-income neighbourhoods in developing countries? How could it be implemented in the case of widely self-help build neighbourhood in Kolfe Keranio, Addis Ababa, with the goal of sustainable built environment, affordable but resilient housing design, infrastructure and enhanced social cohesion?

Applying circular building principles in a developing country such as Ethiopia sets a new set of challenges in comparison to a housing scheme developed on the same values in the western world. Different conditions may be already present and therefore not necessary to recreate, for instance, the above-mentioned strong social network embedded in the informal sector. The goal of the design project is to explore the potential of various alternate circular strategies and solutions in low-income neighbourhoods such as Kolfe, Addis Ababa.

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1   John F. C. Turner, *Housing by People: towards Autonomy in Building Environments* (London: Marion Boyars Publishers, 2009), 7.

2   Interviews with the local inhabitants (Addis Ababa, November 2019)

3   Shiferaw, "Self-Initiated Transformations of Public-Provided Dwellings in Addis Ababa, Ethiopia," 446.

4   Interviews with the local inhabitants (Addis Ababa, November 2019)

5   Shiferaw, "Self-Initiated Transformations of Public-Provided Dwellings in Addis Ababa, Ethiopia," 447.

6   "Circularity in the built environment: Case Studies," *The Ellen MacArthur Foundation*, April, 2016, accessed November 28, 2019, https://www.ellenmacarthurfoundation.org/assets/downloads/Built-Env-Co.Project.pdf.

7   "Circular Economy in Africa," *The African Circular Economy Network*, accessed November 26, 2019, https://www.acen.africa/.

To map and reapply present circular patterns and develop new ones can be approached on three different levels. Firstly, the present social network present in the neighbourhood can contribute to the pursuit of circularity to be community-driven. Therefore, social cohesion is an important aspect to be addressed in the design as well as the preservation of the current network and enabling it to thrive in the future by providing sufficient communal spaces, public space as well as developing thresholds and transitional zones respecting the way of life in the neighbourhood and the inhabitants' sense of privacy.

Secondly, the infrastructure of the neighbourhood needs to be addressed. Improved water management in the area is a priority including the revitalisation of the riverbank and provision of amenities missing by the inhabitants. Further, for instance transport, alternative energy sources and waste treatment provide opportunities for circular strategies. The expansion of the commercial zone of the market by creating more opportunities and space for home-based economic activities.[1]

Thirdly, the materiality of the dwellings and construction is an essential part of a new circular design that could accommodate new sustainable approaches as well as repurposing the current materials, that do not enable vertical extensions. Recycling old material and incorporating them into their dwellings is also a pattern present in the neighbourhood, however, a desire for higher quality and permanent materials is pervasive and requires new techniques, that would not be import-based but would stay local and complying with higher living standards.[2]

All these aspects should be explored without the tendency to romanticise the living conditions of Ethiopian people and rather to focus on preserving the qualities that are inherent to the inhabitants and on separating them from the negatives impacting their living standard. Using the circular principles should provide a lens for approaching the design and creating a future-proof neighbourhood that would accommodate all needs of inhabitants seeking the balance between resiliency and affordability[3] and combine all three aspects of community, infrastructure and construction in one metabolism in the form of a neighbourhood, with the possibility for further expansion in the future.

C.2 _ Process

a) Method description;

In this graduation project multiple research methods are being utilised contributing to a complex picture of the context of the housing design. The first, visual ethnography, focuses on developing visual methods of research[4] and serves as a visual narrative of everyday practices, that could be identified as patterns, helping observer perceive the studied space or area from user's point of view.

The second method was a general analysis of the various aspects of the wider context of the country and city, that our site was located in, divided into four topics of soft data, hard data, spatial mapping and housing and gave us general context to classify specific urban tissues as well as the general policy towards built environment in different phases of the city's development.[5]

1   Berhanu Gebrewold, "Appropriating spatial accomodations," in *Building Ethiopia*, ed. Cherenet Zegeye and Helawi Sewnet (Addis Ababa: EiABC, 2012), 271-78.

2   Demissachew Shiferaw, "Self-Initiated Transformations of Public-Provided Dwellings in Addis Ababa, Ethiopia." *Cities* 15, no. 6 (1998): 437–48. https://doi.org/10.1016/s0264-2751(98)00039-0.

3   Peer Smets, Jan Bredenoord, Paul van Lindert, "Introduction: Governance, Sustainability and Affordability of Low-income Housing," in *Affordable Housing in the Urban Global South: Seeking Sustainable Solutions,* ed. Jan Bredenoord, Paul van Lindert and Peer Smets (Oxon: Routledge, 2014), 1-14.

4   Kimberly Powell, *Viewing Places: Students as Visual Ethnographers* (Art Education 63, no. 6, 2010), 44-53.

5   Daniela Míková, Lecture Series Research Methods paper, AR3A160 (2019/20 Q1)

The third method then was an analysis of scholarly articles and sources related to the topic of the studio aiming at creating background knowledge of the issues at hand on a more theoretical level.[1]

The last could be considered an ethnographic method or praxeology applied during the field trip that provided invaluable input through number of interviews and participatory design research, during which we interacted directly with locals and provided tools for them to show their aspirations of their ideal housing situation.

b) Literature and general practical preference;

John Turner, the author of Housing for people (1976), introduces the practice of self-help housing as a new housing concept rather than only a phenomenon to be studied. His observations in slums in Peru highlight the positives of autonomy in the built environment and compare it to low-income housing in western countries, that offer no escape to people trapped in poverty. It is the 'lateral information and decision network'[2] that gives people more power and control over their living conditions.

Alejandro Aravena, well-known for his influence in the field of low-income housing design, applied the method of participatory design and interview with the locals, who were about to be resettled in a social housing project in northern Chile.[3] His conviction that the only solution to rapid urbanisation and consequent deepening poverty comes from the slums and favelas resulted in the goal to provide the frame and later the families would take over and finish and appropriate the house through their own building power and network.

Demissachew Shiferaw argued already in his study of informal housing in Addis Ababa in the 90s that the self-help improvements to dwellings by the inhabitants present no direct cost to the government and increase the plot market value.[4] In the same direction followed the research of the Addis Ababa University EiABC, focusing more specifically on the principles that should be applied by designing for such communities. The focus on the appropriation of space is discussed in the book Building Ethiopia (2012).

C.3 _ Relevance

Africa is justifiably called the most circular continent with the lowest ecological footprint. People have an inherent understanding of reusing materials and valuing available resources, moreover local communities are often highly collaborative which is crucial for applying any circular strategies. However, these practices are not only connected to traditional ways of life but also to poverty and low living standard and part of the global problem of rapid urbanisation and consequent

The research question I'm focusing on is closely connected to analysing present informal patterns that could be incorporated in the future design to preserve people's way of life and invisible social network. Our findings proved that letting people define their environment is important for space appropriation and contributes to social cohesion. My personal focus will be how to pursue this goal along with seeking the balance between efficiency and affordability while implementing principles and strategies for a circular environment to keep the neighbourhood resilient in the future.[5]

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1   Daniela Míková, Lecture Series Research Methods paper, AR3A160 (2019/20 Q1)

2   Turner, *Housing by People: towards Autonomy in Building Environments*, 7.

3   Alejandro Aravena, "My architectural philosophy? Bring the community into the process," filmed October 2014 at TEDGlobal, video, 2:30, https://www.ted.com/talks/alejandro_aravena_my_architectural_philosophy_bring_the_community_into_the_process/discussion?referrer=playlist-11_must_see_ted_talks#t-365570

4   Demissachew Shiferaw, "Self-Initiated Transformations of Public-Provided Dwellings in Addis Ababa, Ethiopia." *Cities* 15, 5 no. 6 (1998): 437–48. https://doi.org/10.1016/s0264-2751(98)00039-0.

5   Daniela Míková, Lecture Series Research Methods paper, AR3A160 (2019/20 Q1)

C.4 _ Time planning

The division of my workload is planned according to the Global Housing Studio's schedule for the Msc3 and Msc4. The first semester is focused on the research and field trip, forming my problem statement and design assignment and producing preliminary design for the P2 presentation in the middle of January.

The second semester then should be dedicated to finalising my design purposal for the P3 review taking place in the week 3.8 on the 3rd of April and then adjusting it and creating final products (poster, models, presentation) for P4 taking place in the week 4.6 (25-29th May) and P5. I plan to continue to develop the project gradually to avoid an abrupt accumulation of work near the deadline.

I have no retakes of exams planned since all have been finished at time of handing-in this plan.

Weekly plan:

1.1 - 1.8	design research / projective mapping
1.9 - 2.1	field trip / site survey
2.2 - 2.3	design hypothesis
2.4	P1 progress review, 3rd December
2.5 - 2.7	preliminary project
2.8	P2 presentation, 15th January 2020
2.9 - 2.10	P2 retake (if necessary), 7th February
3.1-3.7	developing the project design in detail, building technology
3.8	P3 progress review, 3rd April
3.9-4.4	final stages of the project development
4.5	producing deliverables for P4
4.6	P4 presentation
4.6-4.9	finalising model and deliverables
4.10-4.11	P5 public presentation

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