

Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences



Graduation Plan: All tracks

Submit your Graduation Plan to the Board of Examiners (Examencommissie-BK@tudelft.nl), Mentors and Delegate of the Board of Examiners one week before P2 at the latest.

The graduation plan consists of at least the following data/segments:

| Personal information | |
|----------------------|-----------------------|
| Name | Tycho Enno van Gelder |
| Student number | 4468961 |

| Studio | | |
|---------------------------------------|---|---------------------|
| Name / Theme | Complex Projects / Beirut Studio / Catastrophe | |
| Main mentor | Hrvoje Smidihen | Architecture |
| Second mentor | Hubert van der Meel | Building Technology |
| Argumentation of choice of the studio | Challenging myself to design in an intricately layered and impacted environment | |

| Graduation project | |
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| Title of the graduation project | Crop Market. Integrating food logistics and wholesale crop market in Beirut's high density urban fabric |
| Goal | |
| Location: | 33.874757, 35.488741 Beirut, Lebanon |
| The posed problem, | <p>Lebanon, a secular Mediterranean country in between Syria and Israel, has been struck by catastrophe and crises in the last decade. Lebanon went through many changes in its tensed up, post-Civil War society.</p> <p>In 2011, 1.5 million Syrian refugees came to Lebanon. They drastically changed the population composition in the country. In 2019, a financial crisis hit Lebanon causing the Lebanese pound (lira) to collapse and push society into further despair and tension (Hamade, 2020). In 2020, the August 4 Port Blast was the tipping point. It crippled Lebanon's import dependent economy, and costs the country over \$15 billion in repairs. The only grain silo in the country, with a capacity of 120,000 tons was obliterated by the blast. The aftermaths of the 2020 blast and the devaluation of the lira, in combination with the already existing extra demand for food due to the 2011 crisis, caused an extreme rise of food prices for suppliers and consumers.</p> <p>These catastrophes challenge the food security in Lebanon, which was already largely dependent on import. Not only recent crises are impacting Lebanon's food security, but also long term approaches.</p> <p>After the end of the civil war in 1990 the country's economy slowly changed from a productive economy with flourishing agriculture and industry sectors to a service-based economy, relying on banking, luxury tourism and real estate. The financial crisis affects the Lebanese</p> |

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| | <p>agriculture also by threatening its production capacity. For the last 25 years, the Lebanese agriculture industry relied on importing seeds, seedlings, fertilizer, pesticide and irrigation systems. This could be done because the lira was connected to the US dollar by the Lebanese central bank. The collapse of the lira means a higher production cost, which the farmers are not able to afford.</p> <p>On top of this food production insecurity, there is practically no planning and overview by the Ministry of Agriculture (MoA) which leads to a lack of regulations. That lack of regulations has as a consequence a chaotic food market, a bad food quality assurance, and leads to certain crop surplus. Besides the lack of regulations, the government budget allocated to the MoA is only 0.5% of the total, while in neighbouring countries this five times more is. There is a lack of food transportation systems and a non-existent distribution system. This bad state of post-harvest handling results in a crop loss (up to 25% of the harvest) and unnecessary food waste. These factors also challenge the food security in Lebanon and Beirut.</p> <p>Steel (2013) states that nowadays, man has detached from food and its origin. Food is the most devalued commodity nowadays, but food shapes the city. Without food and food supply, there would be no city. To secure the future of farming in Lebanon, a (Beiruti) youth interest in food and farming is necessary. The advantage is that Beiruti youth act conscious about healthy food due to the rich Lebanese food culture and traditions. They are eager to learn more about the origin of Lebanese cuisine and eager to discover new interests. Another advantage is the education system. In Lebanon, (higher) education is in good shape, but the disadvantage is proper jobs after a degree are lacking. Many young professionals escape their country, resulting in a lack of development and a so called 'brain drain'. Getting the Beiruti youth interested in food and farming is important for future food security and the future of agriculture and food, as the average farmer is 52 years old. These factors form an opportunity to increase food security in Lebanon and Beirut.</p> <p>In short:</p> <ul style="list-style-type: none"> - Bad post-harvest crop handling and a dying out agriculture sector leads to food waste in Beirut and Lebanon. - National and global crises and catastrophe leads to food insecurity in Beirut and Lebanon. - Segregated people and no public space in Beirut leads to disconnection. <p>These conclusions translate into general ambitions:</p> <ul style="list-style-type: none"> - improving post-harvest handling - sparking youth interest in agriculture - reconnecting Beirut people (with the origin of food) - |
| <p>research questions and</p> | <p>The main research question is as follows: "How can a wholesale market and food logistics facility be integrated in a high density urban fabric in Beirut?"</p> |

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| | <p>During research and benchmarking through analysis of other architectural design projects, other questions came up that were used during architectural reference projects research and analysis: “What is the logistic/public program division? How is the public and logistic program in the project organised? How is parking organised in the project? How are the entrance flows organised in the project?”</p> |
| <p>design assignment in which these result.</p> | <p>The design assignment has three ambitions:</p> <ul style="list-style-type: none"> - food chain. Strengthening the food chain from land to city - public space. Adding public space to the city of Beirut - resilient future. Contributing the food security in Beirut and Lebanon <p>The posed problems and research question lead to the design assignment of a food logistics facility (transport, distribution & storage) and a wholesale crop market (public space, buying, selling) as protagonist project being part of a bigger market district in the strategy for the “Beirut Mosaic”, a suburb near the city centre and Ramlet-al-Bayda beach.</p> |
| <p>The design assignment has certain guidelines that follow from the reference benchmarking and site analysis.</p> <ul style="list-style-type: none"> - The division between logistic and public is around 1:2, meaning the public part of the building is almost twice the size of the logistics part. - The logistic and public program in the project are grouped together, with the administrative and support functions acting as a link between those program elements. - Building as compact as possible, meaning integrating program functions into another function - Integrating public and logistic parking in the building to optimize plot use and prevent gigantic parking lots around the building. - The flows in the building are separated between the public and logistic side to prevent public visitors colliding with food logistics. - The flows to the site influence the program on the plot - Keeping the site location quality of the street cutting through plot to enhance public street and connect to the group strategy <p>With these guidelines for the MSc4 design phase the design assignment can be integrated in Beirut’s urban fabric, taking into account to integrate parking in the building, to integrate and combine program elements, to compact the building as much as possible, to optimize design flows and to keep the qualities of the site and surroundings and enhance them</p> | |
| <p>Process</p> | |
| <p>Method description</p> | |
| <p>The aim of this research is to form a design proposal for a food logistics facility and wholesale crop market in Beirut. This proposal reacts to several challenges in Beirut. The research question will be answered using the main research methods. The main methods and techniques used in this graduation design assignment, are:</p> <ul style="list-style-type: none"> - Analysing, benchmarking and comparing architectural reference projects to get an understanding of the program, flows and process and giving answers to the sub questions - typology research in academic literature and architectural reference projects - “optioneering”, the design exercise in which variations are made and positives and negatives are described, to find the optimal (provisional) design choice as a basis for MSc4 design phase. <p>The first part of the research was to get an understanding of the challenges in agricultural production in Lebanon and how it affected Beirut. From this research the research question</p> | |

derived. The second part was to analyse the city of Beirut, and more specifically the Ramlet-al-Bayda suburb "Beirut Mosaic" by going on a field trip to get visual material of the site and interviews with local architects and university professors to get an understanding of the city of Beirut and how food logistics and markets play a role in the city. The third part of research was finding architectural precedents of logistics and public markets, and analysing and comparing them according to the research question and sub questions. This research lead to preliminary guidelines for the massing design.

Together, these steps give preliminary conclusions to the research question and set guidelines and constraints to help and guide the MSc 4 design phase of the graduation project proposal.

Literature and general practical preference

book

Steel, C. (2013). *Hungry City – How Food Shapes Our Lives* (1st ed.). Vintage Digital.
<https://oiipdf.com/hungry-city-how-food-shapes-our-lives>

articles

Cadilhon, J., Fearne, A. P., Hughes, D. R., & Moustier, P. (2003). Wholesale markets and food distribution in Europe: New strategies for old functions, discussion paper, Centre for Food Chain Research.

Francis, M., & Griffith, L. (2011). The Meaning and Design of Farmers' Markets as Public Space: An Issue-Based Case Study. *Landscape Journal*, 30(2), 261-279.

Hoteit, M., Al-Atat, Y., Joumaa, H., Ghali, S.E., Mansour, R., Mhanna, R., Sayyed-Ahmad, F., Salameh, P., & Al-Jawaldeh, A. (2021). Exploring the Impact of Crises on Food Security in Lebanon: Results from a National Cross-Sectional Study.

Kalaïtzis, P., Bitá, E. C., & Hilmi, M. (2016). Innovative Postharvest Technologies for Sustainable Value Chain. *Mediterra*, 11, 263-280.

Levy, A. (1999). Urban morphology and the problem of the modern urban fabric: some questions for research. *Urban Morphology* (1999), 3(2), 79-85.

Mahfoud, C., & Adjizian-Gerard, J. (2021). Local adaptive capacity to climate change in mountainous agricultural areas in the eastern Mediterranean (Lebanon). *Climate Risk Management*, 33.
<https://doi.org/10.1016/j.crm.2021.100345>

Maged, Y., & Farah, M. (2019). Towards a creative sustainable promenade in informal souk architecture case study: Mar Elias Camps, in Beirut, Lebanon. *BAU Journal - Creative Sustainable Development*, 1(1), Article 11. <https://digitalcommons.bau.edu.lb/csdjournal/vol1/iss1/11>

Morganti, E., & Gonzalez-Feliu, J. (2015). City logistics for perishable products. The case of the Parmaís Food Hub. *Case Studies on Transport Policy*, 3, 120ñ128.
<http://dx.doi.org/10.1016/j.cstp.2014.08.003>

Tleis, M., Callieris, R., & Roma, R. (2017). Segmenting the organic food market in Lebanon: an application food market in of k-means cluster analysis. *British Food Journal*, 119, 1423-1441.
<https://www.emerald.com/insight/content/doi/10.1108/BFJ-08-2016-0354/full/html#sec001>

Zurayk, R., & Ghyda, T. A. (2009). The Lebanese Terroir: a challenge of quality. UNESCO conference on Localizing Products: A Sustainable Approach for Natural and Cultural Diversity in the South, Colloque <<Localiser les produits>>, 1-11.
https://www.researchgate.net/publication/228832968_The_Lebanese_terroir_A_Challenge_of_Quality

Timotijevic, B. (2011). Architectural aspect of solutions for ambiental conditions in the fresh fruit and vegetable wholesale market buildings. *Architecture and Civil Engineering*, 9(1), 177 - 192.
<http://www.doiserbia.nb.rs/img/doi/0354-4605/2011/0354-46051101177T.pdf>

precedents

- WMA (2008) – Mercabarna Flor Market
A flower market and distribution center near Barcelona, Spain
- H.P. Chueh Architects & Planners (2010) – Taipei Flower Wholesale Market, Taiwan
International Flower Trade Center
A flower market and auction center in Taipei, Taiwan

- Sarbjit Bahga (2011) – Fruit and Vegetable market, Mohali, Punjab
A wholesale fruit and vegetable and farmer’s market in Chandigarh, India
- OMA (2015) – West Louisville Food Port
(not realised) A food market in West Louisville, USA
- MVRDV (2016) – Tainan Xinhua Fruit and Vegetable Market
A wholesale fruit and vegetable market in Tainan, Taiwan
- 3xn (2023) – Sydney Fish Market
A food market in Sydney, Australia

interviews

Rani al Rajji (Rani al Rajji architects)
Beirut; part 1 – in the streets near LAU
(R. al Rajji, informal group interview, October 5 2020)

Rani al Rajji (Rani al Rajji architects)
Beirut; part 2 – at BHIVE café
(R. al Rajji, informal group interview, October 5 2020)

Roula el Khoury (LAU assistant professor)
Beirut – at PAUL on Bliss street
(R. el Khoury, informal group interview, October 6 2020)

Tarek Zeidan (Nabil Gholam architects)
Beirut – at NG^a office
(R. al Rajji, informal group interview, October 6 2020)

Reflection

1. What is the relation between your graduation (project) topic, the studio topic (if applicable), your master track (A,U,BT,LA,MBE), and your master programme (MSc AUBS)?

The graduation project topic is related to the group strategy reacting to project topic of catastrophe. In this group strategy the graduation project plays a protagonist role in to enhance the already existing features. The group strategies together contribute to a general strategy for Beirut in the future. The crop market aims to improve food logistics and provides public space and a place to meet to the inhabitants of Beirut. This incorporating of public aspects has been voiced throughout the master Architecture.

This graduation project follows up on the MSc 1 museum proposal in Haarlem, being also a public building with an aspect of storing and conserving. The graduation project is researched on a larger scale, and follows as a final (semi) public building design in my master programme at TU Delft.

2. What is the relevance of your graduation work in the larger social, professional and scientific framework.

This graduation work tries to adjust to the larger context of Beirut and adding a new perspective on typology and program function combination. The combination of a food logistics and market building sets an example on how to address a combination of challenges in the city.