

Redevelopment of industrial heritage sites

Effects on the liveability of surrounding neighbourhoods and the role of local government



(Karstkarel/Stichting DBF, 2014)

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1. Summary

In populated cities it is a smart and sustainable option to transform and redevelop real estate. Redeveloping industrial heritage sites is a good way to preserve their cultural-historical value instead of demolishing it. With a qualitative research approach this thesis researches the effects of the redevelopment of industrial heritage sites on the liveability of nearby residential areas. It tries to find out what aspects contribute the most to a change in liveability. In addition to this the thesis is also about the role of the government in the redevelopment process. After the financial crisis the governmental land use development policy changed to a more organic and enabling system. The thesis focuses on two redeveloped industrial heritage sites and the surrounding neighbourhoods: the Gasfabriek in Meppel and the Leerlooierij in Heerenveen. The main result is that most important dimension of liveability to change in reaction to the development of the nearby industrial heritage site seems to be the social dimension. This is mainly because the redevelopment reinforces the residents' sense of place and sense of identity.

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2. Introduction

2.1. Background

The Netherlands is a densely populated country and space is becoming scarcer, therefore the ideas of the compact city become more and more relevant. It is aimed to reduce automobile-related energy use, urban air pollution, and sprawl-related farmland and habitat loss by promoting the re-use of urban brownfield sites, high-density and mixed-use development, and public transit. The compact city ideal relates to discussions of urban sprawl, smart growth, quality of life and questions of urban housing availability and affordability (Gregory, Johnston, Pratt, Watts & Whatmore, 2009). Smart growth refers to sustainable growth and environmental impacts, transportation and green networks that enable this, multifunctional land use and variations in density to accommodate this (Van Assche, Beunen & Lo, 2015).

The Dutch government's policy on redevelopment, on a national and municipality level, is based on the concept of the compact city. The purpose of this is to make the best use of the space that the city has (Korthals Altes & Tambach, 2008). A smart growth option is the redevelopment of brownfield areas, these are land and structures that are known or perceived as contaminated that are underutilized or not unused. Decontaminating Brownfields reduces community health risk and creates opportunities for redevelopment activities that will bring jobs, payments of locally assessed property taxes, housing and open space opportunities to communities that badly need them (Greenberg, Lowrie, Mayer, Miller & Solitare, 2001). The reuse of real estate is likewise a smart growth option. The shift to building reuse and adaptation has become an increasing trend within the last decade. In many cases, increasing the life of a building through reuse can lower material, transport and energy consumption and pollution and thus make a significant contribution to sustainability. There is ubiquitous convergence among researchers that adaption can make a significant contribution to the sustainability of existing buildings. There is also a growing perception that it is cheaper to convert old buildings to new uses than to demolish and rebuild (Bullen & Love, 2010). Another method for governments to ensure quality of life and to improve liveability is renewing urban areas. Urban renewal refers to a range of strategies aimed at reshaping urban landscapes and remedying social and economic problems associated with run-down innercity neighbourhoods (Gregory et al, 2009).

Clearly, redevelopment projects have positive effects for cities and improve the use of the land that's being redeveloped. However, areas or neighbourhoods in cities don't stand on their own, all together they form a city. When an area is redeveloped it has an effect on the surrounding neighbourhoods. Linn (2013), Chau and Wong (2014), Woo and Lee (2016) and Van Duijn, Rouwendaal and Boersema (2016) found that redeveloped areas or structures have a positive effect on the property values of nearby residential areas. One could conclude that with this increase of property values the liveability of these residential areas also increases. People pay more for the houses so the neighbourhood would have to be more liveable than before. However, with this one only has a rough approximation of the increased liveability. Liveability is a difficult concept to measure, it consists of several different aspects and cannot be expressed with only a monetary value. There is ample research on the effects of redeveloped areas on property value but not on the actual liveability and the aspects of liveability that mattered the most to increase the property values. This thesis adds this to the existing

research on the external effects of the redevelopment of industrial heritage sites. In addition to this the thesis looks at the role local governments play in these redevelopments, especially in the light of the changing role of the governments after the financial crisis.

2.2. Research problem

What are the external effects, in terms of liveability, of the redevelopment of an area on the nearby residential areas? Sub-questions to this main research question are:

- What are the most important aspects of liveability that change in reaction to the development of the nearby industrial heritage site?
- Does the height of the costs, the scale of the redevelopment and the new function matter for the effects on liveability in the surrounding neighbourhood?
- What role do local governments play in the repurposing of real estate?

2.3. Structure of the thesis

This thesis is structured as follows: first will be the theoretical framework in which relevant theories and concepts are discussed, this also includes the conceptual model. After this the methodology will be outlined. Third are the results of the research and last are the conclusions.

3. Theoretical framework

The external effects of the redevelopment of an area should be realised and that's why there are several recent studies that research the effect of redevelopment on property values of nearby residential areas. Chau and Wong (2014), who researched urban renewal in Hong Kong, found that on the one hand nearby properties may rise in value because it helps to reduce the negative externalities posed by older buildings. Urban renewal may also create a better environment and introduce new amenities into a community. These effects are stronger for larger urban renewal projects and for projects with more commercial facilities. On the other hand, urban renewal projects reduce the value of nearby buildings beyond the boundaries of the project because these are by definition excluded from the urban renewal project. The negative effect was stronger for older buildings and for those buildings located closer to the project's boundaries. Linn (2013) researched the effects on nearby housing prices of brownfield redevelopment in Illinois, US. He found a small increase in the nearby property value because of decreased contamination risk and amenities associated with redeveloping the brownfield. The effects lessen the farther the property is away from the brownfield. The effects also appear to be stronger for low-price houses. These same results were found by Woo and Lee (2016) who did a similar research as Linn (2013) in Cuyahoga County, Ohio, in the US. Van Duijn et al. (2016) researched the effects of the transformation of 36 industrial heritage sites spread over The Netherlands. They also found positive external effects on nearby house prices because of the redevelopment, although these effects were very local; the house prices increased for the houses in a 500 meter radius around the object. These effects were however mostly driven by the redevelopped heritage sites in the four largest cities in the Netherlands. There was almost no external effect on the house prices in the smaller cities and villages in the Netherlands.

The transformation of industrial heritage sites is especially relevant for the development of neighborhoods and communities. It relates to the creative class concept of Florida (2012). He states that waste is the enemy of creativity and that the creative ethos demands that we cultivate and utilize all of our natural and human resources. Furthermore, creativity requires diversity (Florida, 2012). These renovated structures facilitate diversity, as a lot of them are facility-sharing buildings. Mixed land use and development is being officially promoted as essential to the creation and maintenance of attractive, liveable and sustainable urban environments (Rowley, 1996). Also, many policymakers believe that renovation of an abandoned industrial site is a tool to upgrade neighbourhoods by attracting higher educated residents, firms from the creative sector and tourists (Van Duijn et al., 2016). Social mixing in itself can promote social order and assist in the creation of more liveable neighbourhoods but the bringing together of different groups can also result in the emergence of tensions, which have to be accounted for in the design and the management of neighbourhoods (Lawton, 2013).

As the neighbourhoods change because of the industrial building that has been redevelopped, there are residents who have been living there before the redevelopment of the nearby building began. These changes have to affect their personal beliefs of the liveability of their neighbourhood. Liveability is a difficult concept to grasp as it is such a broad concept and it is dependent on the scope and scale one researches. Liveability refers to the environmental conditions which, along with socio-economic conditions, contribute to quality of life. It describes the degree to which a place supports quality of life, health and well-being (Namazi-Rad, Perez, Berryman & Wichramasuriya, 2016). The

concept of livability is a qualitative construct representing a set of characteristics that relate to the attractiveness of an area as a 'desirable' place to live, work, invest, and conduct business (Giap, Thye & Aw, 2014).

So what are indicators of the liveability? For their 'global liveable cities index' Giap, Thye, Yam, Low and Aw (2012) used five themes, economic vibrancy and competitiveness (1), domestic security and stability(2), socio-cultural conditions(3), public governance(4) and environmental friendliness and sustainability(5), to operationalise measurement of liveability. Of course, in researching neighbourhoods instead of cities these aspects need to be narrower. Leby and Hashim (2010) conducted a study about the relative importance of dimensions of liveability in the eyes of the neighbourhood residents in one of the neighbourhoods in the Subang Jaya Municipal Council vicinity, Malaysia. For this they divided liveability into four dimensions, assigning indicators to each dimension. These are as follows: social dimension (social relations): behavior of neighbors (nuisance), community life and social contact, sense of place; physical dimension (residential environment): environment quality, open spaces, maintenance of built environment; functional dimension (facilities and services): availability and proximity of amenities, accessibility, employment opportunities; and the safety dimension (crime and sense of safety): number of crime, number of accidents, feeling of safety.

The redevelopment of real estate ties with the broader practice of planning. The Dutch planning practice has long been viewed as atypical and exemplary. It has three main institutions: active land policy, comprehensiveness and integration. The financial crisis has changed this planning system, the tightly coupled system is very sensitive to shocks. It changed to a more organic planning system with a greater role for smaller private actors and an enabling role for governments. This is better at allowing for adapting to changing circumstances (Buitelaar & Bregman, 2016). Van der Krabben and Jacobs (2013) also conclude that the Dutch government should restrict the use of the integrated, active land policy because of the risks involved. Another feature of contemporary planning practices is an increased attention to participation and say in the planning process. Interest groups and residents are consulted *during* the planning process (proactive planning) and not only after the planning process is done (reactive planning). Consultation is a form of public participation in which the government gives involved parties the chance to have their say in particular intentions (Voogd, Woltjer & Van Dijk, 2012). In case of an alteration in the zoning plan because of the change of the function of a building, people can also give their opinion. The concept zoning plan has to be available for inspection for everybody during six weeks, in which time people can give their opinion. After this the plan is established and if directly concerned people do not agree with it they can appeal the decision (Van Doorn & Pietermaat-Kros, 2010).

3.1. Conceptual model

The theoretical framework can be summarised using figure 1, the conceptual model. The transformation and reuse of industrial heritage sites increases the property value of nearby residential areas, thus increasing the liveability (represented by the property value). On the other hand, the transformation of industrial heritage sites increases the liveability of nearby residential areas, which in turn increases the property values in the nearby residential areas.

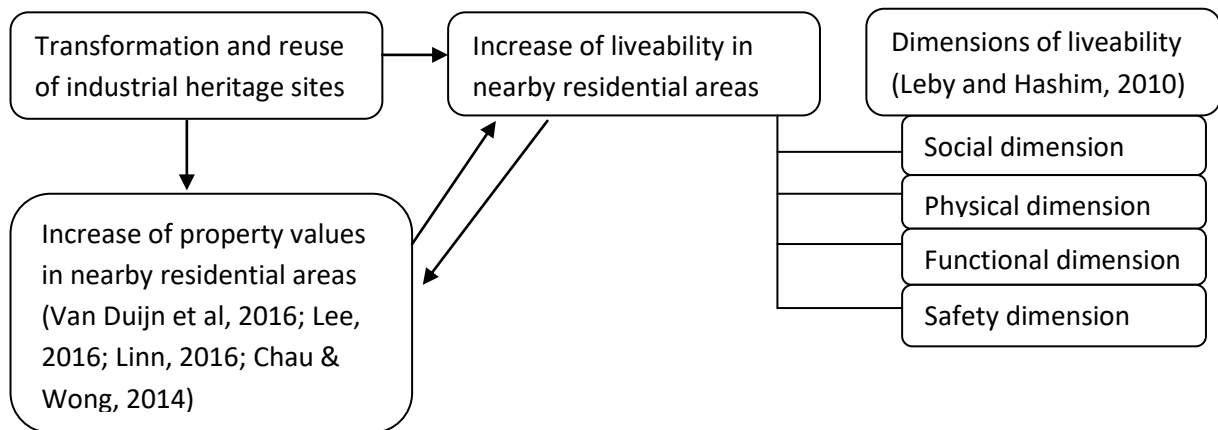


Figure 1: conceptual model (author).

4. Methodology

This chapter explores the used research methodology and it is separated in different paragraphs. First the research approach is described, after which the selected heritage sites and the interviewees are outlined. Finally, ethical issues are discussed. The interview guide can be found in the appendix.

4.1. Research approach

The research for this thesis focusses on two transformed and reused industrial heritage sites and their surrounding neighbourhoods. Two of the 36 sites that were researched by Van Duijn et al. (2016) were selected for further analysis. The two sites were selected by year of completion and by their proximity to Groningen, for practical reasons. The sites that were completed the most recent and that were relatively the closest to Groningen were chosen, these are the Gasfabriek in Meppel and the Leerlooierij in Heerenveen. Figure 2, on the next page, illustrates all 69 redeveloped industrial heritage sites in the Netherlands with detailed maps of the neighbourhoods surrounding the selected cases.

The data is collected by in-depth, semi-structured interviews. Clifford, French and Valentine (2010) define a semi-structured interview as: “a verbal interchange where one person, the interviewer, attempts to elicit information from another person by asking questions. Although the interviewer prepares a list of predetermined questions, semi-structured interviews unfold in a conversational manner offering participants the chance to explore issues they feel are important.” Interviews were chosen to allow for open answers because of the complex concept of liveability and to learn the background of the redevelopment process. A quantitative research approach would have been less suitable because that doesn't allow the respondents to state their experiences and perceptions. The interviews are semi-structured to allow for a natural flow of the conversation but at the same time ensuring that the sought-after subjects are covered. The respondents for the interviews were public servants of the respective municipalities and an employee of Stichting DBF, a foundation that works a lot with repurposing buildings.

Because of the variety of developments in the selected neighbourhoods, in terms of the effects of the redevelopment of industrial real estate on the liveability of the surrounding neighbourhoods the thesis is less focused on the two selected industrial heritage sites and the surrounding neighbourhoods than planned. The results are based on the experiences of the interview respondents and are more about the effects of redevelopment (primarily of industrial real estate) on the liveability of the surrounding neighbourhoods in general instead of only focussing on the selected neighbourhoods. This is because of the addition of other cases that were brought up by the respondents. This was of course possible because of the open-ended nature of interviews, and this was proven to be a real advantage of the data-collection method. A drawback to interviews as the data-collection method is the time it takes to arrange and schedule the interviews. This is why only three interviews are taken. More interviews would have added to the reliability and the robustness of the research. Interviews with more municipalities in which industrial real estate was redeveloped would have been beneficial.

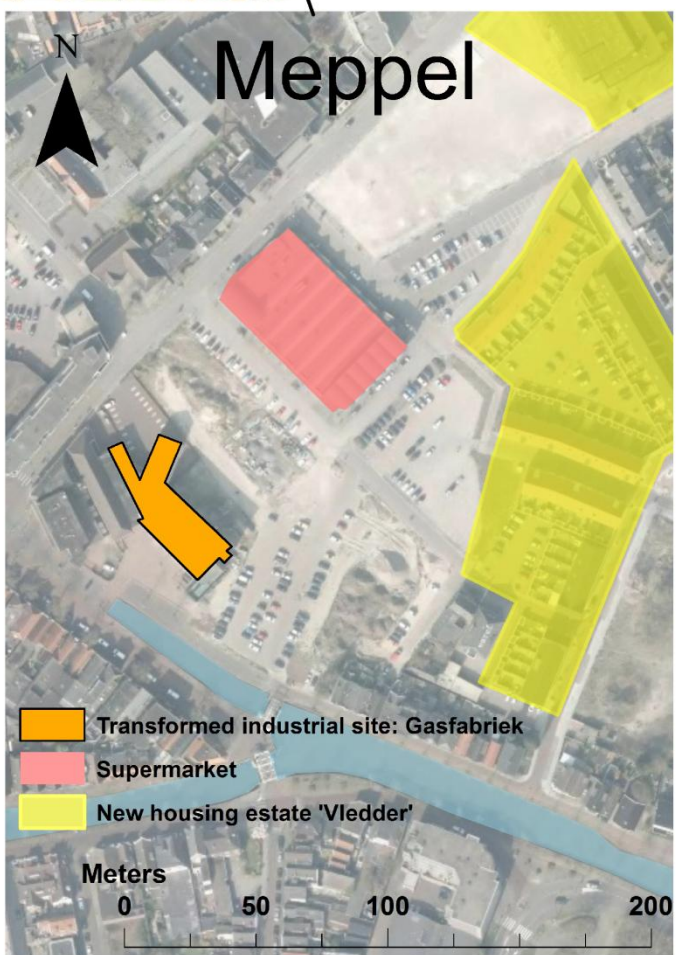
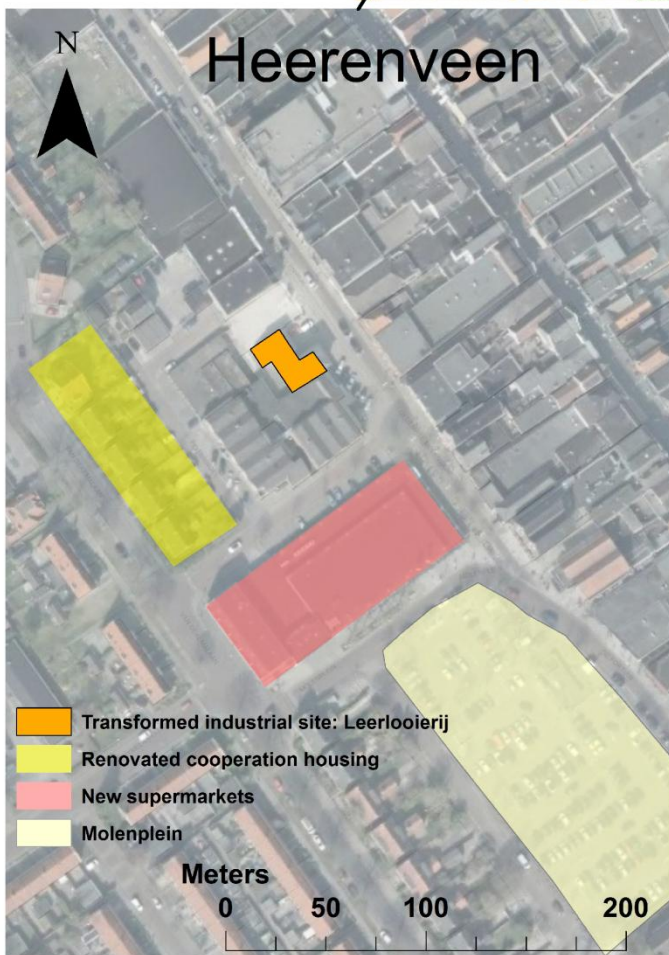
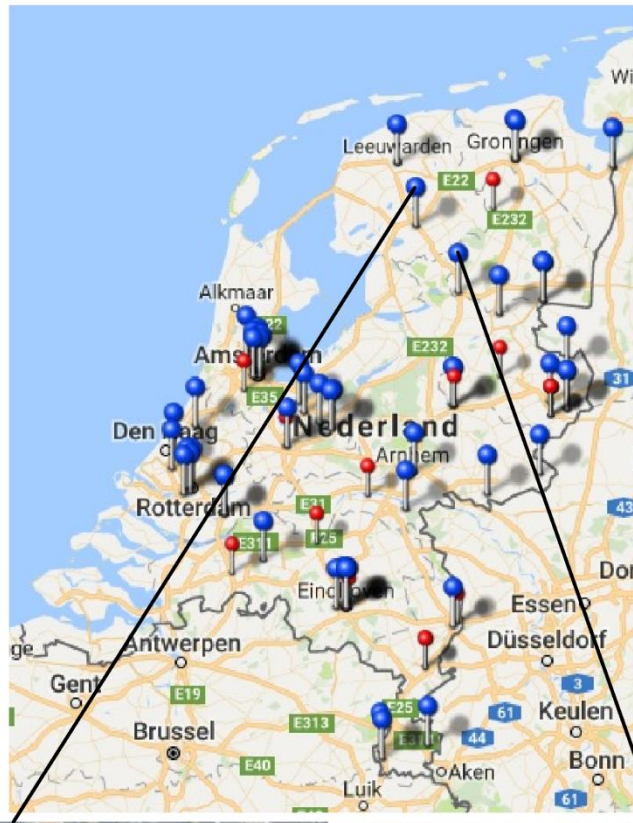


Figure 2: map of the 69 redeveloped industrial heritage sites in the Netherlands (Nationaal Programma Herbestemming, 2016) and detailed maps of the neighbourhoods surrounding the selected cases (made by the author using the GIS program ArcMap).

4.2. Selected industrial heritage sites

Leerlooierij (Heerenveen)

When this building was originally built is not sure but from 1836 till 1867 it was used as as a leather tannery. In 1867 it was rebuilt and sold to a producer of horsehides, who used it till 1912. After this the building was used by a lot of different companies and it started to deteriorate. There were problems with the whole neighbourhood where the leerlooierij is in and the municipality and housing cooperatives started a plan to revitalise the area. Stichting DBF got the assignment to transform the building. A total investment of €645.000 was made and the transformation was finished in 2007. The current function is office/creative space. The plans for the revitalisation of the neighbourhood were delayed and this is noticeable for the lease of the building. At the moment three of the five units are being rented. (Nationaal Programma Herbestemming, 2016; Stichting DBF, 2016).

Gasfabriek (Meppel)

This factory-building was originally built in 1861 and after it lost its original function it was used for a lot of different purposes. Architecture agency B+O started the transformation in 2006 with a total investment of €5.700.000, the transformation was complete in 2009 (Van Duijn et al, 2016). The goal is to provide accomodation to starting entrepreneurs in the creative industry. Besides the architecture agency a range of companies use the building, a photo-studio, a furniture business, a law office and a grand café to name a few. The gasfabriek is a municipal monument. (Nationaal Programma Herbestemming, 2016).

4.3. Interview respondents

- Respondent 1 is a communicational and project employee at stichting DBF, where she has been working for ten years. Stichting DBF stimulates the liveability and economy of rural areas in the North of The Netherlands. Stichting DBF is the owner of the leerlooierij in Heerenveen.
- Respondent 2 is an architect by education and worked for two architecture agencies before starting her own practice. She has been working as urban development engineer for the municipality of Heerenveen several years now.
- Respondent 3 is an environmental scientist/city planner by education and has been working in the area for about 20 years. He has been working as policy advisor spatial development for the municipality of Meppel since 2009 and is involved in the developments surrounding the Gasfabriek.

At the start of every interview permission was asked to record it, the interviewees were also explained that the interview would be processed for this bachelor thesis. The interview with respondent 1 took place in the office of Stichting DBF in Grou, the interview with respondent 2 took place in the cafeteria of the Heymansbuilding of the University of Groningen and the interview with respondent 3 took place over the phone. The interview over the phone was because of practical, scheduling reasons. In this interview the drawbacks of the indirect communication were sometimes noticed, for example the absence of reacting to non-verbal communication and both people accidentally speaking at the same time. These drawbacks were of minor influence on the

interview. Because the interviews were in Dutch the transcripts were omitted from this thesis.

4.4. Ethics

The interviewees were treated with respect and the interviewer tried his best to keep his own opinions and assumptions at bay. Respondents are not mentioned by name to ensure their anonymity. All respondents were assured that the data collected will only be used for this thesis. This also resolved the potential problem of the power-relation between the interviewer and the interviewees; it could for example be that a respondent was hesitant to answer certain questions. The interviewees who asked for it are going to get a copy of this thesis after the completion, as thanks for the interview.

5. Results

5.1. Process of redevelopment

The process of redevelopment is dependent upon if the real estate is property of the municipality or not. If the municipality is the owner of the real estate and is selling it, they have more control over the new function. In the other case, if the owner is a private party, most of the time they talk with the municipality because the function in zoning plan has to be altered. The effects are being looked at and if the initiators have a good plan that the municipality agrees with, then the zoning plan could be altered.

Municipalities especially want to cooperate when the building is a monument, to retain it.

5.2. Other developments in the selected cases

As mentioned in the methodology section, the two cases are subject to more developments than just the transformation of the industrial heritage sites and this made things difficult. In Heerenveen, the area of the street Gedempte Molenwijk (the street where the leerlooierij is located) has been an eyesore for the municipality for a long time. There are problems of nuisance from the coffeeshops and casino's, these are located North-West relative to the Leerlooierij. It is in general a rundown area. This is why the local government and the housing cooperation made a plan to revitalize the neighbourhood. The redevelopment of the leerlooierij was only the first step in this plan. Unfortunately the plan got delayed because of the recession and political issues. Not too long ago the parking area/public square 'Molenwijk', financed by the municipality among others, was opened and only recently two new supermarkets opened. In the area in Meppel where the gasfabriek is located, a new housing estate 'Vledder' was and is being developed. The development is going slow and the municipality is being blamed for that, even though they are not the developers. Current developments are that the municipality made a 'voorbereidingsbesluit', this means that at this moment no new construction is allowed in the area and that the municipality is going to alter the zoning plan (Voogd et al, 2012). They do this because the current zoning plan allows for building close to the Gasfabriek and they don't want the developer of Vledder to do this.

5.3. Changing role of government

The public participation aspect of contemporary planning practices is present in both municipalities. An creative way of public involvement in an example of municipal property can be found in the case of the Broedstoof in Heerenveen. The Broedstoof was built in 1949 as an 'industrial-flat', a building to accommodate several little factories and companies. From 1966 till 2002 it was used as a firedepartement-building, after which it was vacant. In 2012 it was transformed to accommodate creative start-up companies (Nijland, 2013). This new function was the outcome of a competition that the municipality came up with to engage the public in the transformation of the building. The municipality of Meppel does not involve the public in individual objects like this but in the formation of their policy, which in turn states how they need to act in certain cases. In 2012 the municipality of Meppel established a 'structuurvisie', this is a policydocument in which the municipality lays down their spatial policy and is binding

for the government that established it (Voogd, Woltjer & Van Dijk, 2012). From the beginning on in the development the municipality really involved their citizens in the forming of their policy. The residents of the city could really discuss and give their opinions on spatial aspects of the city which they think are of importance.

The changing, more enabling, role of the local government is also a part of this 'structuurvisie'. "Our role is mainly to facilitate the redevelopment (...) we do that mainly by what we can influence: the rules". They reduce their control over development to what is strictly necessary, they regulate the land use to prevent negative externalities and so they create an approach that resembles the English or Belgian 'land-use management' approach (Buitelaar & Bregman, 2016). The municipality also does this in the current development of the area surrounding the Gasfabriek. They are going to alter the zoning plan to prevent the developer of the housing estate Vledder building too close to the industrial heritage site. "The government gets a new role and is moving back, we determine the qualitative framework but we are not the developer and are not going to be the developer. That means that we have to initiate or facilitate parties to arrange such matters. (...) Our role is different in comparison to ten or fifteen years ago, then we bought everything, we did everything, nowadays our role is to enable private parties to do so" (respondent 3). This facilitating role of the government is also noticeable in the municipality of Heerenveen. The municipality invests in the public space in the area surrounding the Leerlooierij and with that they try to 'seduce' private also to invest in real estate in the area. "It's a joint effort of all sorts of things and municipalities have a role of... in any case in conversations with others, to make a vision for such an area, to activate people, also investors, also housing cooperations and to invest themselves where they can, in their property or in public space. The municipality can have a role in that joint effort to get something going" (respondent 2).

5.4. Effects on neighbourhood

The transformations of a derelict building will naturally upgrade a neighbourhood and will add to the quality of life in a neighbourhood, but what dimension of liveability will it affect the most? Something that was a big part of all of the interviews was the importance of the preservation of cultural-historical value of the industrial buildings and with it the feeling of identity people attain from it. This can be linked to the concept of 'sense of place', one of the indicators of the social dimension of liveability (Leby & Hashim, 2010). A sense of place relies on the individual, with places becoming significant places for them alone. To develop a sense of place requires that one knows the place intimately and reacts to it emotionally. A sense of place is important for individual (and also community) identity. This is also closely tied with the concept of home. To have an authentic sense of place is to have a sense of belonging, a very deep sense of attachment, making place a strong part of who you are and the way you think about yourself (Holloway & Hubbard, 2001). As respondent 3 put it: "It was clear that the inhabitants of Meppel were of the opinion that the identity of Meppel had to be explicitly protected. (...) A big part of our identity, who we are as Meppel, a town where there is a lot of industry, where there is a lot of work, which is a part of our identity and eventually it became clear that a part of our built cultural-history was very important." Your identity – the way you think about yourself and the way others think about you – is defined not just by what you are but also what you are not (Holloway & Hubbard, 2001).

“Literally, inhabitants told us: it shouldn’t be that when you enter Meppel, you could have just as well entered Almere or any other city, you have to know you enter Meppel.” The inhabitants of Meppel identify themselves and their home, their hometown, with the presence of industrial buildings and not with only new buildings as is the case in the example, a new city like Almere.

With regard to the case of the Broedstoof in Heerenveen “the neighbourhood said... they insisted that the building had to be preserved. They thought it... they were attached to it. They thought it was a piece of characteristic that just belongs to be place” (respondent 2). This quote refers to the place attachment of the neighbourhoods’ inhabitants. Place attachment is the closest component part to ‘sense of place’. Place attachment refers specifically to the extent to which an individual has positive feelings about their local environment and/or community. A person’s attachment to place can be enhanced by their investment of effort in changing it (Vanclay, 2008). So, by stating they didn’t want the building to be demolished and because of the actual transformation, the inhabitants effectively enhanced their attachment to the neighbourhood. The transformation of the building also had effect on the physical dimension and the safety dimension of the liveability of their neighbourhood: “They think it’s a building with characteristic traits and it is nicely renovated because it got a new function (...) that resonates in the environment (...) that’s something else than when it was closed shut and you have to watch out for strange things at night, that gives a different feeling.”

Stichting DBF is mainly active in the rural areas in the North of The Netherlands. That is why respondent 1 says the biggest effect of redevelopment in general is on the functional dimension. The foundation works with redevelopment to turn old buildings into an amenity for the neighbourhood or village. The social dimension can develop from the generated effect of the functional dimension. For example: when a vacant building gets turned into a bar or a multi-functional accommodation, people can use this amenity to get together and socialize. Economical interests are a precondition to redevelopment for Stichting DBF because the investments have to be sustainable.

5.5. Scale and new function

Sustainable investments and sustainable development are developments that also carry on working in other aspects of the city. The creation of a kind of ‘snowballeffect’ in the development of an rundown area can be a really good consequence of the redevelopment of old real estate. Scale plays a big part in this. Individual buildings like the Leerlooierij do not have the right scale to generate this snowballeffect to upgrade the area, there are more projects needed for this. respondent 2 relates this to the redevelopment of the Phillips buildings in Eindhoven. These buildings are so big that they carry the vitality of that part of the city. The redevelopment of that real estate really shines through to big big part of the city around it.

The qualitative framework given by municipalities will not allow for the changing of functions that will have negative effects on the surrounding area. An example of this is

an discotheque in an old industrial building situated in a residential area, this would obviously cause nuisance and would not be allowed. So the exact new function of redeveloped real estate will not really matter. The only exception to this would be if the building would become a general amenity of a public destination, in that way the availability and proximity of amenities (functional dimension) would improve and as a result of that the community life and social contact (social dimension) can improve.

6. Conclusions

For this thesis the redevelopment of industrial heritage sites was researched using semi-structured interviews. The research questions were: what effects does the redevelopment of industrial heritage sites have on the liveability of the surrounding neighbourhood? And what role does the local government play in the redevelopment of the industrial heritage sites? For this the research was focussed on two cities, and in particular two heritage sites in those cities: the Gasfabriek in Meppel and the Leerlooierij in Heerenveen.

In both cities the current facilitating and enabling role of the local government with public participation was seen. In Meppel the municipality lets the citizens participate on a broader level, in their policy making process. In that way they ensure they will act in the interests of their citizens. In Heerenveen a very creative way of involving citizens was seen in the form of a competition for the new function of the Broedstoof. In the dealing with the redevelopment of the industrial heritage sites and the development of the area both municipalities had a kind of a background role and try to activate and facilitate private parties. These are examples that add to the research about governmental land policy (Buitelaar & Bregman, 2016; Van der Krabben & Jabocs, 2013).

In residential areas where there is industrial heritage, people identify themselves with it. So when an industrial heritage site is properly transformed and restored this adds to people's sense of place. This is because they are proud of this development, proud of the fact that the cultural-history of their town is properly restored again. This is why it seems like the social dimension is the most important aspect of liveability to change with regard to the redevelopment of industrial heritage sites. The physical and safety dimension also matter but not as much as the social dimension because it includes sense of place. The redevelopment can also positively change the functional dimension of liveability but this depends of the new function of the building. It also seems that the scale of the redevelopment influences how much the liveability changes. These insights add to research about the external effects of the redevelopment of industrial heritage sites. Whereas Linn (2013), Chau and Wong (2014), Woo and Lee (2016) and Van Duijn et al. (2016) researched the financial side, this covers the more 'softer' external effects.

The role of the local governments in the redevelopment of the industrial heritage sites was in general as expected. In Heerenveen we saw a more integrative approach to upgrade the area with the municipality investing in public space, giving Stichting DBF the opportunity to redevelop the Leerlooierij and in this way trying to activate private parties to also invest in the area. The municipality of Meppel has more of a kind of wait-and-see approach, they don't take initiative and have faith that private parties will invest in industrial heritage. Of course literature describes this kind of approach but an approach this loose and detached was surprising.

As said, the redevelopment of industrial heritage mainly reinforces the social dimension of liveability, and in particular the sense of place and the sense of identity. This can be used as an impetus for other municipalities who have derelict industrial real estate in residential areas to redevelop these sites. These redeveloped industrial sites can then also be used to attract new people to the city.

A limitation to the research for this thesis is that it used three interviews for its data. Interviews with more municipalities that feature redeveloped industrial heritage sites would have added to the reliability and the robustness of the research. Another limitation is that with the qualitative approach the effects of the two selected redeveloped sites on the neighbourhoods' liveability were not directly measured. Possible future research could measure these effects with quantitative research done with multiple different cases across the country with a lot of respondents that live nearby the sites. With this, the influence of the scale of the redevelopment and the influence of the new function could also be properly researched.

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Appendix: Interview guide

Is it ok if I record this interview?

Introduction

Could you tell something about your background?

- Education
- What did you do before your current job?
- When did start working for this organization?
- Function in organization

Main questions

- Could you describe the process of repurposing real estate?
- What role does the municipality have?
- Did this role change over the years/after the financial crisis?

- What real estate can be repurposed?
- Who are involved? Also residents?
- How do you choose the new function?

- Do you talk to the stakeholders after the transformation?
- What effects on the surrounding neighbourhood do you notice?

Could you tell more about the project the Gasfabriek/the Leerlooierij?

- Who are involved? Also residents?
- How do you choose the new function?

- Do you talk to the stakeholders after the transformation?
- What effects on the surrounding neighbourhood do you notice?

Could you tell about other examples of repurposing (industrial real estate)?

- What effects on the neighbourhood did you notice?
- Role of municipality

What makes for a good repurposing project?

What influence does the scale and new function of the building have?

What dimension of liveability does the redevelopment of industrial heritage sites influence the most?

- Functional/Physical/Social/Safety.
- On what is this dependent?

Concluding question

Is there something you would like to add?