Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences

Personal information	
Name	Luka Brandsma
Student number	

Studio		
Name / Theme	Architectural Engineering, Harvest	
Main mentor	Yannick Warmerdam	Architecture
Research mentor	Mo Smit	Architecture
Argumentation of choice of the studio	The natural system is treated as a vast resource mine, leading to shortages of materials and pollution. Architecture's role in material flows and waste underscores our need to rethink our relationship with nature. My passion for biology and natural processes drives me to explore how buildings can emulate mushrooms, seamlessly integrating with and returning to nature. This aligns with the Architectural Engineering Studio's themes, aiming to shift the narrative from exploiting nature to symbiotic coexistence. I aim to make this mindset not only simple and logical but also conventional, fitting within the studio's flexible, holistic approach.	

Graduation project	
Title of the graduation project	Grow to Build: Redefining the Peri-Urban Interface of the Dutch City Assen through a Centre for Regenerative Self-Building
Goal	
Location:	Schieven, Assen, Drenthe, The Netherlands
The posed problem,	This project explores the problems of a lack of housing in the Netherlands, the inevitable city expansion in the future and the current linearity of the construction and agriculture industries. Furthermore, it addresses issues revolving around the regenerative design approach and challenges of self-building in the Netherlands.
research questions and	<u>Overall Design Question:</u> How to design for self-build architecture in the peri-urban border condition of the Dutch city Assen, as part of an alternative solution for city expansion, by establishing a regenerative relationship of the building and the landscape? <u>Thematic Research Question:</u> How can we translate the relationship of Vernacular Architecture in Drenthe with its landscape to applicable knowledge for regenerative self-building in the modern context?

	<u>Subquestions Research:</u> 1. What role did vernacular hallenhuis farms and the farmyards play in the social-economical context of Drenthe? 2. What was the relationship between the tectonics of vernacular hallenhuis farms in Drenthe and their surrounding landscape? 3. What are the opportunities and implications of introducing production strategies in the ecosystem to meet the demand for regenerative building materials? 4. How can the opportunities and potential barriers of the vernacular architecture of farms in Drenthe inspire modern regenerative self-building techniques?
design assignment in which these result.	The overall objective of this graduation project is to improve the collaboration of the cultural landscape with the natural system through architecture and city expansion. The following aims are part of this objective: The project showcases how applying regenerative principles can enhance the relationship between architecture and the ecosystem. The project rethinks peri-urban development. Additionally, the project provides self-builders with tangible knowledge and tools for regenerative construction. Finally, it explores regenerating agricultural land through holistic production, highlighting architecture's role in land regeneration. The design envisions a network of self-builders integrated in the urban plan, with a central hub facilitating the physical connection between parties and material flows. Within the design objective, there lies a focus on researching how the interrelation of vernacular practices with the landscape and local craftmanship in Drenthe can be applied to self-building in the current context. The research paper acts as a foundation from which the tectonics and materialisation can evolve in the design phase. The possibilities and implications related to regenerative self-building inspire and challenge the upcoming design process and add to finding solutions for a circular economy. Though rooted in the context of Drenthe and the Netherlands, the design's focus on self-builders using regenerative materials can spark broader industry reconsideration. This suggests a need for systemic evolution alongside architectural change, where this design can contribute to catalyzing a truly sustainable future. In short, the graduation project aims to emphasize the interrelatedness of ecosystems and the built environment and finally to make the approach of regenerative architecture tangible for self-builders.

Process

Method description

This master thesis transitions from theoretical exploration of city expansion through self-building and human-nature relationships to practical architectural application. Firstly, to comprehend the interrelation with the landscape, the function and farmyard elements, tectonics and origin of building materials of the hallenhuis (a vernacular farm) in Drenthe are analyzed and compared to the mapping of the ecosystems that are connected to the farm. The case study is based on literature, maps, fieldwork and archival research.
Secondly, the implementation of growing regenerative building materials in the modern context is evaluated according to a SWOT analysis to map the implications and opportunities of introducing a regenerative production chain. The assessment is based on the Doughnut of social and planetary boundaries model by Kate Raworth. Both the vernacular building materials from the case study and other state of the art regenerative materials are assessed with data from interviews with employees of Staatsbosbeheer and state of the art literature on regenerative practices. Thirdly, a comparative analysis of the hallenhuis case study and a case study on Walter Segal's Self-building method explores the applicability of vernacular practices of the hallenhuis to modern self-building practices.

Literature and general practical references

The research is conducted within the academic frameworks of regenerative design as proposed by John T Lyle in *Regenerative Design for Sustainable Development* and further discussed by for example several works by Chrisna Du Plessis. The topics overlap with bioregionalism, critical regionalism and hint towards permaculture. The architectural expression of the vernacular farm is analyzed according to the tectonics theory of Kenneth Frampton and his book *Studies in Tectonic Culture: the poetics of constriction in nineteenth and twentieth century architecture*. The historical and situational context of Drenthe and the hallenhuis is mapped by books such as *Dorpen in Drenthe* by A Kleijn (1984) and *Langs oude Drentse boerderijen* by Jan Jans, Everhard Jan and L. de Jong (1980), the historical works and archive collection of professor A. Blauw (1983) and drawings from the Provinciale monumentenzorg found in archives in Drenthe and Groningen.
Information on current policies and regenerative materials are sought in references such as Inspiratieboek biobased en natuurinclusief bouwen by College van Rijksadviseurs (2023) and similar research projects such as Naar een Nieuwe Streekarchitectuur by Stichting Bouwtuin (2022) or through interviews with forest managers of Staatsbosbeheer Corné Joziasse and Kees van Son.
Walter Segal's method is approached through *Walters Way & Segal Close: the architect Walter Segal and London's self-build communities* (2017) *and Learning from Segal: Walter Segal's life, work and influence* (1989).

Reflection

Relation between the project, the studio, the Master track and the Master

My graduation project is part of the Harvest studio topic. My project dives into the production of local regenerative building materials, which aligns with the harvest theme. I also look into the vernacular history of the design location to really grasp the material flows and the social and economic networks related to the flows. The tectonic perspective in the graduation is an approach that is very suitable for the graduation studio, architectural engineering, where engineering and architecture become one. Within the Architecture track the project investigates the effects of materialization and the important relationship between the design and the building process. The wide scope necessary to understand the complexity and functioning of the ecosystem services in collaboration with the natural system pushes this research beyond the field of architecture to explore the fields of urbanism, landscape design and ecological studies. I also find myself involved in exploring policies surrounding self-building, land use and ownership. The regenerative approach asks for a broad perspective on the built environment, so it is not unthinkable that this project does not limit itself to architecture alone, even if that is the main focus of the design. This project deals with a wide variety of aspects of the different chairs and tracks within the faculty of Architecture, Urbanism and Building Sciences.

Relevance of the project

This project aims to inspire both individuals within and beyond the building industry to embrace regenerative principles. By demonstrating the societal benefits of reconnecting with nature, it encourages practical application. The project introduces self-builders to an alternative, potentially transformative choice for sustainable living amidst urban expansion and housing challenges.

In the professional field of architecture, this graduation is adding to the growing research on the possibilities for regenerative building methods. It also invites architects to rethink their role as a designer. What if we design the conditions, the possibilities and let people design their own space?

The urban execution of a regenerative approach to housing might not seem as tangible currently, but can have potential in the long run. Interest in sustainable community living is growing. Though located in the context of Drenthe and the Netherlands, the design's focus on self-builders using regenerative materials can spark broader industry reconsideration. This suggests a need for systemic evolution where this design can contribute to catalysing a truly sustainable future.

As the research is set in Drenthe this province will find this information the most relevant. However, other regions with similar soil types and ecosystems can still benefit from the information. Researchers looking at other biotopes can take a more general look and use the applied methodology of the research as an example for their own research. As soon as Dutch institutions are genuinely interested in adopting a similar approach to their city expansion this study, together with existing studies in the Netherlands, can be seen as a starting point. A larger research with more data collection is advised before implementation.

Thus, the project is relevant to self-builders, architects interested in biobased and sustainable design, planning departments of governments, farmers and concerned citizen interested in learning about sustainable efforts in the building industry.