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
Wessel Geert de Graaf
4394089

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

Delegate Examiner:
Dr.mr. Fred Hobma

c) Argumentation of choice of the studio:

For various reasons my choice for the implementation of my graduation year fell on the Global Housing Graduation Studio: Addis Ababa Living Lab. First of all, during my studies I experienced for so far a lack of focus on social aspects such as gentrification, participation and community design. With an ethnographic research approach and the topic of housing in a country where the way of living is farfetched to what I am used to, I believe that societal issues will arise during this graduation project and that elaborate social research will be held. Besides, a project in a for me completely unknown context needs rethinking in aspects as technical implementation, climate control and material use. Moreover, I have not done any housing project yet during my study, while I believe it is a rather challenging field within architecture which I would like to discover more thoroughly.

C - Graduation Project

Rediscovering the Roots of the City
Creating Synergy Between Addis Abba's Urban Dwellers and Rivers

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) What is the problem that you want to tackle? (**Problem Statement**);
b) What is the **Research Question**? (The question(s) should be specific - not vague - and formulated in a such a way that you feel that you can contribute to provide an answer to it (them).);
c) What is the **Design Assignment** that you have in mind to explore a possible solution to the problem formulated in a) and to contribute a possible answer to the question(s) formulated in b)

Note: The Section C.1 (Goal) should be <u>a revised version of your **thesis statement essay**</u>, (word length around 1000 - 1500 words).

Cities in the Global South, and more specifically in Sub-Saharan Africa are growing rapidly. Demographic statistical data indicates that the absolute number of urban population in this region will be tripled by 2050 compared to 2015; The current amount of 400 million urban dwellers will increase towards the 1.2 billion.[1] Cities in the Global South are urbanizing faster than public authorities can manage which results in a lack of basic infrastructure and services.[2] Moreover, water bodies get invariably ignored by urban planners.[3] This has severe consequences for the biodiversity and human livelihoods that are linked to water in- and outside the urban perimeter.[4] On city scale, the absence of water management in urban-planning schemes and the uncontrolled formal and informal urbanization make rivers become the armpit of the megacity; The water quality of urban streams are uniformly extremely poor, river banks become dump sites and homes for the poorest of the city.[5]

Addis Ababa, the capital city of Ethiopia with a population of approximately 3.4 million, is not an exception.[6] It is a fast growing city, projected to grow by 3.8 per cent each year in the upcoming 15 years;[7] A city bursting at the seams. Ethiopia is often referred to as the "water tower" of eastern Africa which can be traced back to the capital. Addis Ababa accommodates many seasonal and perennial streams coming together in the little and great Akaki rivers. They feed into the Awash basin, south of the city, and continue to the lakes in the Rift Valley.[8] However, due to fast population growth, uncontrolled urbanization, lack of sanitation infrastructure facilities and poor (industrial)

[1] Mathias Spaliviero et al., "Urban resilience building in fast-growing African cities*," Urban Africa: Risk Knowledge* (2019): 1.

[2] Francine van den Brandeler et al., "Megacities and rivers: Scalar mismatches between urban water management and river basin management*," Journal of Hydrology* 573 (2019): 1067-1074.

[3] Karl M. Wantzen et al., "Urban Stream and Wetland Restoration in the Global South—A DPSIR Analysis," *MDPI Sustainability* 11, 4975 (2019): 2-3.

[4] Ibid.

[5] Ibid.

[6] UN-HABITAT, *Condominium Housing in Ethiopia: The Integrated Housing Development Programme* (Nairobi: United Nations Human Settlements Programme, 2011), 1-2.

[7] Ibid.

[8] Hamere Yohannes and Eyasu Elias, "Contamination of Rivers and Water Reservoirs in and Around Addis Ababa City and Actions to Combat It," *Environ Pollut and Climate Change* 1: 116 (2017)*.*

waste management the rivers and streams of the city are highly polluted.[9] They have simply become the waste dump of the city.[10]

These bad conditions are a high threat for human health and the functioning of ecosystems in and around Addis Ababa.[11] Besides, as a result of a lack of adequate attention from the urban planners towards the riverbanks and streams, they have not been integrated in the urban fabric and became occupied by large numbers of informal settlers, who live in very poor conditions, especially during rainy seasons when floods occur.[12] Subsequently, the rivers of Addis Ababa are not embedded in the urban fabric and - except as dumpsite - not accessible for its inhabitants.[13] The poor river conditions results in a serious impact on the environmental, social and economic domain in and around Addis Ababa; The ecosystem of the river is already highly damaged, the community's health gets (indirectly) affected and there is an economic loss and negative impact on the country's GDP.[14] To tackle these degradations, the preservation and improvement of the water bodies in the city is essential. A development of a 'River Culture', an environment in which people live in harmony and respectfully with water, and an acknowledgment of the values of the streams and rivers is required.[15] Therefore, water should be better incorporated into the urban planning schemes.[16]

However, to succeed it is crucial to see how this 'River Culture' interacts with the dwelling landscape; A landscape that houses its inhabitants and support their (informal) activities and needs. Besides the high percentage of sub-standard slum housing conditions in the city, public facilities accommodating the residents' (informal) activities and needs are lacking in the dwelling landscape.[17] There is a huge shortage of green space, urban public open spaces and no facilities for urban farming.[18,19,20] The lack of green space does not only influence ecosystems but also results in heat island effects across the city.[21] Urban public open spaces, key contributors for a sustainable community, are neither working properly nor enough available.[22] And despite the large amount of families dependent on urban farming, policy makers fail to incorporate urban farming in the urban planning scheme.[23] This number of families

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[9] Y. Worku and M. Giweta, "Can We Imagine Pollution Free Rivers around Addis Ababa city, Ethiopia? What were the Wrong-Doings? What Action Should be Taken to Correct Them?," *J Pollut Eff Cont* 6: 228 (2018).

[10] Yohannes, "Contamination," 1.

[11] Ibid.

[12] Berhanu Mekonnen, "Characteristics of Riverbank Informal Settlements in Addis Ababa, The Case of Great Akaka River" (Master Thesis, Addis Ababa University, Department of Urban and Regional Planning, 2007), 2-3.

[13] "UNA Rivers: Addis Ababa," Local Governments for sustainability Cities Biodiversity Center (ICLEI CBC), accessed November 25, 2019, https://cbc.iclei.org/una-rivers-addis-ababa/.

[14] Yohannes, "Contamination," 10.

[15] Wantzen, "Urban stream," 36-37.

[16] UNESCO / ARCEAU IdF, Water, Megacities & Global Change (Paris: UNESCO / ARCEAU IdF, 2016), 21-22.

[17] UN-HABITAT, "Condominium," 1.

[18] Mathias Tesfaye Abebe and Tebarek Lika Megento, "The City of Addis Ababa From 'Forest City' to 'Urban Heat Island': Assessment of Urban Green Space Dynamics," *Journal of Urban and Environmental Engineering* , Vol. 10, No. 2 (2016), 254-262.

[19] Anteneh Getnet Birru, "Sustainability and Open Space. The Spatial Sustainability of Open Spaces in New Condominium Neighborhoods of Addis Aabba" (Master Thesis, EiABC and Addis Ababa University, Housing and Sustainable Development, 2014), 3.

[20] Tewodros Firdissa Duressa, "Livelihood Dependence on Urban Agriculture in Addis Ababa, Ethiopia" (Master Thesis, Norwegian University Of Life Sciences, Noragric, Department of International Environment and Development Studies, 2007), 3-4.

[21] Abebe, "The City," 262.

[22] Birru, "Sustainability," 2-3.

[23] Duress, "Livelihood," 3-4.

probably only increases as result of urbanization and increase of food demand in the city. The consequences of a lack of useful urban public (green) spaces and incorporation of urban farming opportunities become prevalent in the newly build condominiums, where due to standardized spaces and restrictive habitation rules the needs of resettled residents are not met; There are no opportunities for informal activities and income generation.[24]

The lack of well-planned urban green spaces ties into the problem of mismanaged waterbodies in Addis Ababa, and facing these challenges jointly can be the foundation for a synergetic environment between the urban dwellers and the rivers of the city. Improvements in the dwelling landscape can contribute to the development of a healthy 'River Culture' and the other way around. This results in the following research question; *How can the dwelling landscape contribute to the development of a healthy 'River Culture' in Addis Ababa and vice versa?*

This project aims to form a vision for the rivers and urban dwellers of Addis Ababa and implement it in a waterbody-linked neighborhood, in this case 24 Kebele. Therefore the following sub-questions have been formulated:

What interventions are necessary to restore and improve the water bodies of the city?

How does a 'River Culture' look like in the context of Addis Ababa and specifically in 24 Kebele?

How does the 'River Culture' and need for densification influence the configuration of dwelling units and vice versa?

What kind of green space, urban public open spaces and urban farming facilities are necessary in 24 Kebele?

How can the 'River Culture' contribute to support informal activities in the dwelling landscape and vice versa?

What design and development process is necessary to relocate the inhabitants taking in consideration their attachment with their current livelihoods?

What construction methods should be used taking in consideration local construction methods and materials?

To find a suitable solution for the problem statement and research question stated above this project aims to propose a plan of the implementation of a 'River Culture' on a city level. This big scale plan/vision should tackle also issues regarding the restauration of the water bodies. Moreover, 24 Kebele will be the case study in the city of Addis Ababa in which the embedment and interaction of the 'River Culture' with the dwelling landscape will be elaborated and worked out into detail. In the case study, the design proposal should deal with the need of densification of the dwellers and the urgency to create a synergetic dwelling environment between the dwellers and the waterbodies and landscape of the neighborhood. At the same time the design should give a solution for the lack of green space, urban public open spaces and incorporation of urban farming in the urban planning scheme. Moreover, the design should take in

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[24] Imam Mahmoud Hassen and Yonas Alemayehu Soressa, "Experiences of the Poor in the Contemporary Urban Resettlement of Addis Ababa," in *The Transformation of Addis Ababa: A Multiform African City*, ed. Elias Yitbarek Alemayehu and Laura Stark (Cambridge: Cambridge Scholars Publishing, 2018), 127-128.

consideration the attachment of the current inhabitants' livelihoods towards their neighborhood and the informal activities and income generation of the dwellers, aspects which are currently missing in the Integrated Housing Development Programme (IHDP) with problematic consequences for the resettled.[25],[26] For the implementation of the design proposal construction methods should be proposed taking into account local building materials and methods.

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;

Research methods

Literature review
To get a better understanding of Addis Ababa and Ethiopia as a whole a background study has been conducted. The focus was on hard data, soft data, spatial mapping and housing which came together in a research booklet. Hereby different time periods in Ethiopia and their influence on Addis Ababa has been discussed. This research, based on literature, formed a collective knowledge base on climate, politics, housing typologies, urban growth, economy etc. in Addis Ababa. Moreover, a selection of articles and books has been studied, getting a better understanding of low-income housing, dwelling in Addis Ababa and participatory planning and design. Both the research booklet and the critical review of a selection of literature functioned as backbone knowledge for the fieldtrip and the design assignment in general.

Architectural Ethnography
During the fieldtrip architectural ethnography is used as research method to get a better understanding of the everyday live and inhabitation patterns in Addis Ababa and more specifically in 24 Kebele. The architectural layer of architectural ethnography makes that the research is focused on the build environment and that the output is a visual representation of the fieldwork, enabling to easily jump between scales, between the detail and the concept and between the empirical and the abstract.[27] This form of research enables the designer to design dwellings which resonate the local cultural practices.[28]

Design methods

Participatory design
Since housing is for people, the perspective of the inhabitants is crucial. Therefore, participatory design methods has been conducted to get a understanding of what the people actually want and need. During the fieldwork this is sought by asking what people whish and let them express it by words and/or drawings.

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[25] Yonas Alemayehu Soressa and Imam Mahmoud Hassen, "Inner-City Dwellers and Their Places in the Context of Adds Ababa's Urban Renewal," in *The Transformation of Addis Ababa: A Multiform African City*, ed. Elias Yitbarek Alemayehu and Laura Stark (Cambridge: Cambridge Scholars Publishing, 2018), 77-78.
[26] Hassen, "Experiences," 127-128.
[27] Momoyo Kaijima, "Learning from architectural ethnography," in *Architectural Ethnography*, ed. Momoyo Kaijima, Laurent Stalder and Yu Iseki (Tokyo: Toto publishing, 2018), 8-14.
[28] Galen Cranz, *Ethnography for Designers* (New York: Routledge, 2016), 3.

Literature and reference projects
During the process of this design project I will continuously consult research papers and reference projects to support my design decisions. Theories and principles gained from western perspectives will be translated into the context of Addis Ababa based on research and the conducted fieldwork. A list of consulted research papers and principles from reference projects together with the participatory design sessions during the fieldtrip will form a backbone of knowledge during the design process.

b) Literature and general practical preference;

Literature

Smets, Peer; Bredenoord, Jan, Lindert, Paul van. Affordable Housing in the Urban Global South: Seeking Sustainable Solutions. Abingdon (Oxon: Routledge, 2014).
> *A bundle of articles about affordable housing in the urban Global South.*

Yitbarek, Elias and Starck, Laura. The Transformation of Addis Ababa: A Multiform African City (Newcastle upon Tyne: Cambridge Scholars Publishing, 2018).
> *A volume about the transformation of Addis Ababa with focus on the development of the city, livelihoods of low-income groups, their participation in redevelopment processes and their social networks of support.*

Mélanie Robertson. Sustainable Cities: Local Solutions in the Global South (Rugby: Practical Action Publishing Limited, 2012).
> *A collection of articles of local solutions in the Global South in the domain of participatory design, waste management, management of potable water, informal providers and urban agriculture.*

Hebel, Dirk E. et al. "SUDU: Manual." Berlin: Ruby Press. (2015)
> *Handbook on how to build a Sustainable Urban Dwelling Unit with local materials and building techniques in Addis Ababa.*

Wantzen, Karl M. et al. "Urban Stream and Wetland Restoration in the Global South—A DPSIR Analysis." *MDPI Sustainability* 11, 4975 (2019)
> *On how to restore urban streams and wetlands in the Global South. Focused on both physical, cultural, economic and technical domain of urban wetland restoration.*

Baloi, Oana. Urban Wetlands in the Core of Africa. Master thesis Wageningen University and Research Centre, Landscape architecture and Planning, 2014.
> *Implementation and protection of urban Wetlands in Kigali, Rwanda.*

Atelier GroenBlauw. Urban Green-Blue Grids For Resilient cities. Retrieved from Urbangreenbluegrids.com.
> *Website focused on resilient city interventions focused on water, greenery and biodiversity in the city.*

Zingstra, Henk. "Wetlands and agriculture - Relevance of good agricultural practice and wetland management guidelines for harmonizing the wise use of wetlands and agriculture." WUR, Wageningen international (2009)
> *On interaction between wetlands and agriculture practices.*

Reference projects

Radburn, Clarence Stein and Henry Wright, New Yerey, US, 1929
Influential planning scheme based on principles following the garden city movement.

Wildwood Park, Green, Blankstein and Russell, Winnipeg, Canada, 1946
Neighborhood with planning scheme based on principles following the garden city movement.

Mickey Leland Condominium site, Housing Development Project Office, Kolfe Keranyo, Addis Ababa, Ethiopia, 2008
Condominium site visited in Addis Ababa. A project from which I can learn what to do and not to do.

Surajaras, Paan. "Breathe: Redefining a zone of informal settlements for Ho Chi Minh City" Master Thesis, TU Delft, Landscape Architecture (2019) Retrieved from: https://repository.tudelft.nl/islandora/object/uuid:6998f760-8921-492a-981b-4698ba513378?collection=education
Landscape Architecture master thesis about redefining water front zone with nformal settlements wth a focus on watermangament.

Boomi Kim. "Mosaic Garden City: redefining the relation between people and nature by structuring water management through landscape infrastructure in an informal settlement, Kampung Tamansari in Bandung" Master Thesis, TU Delft, Landscape Architecture (2019) Retrieved from: https://repository.tudelft.nl/islandora/object/uuid%3A6f5c4b66-4aa3-42cd-b490-6702c9a246e8?collection=education
Landscape Architecture master thesis about redefining relation between people and nature in an informal settlement by water management and landscape architecture.

C.3 _ Relevance
In this section, you should highlight the value of the graduation project in the larger social and scientific framework.
Note: This section should be no longer than 500 words: It can be a summary of parts of the problem statement.

From the problem statement it already became clear that the disconnection of urban dwellers with rivers has severe consequences for the city in the social, economic and environmental domain. And that it is not an issues only occurring in Addis Ababa. It is a general trend that cities in the Global South are urbanizing faster than public authorities can manage which results in poor housing conditions and a lack of basic infrastructure and services.[29] Subsequently, waterbodies get ignored by urban planners whereby the rivers become the armpit of the city, deteriorating ecosystems and the living standards of the urban dwellers.[30] This, while good water management has enormous potential for the city; it can considerably improve the living conditions and restore ecosystems.

   Therefore, it is highly valuable to find out what interventions improve both the dwelling landscape and the quality of the waterbodies in order to create a River Culture; A synergetic living environment between the urban dwellers and the rivers of the city.[31] A River Culture can play a vital role in facilitating qualitative public spaces, primary functions and amenities, the restoration of ecosystems and above all an environment where people live in harmony with nature. By forming a vision and thereby focusing on the implementation in practice (in this case 24Kebele), this project can provide guidance for the redevelopment of waterbody-linked neighborhoods in fast growing cities in the Global South.

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[29] Brandeler, "Megacities and rivers," 1067-1074.
[30] Wantzen, "Urban Stream," 2-3.
[31] Ibid.

C.4 _ Time planning

In this section, you should present a scheme of the division of the workload of the graduation project in the 42-week timeframe.

Compulsory in this scheme are the examinations at the middle and end of the semester, if required, the minors you intend taking and possible exams that have to be retaken.

Note: The submitted graduation contract might be rejected if the planning is unrealistic.

Month	Week	No.	Milestone	Design	Graphic Novel	Research methods
Sep	36	1.1		Research	Graphic Novel	Research methods
	37	1.2		*Research booklet*		
	38	1.3		*Critical review literature*		
	39	1.4				
Oct	40	1.5				
	41	1.6				
	42	1.7				
	43	1.8				
	44	1.9				
Nov	45	1.10	FIELDTRIP	Fieldwork		
	46	2.1				
	47	2.2				
	48	2.3		Problem statement,		
Dec	49	2.4	P1	Design hypothesis		
	50	2.5			Preliminary design	
	51	2.6				
	52		*CHRISTMAS HOLIDAY*			
Jan	1					
	2	2.7				
	3	2.8	P2			Graphic Novel
	4	2.9			*Processing Feedback*	
	5	2.10				
Feb	6		*SPRING HOLIDAY*		*P2 retake*	
	7	3.1		Design development	Model making	Building technology
	8	3.2		*Urban strategy*	*Site*	*Structural*
	9	3.3		*Building design*	*Building*	*Climate*
Mar	10	3.4				*Detailing*
	11	3.5				
	12	3.6				
	13	3.7		Prepare presentation		
Apr	14	3.8	P3			
	15	3.9				
	16	3.10				
	17	4.1				
	18	4.2				
May	19	4.3				
	20	4.4				
	21	4.5		Prepare presentation		
	22	4.6	P4			
Jun	23	4.7		Design development		
	24	4.8		*Processing feedback*	Prepare presentation	Printing and finalizing
	25	4.9		*Finalizing drawings*		*Booklet*
	26	4.10	P5			*Posters*
Jul	27	4.11				*Model*

10

C.5_ List of References

Abebe, Mathias Tesfaye and Tebarek Lika Megento. "The City of Addis Ababa From 'Forest City' to 'Urban Heat Island': Assessment of Urban Green Space Dynamics." Journal of Urban and Environmental Engineering, Vol. 10, No. 2 (2016): 254-262.

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Hassen, Imam Mahmoud and Yonas Alemayehu Soressa. "Experiences of the Poor in the Contemporary Urban Resettlement of Addis Ababa." In The Transformation of Addis Ababa: A Multiform African City, edited by Elias Yitbarek Alemayehu and Laura Stark, 127-128. Cambridge: Cambridge Scholars Publishing, 2018.

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UN-HABITAT. Condominium Housing in Ethiopia: The Integrated Housing Development Programme. Nairobi: United Nations Human Settlements Programme, 2011.

Van den Brandeler, Francine et al. "Megacities and rivers: Scalar mismatches between urban water management and river basin management." Journal of Hydrology 573 (2019): 1067-1074.

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