

facing the false sense of food security

home to fork



Institution
TU Delft | Architecture

Author
YuHyun Oh

Course
AR3A010 | Research Plan
November 2024

Studio
AR3AD100 | Advanced Housing Design
2024~2025

Instructor
Olv Klijn

Alejandro Campos



01

In the summer of 2015, I found myself crammed into a tiny 4-by-6-meter studio, sharing the space with around six other guys. Clothes littered the floor where we slept, and the air was thick with the stale stench of makeshift ashtrays mixed with the toxic fumes of mosquito-repelling incense. The others were back working at the company office, spending another day trying to sell smartphones as part of a “legal” pyramid scheme. I had basically quit, but without any means to afford my own place, my only option was to keep my mouth shut and hope they didn’t kick me out.

I was down to a single pack of instant noodles a day. A bulk pack of five Jin Ramen (Spicy) cost 2.200 KRW (about 1,5 euros). By eating just one a day, I could stretch out 2.200 won for five whole days. It had been

over two weeks since I started rationing my meals. As I watched the noodles boil, it occurred to me it was possible to starve right in middle of one of Seoul’s wealthiest districts. I never really thought about it before, much less imagine it could happen to me. Hunger was something that happened elsewhere in places like North Korea or overseas.

If someone was unlucky enough to be unseen and have nowhere to turn to, the rest of the city simply carried on, indifferent to the reality of food insecurity.

Anecdote on importance of food security

01 Photo of Bulk pack of Jin Ramen instant noodles
YuHyun Oh

Problem Statement

The Netherlands is perhaps one of the last places one would expect to encounter issues of food insecurity. While large *hypermarkets* like Walmart or Carrefour are rare in the country, the average distance to a *supermarket* is just 900 meters, or about a 15-minute walk, according to the Centraal Bureau voor de Statistiek (2010). Inside these stores, consumers are met with aisles of cosmetically flawless produce and neatly packaged food products. In 2020, the Netherlands was the **largest exporter of meat** in the EU, with 85% of that meat produced or processed domestically (Centraal Bureau voor de Statistiek, 2021). Widely touted as the second largest food exporter by value after the United States, the Netherlands is known as a global leader in agricultural innovation and production (Viviano, 2017). However, the abundance is deceptive. The true cost of this convenience lies elsewhere.

In Midden-Delfland, one is greeted by an almost surreal tranquility of green pastures and grazing cows; yet, beneath this serene exterior, the landscape faces a hidden crisis. Nitrogen compounds leaching from agricultural pastures and barns are polluting the famed waterways. In fact, the Netherlands has the **highest nitrogen emissions** per hectare in Europe (Kuczuk & Janusz, 2018, p. 41). Given the country's significant meat exports, it is no surprise that it also has the **highest livestock density** in Europe (Westhoek & Boezeman, 2024). This not only affects groundwater, but has also contributed to the loss of **approximately 80%** of the Netherlands' original biodiversity (Notenboom et al., 2006).



01

The consequences of excess nitrogen extend beyond environmental damage. The so-called nitrogen crisis (stikstofcrisis) of the Netherlands was formally recognized in 2019, following a ruling by the Administrative Jurisdiction Division of the Council of State. Legislation aimed at reducing nitrogen emissions led to the suspension of around **18,000 construction projects**, further worsening the country's housing crisis (NOS News, 2019).

The nuances of this issue are deeply complex and multifaceted, and so too are the potential solutions. The massive farmer protests of 2022 serve as a clear reminder that the problem cannot be resolved by simply telling farmers to stop producing livestock or by relying on buyout schemes. Get rid of the cows and pigs? Reduce or halt meat exports? Just stop eating meat? These broad-stroke solutions fail to address the intricacies of the agricultural system and its deep integration into the Dutch economy and culture. Implementing meaningful change requires a deeper investigation to retrace our steps back to the root of the issue—our consumption habits.

As a society, we must rethink our relationship with food. If the means to practice food autonomy can be facilitated, it presents an opportunity to better understand what we eat and how we eat. By moving away from reliance on industrial-scale agriculture, individuals can engage in a grassroots, bottom-up approach to transforming the industry. Change need not be driven solely by institutions and government bodies. It can emerge from the **everyday choices and lifestyles** of ordinary people by empowering them to make those choices.

Architecture cannot single-handedly solve the environmental crisis or the social challenges that underpin it. However, it has the potential to reshape daily habits that prop up the current, unsustainable food system. Bringing the various processes of **production, preparation, distribution, and consumption** into our homes enables the dweller to take power back from global distribution systems and corporate farming.

Food is **power**. Food is used by autocrats to bribe militaries into quashing dissent. Food has swayed votes and pushed legislation in democracies. Still today, food is responsible for political unrest, refugee crises, and violent conflict around the world. Sheltered as we are from the horrors of scarcity in the Netherlands, the continuation of unsustainable food consumption and production practices may be the tipping point that dismantles the deceptive lull of food security.

The Netherlands exports meat by producing livestock, but the maize that feeds the livestock is largely imported from Ukraine (Centraal Bureau voor de Statistiek, 2021). And now Ukraine is at war. Meanwhile, healthy harvests rely on bees for pollination and bioculture to create optimal soil conditions, yet pesticides and fertilizers wreak havoc on biodiversity. How truly stable are the global supply chains and the ecosystems that enable our quality of life? Are we really as secure as we believe we are?

Food security is not an immutable truth, it is a moment in time. It should be on all of our minds.

01 Photo of the delightful mystery meat of the Frikandel
YuHyun Oh

SOURCES of CURIOSITY

*in media
in literature
in observation
in living*

Media & Literature



01

A scene from a short documentary features Alik Pelman, a researcher at Technion, who claims to grow all his food on a 750 m² plot of land. Defying the common perception that self-sufficiency requires extensive labor and time, Pelman maintains his entire diet with only 8 hours of work per month.

Pelman has co-authored two scientific papers on the subject: 'A Life-Cycle Approach Highlights the Nutritional and Environmental Superiority of Agroecology over Conventional Farming: A Case Study of a Mediterranean Farm' and 'Individual Nutritional Self-Sufficiency: A Viable Option in the Present Era.' These studies will provide insights into the viability of food autonomy and self-sufficiency.

01 Alik Pelman (second from right) prepping ingredients
(Eco No-Mads, 2024b)



02

Documentaries and films about food have always fascinated me, ever since I watched the 2008 documentary "Food, Inc."

In a recent interview with comedian Theo Von, investigative journalist Nate Halverson discussed his documentary "The Grab," directed by Gabriela Cowperthwaite. The film explores a seven-year investigation into the covert geopolitical maneuvers by various nations to control essential resources like food and water.

Halverson's findings reveal how certain countries strategically acquire and manage global food supply chains to enhance their political influence. This underscores the critical role of food security in international relations.

The Netherlands, renowned for its agricultural technology, plays a significant role in modern food production and distribution. To gain deeper insights into these dynamics, I plan to interview an acquaintance studying at Wageningen University & Research, a leading institution in agricultural sciences.

02 Scene from The Grab (2022)
(Cowperthwaite, 2022)



03

03 Poster of The Grab (2022)
(IMDb, 2022)

Observation



01

While living in Rotterdam Zuid, I frequently visited Zuiderpark and passed by the community garden Volkstuinvereniging de Zandweg (the Zandweg Allotment Garden Association). Although residents don't live on-site, the garden includes huts designed for overnight stays during the warmer months.

Conducting interviews with board members and gardeners about funding, membership, and community engagement could offer valuable insights into the organization and management of similar community gardens in the Netherlands.

Another informative case study would be Herenboerderij farm in Boxtel, where 200 families collectively hire a farmer to produce food.

01 Breakfast spread at VTV de Zandweg
(VTV de Zandweg, n.d.)

02 Tomatoes grown by member of VTV de Zandweg
(VTV de Zandweg, n.d.)



02

Living



01



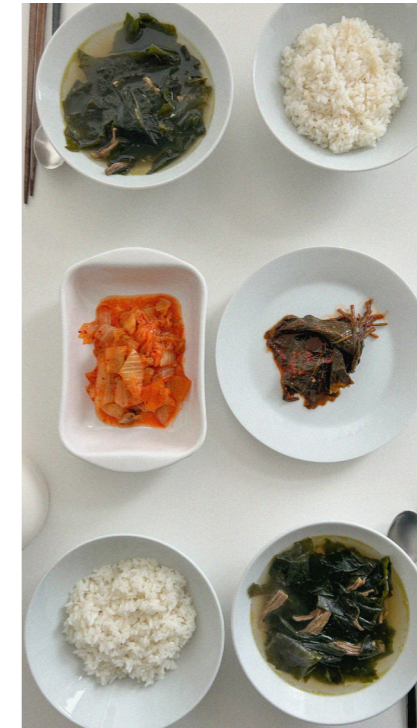
02



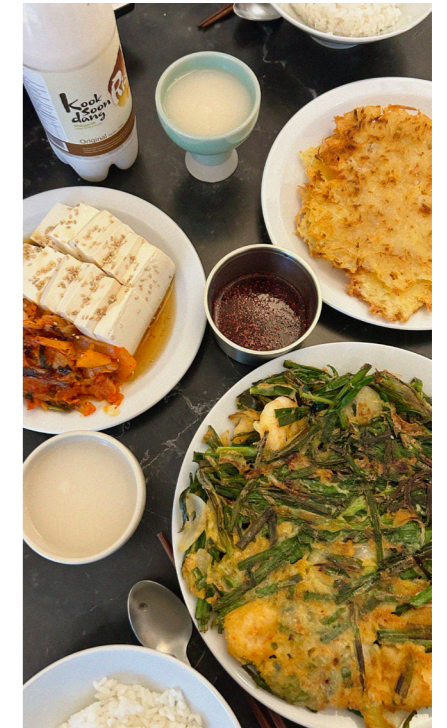
03



04



05



06

There's a pervasive stigma surrounding the vegan diet. Instead of being seen as unique dishes that happen to be plant-based, vegetarian options are often presented as imitations of their meat counterparts, especially in fast food chains and canteens. For instance, plant-based options are marketed as "nuggets" made from plant fibers instead of chicken or as "burgers" with a vegan patty instead of beef. The result? These dishes are perceived as inferior versions, "lesser" in comparison to the originals.

Our approach to meat consumption is often polarized; it's an all-or-nothing mindset. You're either a meat-eater, or you're not. But

why can't we just eat less meat? In many Western dishes, meat dominates the plate while vegetables are mere sides. This makes meat feel irreplaceable—after all, what is a steak dinner without the steak? What is a sausage or a beef stew that contains no meat?

To foster healthier and more sustainable eating habits, we need to rethink our meals. Imagine if meat were a smaller component, complementing rather than dominating, so it could be omitted or reduced without compromising the dish's integrity. Shifting our focus this way could open the door to more balanced, flexible eating patterns.

01 Chestnut mushroom soup. No meat.
YuHyun Oh

02 Bibimbap (mixed rice). Spoon of tuna extract for the vegetables.
YuHyun Oh

03 Bibim-myeon (mixed noodles). Eggs (optional).
YuHyun Oh

04 Vegetable curry. Beef stock (optional).
YuHyun Oh

05 Miyeokguk (seaweed soup). 200g of beef brisket for 5 servings.
YuHyun Oh

03 Jeon (potato and garlic chive pancakes). Shrimp (optional).
YuHyun Oh

HOME TO FORK

01

facing the false sense of food security

02

The title *'Home to Fork'* is a play on the 'Farm to Fork Strategy'—one of the components of the European Green Deal (2020). According to the European commission, the initiative aims to "accelerate our transition to a sustainable food system" with the following objectives:

1. Have a neutral or positive environmental impact
2. Help to mitigate climate change and adapt to its impacts
3. Reverse the loss of biodiversity
4. Ensure food security, nutrition and public health, making sure that everyone has access to sufficient, safe, nutritious, sustainable food
5. Preserve affordability of food while generating fairer economic returns, fostering competitiveness of the EU supply sector and promoting fair trade

(European Commission, n.d.)

The sub-title *'facing the false sense of food security'* is an alliteration and play on the phrase 'false sense of security.' It suggests that food security is deceptive and that we must tackle the unsustainable food system.

01 Title
02 Sub-title

What strategies can effectively integrate food production and preparation within residential communities to develop a sustainable food system?

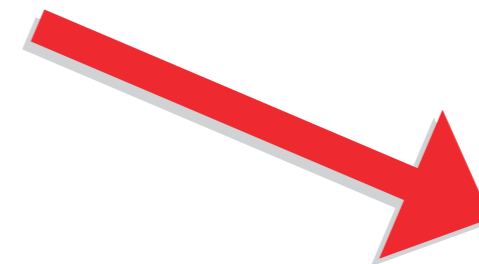
03



04

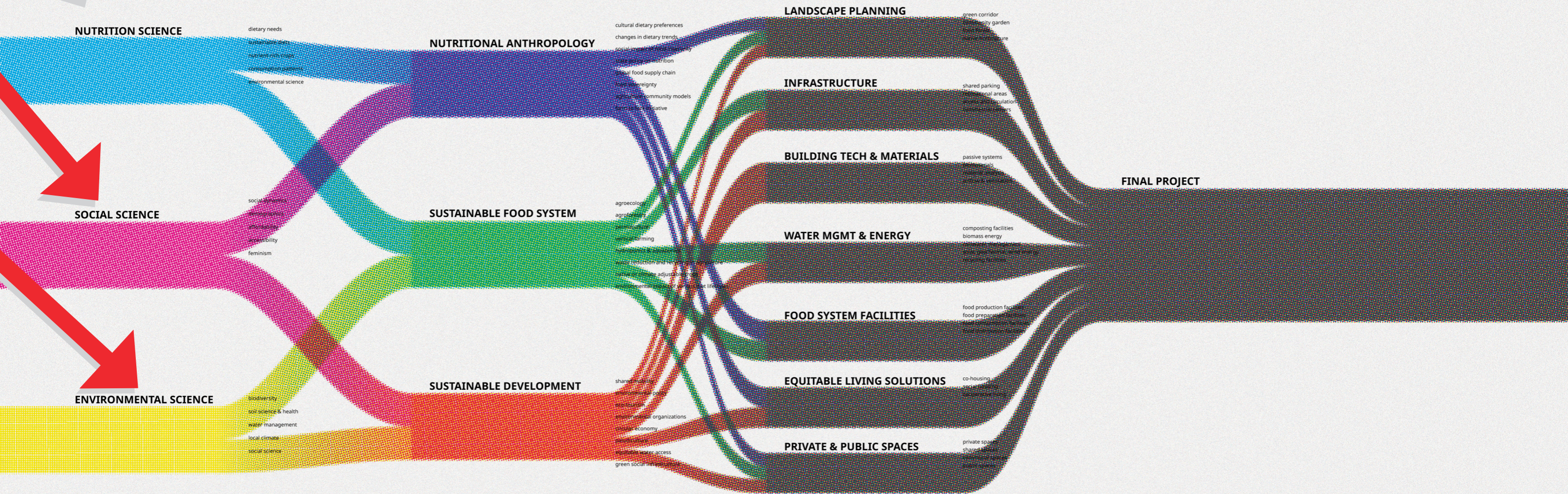
The research question can be disassembled into three distinct segments that can be further elaborated into sub-categories. The preliminary research will be comprised of these three sciences that will be further broken down in latter research phases.

- /// NUTRITION SCIENCE
food production and preparation
- /// SOCIAL SCIENCE
within residential communities
- /// ENVIRONMENTAL SCIENCE
to develop a sustainable food system



03 Research Question
04 Sub-question Disassembly

Diagram of Research Methodology



PRELIMINARY RESEARCH

the sciences
data analysis, scientific journals, literature review

SECONDARY RESEARCH

real world application
documentaries, case studies, interviews

TERTIARY RESEARCH

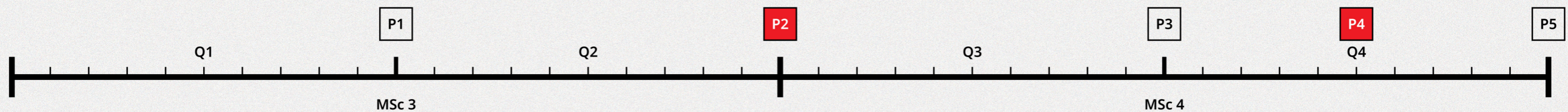
connection to built environment
case studies, field work, web search

DELIVERABLES

design development
web search

MODEL MAKING

final stretch



Preliminary Research *THE SCIENCES*

*data analysis
scientific journals
literature review*

NUTRITION SCIENCE

- dietary needs
- sustainable diets
- nutrient-rich crops
- consumption patterns
- environmental science

SOCIAL SCIENCE

- social dynamics
- demographics
- affordability
- accessibility
- feminism

ENVIRONMENTAL SCIENCE

- biodiversity
- soil science & health
- water management
- local climate
- social science

Secondary Research *REAL WORLD AP- PLICATION*

*documentaries
case studies
interviews*

NUTRITIONAL ANTHROPOLOGY

cultural dietary preferences
changes in dietary trends
social impact of food insecurity
state policy on nutrition
global food supply chain
food sovereignty
agriculture community models
farm to fork initiative

SUSTAINABLE FOOD SYSTEM

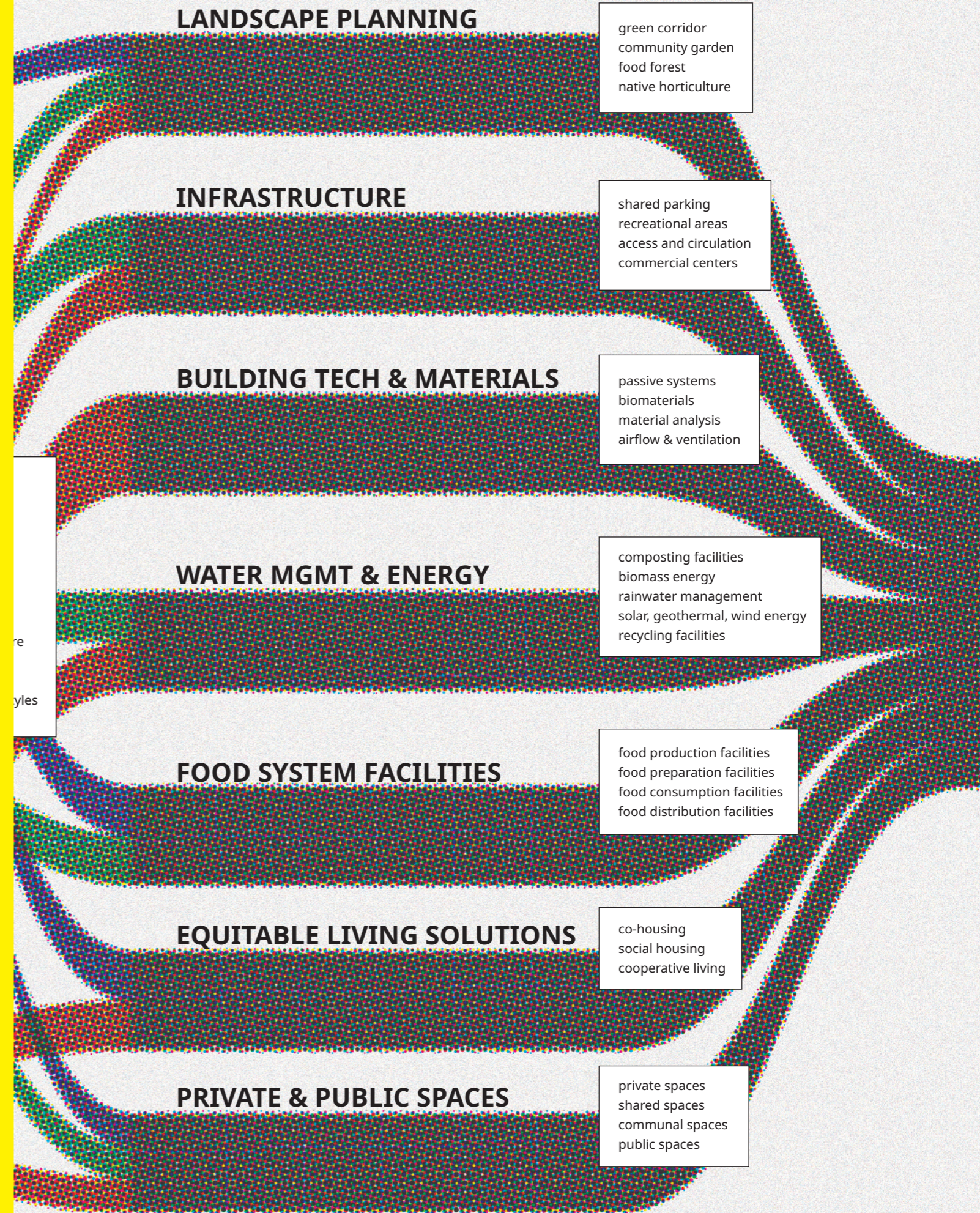
agroecology
agroforestry
permaculture
vertical farming
hydroponics & aquaponics
waste reduction and recycling in agriculture
native or climate adjustable crops
environmental impact of various diet lifestyles

SUSTAINABLE DEVELOPMENT

shared mobility
environmental policy
eco-tourism
environmental organizations
circular economy
paludiculture
equitable water access
green social infrastructure

Tertiary Research **CONNECTION TO BUILT EN- VIRONMENT**

*case studies
field work
web search*



Bibliography

ONLINE ARTICLES, JOURNALS, PAPERS

- Centraal Bureau voor de Statistiek. (2010, September 6). Supermarkt voor meeste Nederlanders op loopafstand. CBS. Retrieved October 10, 2024, from <https://www.cbs.nl/nl-nl/nieuws/2010/36/supermarkt-voor-meeste-nederlanders-op-loopafstand>
- Centraal Bureau voor de Statistiek. (2021, June 23). The Netherlands is the EU's largest meat exporter. CBS. Retrieved October 10, 2024, from <https://www.cbs.nl/en-gb/news/2021/25/the-netherlands-is-the-eu-s-largest-meat-exporter>
- Desai, R. (2023, Jan 24). Dispatch from Tromsø: From Raging Bull to Joyland. Film Companion. <https://www.filmcompanion.in/features/film-festivals/reviews/dispatch-from-troms-from-raging-bull-to-joyland>
- European Commission. (n.d.). Farm to Fork Strategy - European Commission. Language selection | Food Safety. Retrieved November 10, 2024, from https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en
- IMDb. (2022). The Grab (2022). IMDb. <https://www.imdb.com/title/tt21820452/>
- Kuczuk, A., & Janusz, P. (2018, December). NITROGEN LEACHING FROM SOILS IN THE ASPECT OF ITS BALANCE. ResearchGate. https://www.researchgate.net/publication/353142153_NITROGEN_LEACHING_FROM_SOILS_IN_THE_ASPECT_OF_ITS_BALANCE
- Lofvers, W., & Musch, M. (2004). Countryside. OASE, (63). <https://www.oasejournal.nl/en/Issues/63>
- NOS News. (2019, September 6). 18.000 projecten in de knel door stikstofuitspraak. NOS. <https://nos.nl/artikel/2300556-18-000-projecten-in-de-knel-door-stikstofuitspraak>
- Notenboom, J., van Veen, M., & Wesselink, L. G. (2006, May). Halting the loss of biodiversity in the Netherlands. pbl.nl. <https://www.pbl.nl/sites/default/files/downloads/500094001.pdf>
- OECD. (n.d.). Nutrient balance. OECD. <https://www.oecd.org/en/data/indicators/nutrient-balance>.
- Pelman, A., De Vries, J. W., Tepper, S., Eshel, G., Carmel, Y., & Shepon, A. (2024). A life-cycle approach highlights the nutritional and environmental superiority of agroecology over conventional farming: A case study of a Mediterranean farm. PLOS Sustainability and Transformation. <https://journals.plos.org/sustainabilitytransformation/article?id=10.1371/journal.pstr.0000066>
- Pelman, A., Nachtomy, O., & Carmel, Y. (2024). Individual nutritional self-sufficiency: a viable option in the present era. Frontiers in Sustainable Food Systems, 8. 10.3389/fsufs.2024.1424879
- Ritchie, H., Rosado, P., & Roser, M. (2017, August). Meat and Dairy Production. Our World in Data. Retrieved October 10, 2024, from <https://ourworldindata.org/meat-production>
- Ro, C. (2024, April 27). Layers Of Responsibility For Dutch Nitrogen Pollution. Forbes. Retrieved October 11, 2024, from <https://www.forbes.com/sites/christinero/2024/04/27/layers-of-responsibility-for-dutch-nitrogen-pollution/>
- TNO. (n.d.). What is nitrogen and can we control it? TNO. Retrieved October 10, 2024, from <https://www.tno.nl/en/sustainable/climate-air-quality/nitrogen/>
- van Halm, I. (2022, August 16). The Dutch Nitrogen Crisis: Consequences of Policy Inaction. Energy Monitor. Retrieved October 10, 2024, from <https://www.energymonitor.ai/policy/the-dutch-nitrogen-crisis-shows-what-happens-when-policymakers-fail-to-step-up/?cf-view>
- Viviano, F. (2017, September). How the Netherlands Feeds the World. National Geographic. Retrieved October 10, 2024, from <https://www.nationalgeographic.com/magazine/article/holland-agriculture-sustainable-farming>
- VTV de Zandweg. (n.d.). Volkstuinvereniging de Zandweg - Rotterdam. Retrieved November 10, 2024, from <https://www.vtv-dezandweg.nl/>
- Westhoek, H., & Boezeman, D. (2024, February 28). No deal on farming: lessons from the Netherlands. | IDDRI. Retrieved October 10, 2024, from <https://www.iddri.org/en/publications-and-events/blog-post/no-deal-farming-lessons-netherlands>

VIDEO MEDIA

- Cowperthwaite, G. (Director). (2022). The Grab [Film]. Impact Partners; Center for Investigative Reporting Studios; Rocklin/Faust. <https://magpictures.com/thegrab/>
- DW Documentary. (2022, October 25). Food security - A growing dilemma | DW Documentary [Video]. YouTube. <https://www.youtube.com/watch?v=wu7PjKawjwI>
- Eco No-Mads. (2024, August 1). Man grows ALL of his food on 750m2 [Video]. YouTube. <https://www.youtube.com/watch?v=TNR8JfHah00>
- IddriTV. (2024, March 28). European agriculture: lessons from the nitrogen crisis in the Netherlands [Video]. YouTube. <https://www.youtube.com/watch?v=ZeCXDDuoD3U>
- UN Environment Programme. (2016, May 10). Why do we need to change our food system? [Video]. YouTube. <https://www.youtube.com/watch?v=VcL3BQeteCc>
- Wageningen University & Research. (2020, June 4). Re-rooting the Dutch food system – from more to better [Video]. YouTube. https://www.youtube.com/watch?v=pJdQI_fYcaE

reflection rejection

Lately, reading text on architectural theory has been somewhat disheartening. I would keep reading the same line over and over again, but my brain would refuse to absorb what the author is trying to say. I get cynical. It all sounds like wild conjectures and pseudoscience. While the talking heads are squabbling about whether we are living in the chthulucene or anthropocene, there are professions that are actually making a difference. Inter-planetary problems are being tackled while architects are still salivating over Mies van der Rohe's corner details.

I am not particularly good with numbers, but I enjoy being thorough and I see this research as a way to get past the mental block. Once I crunch the numbers and delve into the details, I'll hopefully end up with something useful for myself at the very least. I suspect the final design of the building will be less exciting than the research itself.

The topic of food security is quite stimulating since there is a lot at stake. While the connection to architecture may seem tenuous, I believe even the smallest connection is worth pursuing. Starvation statistics are often overlooked by the general public because they aren't as eye-catching as genocides and don't seem to have a clear perpetrator. Yet, an estimated 70 million to 80 million people died in famines during the 20th century. How many more in this century? Solving the looming food crisis is an inherently multidisciplinary problem, and I am eager to see how architecture might contribute—however large or small—to a solution.