Implementing post-growth planning

A case study of the Suikerzijde

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Summary

Post-growth planning aims to move spatial planning from planning for economic goals to planning directly for environmental and social goals (Durrant et al., 2023). However, within research there has been little focus on its practical implementation (Polewsky et al., 2024). This research evaluates how post-growth planning can be implemented into current spatial plans through a case study of the Suikerzijde. The following question is answered: How can the municipality of Groningen implement post-growth principles into their plans for the Suikerzijde? Multiple qualitative methods are used, including a literature review, an analysis of policy documents and news articles, and an interview. Six post-growth principles were found in literature: resource and energy consumption, housing, mobility, the inclusion of nature, direct environmental impact and the planning process. These principles were used to evaluate the extent to which the Suikerzijde project aligns with post-growth. It was found that all principles were at least somewhat included in the plans. However, there is still quiet some room for improvement, especially when it comes to the resource and energy consumption and housing. Two obstacles were highlighted to implementing these principles, namely that growth is deeply embedded into our culture and that planning happens within a broader institutional framework aimed at growth. This thesis recommends future research to explore ways to overcome these obstacles, as a way to implement post-growth planning successfully and move towards a sustainable society.

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I. Introduction

1.1 Background

Climate change, environmental degradation and other sustainability challenges are among the most pressing issues of our time (Nguyen et al., 2023). The need to become more sustainable is recognized globally by governments and private actors alike. Spatial planning plays an important role in organizing this transformation to a sustainable society (Schmid, 2022). Two perspectives on how to achieve this transformation can be distinguished, namely green growth strategies and post-growth strategies.

Currently, the most common strategy used is that of green growth (Hickel & Kallis, 2020; Parrique et al., 2019), while post-growth planning is an alternative perspective on what planning should be (Perik, 2023). Green growth aims for strong economic growth while ensuring environmental and social sustainability (Global Green Growth Institute, 2016). The main premise of green growth is that GDP can be decoupled from its negative environmental impacts, allowing for infinite economic growth (Meran, 2023; Parrique et al., 2019; Stoknes & Rockström, 2018).

However, the post-growth perspective argues that the amount of decoupling needed for green growth to work is not happening and is also not likely to happen in the future (Durrant et al.,2023; Meran, 2023; Parrique et al., 2019). Therefore, it rejects economic growth as the main indicators of successful planning and instead aims at directly planning for environmental and social goals (Durrant et al., 2023; Rydin, 2013; Savini et al., 2022b). This requires a mindset shift, from a mindset of infinite growth to a mindset of sufficiency (Kurz, 2019).

To move planning beyond growth, current post-growth research focuses on critiquing current practices and investigating ways to move towards a post-growth way of planning. According to Durrant et al. (2023), this transformation of planning itself is to be changed through changed practice. However, as mentioned by Polewsky et al. (2024, p.4), current post-growth planning is ‘’highly theory-driven’’, while there is little focus on its practical implementation.

In this context, this research aims to evaluate how post-growth planning principles can be implemented in current spatial plans. This is done through a case study of the development plans for the Suikerzijde, which is the municipality of Groningen’s plan to build a new neighbourhood on the site of a former sugar factory (Gemeente Groningen, 2022e).

By investigating how post-growth principles can be implemented into these spatial plans, this research highlights how spatial planners can make more sustainable plans and what institutional obstacles they encounter in doing so. These obstacles are important for governments and policymakers to know so that they can facilitate post-growth planning by addressing them. All of this together can move post-growth planning towards practical implementation, which is necessary to transform towards a fully sustainable and just society.

1.2 Case study of the Suikerzijde

The municipality of Groningen has high ambitions when it comes to sustainability. At the same time, the city is dealing with a growing population and the ambition to build more housing to meet the high housing demands (Gemeente Groningen, 2021a). These challenges all come together in a plan to build a completely new city district, called the Suikerzijde.

The Suikerzijde is a plan of the municipality of Groningen to develop a new city district on the grounds of a former sugar factory. This vast area covers 165 hectares and lies only two kilometres away from Groningen's city centre. In 2008, the sugar factory that used to be here closed and in 2010 the municipality of Groningen bought this land. From the start, the municipality had the intention of developing new housing here, but because of the economic crisis of that time, these plans were pushed forward (Gemeente Groningen, 2022e). In 2016, the municipality started picking these plans up again (Gemeente Groningen, 2021) and after eight years of planning the groundworks started in March 2024 (De Suikerzijde, 2024).

For the Suikerzijde, the municipality aims to develop this area as a dense city district, with a good mix of different functions and all the facilities needed in a dense urban area. On top of that, there should be enough space for greenery and public squares and there should be an emphasis on cycling, walking and public transport (Gemeente Groningen, 2021). As stated by Gemeente Groningen (n.d., p.3), ''The Suikerzijde should feel like the existing inner city but more contemporary and aimed at the future: little cars, lots of greenery, less busy and with a healthy living environment for everyone''(Gemeente Groningen, n.d.). Chapter 4.1. goes more in-depth into the plans for the Suikerzijde and the extent to which post-growth principles are included.

1.3 Research problem

Research question: How can the municipality of Groningen implement post-growth principles into their plans for the Suikerzijde?

Sub-questions:

- What is post-growth planning and how can it be used to evaluate the sustainability of spatial plans?
- What are the plans of the municipality of Groningen for the development of the Suikerzijde?
- What post-growth principles are present and which post-growth principles are absent in the spatial plans for the Suikerzijde?
- What are the obstacles to implementing post-growth principles into the plans of the Suikerzijde?

1.4 Structure of the thesis

The structure of this thesis is as follows. First, chapter 2 establishes the theoretical foundation of this research. It looks into six different post-growth principles, as well as the obstacles to including post-growth principles in spatial plans and it shows the conceptual model. After this, Chapter 3 goes into detail about the methodology used, highlighting the methods used for data collection and data analysis, and the ethical considerations taken into account. Chapter 4 presents the results of this research, by assessing the presence of post-growth principles in the plans for the Suikerzijde and identifying the obstacles found for including post-growth principles in these plans. Finally, chapter 5 concludes this research, giving answers to the research questions, summarizes the main findings of this research and places them in a broader context. From this, it reflects the research and the process behind it and gives recommendations for future planning practice and research.

II. Theoretical Framework

2.1 Post-Growth principles

2.1.1 Resource and energy consumption

In essence, post-growth is about reducing the resource and energy throughput of high-income countries to stay within planetary boundaries (Hickel & Hallegatte, 2022). Reducing resource and energy consumption thus underlies all other principles. In the context of this thesis, resources and energy consumption are seen as both the resources and energy that are needed to realise the plans for the Suikerzijde, as well as how resource and energy are consumed in the neighbourhood after it is realised. For example, the former focuses, among other things, on how much and what materials are used in the construction, whereas the latter focuses on aspects like the proportion of renewables in the energy mix and the local production of resources.

Besides this, circular economy principles are also part of post-growth, as our society will always be dependent on resources (Schröder et al., 2019). However, circularity needs to be more collective and locally organized and should shift its focus from the monetary value of waste to its socio-ecological value (Savini, 2023).

2.1.2 Housing

Housing is a crucial part of the post-growth planning debate. Housing and especially new housing developments consume a lot of material, energy and land, and are closely related to urban sprawl, the cement industry and extraction of materials (Schneider et al., 2013). The housing types, sizes, densities, locations and related infrastructures all influence in what way and to what extent housing affects the environment and social structures (Cucca & Friesenecker, 2022).

Post-growth planning offers an alternative perspective on what housing should/could be. It sees houses not as a financial investment or a status symbol, but rather as hubs for conviviality, serving crucial social functions such as social networking (Schneider et al.,2013). As stated by Savini & Bossuyt (2022, p.35) ''housing is not a commodity but an essential social good.'' This perspective emphasizes the need for more affordable and democratic housing and tries to limit its ecological impact (Cucca & Friesenecker, 2022).

To achieve this, degrowth argues that housing should be de-commodified, for example through public housing, housing cooperatives or as housing commons (Savini & Bossuyt, 2022). Besides this, housing should focus on compactness and sufficiency, where current housing capacity is better utilized and square meters per person are reduced (Schneider et al.,2013; Krähmer, 2022). This can be achieved for example by house sharing and refurbishment of older homes (Schneider et al.,2013). At the same time, new developments should be downscaled (Ermgassen et al., 2022) and when new developments do happen they should focus on compactness and avoid expansive homes (Xue et al., 2017).

2.1.3 Mobility

Current-day mobility is heavily focused on privatized, motorized vehicles, which rely on large infrastructures and are still largely based on fossil fuels (Cattaneo et al., 2022). Post-growth planning recognizes this and advocates for drastic changes. It aims at reducing the overall energy and material throughput of mobility, transport and its related infrastructure. This should be realised by reducing the overall amount of mobility and transport while moving away from cars and towards low-carbon modes of transport (Chertkovskaya & Paulsson, 2022).

To reduce overall mobility, our society should be more locally organized (Jess, 2023). Cattaneo et al. (2022, 481) highlight this by stating that mobility can be reduced by ''the re-localization of life as close as possible to residential locations.'' According to Savini et al. (2022b), this re-localization is reached through mixed land use patterns that ensure that people's everyday activities are close to their residences, thereby limiting their need for mobility.

Besides this, Cattaneo et al. (2022) argue that post-growth mobility should be focused on active (e.g. walking and cycling), hybrid (e.g. e-bike) and shared (e.g. shared e-bike or e-scooter) modes of transport. These modes are at a trade-off of being socially desirable, while still being practical.

2.1.4 Inclusion of nature

It is well known that including nature in our cities is beneficial for both social and environmental outcomes. It has a positive effect on mental and physical health (Bosch & Sang, 2017; Hamel et al., 2021), makes cities more resilient against climate change, enhances biodiversity in cities and strengthens ecosystem services (British Ecological Society, 2021; Depietri & McPhearson, 2017). Because of this, also post-growth planning advocates for including more nature in our cities (Kronenberg et al., 2024; Savini & Schönfeld, 2022).

As stated by Savini & Schönfeld (2022, p.1), post-growth should ''foster a symbiosis between humans and natural ecosystems through the implementation of regenerative and participatory design.'' This requires a shift in our relationship with nature (Casa, 2012) and seeing non-human species as stakeholders in our cities (Kronenberg et al. 2024).

This is achieved by reintegrating biodiversity into urban areas, expanding blue and green infrastructure, fostering nature-based solutions and ensuring that nature is part of people's everyday lives (Kronenberg, 2024).

2.1.5 Local environmental impact

The next principle regards the local environmental impact, especially of new urban developments. Savini (2021) argues that urban developments are the driver of economic growth, and thus post-growth should focus on reducing new urban developments. Ruiz-Alejos & Prats (2022) take a slightly different approach and state that new developments can be part of the transition to a post-growth world, but only if the end goals outweigh the local environmental impact and carbon emissions, resource and energy consumption are drastically reduced, ecological conditions are enhanced and the development is equitable and just. Views thus vary between scholars, but if new developments take place the local environmental impact should be limited and the end goal should outweigh this impact.

2.1.6 Planning process

The last post-growth principle relates to the planning process. Spatial planning should prioritize social and environmental goals above economic goals. According to Xue (2022),the process should be open and well-informed, and planners should try to mobilize social groups that support post-growth values behind shared strategies for environmental sustainability and social justice. Post-growth planning also aims at making the planning process more democratic and just by actively engaging people in the design, governance and maintenance of their local community (Savini et al., 2022a).

2.2 Operationalisation

Table 1 below shows how the post-growth principles mentioned above were recognized in the data.

Table 1

Operationalisation

Post-growth principle		**How to recognize it in collected data**
Energy and resource use	Resource and energy consumption	Reference to measures taken to limit resource and energy consumption
	Circularity	Reference to the reuse of waste and measures taken to become circular
Housing	Compactness	Reference to limited floor space per person
	Housing ownership	Reference to public housing, housing cooperatives or non-commodified ways of living
	Types of housing	Reference to different types of housing
Mobility	Land use patterns and functions	Reference to close proximity of different functions
	Sustainable transport systems	Reference to measures taken to promote active, hybrid and shared modes of transport
Inclusion of nature	Nature inclusion	Reference to the inclusion of nature
Direct environmental impact	CO2 emissions	Reference to measures taken to limit CO2 emissions of construction
	Local environmental impact	Reference to measures taken to limit local environmental impact
Planning process	Engagement of local communities	Reference to measures taken to engage local citizens and communities in the design process
	Goals of the project	Reference to planning directly for environmental and social goals

2.3 Obstacles to implementing post-growth principles

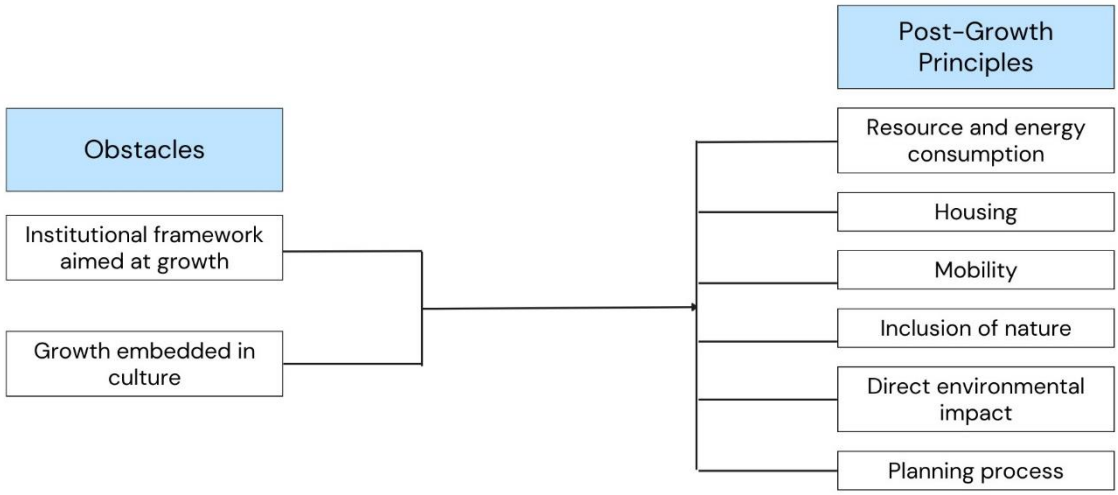
In literature, multiple obstacles in moving towards a post-growth future have been identified. Firstly, the planning process happens within a broader institutional framework, that is oriented towards economic growth (Büchs & Koch, 2019; Mete, 2022). Within this framework, planners ‘’are subject to the political reality, formal rules and regulations, and informal norms of conduct’’ (Perik, 2023 p.15). For example, in the context of The Netherlands, local spatial plans need approval from the municipal council. This could be an obstacle to including post-growth principles in such plans, especially if you have a more conservative council (Perik, 2023). To overcome this, effective communication is crucial in convincing the municipal council of the necessity of including these post-growth principles. Besides this, growth is deeply imbedded into western culture. Therefore, moving towards a post-growth future also requires radical shifts in our cultural values (Büchs & Koch, 2019; Kongshøj, 2023).

2.4 Conceptual model

Figure 1 shows the conceptual model used in this research. On the left, it shows the obstacles to implementing post-growth principles. These influence the post-growth principles on the right, as shown with the arrow between them. Through doing a case study, this thesis looks at these different obstacles and how they relate to the different post-growth principles. By doing this, it highlights what obstacles need to be overcome to implement these post-growth principles into current spatial plans.

Figure 1

Conceptual model



III. Methodology

3.1 Data Collection

This research uses a mix of qualitative methods, including a literature review, the analysis of policy documents and news articles and an interview. Table 2 shows which method was used to answer which sub-question .

Table 2

Research methods per sub-question.

Sub-question	Method
What is post-growth planning and how can it be used to evaluate the sustainability of spatial plans?	Literature review
What are the plans of the municipality of Groningen for the development of the Suikerzijde?	Policy documents + News articles + Interview
What post-growth principles are present and which post-growth principles are absent in the spatial plans for the Suikerzijde?	Policy documents + News articles + Interview
What are the obstacles to implementing post-growth principles into the plans of the Suikerzijde?	Literature review + Interview

3.1.1 Policy documents

Policy documents were used to answer research questions 2 and 3. These documents had to meet the following criteria to ensure they were relevant to this research:

- They should be official documents from the municipality of Groningen or official documents made on behalf of the municipality of Groningen
- They should include information about the spatial plans for the Suikerzijde
- They should include information regarding the post-growth principles included in this research.

The policy documents used for the evaluation are shown in Table 3. They are official documents published by the municipality of Groningen. These documents are publicly available through the website of the municipality of Groningen. They are also included in the references.

Table 3

Policy documents used for evaluation

ID	Name of publication	Publisher	Date	Pages
D1	Sz-corporate-brochure	Municipality of Groningen	n.d.	13
D2	Stedenbouwkundig Plan De Suikerzijde Noord: Uitwerking eerste deelgebied	Municipality of Groningen	March 2020	62
D3	Ontwerp openbare ruimte: De Suikerzijde Noordoost	Municipality of Groningen	March 2021	33
D4	Structuurvisie De Suikerzijde	Municipality of Groningen	June 2021	110
D5	Bestemmingsplan De Suikerzijde, deelgebied Noord	Municipality of Groningen	April 2022	135
D6	De Suikerzijde: Stedelijk en Groen	Municipality of Groningen	July 2022	7
D7	Samenvatting Plannen De Suikerzijde	Municipality of Groningen	September 2022	14
D8	Meest gestelde vragen over De Suikerzijde	Municipality of Groningen	November 2022	4
D9	De Suikerzijde Noordzijde: Ontwerp Beeldkwaliteitsplan	Municipality of Groningen	November 2023	60

3.1.2 News articles

Besides policy documents, news articles published by the municipality of Groningen were used. These are official news articles that the municipality published to inform the public about the developments of the Suikerzijde. These were found on the official website of the project. The articles used are shown below in Table 4.

Table 4

News articles used for evaluation

Name of publication	Publisher	Date
Akkoord over natuurcompensatie De Suikerzijde	Municipality of Groningen, Stichting Natuur en Milieufederatie Groningen	June 2023
Zonnedak Zeefgebouw in werking	Municipality of Groningen	July 2022
Overeenstemming over eerste werkzaamheden De Suikerzijde	Natuur en milieu federatie Groningen, Municipality of Groningen, Province of Groningen	November 2022

3.1.3 Interview

On top of the analysis of policy documents and news articles, an interview was conducted with a representative of the Suikerzijde project. The interviewee is an area developer working on the project of the Suikerzijde and is closely involved in the development of the plans. This interview was conducted to get further insight into the extent to which the post-growth principles were included in the plans and the obstacles to implementing these principles. In this way, the interview gave a deeper understanding than just analysing policy documents and news articles. This interview was arranged by contacting the project bureau through email.

3.2 Data analysis

Deductive coding was used for the analysis of the policy documents, news articles and the interview. The post-growth principles that were highlighted in the theoretical framework were used as a basis for the codes. One additional code was added for the obstacles.

It is important to note that these codes capture the broader topic of the principles, and all mentions of this topic were coded, no matter if they aligned with post-growth or not. After that, the content of the codes was analysed to assess the extent to which the plans aligned with post-growth, using the operationalisation shown earlier in table x.

The interview was first transcribed using Amberscript and this transcription was checked to make sure it was accurate. After this, the transcription was uploaded to Atlas.ti, where it was coded. All the other data was downloaded and directly uploaded to Atlas.ti. Appendix A shows the codebook highlighting all the codes.

3.3 Ethics

Since this research works with self-obtained personal data, ethical considerations have been taken into account. The name and job title of the interviewee were collected, but only the job title will be mentioned in this thesis. However, from this job title, the respondent could still be identified. That is why multiple data protection measures were taken. Firstly, the respondent had to sign a consent form, indicating under which conditions they would be participating in the interview. Included in these conditions was that the respondent could withdraw their consent until two weeks after the interview. The interview was recorded on the researcher's cell phone and transferred to their personal computer. The virus and threat protection on this computer were updated to make sure it was safe to store the personal data on it. After this transfer, the recording was deleted from my phone. The data is only stored on this computer and will only be shared with the supervisor of this thesis as part of the grading. It is assumed that this supervisor treats the data in line with the guidelines of the University of Groningen. The choice of programs used for the data analysis was also carefully considered to make sure they were safe. Amberscript was ultimately chosen since is a paid service which is used by the University of Utrecht and works in Dutch. Atlas.ti was chosen since it was recommended in an earlier course and was thereby considered to be trustworthy.

IV. Results

4.1 Evaluation of the plans for the Suikerzijde

4.1.1 Resource and energy consumption

The plans for the Suikerzijde display commendable efforts in reducing its material and energy throughput. The realisation of the project will take many years and its flexible approach to energy matches this, since its allows new technologies to be implemented whenever they are developed in the future (Gemeente Groningen, 2021c).

The realisation of the first part looks promising. The neighbourhood is going to be CO2-neutral and free of gas (Gemeente Groningen, 2022e). Buildings are fully electric, provide their own energy through solar panels (Gemeente Groningen, 2020) and thermal heat systems will provide heating and cooling (Gemeente Groningen, 2021c). This makes all energy used in the neighbourhood renewable (Gemeente Groningen, 2020). The overall energy use will be limited as much as possible through the use of smart grids (Gemeente Groningen, 2021c) and street lights will be dimmed when possible(Gemeente Groningen, 2020).

Besides this, attention is also paid to the material used. A material passport is being used in which all materials used in buildings are being registered (Interview). This allows them to be recycled or reused in the future. However, which materials are going to be used is still being debated. In this process, the developers are also looking at building with wood in contrast to traditional building methods using concrete (Interview). The policy documents highlight that circular economy principles are important, however no concrete measures are mentioned. However, they aim to reuse all of the waste that the municipality is responsible for, which is in line with the municipality's policies (Gemeente Groningen, 2021c).

Besides all of this, there is also quite some room for improvement, especially when looking at the energy and material use from construction. The construction of this new district will use a lot of energy and materials. Arguably, such a new development is not in line with post-growth planning. However, this area used to be a factory and closing down harmful activities and replacing them with housing is part of the post-growth agenda.

4.1.2 Housing

The municipality of Groningen aims to manage its population growth within the existing city, by densifying current neighbourhoods and transforming industrial areas to residential areas (Gemeente Groningen, 2021c). The Suikerzijde project falls into the latter category. It is designed to be a dense city district, comparable to Groningen's city centre. Through different phases, it is aimed to develop approximately 5.000 homes in the whole 165-hectare area. Therefore, this development might align with a post-growth new development. However, as mentioned in the interview, there will still be large houses, which does not align with post-growth housing.

For the realisation of the housing, there is cooperation between the municipality, two housing cooperatives and a developer (Interview). This cooperation with the housing cooperatives is in line with post-growth, but the inclusion of a developer is not. Especially because 400 of the 700 houses are going to be owner-occupied (Interview), which does not align with the aim of post-growth planning to de-commodify housing.

4.1.3 Mobility

In designing its mobility solutions, the Suikerzijde uses the STOMP principle (interview). This method prioritizes walking, then cycling, then public transport, then mobility as a service and the least priority is given to private car use. This aligns with Cattaneo et al. (2022) their perspective that post-growth mobility should focus on active, hybrid and shared modes of transport. Besides this, the Suikerzijde is planned to be a diverse neighbourhood, with a mix of different functions, focused on proximity (Gemeente Groningen, 2022a). This was also highlighted in the interview, where the respondent stated that there would be ‘’many facilities … [so] that you might not even have to leave the neighbourhood’’. This aligns with the post-growth aim to reduce overall mobility and re-localize life around residential locations through the use of mixed land use patterns and proximity between different functions (Savini et al., 2022b).

4.1.4 Inclusion of nature

For the inclusion of nature, the Suikerzijde aligns very well with post-growth planning. Biodiversity is integrated into the neighbourhood, there is a lot of blue and green infrastructure, nature-based solutions are used and nature will be part of people’s everyday life. This is firstly seen in the planning process, where there was a lot of communication with nature organisations which looked at how the animals and plants currently living in the area will be impacted. In this way, animals and plants were represented as stakeholders in the city. This is also seen in the design of the plan. There will be a big park with areas for recreation, quiet areas for animals and water (Gemeente Groningen, 2022b). Streets will include a lot of green and some will include bioswales, which foster biodiversity and are used as water catchment (Gemeente Groningen, n.d.). Buildings are designed to be nature-inclusive, for example by providing housing for birds and bats, and many will have green roofs (Gemeente Groningen, 2020). A nature compensation area has already been created to compensate for the species that used to live in this area (Gemeente Groningen, 2022b). On top of this, the Suikerzijde will be connected to the urban ecological structure of the city and nature outside of the city (Gemeente Groningen, 2022e), further fostering biodiversity. This all together makes it that, from the perspective of nature inclusion, the Suikerzijde aligns well with post-growth planning.

4.1.5 Local environmental impact

Since there is no consensus among post-growth scholars, it is a bit hard to assess the local environmental impact. From a critical viewpoint, the Suikerzijde is a new development and thus by default does not fit post-growth, since urban developments are the driver of economic growth (Savini, 2021). However, from a less critical perspective, the Suikerzijde aligns more closely with post-growth planning. In the design process, there was close

communication with multiple nature organisations and the plans were adjusted to minimize the local environmental impact. This was done for example by enlarging the park and lake which are habitats for bats and birds (Interview) and integrating existing trees into the plans as much as possible (Gemeente Groningen, 2021b) . Besides that, as per Dutch law, CO2 and other emissions were accounted for and did not exceed legal standards (interview). However, from a post-growth perspective, it is questionable whether or not the end goal outweighs the impact. Especially when post-growth planning aims at better utilizing the current housing stock (Schneider et al., 2013; Krähmer, 2022), instead of new developments like the Suikerzijde.

4.1.6 Planning process

For the planning process, the Suikerzijde is a bit of a weird case. Post-growth planning aims at achieving a democratic and just planning process by actively involving citizens. However, since the site of the Suikerzijde is an old factory ground, there are almost no citizens living on the site, except the forecourt of the old factory which will be developed at a later stage (interview). This means that there are not many citizens to involve in the design. However, there was a group for residents and stakeholders from the surrounding area, in which they could provide feedback on the plans for the Suikerzijde. On top of this, important documents were available for inspection at the municipality, where people could provide feedback. This is not an active involvement of the citizens, but in this way, the different interests of citizens are still taken into account. Therefore, the planning process does not resemble one that would fit post-growth planning, but that might have more to do with the location of the site than with anything else.

4.2 Overview of principles

Table 5 shows all the post-growth principles and the extent to which they are included in the plans for the Suikerzijde. Putting these in on table shows multiple things. Firstly, all post-growth principles are at least somewhat included in the project. However, there is still a lot of room for improvement. Especially when it comes to reducing energy and resource consumption of construction and the decommodification of housing. There was attention paid to reducing resource and energy consumption of construction, for example in choosing what materials to use (interview), but for the end goal to outweigh this, resource and energy consumption of construction must be limited as much as possible. With regards to housing, a completely different approach needs to be taken. Housing should not be realised through cooperation with a private developer, but should be realised fully by housing cooperatives, as social housing or as housing commons.

Table 5

Presence of post-growth principles in the plans for the Suikerzijde

Post-growth principle		**Aligns with post-growth**	**Does not align with post-growth**
Energy and resource use	Resource and energy consumption	CO2 neutral, buildings fully electric, use of smart grid	Still a new development, which comes with a lot of resource and energy use
	Circularity	Material passport, aim to reuse all waste	No concrete measures on how to make it fully circular
Housing	Compactness	High density, no big villas	Still big houses included
	Housing ownership	Cooperation with housing cooperatives	Cooperation with housing developer
Mobility	Land use patterns and functions	Mix of different functions, focused on proximity	
	Sustainable transport systems	Walking, cycling, public transport and shared modes prioritized above car use	A lot of investments in new infrastructure including for cars
Inclusion of nature	Nature inclusion	Close communication with nature organisations, streets include a lot of green, nature-inclusive buildings, connected with urban ecological structure	
Direct environmental impact	CO2 emissions	CO2 emissions did not exceed legal limits	No information on specific measures taken to reduce CO2 emissions as much as possible
	Local environmental impact	Compensation for species that were living there, keeping as much trees that were there already	Still a new development
Planning process	Engagement of local communities	Local residents and stakeholders could give feedback	Local citizens were not directly involved in the design
	Goals of the project	Social and environmental goals were important	Economic goals were also important

4.3 Obstacles to implementing post-growth principles

Both obstacles highlighted in the literature are also present in the case of the Suikerzijde. Firstly, planning happens within a broader institutional framework aimed at growth. The municipality of Groningen has many different ambitions, and some post-growth principles might conflict with other ambitions. This was mentioned in the interview, where the respondent said that ''preferably you want everything''. Some post-growth principles, like the inclusion of nature, are clearly being prioritized, leading to them being successfully implemented. However, other principles have lower priority which leads to them being sacrificed in order to obtain other ambitions. For the municipality of Groningen to include all principles, it must prioritize post-growth principles above their other ambitions. As mentioned in the literature, effective communication is needed to highlight the need for this.

The second obstacle is that growth is still deeply embedded into our culture. This was highlighted in the case through little demand for some post-growth principles. Implementing principles that challenge growth could even lead to a feeling among citizens that their culture is being attacked or undermined. Beside this, post-growth planning aims to reach a post-growth future in a democratic and just way (Savini et al., 2022b). Therefore, there must thus first be a cultural shift towards post-growth. This is the only way for the municipality to make sure that the inclusion of post-growth principles in planning happens in a democratic and just way and it does not lead to friction or unsatisfaction among citizens. The best example of this obstacle is in housing. Where post-growth planning aims for compact housing, reducing the meters of floor space per person (Schneider et al.,2013; Krähmer, 2022), many citizens of Groningen would like to move towards a bigger house (Bleijenburg et al., 2019).

Table 6 shows which obstacles are linked to which post-growth principles. This is useful for planners and policymakers that want to facilitate specific post-growth principles, since this shows them which specific obstacles they need to deal with in order to do so.

Table 6

Post-growth principles linked to the obstacles

Post-growth principle	**O1**	**O2**
Reduction of energy and resource use	NO	YES, new (housing) developments are a big ambition of national and local government
Housing	YES, private homeownership and wanting a big house is still a big part of our culture	NO
Mobility	YES, car use is still a part of our culture	NO
Nature inclusion	NO	NO
Direct environmental impact	NO	YES, new (housing) developments are a big ambition of national and local government
Planning process	NO	YES, including citizens in the design can clash with the ambition to realise the plan as soon as possible

V. Conclusion

In order to transform to a sustainable society, post-growth planning argues that the current green growth strategy is not working because the amount of decoupling needed for it to work is not happening. Therefore, it highlights the need to move from planning for economic goals to planning directly for environmental and social goals. However, as argued by Durrant et al (2023), this requires a completely different way of planning. In this context, this research aimed at evaluating how post-growth planning can be implemented into current spatial plans. This was done through evaluating a case study of the spatial plans for the Suikerzijde, which is the municipality of Groningen's plan to build a new neighbourhood on the site of a former sugar factory.

Six different post-growth principles were highlighted and used to evaluate the extent to which post-growth principles were already present in the plans. These include resource and energy consumption, housing, mobility, the inclusion of nature, direct environmental impact and the planning process. It was found that all principles were at least somewhat included in the plans. However, there was still quiet some room for improvement, especially when it comes to the resource and energy consumption of the construction of the project and the way housing is organized.

Two main obstacles were highlighted to further implement these post-growth principles. Firstly, growth is still deeply embedded into our culture, which leads to problems with implementing post-growth principles in an democratic and just way. Secondly, the municipality has a lot of different ambitions and sustainability is only one of them, which means sustainability is sometimes sacrificed in order to obtain other ambitions. In order for the municipality of Groningen to implement all post-growth principles, these obstacles need to be overcome.

The obstacles highlighted are not exclusive to this case. These obstacles are likely to occur when applying post-growth planning in another context as well. Therefore, it is important that future research looks for ways to deal with these obstacles, in order to successfully implement post-growth planning. It is also important for planners and policymakers to know these obstacles, if they want to implement post-growth planning principles into spatial plans successfully.

The policy documents, news articles and interview together lead to a good understanding of the plans of the Suikerzijde, and the extent to which post-growth principles were included. However, this data is somewhat limited in understanding the planning process and the institutional framework in which it takes place. The interview gave good insights into this, but is still limited and more in depth research is needed. Besides this, this thesis only looks at one case study, in an municipality that is quiet progressive when it comes to sustainability. Research into other case studies might show additional obstacles that were not present in this case. On top of that, it was outside of the scope of this research to find ways to deal with the obstacles that were found in this research.

It is recommended that further research focuses on finding ways to overcome the obstacles mentioned in this thesis. Future research is needed to find ways to shift our culture away

from growth and towards post-growth and future research is also needs to look into how post-growth principles can be prioritized in governmental policies. Besides this, future research could look into other case studies, which might find additional obstacles to implementing post-growth planning. It could also focus more in-depth into the institutional framework and how to transform that towards post-growth.

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VII. Appendix

Appendix A: Codebook

Code group	Code sub-group	Code	Code description
Post-growth principles	Energy and resource use	Resource and energy consumption	Reference to resource and energy consumption
		Circularity	Reference to waste, reuse of waste and circularity
	Housing	Compactness	Reference to compactness and floor space per capita
		Housing ownership	Reference to housing ownership, housing market and housing prices
	Mobility	Land use patterns and functions	Reference to land use and proximity of different functions
		Sustainable transport systems	Reference to transport modes and infrastructure
	Inclusion of nature	Nature inclusion	Reference to the inclusion of nature
	Direct environmental impact	CO2 emissions	Reference to CO2 emissions of construction/ realising the plan
		Local environmental impact	Reference to the impact on the local environment
	Planning process	Engagement of local communities	Reference to the role of the local citizens and communities in the project design
		Goals of the project	Reference to the goals of the project
Obstacles to implementing post-growth principles		Obstacles	Reference to the institution and regulatory framework wherein the design process takes place

Appendix B: Interview guide

General:

Wat is jouw rol binnen het project?

Mobility

- Wat is de precieze rol van de auto?
    - Gaat iedereen een auto hebben?
    - Wat wordt er gedaan om gebruik van de auto zo laag mogelijk te houden?
- Wat wordt er gedaan om fietsen en wandelen te stimuleren?
- Is er ook gekeken naar gedeeld vervoer, zoals autodelen?
    - Hoe wordt dat eventueel gestimuleerd?
- Hoe worden verschillende functies gemixt binnen de buurt?
    - Is hierbij ook specifiek gekeken naar het verminderen van de mobiliteit, omdat het meeste wat de mensen nodig hebben binnen wandel afstand is?
    - Hoe zit het met verandering van functies?

Housing:

- Hoe compact wordt de buurt?
    - Gemiddelde m2 per persoon?
- Wie bouwt de huizen en wie wordt er daarna eigenaar van de huizen?
- Wat voor soort huizen worden het?
    - Worden de huizen koop- of huurhuizen?
    - Sociale huur?
- Wat wordt er gedaan om de huizen betaalbaar te houden?
- In hoeverre wordt er ingespeeld op de vraag?

Inclusion of nature:

- Wat is de rol van natuur in dit project? En hoe wordt het inbegrepen in het project?
- Wat wordt er gedaan om de biodiversiteit binnen de buurt te stimuleren? En waarom is het zo belangrijk?
- Met welke natuurorganisaties is gesproken?

Energy and resource use:

- Wat wordt er gedaan om het materiaal gebruik zo laag mogelijk te houden?
- Wat wordt er gedaan om het energie gebruik zo laag mogelijk te houden?
- Wat wordt er gedaan omtrent circulariteit binnen de suikerzijde?
    - Wordt er bijvoorbeeld ook gekeken naar wat voor materialen er gebruikt worden? En de bouwwijze?
    - Hoe zit het met de infrastructuur die aangelegd wordt? Wordt daarmee ook rekening gehouden met circulariteit?

Direct environmental impact:

- Is er ook rekening gehouden met de CO2 uitstoot van het bouwen?
- Hoe wordt de bestaande situatie meegenomen in de toekomstige plannen?

If we have time:

Planning process:

- Hoe zijn de bewoners bij het project betrokken?
- Hoe werd er gedurende het project naar duurzaamheid gekeken? Was het vanaf het begin het project een van de belangrijkste punten? Of waren er andere punten belangrijker, bijvoorbeeld het voorzien van zoveel mogelijk huizen?
    - Wat is de relatie met andere doelen?
- Zijn er bepaalde compromissen genomen omtrent duurzaamheid?
- Was het moeilijk om duurzaamheid te balanceren met andere doelen?
    - Ook met doelen van de gehele gemeente?
- Hoe zit het met de financiering van duurzaamheid?

Appendix C: Consent form

Onderzoeker: Rick Dijkstra

Voor mijn bachelor thesis doe ik onderzoek na de toepassing van post-groei principes in ruimtelijke plannen, met als case study de plannen voor de Suikerzijde. Het onderzoek kijkt naar hoe deze principes zijn toegepast in de plannen van de Suikerzijde en hoe ze het best kunnen worden toegepast in andere ruimtelijke plannen. Dit interview is deel van mijn thesis en heeft als doel een beter inzicht te krijgen in de plannen voor de suikerzijde en het proces daarachter.

Deelname aan dit onderzoek is volledig vrijwillig. Als u uw deelname aan dit onderzoek op wil zeggen kan dit tot 2 week na het interview. Uw data wordt beheerd door de onderzoeker en de Rijksuniversiteit Groningen en wordt niet gedeeld met derden. De data zal maximaal een half jaar opgeslagen worden na dit interview.

Als u het goed vindt zal ik de audio van dit interview opnemen op mijn mobiel. De informatie die u tijdens dit interview verstrekt zal worden gebruikt voor mijn thesis. Als u een vraag niet wilt beantwoorden hoeft dit niet. Hiernaast worden uw naam en functietitel opgeslagen. Alleen uw functietitel zal zichtbaar zijn in het uiteindelijke onderzoek, tenzij u hierin op een andere manier aangesproken wil worden. Uw naam wordt niet gepubliceerd. Als u wilt kan ik een kopie verstrekken zodra mijn onderzoek is afgelopen.

Als u uw deelname wilt opzeggen of als u verdere vragen hebt kunt u contact met me opnemen via: H.dijkstra.17@strudent.rug.nl

Geef aan of u het hiermee eens bent:

□ Ik ben genoeg geïnformeerd en geef toestemming om deel te nemen aan dit onderzoek.

□ Ik geef toestemming om de audio van dit interview op te nemen.

□ Ik wil graag het onderzoek ontvangen zodra dit afgelopen is.

Naam deelnemer:

Handtekening deelnemer: Datum:

Handtekening onderzoeker: Datum: