

Sustainable Development of Industrial Areas

A practical research towards the importance of land allocation within the development process of a sustainable industrial area

Pauline Martens

Colophon

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Graduation thesis

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Preface

This report represents my graduation thesis about sustainable development of industrial areas. The graduation thesis is the final exam of the master track 'Construction Management and Engineering', provided by Eindhoven University of Technology. The research is done in association with ARCADIS, 's-Hertogenbosch.

By writing this thesis, I wanted to increase my knowledge about the market for industrial areas and possibilities for including sustainability in the concept. The market for industrial areas is complex and includes a lot of politics, which makes successful development difficult to achieve. I have noticed that doing research towards the implementation of sustainability on industrial areas requires a clear delineation; sustainability could be defined in various ways.

Six months of hard work has resulted in this graduation thesis. The level of the report could not be achieved without the assistance of two docents from Eindhoven University of Technology, Wim Schaefer and Bart van Weenen, and Imke Vos, my mentor by ARCADIS. I like to thank them for their effort and support during the research. I would also like to thank Erik Blokhuis for his feedback on my graduation thesis. For their support and brainstorming outside the office hours, I would like to give special attention to John, Thea, Roel and Thijs.

Finally, this research couldn't be done without the participants for the case study and the interviewed experts. They provided sufficient data and information to complete this thesis.

Pauline Martens

Management summary

This research argues that land allocation could positively influence the development process of a sustainable industrial area. Therefore, the focus in relation to sustainable development is on preserving the area on long-term and avoiding obsolescence of an industrial area.

The research question is: 'What is the importance of land allocation policy in the development process of a sustainable industrial area?'

A desk research is done towards the current situation on industrial areas, the development of a sustainable industrial area and land allocation as instrument to advance this development. The theoretical statements are underlined with a case study, in which four sustainable industrial areas are selected. For every case, interviews are held with the land owner and a user. Their experience with land allocation as tool is inserted in the results and conclusions.

The theoretical framework describes the current problems on industrial areas, which are obsolescence, cluttering of the built environment and stagnating redevelopment. The noticed problems could often be avoided by improving the decisions made in the preliminary phases of the development process. Most relevant stakeholders are the municipality, as land owner, and the entrepreneurs, as user of the area. Responding to the trend of sustainability, the factors that enable the development of a sustainable industrial area are discussed. Three main factors could be distinguished: policy and governance, spatial layout and energy- and material use. Spatial layout and energy- and material use are physical factors which are strongly related towards the implemented policy and governance.

The implemented land allocation is an interesting tool to discuss on project scale for the development of a sustainable industrial area. A plan for land allocation could be made in the plan development phase of the building process. Land allocation is considered on three aspects: (1) type of ownership: sale or leasehold (2) housing conditions (3) pricing policy: for example giving discount on the land price when certain conditions are met.

Especially leasehold is seen as an interesting type of ownership. For the land owner leasehold gives advantages on financial field and for the involvement in the area. For the user financial feasibility of the realization of a property is an incentive to choose for leasehold. Conditions that are relevant to implement are: clustering of businesses, requiring park management, preserving the situation and requirements for the layout and land use of a plot. About implementing pricing policy, a lack of literature is available. The case study shows however, that pricing policy could be a useful stimulation tool, provided that the land owner is financially able to implement the tool.

The research states that the proposed land allocation policy tackles several problems on industrial areas. Successful implementation of the land allocation policy mainly depends on the ambitions set by the land owner, the location of the industrial area and the economic situation.

1. Research layout

1.1. Research context

More than one third of all industrial areas in the Netherlands are considered as obsolete (figure 1.1). Obsolete areas often have to deal with vacancy, which can result in unsafe areas, impoverishment and value decrease of the property and the land. A downward trend arises and settled companies will look for other places. This strengthens the vacancy within an area and the attractiveness of the area will further decline. A reinforcing loop is the result. Through this trend the used space for industrial areas increases (Tweede Kamer der Staten-Generaal, 2006). According to IBIS (2011) the provinces Noord-Holland, Zuid-Holland and Noord-Brabant have the most obsolete industrial areas. To avoid the obsolescence of new areas, these areas need to be built in a more sustainable way while taking into account the life cycle of the area.

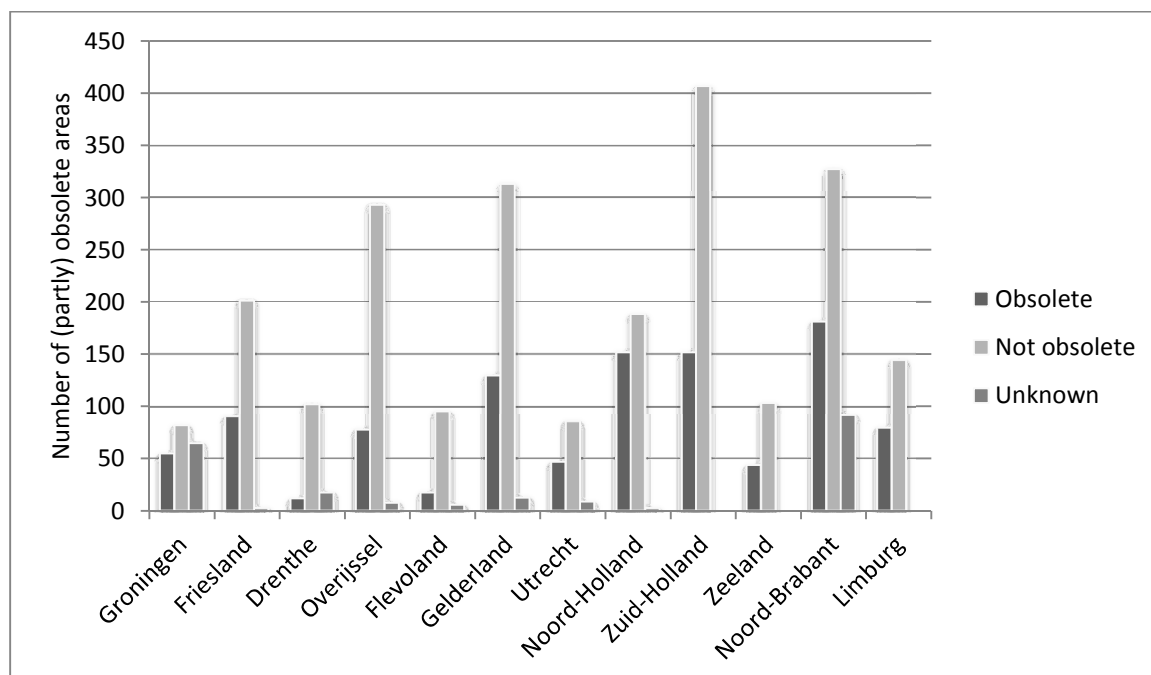


Figure 1.1: Obsolescence industrial areas in the Netherlands per January 1st 2011 (Based on IBIS, 2011)

Another problem is that the obsolete areas cause cluttering of the built environment. The development of new industrial areas occupies the limited green areas in the Netherlands. To avoid this cluttering while still answering the demand for industrial areas, the redevelopment of existing areas is important. Considered is however, that this redevelopment stagnates, despite the attention it has gained last years by the government (Blokhuys, 2010).

ETIN Adviseurs (2007) claims that besides critical quantitative notions, industrial areas nowadays also have to deal with qualitative criticism. The quality of the entire area becomes

more important than the quality of the individual property. However, the current public space of industrial areas shows a lot of problems, like a lack of maintenance of the infrastructure and green, insufficient parking facilities, litter and a lack of capacity.

Desired situation

VROM (2010) describes a desired situation for the market of industrial areas in which the focus of the developer switches towards a broad urban perspective, more possibilities arise for renting properties, park management is implemented in earlier stages of the development process, public-private partnerships are used to develop an area, private parties invest more in redevelopment and investors and developers have a structural focus on industrial areas.

1.2. Problem focus

The incentive to select this research topic about sustainable development of industrial areas is related towards the ambitions of the region Eindhoven. The governmental parties of Brainport area, as this region is mentioned, have the ambition to become an energy neutral region in 2040. This means that all the energy that will be used in Brainport area has to be generated locally. The main reasons for this statement are:

- The amount of fossil fuels is decreasing
- The CO₂ emission has to be reduced
- Fossil fuels are often generated in political unstable regions

According to this framework, the Brainport area has to investigate the sustainable development of dwellings, industrial areas, leisure and infrastructure. In this report the focus is on industrial areas.

Nowadays, industrial areas have to deal with a lot of problems related to finance, quality, demand and life span. Stakeholders are becoming more aware of the importance of sustainability measures, considering the social value as well as the financial advantages. Besides this, within the private parties the trend could be noticed that they focus more on a life cycle approach for new developments. This trend could be a result of the progress on sustainability field; optimization of the life cycle of an area or product will lead to a product that needs less recovery energy and could relatively easily be given a second life.

A lot of research is already done on the field of the quality and sustainability of industrial areas. However, the emphasis of these reports is mainly on sustainability and less on the life span; often the aspect 'planet' in the well-known triptych 'people, planet, prosperity' is the main incentive. Therefore my research is about the optimization of the life span of industrial areas, so that obsolescence and depreciation of these specific urban areas could be avoided. Currently, the obsolescence enters between the five and fifteen year after realization, but

this number differs per type of industrial area and depends on the features of the industrial area (ARCADIS, 2010). The organisation and planning of an industrial area seems to be crucial for further development. Problems with the quality on industrial areas and preserving industrial areas on long-term could often be derived from decisions made in the preliminary phases of the development process (Blokhuys, 2010; THB, 2008).

To be able to optimize the development process of industrial areas, the research will be done from the perspective of land allocation. The land allocation plan is part of the preliminary process of the development. In figure 1.2 an overview is given of the influence of the used policy and governance on the physical aspects for achieving a sustainable industrial area. The possibilities for land allocation policy as tool will be investigated in detail in this report.

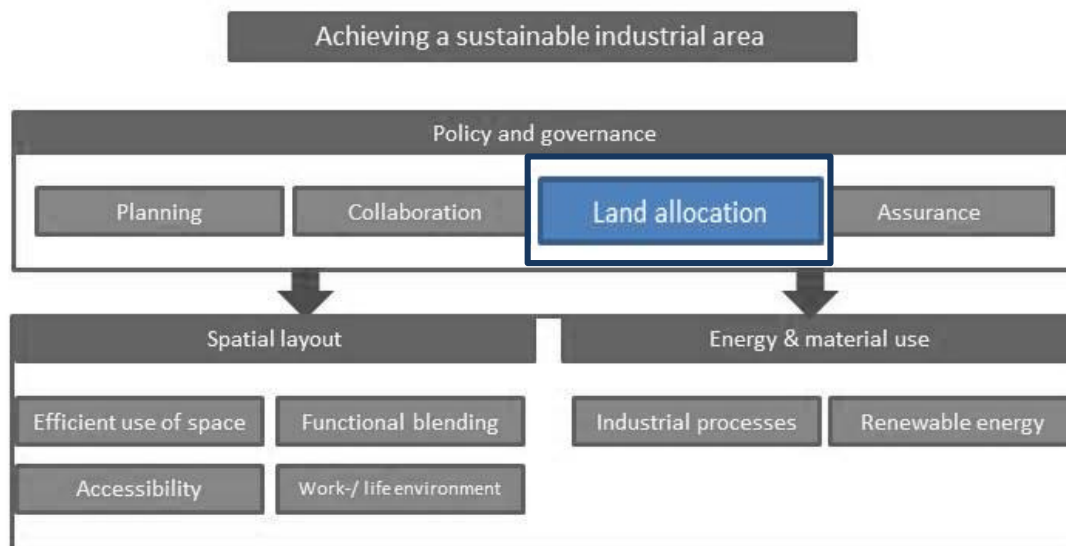


Figure 1.2: Overview factors sustainable development

1.3. Key question

As a result of the problem focus, the key question for this thesis will be: ‘What is the importance of land allocation policy in the development process of a sustainable industrial area?’

Several sub questions arise as a result of this key question. The following sub questions are discussed in the report:

Theory

- ‘How could sustainable development be defined?’
- ‘What is the current situation of industrial areas, which stakeholders are relevant in this context and which trends could be noticed?’
- ‘What factors contribute towards realizing a sustainable industrial area?’

- 'Which advantages and disadvantages provides land allocation within realizing a sustainable industrial area?'

Case study

- 'What is already done with land allocation for realizing a sustainable industrial area?'
- 'To what extent differ the land owner and the user in their vision?'
- 'What are the lessons learned?'

1.4. Objective

Expected is that the research model will show both policy and spatial measures that could be taken in the preliminary phases of an industrial development that optimize the area, extend the life span and attracts more business. The measures have a high economic, social and environmental value. Besides this, the research is expected to show the high importance of land allocation in achieving sustainable development of these industrial areas. Land allocation may also be used as stimulating tool.

The research will give land owners and developers information to improve the life span and preserve quality on industrial areas. This approach of industrial area development will function as a unique selling point for the projects.

1.5. Research boundaries

Research boundaries are set for obtaining appropriate results and being able to focus on a particular issue within the sustainable development. For setting research boundaries, some assumptions have to be made.

This research will focus on new industrial areas. Despite there is a crimp expected in many regions of the Netherlands from 2020 (PBL, 2011), new industrial areas are still an interesting topic for developers and municipalities nowadays. Redevelopment of industrial areas will also be important in the future, but the financial statement of such a project keeps the most actors acting reservedly. Nevertheless, the tools that will be discussed in the research and the model used, could partly be interesting for redevelopment of industrial areas.

When looking at sustainable implementations for industrial areas, two different types of designing an industrial area could be indicated. First, a sustainable industrial area could exist of sustainably built individual properties. Every building is in this case sustainable or energy neutral. Second, an industrial area could be sustainable over the entire area. Sustainability is provided by collective facilities and the area is managed by a park management organization

or the owner of the industrial area. This kind of industrial areas focuses on urban scaled solutions and is developed as a sustainable area in the preliminary phases. In this research, the statement will be made that this second type of industrial area is the most interesting one. Through this construction, the life cycle of the area will be increased by good management and the presence of involvement from the entrepreneurs and perhaps developers.

A geographical limit is not set, because the research is on a certain level of abstraction that it could be applied in several regions of the Netherlands. A notion has to be made that regions that expect a clear crimp in the coming years, will less profit from this research.

1.6. Research model

In figure 1.3 the research model for this thesis is shown. The model represents the steps that have to be taken to answer the key question.

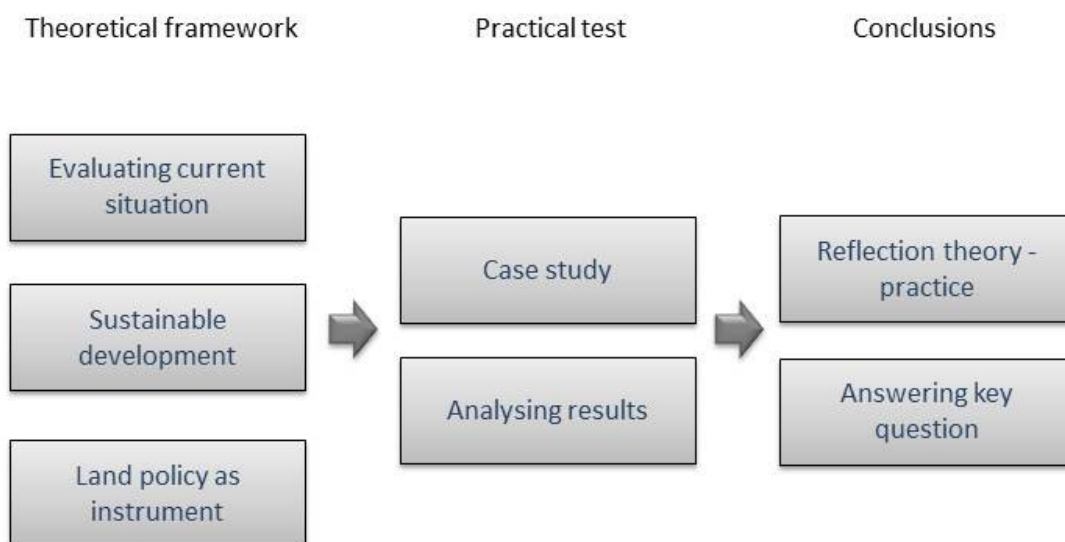


Figure 1.3: Research model

First, the current situation on industrial areas has to be analysed. In this context problems and causes are mentioned, stakeholders analysed and trends discovered. It is also important to know what the possibilities for sustainability are and what sustainable measures could be taken on industrial areas. Third, the opportunities for applying land allocation as instrument to achieve a sustainable industrial area are investigated.

After the theoretical framework is set, a case study is done to gain information about subjects like support, feasibility on juridical and financial field, incentives, risks and attitude towards the future. This case study provides a comparison between the land owner and the user and some lessons learned.

With the input from the case study, the theory is reflected. Finally, all sub questions are discussed so that the key question could be answered.

1.7. Research methods

A desk research will provide theoretical input for the research. This desk research includes underpinnings to establish several definitions and findings done by earlier researchers about the topic. For the desk research documents are used from both public and private parties. The desk research will be complemented with interviews. The interviews will be done with some stakeholders that are experts on the field of industrial areas and land allocation.

The practical test will provide data for reflecting the theory and giving advice about the topic. This data will be qualitative. A qualitative analysis is chosen because of the nature of the research question; it mainly focuses on a certain approach to achieve a desired situation. Besides this, no relevant quantitative data were already available for this research. For the practical test four cases are used. The cases are discussed and compared according to nine management factors. Interviews are used to gain sufficient data about the cases on these nine factors. Additional information about the cases is obtained from literature.

Part I. Theoretical framework

2. Definitions

This graduation thesis is about the sustainable development of industrial areas. According to this, several definitions are important to define before discussing further theory.

2.1. Industrial areas

According to IBIS (2009), an industrial area could be defined as a type of work location. The definition of the organization is as followed: *'A work location with a size of at least 1 ha gross marked and suitable for trade, industry and business. On these sites some commercial and non-commercial services, like office buildings and shopping, could be present, but these functions only have a small share in the total surface of the area. The following areas aren't industrial areas: a seaport area, an economic zone, an office location, an area for extraction of raw materials, an area for oil- and gas extraction, an area for extraction of water, an area with agricultural goals and an area for waste dump.'*

2.2. Sustainable development

In 1987, the Brundtland report already discussed the definition of sustainable development. According to this organization, sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains two key concepts:

1. The concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given
2. The idea of limitations imposed by the state of technology and social organizations on the environment's ability to meet present and future needs.

This definition is still quite abstract; therefore some more literature is studied. Blok and Gervásio (2008) argue that sustainability is much more than just the environmental impact. The three keys people, planet, profit reflect that besides environmental issues, also social and economic issues are involved. 'Stuurgroep Boegbeeld Duurzame Bedrijventerreinen' (1998), part of the Dutch Department of Economic Affairs, defines the definition of sustainable development as *'collaboration between enterprises and with governmental agencies on industrial areas, focusing on the improvement of the economic result, decrease of the environmental impact and more efficient use of the built environment.'*

The last definition focuses most on preserving an area on long-term and avoiding obsolescence. Therefore this definition will be used in the report as starting point to describe sustainable development. As a result, in the report emphasis will not only be on environmental issues, but also on economic and social issues.

Certification

Nowadays a lot of instruments are available to control the sustainability of a development. The instruments are focusing on a urban development or the development of a particular building. The following instruments are relevant towards this research (Agentschap NL, 2011):

- Duurzaamheids Profiel van een Locatie (DPL)
- LEED
- GreenCalc+
- BREEAM-nl: gebiedsontwikkeling

These instruments are focusing on area development and do not only take into account energy criteria, just as the prior definition indicates. Further research indicates that DPL is mainly used for the measurement of the people, planet, profit value of living areas, and less suitable for industrial sites. Because LEED is largely based on BREEAM (UK Green Building Company, 2011) and last summer is decided that GreenCalc+ will continue in the name of BREEAM as the BREEAM-light certification, the BREEAM-nl instrument seems to be the most suitable for the sustainable development of an industrial area. This instrument will be used in the report to test the proposed tools on their general sustainability score.

2.3. Development process

The development process of industrial areas is shown in figure 2.1¹. The figure is based on several sources (AgentschapNL, 2011; Blokhuis, 2010; WVI, 2004;).

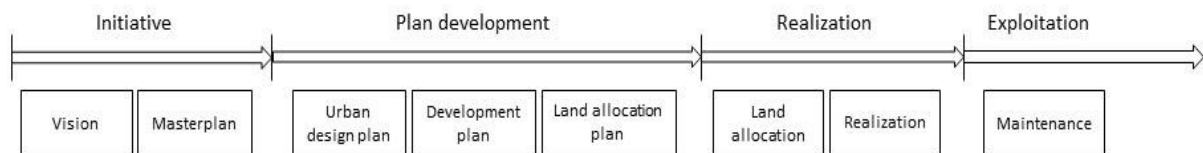


Figure 2.1: Development process of industrial areas

In the initiative phase a certain demand is noticed, generally by the municipality. To gain a program of requirements, preliminary urban studies are done, in which environmental and area characteristics are mentioned. The type of collaboration structure will be determined, for example a public-private partnership or a public development project. Contracts for the collaboration are made and a project organisation might be formed. The initiative phase will result in a vision for the project and a master plan that describes the headlines of the area development.

The plan development phase is featured by elaborating the vision about the desired layout of the area. Additional studies could be done towards safety and environmental effects of

¹ This description is a general one; every project is unique and requires its own specific approach.

project. Land will be prepared for the allocation by the land owner. Instruments for this phase are the urban design plan, development plan (known as 'inrichtingsplan') and allocation plan. The urban design plan describes the design conditions of the built environment; the development plan describes the layout of the public spaces. By using an allocation plan the land acquisition party is able to set conditions towards the possible developer or entrepreneur and the management of the area. The acquisition party has the responsibility to ensure that the established ambitions in the previous phases are taken into account. Meanwhile this part of the process doesn't always gain sufficient attention, this step is seen as a chance for developing a sustainable industrial area.

After the plan development the realization takes place. The land will be allocated to interested parties and the design could be realized.

Finally the project reaches the exploitation phase. A maintenance plan is used for the management and maintenance of the area. In case of industrial areas the municipality is usually responsible for the maintenance of the public spaces. The companies themselves take care of the maintenance of their properties.

3. Exploring industrial areas

In this chapter the current situation of the market for industrial areas is described. Actual problems will be explained in more detail and housing criteria of new businesses are mentioned, so that requirements for a new area become clear. The main stakeholders are discussed, which gives a framework for further research. Finally the trends and developments on the field of industrial areas are investigated.

3.1. Current situation

3.1.1. Problems

In the research layout the obsolescence within industrial areas is discussed. According to IBIS (2011) four types of obsolescence could be indicated. These four types of obsolescence are:

- Technical obsolescence concerns the physical and non-physical infrastructure that no longer meets the requirements of the users, like wear of materials, a lack of fiberglass internet or a lack of public transport in case of labour intensive business.
- Economic obsolescence is the decrease of value that the area delivers towards the economic situation of the city, but also the reduction of the value of land plots and the available real estate.
- Spatial obsolescence includes both the lay-out of the area and the spatial embedding in its environment.
- The social obsolescence concerns the social safety and other liveability aspects.

Other problems that are mentioned in the research layout are the cluttering of the built environment and a stagnating redevelopment. Olden (2010) concludes in his report that the approach of municipalities for the planning of industrial areas still doesn't reach the goals set by the VROM and THB in the past years. The regional policy for industrial areas isn't sufficient to limit the supply of prepared plots. To change the current situation on industrial areas, several causes have to be taken into account. The causes are clustered in 'planning and organisation' and 'architectural and urban design'.

3.1.2. Causes

Planning and organisation

Taskforce (Her)ontwikkeling Bedrijventerreinen (2008) mentions several important causes. First, the spatial context and planning could influence the obsolescence. This includes the spatial alternatives that investing businesses have, the attractiveness of these alternatives, and the conditions that the government creates on spatial, social and infrastructural field to gain value creation. Besides this, the structure of the real estate market has to be considered. The standard approach of the municipalities and developers for the development of industrial areas, namely by allocating every singular plot towards the end user, has led towards unstructured ownership (Deloitte, 2010; THB, 2008; VROM, 2010). The market for industrial areas is therefore quite fragmented; most plots are owned by the user.

The areas may be an interesting investment for investors, therefore chances for the switch from fragmented development of the plots towards area development should be investigated. Developers and investors in real estate will have interest in the areas when the market for industrial areas moves from a land focused market towards a property focused one. This implementation will open the market for sustainable asset management and the development of a high quality sustainable area. Also Schaefer and Gordon (2007) do see the chances of this transformation.

Urban development, real estate exploitation and real estate management are not approached integrally by its stakeholders, which leads to a lack of innovative developments and less quality than desired for a longer life span. Park management is implemented during the years, meanwhile this is preferred at the beginning of the life cycle of an industrial area (VROM, 2011). A last important aspect is the willingness and possibility to redevelop certain industrial areas. Investments have to be done cooperatively to give redevelopment a chance.

Architecture and urban design

Schaefer and Gordon (2007) argue that industrial areas have a strong monotonous character; there is a lack of functional blending on industrial areas. Obsolescence is considered as one of the most important causes of inefficient use of space on the market for industrial areas. Therefore obsolescence could be defined either as a cause or a result of the current situation on industrial areas.

Industrial areas are often realized unstructured and architectural or urban planning is barely present. The focus of an area is still mainly on separation of functions, whilst a mix use of the area is becoming more popular through its positive effect on the quality of an area. Besides the lack of architecture and urban planning and the functional division ETIN Adviseurs also noted some problems with the public spaces, like a lack of maintenance of the infrastructure and green, the capacity of the infrastructure, litter and a lack of parking places.

3.2. Housing criteria

The experienced quality on industrial areas is mainly based on sufficient space, flexibility and accessibility. Secondly, architecture, facilities and urban planning are relevant. In this context ETIN Adviseurs (2007) states that the experience and appearance of the industrial areas become more important for businesses.

Schaefer and Gordon (2007) investigated the housing criteria for businesses on industrial areas and determined three main factors: 1. Same appearance of the businesses, 2. Relations between the businesses and 3. Presence of similar businesses. ETIN Adviseurs (2007) established some spatial factors that stimulates the migration of businesses, namely 1. Possibilities for extension, 2. Representation of the area and 3. Parking facilities. This numeration underlines the earlier statement of ETIN Adviseurs that the appearance of an industrial area is getting more attention nowadays.

3.3. Involved actors

Three main stakeholders could be identified: public parties, private parties and users. These different kinds of stakeholders all have their own focus within the case of industrial areas.

Public parties

- Land acquisition party

In the Netherlands the land acquisitions party is generally the municipality. Currently the land acquisition party prefers to sell new plots to attract businesses for the region or municipal. To generate a sustainable area the land acquisition party could implement push or pull options (Deloitte , 2010).

- Municipality

The municipality could implement stimulating policy according to sustainable development of industrial areas. Responsible for prevention against cluttering and obsolescence and ensuring the zoning plan.

- Provincial department

Provincial department should motivate municipalities to focus on regional level instead of their own situation. Responsible for ensuring the provincial structure vision.

- Public parties focused on industrial areas

Functions as financial support and advising party for the Province about redevelopment of industrial areas, examples are BrabantseOntwikkelingsMaatschappij (BOM) and LimburgHerstructureertBedrijventerreinen (LHB).

Private parties

- Park management organization

Their task is preserving the industrial area in the exploitation phase. The park management could provide collective facilities.

High effectiveness is reached when a separate park management organization is set up in the area in the form of a foundation or a cooperative association. These juridical forms are preferred because of the limited responsibility of the management (Deloitte, 2010).

- Energy companies

An energy company could provide alternatives for energy supply by using sustainable energy resources. The company has generally a lot of knowledge about new developments.

- Investors

The investor need to be stimulated to invest in industrial areas. Investors could be an important factor by extending the life span of an area, they are mainly involved in the exploitation phase. Currently the ownership of plots is very fragmented and unattractive for investors. Therefore investors are not very active on the market of industrial areas.

- Developers

A developer participates in the design and realization of new areas. Nowadays there is a lack of developers involved in the development of industrial areas.

The fragmented ownership contributed to this. The involvement of developers could be increased (VROM, 2010).

Users

○ Current users

Especially common users, like entrepreneurs, lessees and employees are relevant. The participation of the users in the redevelopment and preservation of their industrial area is important to achieve goals.

○ Future users

At the moment future users mainly choose for new areas instead of existing areas. Future users have to be triggered to choose for more sustainable and high quality areas.

○ Surrounding residents

In case of development of an industrial area the surrounding residents have to be taken into account in relation to environmental and safety rules.

3.4. Trends and developments

Related to the market for industrial areas, several trends and developments are considered in this paragraph.

Sustainability

The annual sustainability monitor of PricewaterhouseCoopers (2011) indicates that the initiatives on the field of sustainable entrepreneurship are rising the last two years, despite the current instable economic situation (figure 3.1).

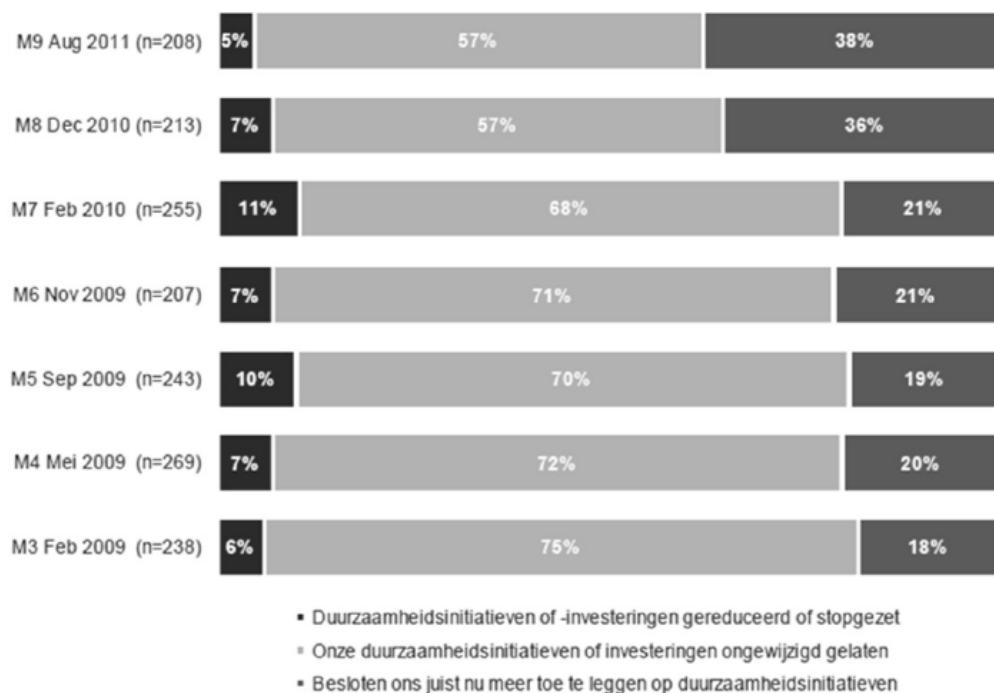


Figure 3.1: Sustainable initiatives (PwC, 2011).

There is an on-going shift from sustainable ambitions on property level towards neighbourhood and municipal level. Numerous municipalities have established a vision about sustainable development. It is important to keep in mind that area development is more than just the sum of the individual properties. Besides this, local energy generation is rising and coherent to the local energy company. Cradle to cradle development is another trend within sustainability, which means that all products could be reused at the moment it becomes waste, and so functions as raw material or nutrient for the environment (KEI, 2010). Its principles are already implemented in for example the design of the Floriade area in Venlo.

Several publications are done by the government that link the current problems of the industrial area market towards sustainable development (THB, 2008; VROM, 2010) and recently AgentschapNL (2011) publicized about focusing on sustainability during the development process; since 2009 the government seems to be actively stimulating sustainable (re)development for the built environment.

Industrial areas that are already developed in a sustainable way are for example De Trompet in Heemskerk, Haven VII in Waalwijk and Ecofactorij in Apeldoorn. There are also some developments planned for coming years like Greenpark in Venlo, Logistiek Park Moerdijk and A4 Zone West in Haarlemmermeer.

Changing demand

At the moment, about 70% of all employment belongs to the service sector (Province of Noord-Brabant, 2008). Especially the share of businesses that are profit minded is increasing in this sector. The interest in a location on an industrial area of the businesses that act in this sector is increasing. In line with this, the development of new work locations represented as care parks, knowledge parks and mixed economic zones where industry, transport and trade mix with sport facilities, entertainment and boulevards is getting more attention. The logistics sector knows the trend towards an increase in scale and the need for multimodal access. This multimodal access is also relevant for production companies. Through the increasing competition, businesses focuses more on their core activities and less on real estate, so that the properties will be standardized or the real estate of the companies will even be outsourced. This last fact is mainly relevant for logistics.

The market demand for industrial areas will decline in the coming years. PBL (2009) investigated the future situation on the market and calculates only in two of the four scenarios a positive number for the remaining planning task of industrial areas till 2020, keeping in mind the industrial areas that are already planned for this period. Therefore the actual assessment of demand (including the already planned areas) will be more positive; it shows positive demand in all scenarios. Both figures about the market demand are inserted in Appendix 1.

Besides this, PBL (2009) points out the increasing focus on redevelopment of industrial areas, especially in regions with a decline in inhabitants, but also mentions the rising bottleneck about financing the redevelopment projects (PBL 2011).

Quality requirements

On area level the users have a growing interest in the design of an industrial area and enhance their quality requirements (VROM, 2006, ETIN Adviseurs, 2007, Province of Noord-Brabant, 2008). The preservation of quality on an area requires a good relationship between the government and the entrepreneurs. Knowledge workers require likewise facilities and a safe work environment. The trend of quality requirements is therefore related to the rising service sector.

Commercializing industrial area development

The last trend is the focus on commercializing the development of industrial areas. Currently the general approach is that municipalities and developers exploit the plots in a new area individually to the users, which leads to fragmentation of the ownership. In this phase a lack of investors and developers is noted. Private parties are mainly active by distribution centres and multi-tenant buildings. This phenomenon is visible in the real estate portfolios, where the properties for businesses only cover two to three per cent. VROM (2010) argues that the knowledge and expertise of the real estate market is not used optimally for the development of industrial areas. Therefore private parties have to play a more important role in the development and maintenance of the areas. Municipalities could stimulate the developers or investors to realize a (part) of the industrial area or give them the responsibility for the allocation of land. It is expected that this process of commercializing will offer advantages for the stakeholders, like the improvement of the quality and economic functioning, collective exploitation of sustainable energy supply, decrease of management and financing risks of the municipality through the experience of the private parties, diversification of the portfolios of the investors and limiting the obsolescence of the areas.

3.5. Conclusion

When the existing literature is analysed and compared with each other, some conclusions could be made about the problems on industrial areas and their causes. First, four types of obsolescence could be distinguished: technical, economic, social and spatial. To improve the life span of an area, these factors have to be influenced positively. The research shows also some more specific causes. These causes could be derived towards planning and organisation aspects and architecture and urban design.

A lot of stakeholders have influence on the development of industrial areas. The government is involved in different ways. Some trends are specially related to certain stakeholders, like

the trend of commercializing industrial area development (developers and investors) and changing demand (users).

The mentioned problems have to be tackled and the trends taken into account to achieve the proposed goals. After investigating the current situation on industrial areas, trends that are relevant and involved stakeholders, the sub question ‘what factors contribute towards realizing sustainable development of an industrial area’ is described in the next chapter.

4. Sustainable development industrial areas

After exploring the Dutch market for industrial areas, developing a sustainable industrial will be discussed. Already in 1998 the Dutch government investigated possibilities to create sustainable industrial areas. These possibilities were documented in 'De handreiking voor het management van bedrijven en overheid'. According to Stuurgroep Boegbeeld Duurzame Bedrijventerreinen (1998) the physical possibilities for the development of a sustainable industrial area could be distinguished into two groups: the application of sustainable business processes and the application of a sustainable design of the area. During the years this division remained relevant, although through innovation some measures became easier to implement, like the use of renewable energy sources in area development, or more accepted by the stakeholders, like park management. However, the attention on the influence of policy and governance on the development of sustainable and high quality areas is increasing in the last years. Several researches are done towards the functioning of the current policy and stimulation of sustainable development by the public parties. A relation is observed between the current policy and physical possibilities.

In figure 4.1 an overview of the implementations for the development of a sustainable industrial area is given. The physical factors mentioned by Stuurgroep Boegbeeld Duurzame Bedrijventerrein are included in the aspects 'Energy& material use' and 'Spatial layout'. The figure is completed with the aspect 'Policy and governance'.

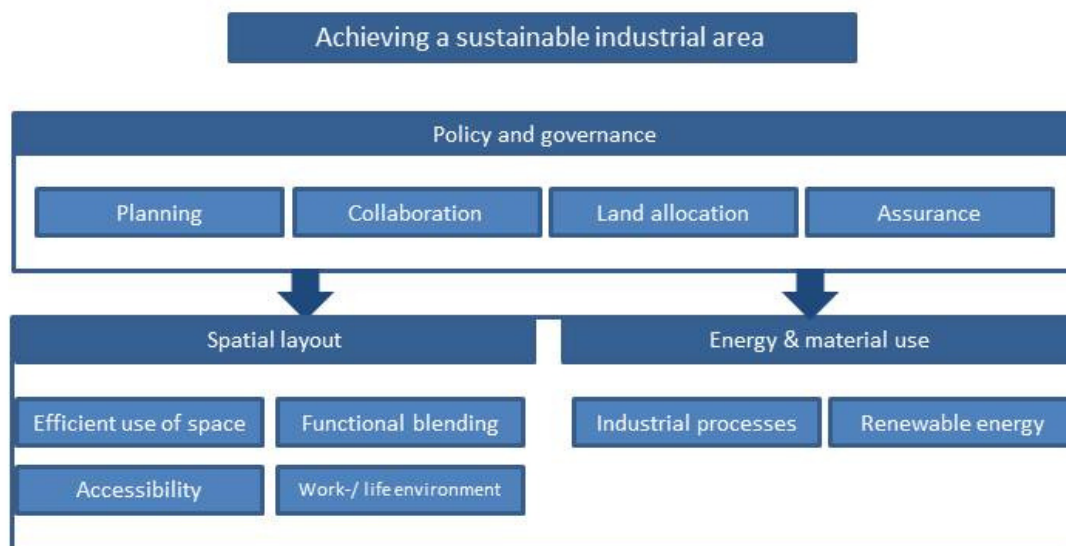


Figure 4.1: Overview factors sustainable industrial area development

In this chapter, the policy and governance tools are discussed first, followed by the more physical aspects 'Spatial layout' and 'Energy & material use'.

4.1. Policy and governance

As shown in figure 4.1, governmental policy plays an important role in the whole case of achieving sustainable industrial areas. In the preliminary phases of the development process, public parties are often involved in the different plans, for example the master plan and possible changes in the zoning plan. The stakeholder analysis also shows that the public parties are involved in several different forms; the municipality is strongly involved on local scale, but also owns a lot of land so that it often functions as the land acquisition party. About 83% of the available land for industrial areas is owned by the municipalities (VROM, 2010).

The Province controls the development on regional level, but is for its executive role assisted by specific public organisations focused on industrial areas and redevelopment². The regulation role of the Province is governed by the Wro, which gives the Province competences for creating a structure vision on provincial level (policy document) and an 'instruction' or integration plan as juridical binding document.

The Dutch government provides the same documents but focuses on national level and gives therefore a framework for its lower governmental parties. Interesting for sustainable development is the 'Bouwbesluit', in which an Energy Performance Coefficient (EPC) for buildings is established. The current EPC value is prescribed at 0,6. In the future this value will be increased till 0,4. The EPC value is especially focusing on reducing the energy use of a particular building and so its CO2 emission (Urper, 2011).

Because the public parties have many ways in which they can influence the area development process on different levels, the most relevant aspects of the functioning of local authorities for this research are mentioned and explained in detail in this paragraph.

4.1.1. Planning

Planning of industrial areas includes the estimation of the demand for new areas and the possibilities to answer this demand. To develop industrial areas and be able to build industrial buildings on it, several legal procedures are required. The procedures belong all to public law. The most important one is the zoning plan. Without a zoning plan the municipality isn't allowed to do site preparation and grant permission for the construction. Through a zoning plan the municipality determines the allowed destination of a certain area. Such a destination could be formulated broadly, like 'business purposes', or in detail, like 'offices'. Often partial areas with specific destinations are created. The municipality is able to include environmental requirements in the zoning plan.

² Every province has its own (re)development company: f.e. in Limburg this organization is called the LHB, in Noord-Brabant the BOM.

In addition to the zoning plan the municipality could establish building regulations. These regulations include the maximal height of a building or the minimal rate of built intensity on a plot (Louw, 2004). Especially this built intensity could be interesting for sustainable ambitions of municipalities.

When there is a specific need for expansion of a new plot on an industrial area or a demand for a new industrial area, the use of the SER ladder is advised for the land allocation. The SER ladder contains the following statements (SER, 2008):

- Use the space that is already available for a certain function or make the space available by redevelopment
- Investigate the possibilities to increase multiple use of space
- When above points could not meet the requirements, the option of expansion could be considered.

By using the SER ladder redevelopment of industrial areas is stimulated and the allocation of new areas limited. The SER ladder was created in 1999, but was not required at that moment. Since 2009 the municipalities have been required to apply the reasoning of the SER ladder in case of the development of new industrial areas through incorporation in the 'Algemene Maatregel van Bestuur Ruimte' by the Dutch government.

4.1.2. Regional collaboration

To avoid an oversupply of new industrial plots, regional collaboration has to be stimulated (Blokhuys, 2010, Ministerie van VROM et al., 2010, PBL, 2009, THB, 2008). The aim for the planning task for industrial areas until 2020 is that this task will be determined by regional collaboration between municipalities and the Province. Through this collaboration the Province and municipalities are able to react quickly on economic developments and excess of land reservation will be avoided. Regional collaboration could be applied for the allocation of new plots as well as the reservations of plots for industrial areas and for decisions about redevelopment and transformation. Although PBL (2009) mentions that collaboration is already usual in most areas, this collaboration is rather limited and includes mainly the strategic reservations on the long-term. The appointments made are often not stringent or the municipalities ignore the commitments.

A recommendation for the municipality is to make regional appointments about land prices that are in accordance with market conditions and use the revenues for quality improvements on new and existing areas. This recommendation is set because municipalities often have a competitive attitude towards each other. A realistic land price meets at least the cost price; in preference even the cost price plus an additional fee. Competitiveness on quality instead of price stimulates the own identity and attractiveness of the region (VROM, 2006).

Stec Groep (2010) provides an overview of the success factors for collaboration derived from ten regions. The most important ones are the factors 'collective goal', 'strong top-down/bottom-up approach' and 'strong drivers and directors'.

Several initiatives are already known, as the Ontwikkelingsmaatschappij Midden-Limburg (OML), the Schiphol Area Development Company (SADC) and As-50 (Oss, Uden, Veghel). In these cases different municipalities collaborate, sometimes even assisted by private parties.

4.1.3. Land allocation

The land owner is able to control the established ambition level for an area in the allocation phase of the development process after these ambitions are set in a master plan and additions are made in the zoning plan. Currently most industrial areas are developed in the traditional way. This means that the municipality acquires the necessary land for development and facilitates the plan development, site preparation and land allocation. After the land is purchased, the user usually built its property. Other ways of allocation could be interesting for sustainable development.

The land owner could set requirements towards the possible investors to ensure that the right business will settle on the right place. Possible requirements are urban conditions, economic requirements, maintenance of the building and park management. An instrument to implement these requirements is the 'plan for allocation' wherein the housing criteria are mentioned. Important in this phase is sufficient meetings between businesses and involved governmental agencies. Collaboration between the businesses, government and developer or entrepreneur could start in this phase.

Looking at the land allocation there are three interesting aspects to investigate in relation to developing a sustainable industrial area:

1. Type of ownership
2. (Housing) conditions
3. Pricing policy

4.1.4. Assurance

To be sure that quality improvement is taken into account in area development, assurance possibilities are indicated. There are two kinds of assurance possibilities: enforceable and unenforceable possibilities. The enforceable possibilities are legally secured. An example of an enforceable assurance possibility is the EPC-value. In the Netherlands every building has to meet this norm. Unenforceable possibilities are applied on voluntary base. These possibilities could be an energy vision of a certain business, or a political energy ambition. Without these unenforceable measures, it appears to be very hard to implement sustainability in area development. Assurance possibilities could be technical, political,

planning or legally focused. They all have in common that they have the target to ensure energy or quality in a complex area development process (Milieu Overleg Lagere Overheden, 2002).

Assurance could also been established by the type of contracting. This is especially relevant when a developer or investor is involved in the development of an industrial area. In the coming years it is expected that, beside the current DBFO and DBFM, new variations on contracting for 'total development' will be frequently used, like BOT, BOO, DBOM and BTM (VROM, 2011).

4.2. Physical measures and chances

To realize the set ambitions of a certain region, municipality or developer for a sustainable area development, measures could be taken based on spatial layout and energy & material use. These measures may be stimulated by the involved parties of the plan development phase through requirements or conditions set in the earlier decision-making process.

4.2.1. Spatial layout

A design of an area will be created in which economic results improve and the environmental load and used space reduces. Both businesses and government realize that industrial areas could add value towards the business. Therefore, the improvement and the preservation of this value is getting more attention and collaboration between the parties in the design phase arises. Park management is a useful tool to preserve the value of an industrial area after realization. Four measures could be taken in the design phase to create a sustainable design.

1. Efficient use of space

In general the plots of an industrial area are optimally distributed over the area. Nevertheless, in practice this distribution is less easy as expected. Businesses move to other places and business that don't fit into the structure appear. To avoid inefficient use of space, multiple use of space could be applied. Businesses or functions could be placed on several layers and businesses could be gathered together in one collective building. These kinds of buildings are mainly hired instead of bought by its users. A disadvantage of this measure is that a collective building is not possible for all businesses, especially production companies need their own building and plot. A second form of intensive use of space is collective use of space. Clustering of businesses with the same needs increase the chances for collective use of the built environment, like a collective stock of strategic plots and joint facilities for the storage of cars, goods and trucks. Third, intensive use of space during the time could be applied. This means that buildings are designed in a flexible way so that they could be

adapted easily. The strategic stock of plots could be used temporary by renting the plots to small business.

2. Functional blending

Since the eighties doubts have been risen about the monotonous character of industrial areas. A lot of businesses that doesn't cause any hinder were located on industrial areas. The monotonous character of the industrial area is considered as one of the aspects that causes the current reputation of industrial areas. Advantages of functional blending are: stimulating employment in the neighbourhood, increasing liveability, reducing the mobility.

3. Accessibility

An important possibility for multimodal transportation is the construction of public terminals that include rail-, water- and tube connections. Besides this, a high density of businesses that have a large-scale flow of goods have to be located in the neighbourhood of these terminals. A high volume is necessary to make the terminal profitable. Another possibility for a sustainable design is high quality public transport. Alternatives for car usage have to be provided. On the industrial area itself, a transport system could be implemented with jointly used bikes, cars and cabs and discounts on public transport.

4. Work- and life environment

Facilities that increase the quality of the work environment are getting more attention from the business. The facilities preserve the value of the real estate of the companies as well as the attractiveness for the employees of the environment and the businesses in this environment. Examples of these commercial facilities that increase the attractiveness are education, flexible workplaces, childcare, shops, etc. Examples of the facilities that are interesting for the preservation of value of the real estate are collective security, collective maintenance and ICT facilities.

Implementation of park management in the area will have to avoid quick obsolescence of areas and easier organisation of collective facilities. Therefore, park management have to be focused on long-term value preservation so that the private parties are willing to invest in realization, management and renewal of the location. For new area development it is recommend to require participation in park management (THB, 2008).

4.2.2. Energy- & material use

The physical flows that result from business-related activities on an industrial area are the main point of this factor. Physical flows are for example energy, heat, water, raw material, persons, goods and rest flows. Improvement of efficiency of these physical flows could result in improvements of the economic situation of the businesses. Besides this, sustainability is considered as a strategic factor that plays an increasing role in the economic decision-

making processes of a business. Two measures could be implemented according to the business processes:

1. Industrial processes

A sustainable area could be reached by exchanging energy, raw materials and water between businesses. The exchange of raw materials, energy and water could be turned into design criteria for new industrial areas. A condition is a specific clustering of businesses that optimize the use of energy, raw materials and water. Another application is the management of rest materials. Suppliers and purchasers of rest materials are brought together. Reduction of waste materials is an important goal of the collaboration between businesses. Exchange of energy and material flows is made possible by realizing infrastructure for this exchange, like separated sewerage for reuse and for waste water and the mutual delivery of heat, CO₂ and waste materials.

Most businesses on an industrial area make use of utilities, like installations for the production of electricity, steam, process water, press air or the purification of waste water. To gain an optimal return the capacity of these utilities has to be entirely used. Therefore collaboration with other businesses could be an option. The same notion could be made by business functions as a cleaning area or a maintenance area. A business could sell some of his capacity towards other businesses.

The focus on core activities has resulted in more collaboration for transport and communication functions. Chances for the companies are on the field of combining and tuning the flow of goods towards, from and within the industrial area. Transportation management could be applied to coordinate the transport of goods and persons at a certain industrial area.

2. Renewable energy

The supply of utilities for gas, water, electricity and sewerage is relevant according to the sustainable design of an area. Utilities with a high return are becoming more available during the years. An option for industrial areas is a heat-power-linkage. Energy for these heat pumps could be kept from renewable fossil fuels gained in the area, as biogas and solar and wind energy. This is also possible for lighting and advertisement. The use of water could be reduced by implementing a rainwater system so that this water could be used for irrigation water or washing. Collectively wind energy could be an interesting option, whereas solar panels are mainly used individually. A new and less common renewable energy source is geothermal energy. In the Netherlands this kind of renewable energy still doesn't get a lot of attention, but in Germany and France different experiments are already done. Chances for geothermal energy are based on the continuous availability and the profitability.

4.3. Conclusion

This chapter shows that the possibilities with sustainability are very broad and diverse. The definition of sustainable development is leading for the measures that could be taken. The ambitions of the municipality and the requirements that are set in the initiative phase and ensured in the plan development, influence further implementation of sustainable development. Therefore policy and governance plays an important role in the feasibility of the sustainable development.

In the next chapter it is investigated how a sustainable area development could be achieved by focusing on the land allocation as tool for this goal. Main focus will be on the following instruments: type of ownership, setting (housing) conditions and pricing policy.

5. Land allocation policy

Different interviews³ and literature (Blokhuys, 2010; THB, 2008) make clear that problems with the quality on industrial areas and preserving industrial areas on long-term often could be derived from decisions made in the preliminary phases of the development process. Meanwhile redevelopment and infill of industrial areas already takes place, it is still hard to compensate the obsolete areas. Therefore, this chapter will investigate the effects of implementing land allocation as tool to gain a sustainable industrial area that will remain functional during the years.

A land allocation plan is normally not determined as a leading step within the plan development phase. Nevertheless, the policy behind it is definable for the further development of the area and the relation between the stakeholders. In figure 5.1 the proposed relation between the land allocation policy and the goals set for the exploitation phase is shown. Therefore, the land allocation plan and the maintenance are highlighted.

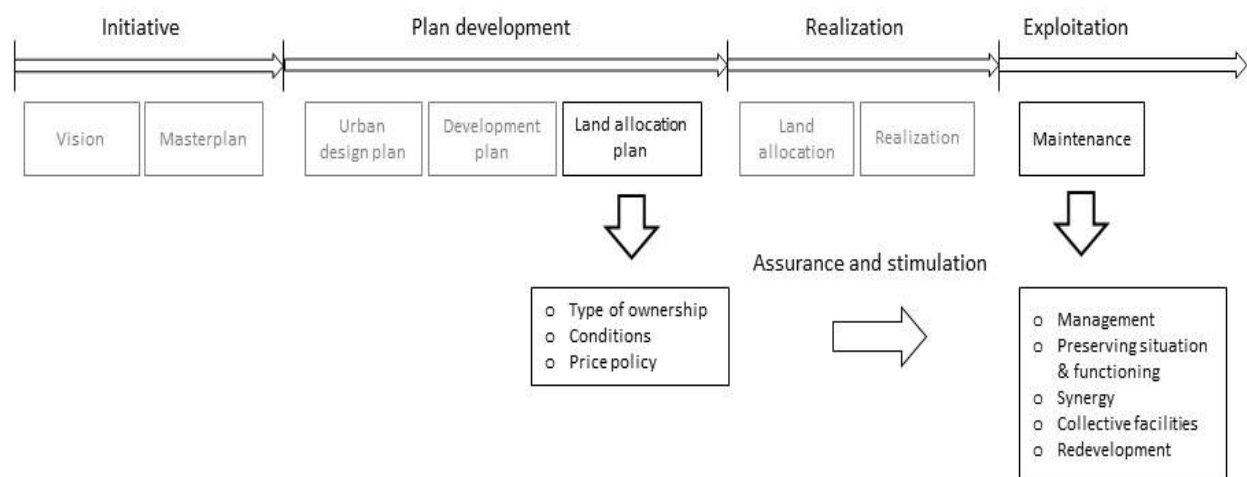


Figure 5.1: Land allocation within the development process

In this chapter the features of land allocation policy are described in detail, so that the possibilities of this tool become clear. The tools will be verified with the BREEAM certification for area development. Finally foreign approaches of the land policy of industrial areas are investigated.

5.1. Features

Every land instrument that could be implemented has to be weighted towards the goals it wants to achieve. For every ambition the right instrument have to be found. Therefore it may occur that an area requires several land instruments instead of one tool for the whole

³ J. Rentrop, Havenschap Moerdijk; H. Ploem, Stec Groep.

plan. Three features are discussed: type of land allocation, setting conditions and pricing policy.

5.1.1. Types of ownership

Different types of ownership are known. The most common one is the sale of land, followed by leasing land. In case of sale the buyer of the land has all the control, meanwhile by leasehold the land owner, this is often the municipality, keeps certain control over the land (RIGO, 2009). Leasehold is a property right, which means that the right is related to the property and not to a certain person. The contracts for leasehold could include requirements about density of the built environment and reservations of land, but also requirements about park management and maintenance. The approach of leasehold with required collective use of provided services for the area is a proposed new allocation model (Agentschap NL, 2011). Agentschap NL recommends innovative land allocation models and leasehold constructions within the checklist for financing sustainable area development.

Renting land is the third type of ownership. Renting land is, unlike the other types of ownership, a personal right related to a good. For that reason financing properties on rent land is more difficult than by sale and leasehold. The possibility to rent on an industrial area is limited towards the rent of a property. The property is in these cases owned by a developer or investor. Because the rarely use of renting land on an industrial area, this type of ownership is not taken into account in the research.

Support

Currently several (sustainable) industrial areas are planned wherein a leasehold construction is investigated and some industrial areas are already realized with leasehold. Four cases will be discussed in the coming chapters. Interviewed experts mentioned leasehold as chance for the future development of industrial areas⁴. However, some doubts are made about the support of this type of ownership under both entrepreneurs and municipalities. Mentioned is that leasehold has to lose its negative image before it will be used on larger scale. Expected is that within the current market leasehold is most supported by large-scaled businesses and starters.

Not all companies have the same housing criteria and the same needs. Bergh and van Wijk (2007) conclude that leasehold is an interesting system for implementing the current changes in the real estate sector through the long-term commitment of the landowner, often the municipality. In the logistics sector, focusing on the core activities is already a common thought. Therefore 'new' financing models are widely implemented, as renting and leasing properties and land. The logistic firms acquire flexibility and have an increasing focus on sustainable development to reduce the negative image of the sector.

⁴ H. Ploem, Stec Groep; W. Korthals-Altes, OTB; M. van Wijk & J. Schroeders, SADC

Financing

The choice between sale and leasehold has influence on the financial status of the stakeholders. In case of sale, the future owner pays the total price of the land plot in one time. However, in case of leasehold, the lessee pays an annual price for the land; this price is often called a canon. Therefore leasehold causes a continuous cash flow of revenues instead of one impulse at a certain time.

Two types of leasehold could be distinguished: perpetual leasehold and continuous leasehold. The main difference is the timeframe of the leasehold: the contract for perpetual leasehold is valid forever, the contract for continuous leasehold could be reviewed after a certain period (RIGO, 2009). In general the timeframe of a continuous leasehold contract is between 30 and 99 years.

Value increase gained during the leasehold period is divided over the landowner and the lessee; the increase is caused by both the regular developments of the market and the public investments in the area. This approach counters the problem that only the investment costs of an area are socialized meanwhile the revenues are privatized. In figure 5.2 the cash flows are shown of both sale of land and leasehold of land. By sale the municipality gains revenues on one specific moment. The revenues are added to the general funds and the municipality has no involvement anymore in the area (left model). By leasehold of land the municipality gains income annually. Where in the past the revenues of the leasehold were usually added to the general funds of the municipality or province, currently these revenues are more often used for the maintenance and management of the area. By doing so, the value of the land could increase and the municipality is able to capture this value. The municipality remains connected to the area (right model).

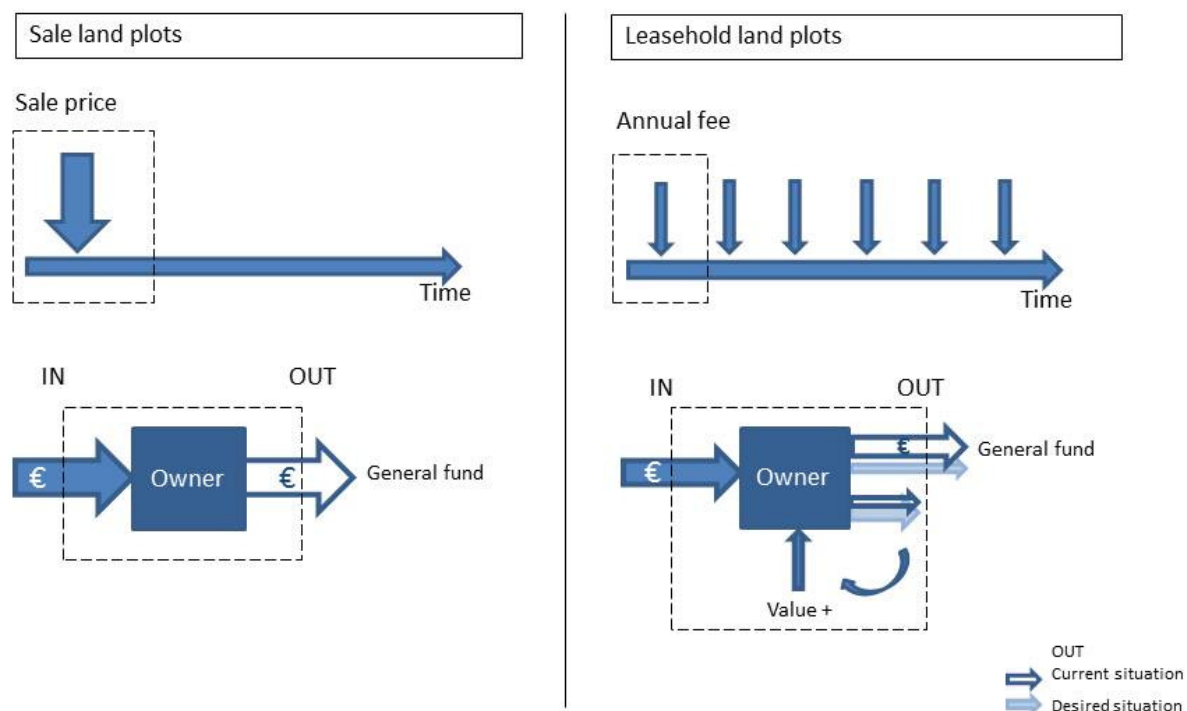


Figure 5.2: Cash flow scheme land owner (here municipality)

It is possible to pay the leasehold price in once, so that the cash flow model shifts towards the model for sale. Therefore, financially this option function quite the same as the sale model. However, the involvement in the area remains.

In Amsterdam the value increase of the land is realized by canon reviews. These reviews occur at the beginning of a new leasehold period, the canon is levelled to the value increase of the land. Good communication between the land owner and the lessee is important to avoid frictions about the review. Rentrop (2011) emphasizes in his interview the financial advantages of leasehold compared with sale for the land owner and especially the continuous flow of cash instead of one payment at the beginning of a development.

Another interesting new financing model is the, so called, 'area fund' that combines the land development and the real estate exploitation for the installation and exploitation of services and public facilities. This model emphasizes the potential of private parties within the development process of industrial areas.

Juridical aspects

Leasehold of land is incorporated in the juridical statues of the Netherlands. Several articles⁵ are specifically written for leasehold of real estate. The articles state that leasehold gives the landowner the competence for requiring the lessee to pay a specific amount of money, the canon, to the leaser on a certain point of time or on repeating moments. The leasehold could be terminated by the lessee, unless it is determined differently in the 'document of settlement'. The timeframe of the leasehold could also be included in this 'document of settlement', as well as the condition that the leasehold cannot be transmitted or allocated without the permission of the land owner.

Pros and cons stakeholders

The stakeholder analysis showed us already the different stakeholders involved in the development process. Most important stakeholders in the case of land allocation are the municipality as main land owner and the users. Where the developer in most area developments has a clear role, within the development of industrial areas his presence is, despite the current focus of the government, still low compared to the municipality (about 20% vs. 80%, VROM 2010). However, the proposed instruments could also be interesting for developers that focus on sustainable development and quality optimization. In table 5.1 the pros and cons are discussed for the landowner and the user.

⁵ Articles 85-100 of book five of the Dutch law: business law

Stakeholder	Pros	Cons
Land owner	<ol style="list-style-type: none"> 1. Keeping influence on the land after exploitation 2. Benefit from (a part of) the increase in value of the land 3. Being able to control the land for redevelopment 4. Leasehold provides a continuous cash flow with a fixed value 	<ol style="list-style-type: none"> 5. Increase of risk-carrying through the on-going ownership 6. Lack of cash flow at the beginning of a development; balancing building projects is more difficult
User	<ol style="list-style-type: none"> 1. Feasibility of the investment 2. Quality preservation area 	<ol style="list-style-type: none"> 3. Financing of the investment in real estate 4. No ownership of the land

Table 5.1: Pros and cons leasehold related to the stakeholders

Land owner

Ad 1: Advantage for the land owner is the control option related to the land exploitation. The land owner is allowed to end the leasehold during the contracting period when the user doesn't meet the minimum requirements. The user has to ask permission to the land owner for the transmission of the buildings and/ or the transmission of the leasehold contract to a new user. Besides, the contract stays intact when the lessee moves because it is related to the plot and not to the lessee. By preserving efficient use of space, leasehold of land appears to be quite effective (WVI, 2005).

Ad 2: The land owner is allowed to review the canon at the beginning of a new leasehold period, in ratio to the value increase of the land. In case of a zoning plan change related to redevelopment of an area, the land could increase in value. This value could be captured by the land owner through a value capturing clause (Wolff, 2006). Through this revision the land owner will profit from their own investments in the area (value capturing), and a closed loop rises. This reinforcing loop is shown in figure 5.3.

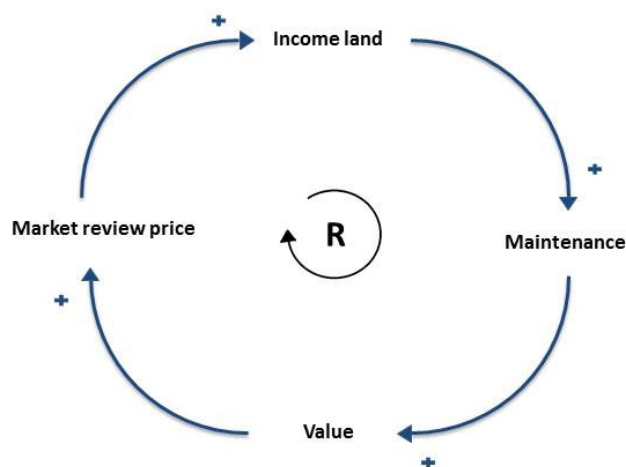


Figure 5.3: Reinforcing loop land value land owner

Ad 3: At the end of the contract, the land owner keeps the control over the land so that redevelopment could be easier implemented by the land owner than in case of sale. Especially when an entire area is owned by the same land owner, the feasibility of redevelopment increases as a result of less fragmentation. The land owner has a strong negotiation position, because permission of the land owner is required for expanding the building, splitting the rights or changing the function.

Ad 4: This incentive is discussed in earlier in this paragraph.

Ad 5: A disadvantage of the choice for leasehold could be the increase of risk-carrying through the on-going ownership. Risks could be bankruptcy of a company or lack of market demand after the end of a contracting period.

User

Ad 1: Advantage for the lessee is the lower price of the property. Only the building has to be bought and not the land, so that less financing is needed. This gives the user the possibility to invest more equity in the core business instead of the real estate. The canon for the land plot could be subtracted from the taxes.

Ad 2: The land owner will use the revenues (partly) for renovation and maintenance of the area, so that the quality of the area will be preserved. The user will profit of these efforts with value increase of the property as well as the level of the work environment.

Ad 3: The municipality is considered by the financiers as a safe stakeholder and therefore financing public leasehold is not very demanding. However, in case of private leasehold financiers handle a stringent policy. Last year they even refused financing private leasehold contracts in several cases (NVB, 2011). To improve this, in November 2011 criteria for leasehold contracts were composed by financiers, land owners, lessees, notary and brokers so that the feasibility of the financing became more clear for the lessee.

Ad 4: Because the user will never be the owner of the land, leasehold has the uncertainty of the influence of the land owner. The land owner is, for example, able to review the canon at the end of a period, but often the user doesn't expect this review because of a lack of knowledge about the leasehold conditions. The height of the review is also difficult to predict.

For a successful implementation of leasehold, support of both land owner and users has to be created. In the Netherlands most entrepreneurs see their property as retirement provision, meanwhile in foreign countries, like the UK, entrepreneurs prefer to invest more equity in the development of their core business than in real estate. For a successful implementation entrepreneurs have to be aware of the advantages of this system and have to release their traditional opinion.

5.1.2. Pricing of land

The land price could be a tool for stimulating developers or entrepreneurs to create a sustainable area or building. This is a pull option to involve entrepreneurs in the

development. The comment has to be made that the land price covers often only a small part of the total investment costs for a new development, dependable of the seize of the plot and building.

A method that could be used is realizing a quality zoning. The land prices in these zonings could vary depending on the urban requirements or the visibility of the location. It is possible to either decrease the land price of plots that know severe urban requirements or increase the price in case of a high-profile location.

Another stimulating method is the implementation of graduated rates for the land that fluctuate dependable on the number of floors and the amount of square meters floorspace. A more often used method in the Netherlands is giving discount on the land price or the annual contribution for park management when the company takes into account certain measures for sustainability (WVI, 2005). In Apeldoorn this method is used by the industrial area 'Ecofactorij'. A similar system is investigated by the development of the Zuidas in Amsterdam. In this case the user would be able to build more square meters when applying certain sustainable measures.

5.1.3. Set conditions

Chances are seen in setting conditions by the land owner towards the housing of businesses in a certain area. Which kind of juridical instruments are used, is dependable of the chosen type of allocation (sale or leasehold). All the discussed instruments in this paragraph are push options. In table 5.2 an overview is given.

	Sale of land	Leasehold
Requirements to do	Easements (erfdienstbaarheid) Chain clause (kettingbeding)	Directly , provided that it meets the principles of leasehold rights
Requirement not to do/ to tolerate	Easements Qualitative requirements	Directly

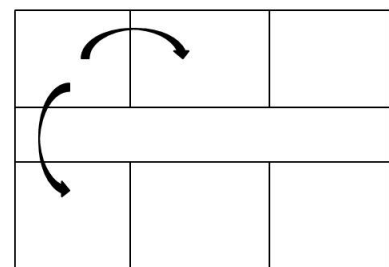
Table 5.2: Instruments for setting conditions towards the land allocation

Sale of land plots

In case of sale, three instruments are investigated (Deloitte, 2010):

1. Easement ('Erfdienstbaarheid'): A dependable right on the property in favour of the owner of another plot. Easements could also be implemented back and forth every plot, so that every plot is a serving area in favour of all other plots on the industrial area.

Generally 'requirements to do' as well as 'requirements to tolerate/not to do' could be imposed by easement, taking into account that the requirements to do have to be related towards the functionality of the easement or management and maintenance



of the plot. An example of a requirement to do is the requirement to maintain the property. An example of a requirement to tolerate is the drainage of water.

2. Qualitative requirements: A private right in which a personal commitment towards a certain property will proceed to the future user. Only requirements to tolerate/not to do could be imposed.
3. Chain clause ('Kettingbeding'): A contractual construction that has the aim to enforce requirements to the successors of a certain property. The chain will be broken when the successor will not implement the requirement. In this case compensation has to be paid and the broken chain loses its legal value. Next successors don't have to meet the set requirements. Another disadvantage of a chain clause is that only requirements from a specific moment are valid; it is quite hard to add new requirements during the time.

Leasehold of land

Some of the requirements in table 5.2 belong to the general conditions of leasehold right; the 'requirements to tolerate/ not to do' could be implemented directly. Other requirements that could be included in the leasehold contract are 'requirements to do', provided that they clearly relate towards the principle of the leasehold rights. When this is provided, the requirement has a pertinent character and the requirement is binding for future lessees. An example of a requirement to do is participating in an organisation that maintains the area or the requirement to execute maintenance. If the requirement doesn't meet the principles of the leasehold rights, the requirement could be linked to the current lessee but not to the future lessees. It is possible to first set an easement for a certain plot and after that lease the land (Deloitte, 2010).

Leasehold of land offers the possibility to set rebuilt requirements, maintenance requirements, tackling vacancy and multiple use of space, while requirements not to do or to tolerate could be implemented with leasehold as well as with qualitative requirements (Wolff et al, 2006).

Recommend conditions

The next conditions are recommended to relate towards the land allocation for gaining a sustainable industrial area as described in this report:

- Clustering of businesses

In case of exchange of energy sources and/or collective facilities, the clustering of the potential exchanger should be determined carefully and businesses have to be matched. Besides the exchange of energy and facilities, clustering could also be used to achieve specific areas, focused on quality requirements. In general businesses could be divided into

several quality classes with its own requirements and values. Specific functional requirements for achieving clustering could be added by implementing leasehold.

- Park management and maintenance

This research shows that it is important to oblige park management before the site is realized. Therefore it is advised to link park management towards the buy or lease of a land plot. Rentrop (2011) argues that management and maintenance of an area is one of the most important factors to achieve a sustainable area. The implementation of park management after businesses are housed could cause problems with the support and financial fundement (Ploem, 2011). The theory argues that park management could be imposed by implementing easement, a chain clause or a leasehold construction. In case of a leasehold construction park management has to be associated with the leasehold rights.

- Preserving situation

Tackling vacancy of buildings could be captured with a leasehold contract. Additional to the public juridical instruments the municipality is able to use leasehold constructions for preserving the use of the land according to the function description.

- Sustainability score

Setting requirements towards the sustainability of the building could be desired to achieve a sustainable industrial area, but these kinds of requirements are still difficult to implement. The described rights in this paragraph don't have the ability to obligate such kind of conditions. Only the maintenance of a building could be obligated by leasehold or a chain clause. The chain clause has some opportunities to impose other 'requirements to do' related to the design of buildings, but the chain clause is only linked to a certain person and not to a certain property. Therefore the clause could be relatively easy broken by bankruptcy or execution through a bank; the long-term effect of the clause is not guaranteed, while in this research this is the emphasized goal.

Instead of using the mentioned push options '*easement, qualitative requirements, chain clause and leasehold*', giving discount on the price of the land, as mentioned in § 5.1.2, should be a feasible pull option to stimulate sustainability in the area, especially a sustainable design of the buildings and sustainable business processes.

5.2. Verification

The theoretical framework argues the position of land tools in stimulating the process of sustainable development. To verify this statement, the BREEAM certification is used. The BREEAM method is mentioned in chapter 2 'Definition framework' as useful certification tool for sustainable development. The BREEAM-gebiedsontwikkeling certification contributes towards a common statement about sustainability in real estate.

BREEAM Gebiedsontwikkeling is divided into six categories of which four are thematic (Sources, Spatial development, Prosperity and Welfare, Area climate) and two are general (Synergy, Management).

A definition for area development is given by the Dutch Green Building Council (2010): the area has to include at least five buildings with public spaces and infrastructure, the area is clear and unambiguous defined and there is a client.

Land allocation tools have influence on certain aspects of the BREEAM certification. By inserting a leasehold construction, the category 'Management' and, within the category Synergy, 'adaptive ability' could be influenced the most; it is considered that the contribution towards the thematic categories is present, but less relevant. The land allocation tools *stimulate* certain measures and do not directly improve the BREEAM certification. Therefore the tool of leasehold mainly focuses on the long-term planning of an industrial area and less on the actual sustainability score. By implementing special conditions or pricing policy towards the land allocation other aspects of the BREEAM Gebiedsontwikkeling certification are stimulated: especially the categories 'Sources' and 'Area climate'. In Appendix 2 a table is inserted that shows the categories of the BREEAM certification and the relation between the land allocation tools and the categories.

5.3. Foreign approaches

Gorter and Olden (2007) investigated the governance of industrial areas in foreign countries and compared these with the Dutch situation. Most countries show similarities on the field of goal setting, the focus of the governance on the development of new areas and the (lack of) attention paid to industrial areas in the spatial planning. Besides these similarities, some differences are noticed.

In Belgium⁶ the role of the municipality in the planning and programming of the areas is limited. The national and provincial government are more involved in the planning than in the Netherlands. Inter municipal collaborations are organised to develop and allocate industrial areas. Germany also has these inter municipal collaborations, but these mainly take place in urban areas so that the influence on rural areas is less. Private parties are able to participate in these collaboration networks. The networks focus not only on industrial areas, but also on shopping malls, dwelling and offices.

In the UK the disposition and development of industrial areas is generally realized in a different way than in the Netherlands. Development and allocation of industrial areas occurs mainly through private parties. Planning and programming is provided by the government.

⁶ The report focuses especially on Vlaanderen

On the business parks⁷ the development of offices and commercial functions is allowed. The entrepreneurs in the United Kingdom are more used to renting properties than the ones in other countries. The economic less well-doing regions are still managed in the more traditional way of governmental influence. The approach of the United Kingdom is often considered as an example for the Dutch government (VROM, 2010).

Different industrial areas are realized by private developers with a specific focus on work environment. Private parties are, unlike in the Netherlands, involved in the development of business parks. Within this development, park management and quality are key issues. Private developers state that the growth of the service sector requires new concepts for buildings. The private developers are interested in developing the business parks because of the possibility to include offices.

Financially the business parks have a different structure than the standard Dutch industrial area. An investor or real estate developer owns the areas and the buildings. Management is the perfect tool to preserve the value of the development. The initial yield is probably about at least ten per cent, risks related to renting the buildings are avoided by long-term tradable contracts. In some cases the first plots are sold to finance the starting investments of the development (Dinteren, 2007). Van Dinteren also describes the trend of changing thoughts about the work environment in the UK. Chiswick Park is a clear example of this. In this case the housed businesses and employees are considered by the management as 'guests' on the business park.

In the Netherlands two industrial areas are realized that have similarities with the UK parks, namely Schieveen and Greenpark. Financially these areas focus on a longer exploitation period than normally, so that there is less pressure from the land exploitation on the innovative concept. In Schieveen the revenues of the development are invested in the development of a surrounding park.

5.4. Conclusion

Different types of ownership are noticed in this chapter. For the development of a sustainable industrial area, ownership with conditions or leasehold is preferred above the traditional ownership of the land. With leasehold, the land owner preserves its influence on the land during the years so that quality assurance is possible and land could be controlled by eventual redevelopment.

A second tool that is investigated is setting conditions towards the land allocation. A distinction is made between the possibilities in case of sale and the possibilities in case of leasehold.

The third tool mentioned in this chapter is so-called 'pull option', namely pricing policy. This tool could stimulate businesses to be actively involved in the development of a sustainable area by providing them financial or design advantages.

⁷ Through the mix of functions the term 'business parks' is often used instead of 'industrial areas'.

In general foreign countries use almost the same starting points for land policy as the Netherlands, but the UK is an exception. Private parties play a more important role in the development of entire industrial areas than in the Netherlands. The interviewed experts all agreed with the fact that land policy could be a useful tool to improve the sustainability and quality of an (new) industrial area development.

Currently several projects are planned that use land allocation tools, and even examples are known that already use this tool. In the next chapters the land allocation of several cases will be investigated in detail so that lessons learned could be established.

Part II. Practical test

6. Case studies

Recently various sustainable developments are realized in which the stakeholders used special land allocation tools. To test the theoretical statements made in the previous section, the development process of four cases is explored. Data is collected by keeping interviews with involved parties and studying literature (figure 6.1).

For testing the support and feasibility for the land allocation tools, the two most relevant stakeholders are investigated and interviewed. These stakeholders are the landowner and the user. The interviews will show the incentives of the landowner for implementing special land allocation and how this is organized. Users of the projects are interviewed about their motivation for a certain location and their experience with the industrial area.

After the interviews are done, the input gained from the interviews will be analyzed and compared with the theory. This will result in recommendations towards the landowner about the application of special land allocation policy.

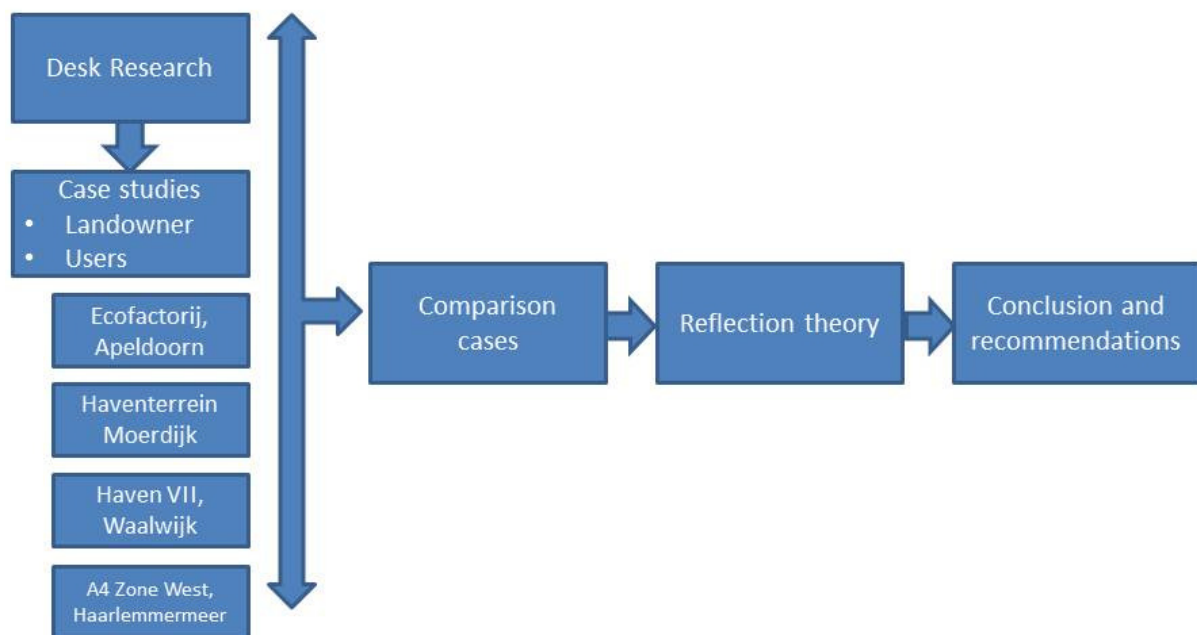


Figure 6.1: Approach practical test

6.1. Case overview

Several new developments have implemented a special land allocation policy to stimulate the development of a sustainable area. The approach and experiences of seven cases are described in this section. Four of them will be used for further research. Klavertje Vier, A4 Zone West and Logistiek Park Moerdijk are in the plan development phase, meanwhile Ecofactorij, Haven van Moerdijk, Haven VII and KampC are realized.

Klavertje Vier, Venlo

The area development of Klavertje Vier in Venlo knows a specific policy for the housing of companies. Land allocation requirements are a part of this planning policy. The land allocation is divided into three parts: the pre selection, the selection and the operation. In the pre selection the companies take initiative to house in the area or the organisation searches for companies that are willing to house in the area. The potential companies are assessed whether or not they belong to the primary target group. In the selection, the potential companies together with the organisation look for an optimal interpretation of the business within the area. In the operation, the chosen location will be further planned by realizing a design for the building and applying for permits.

Important requirements, which are determined in the Master plan for the area and that are relevant for the land allocation, are i.a.: the application of innovative sustainability principles, preserving of the character native to place and adjustment of different functions of the businesses to each other so that value will be created.

Klavertje Vier has a strong focus on the synergy between the companies. Therefore a desired segmentation of companies is made. A qualitative cycle shows the advantages that could be achieved by implementing synergy. Important is that the residues of a certain company could be used as raw materials by another company. The policy according to this synergy is represented in the housing criteria.

The sustainability principles have effect on the implementation of park management. From this point of view the land exploitation will be done by leasehold constructions. Further implementation of this approach has to be investigated.

A4 Zone West, Haarlemmermeer

A4 Zone West belongs to one of the pilot projects initiated by VROM, namely 'Pilotproject Noord-Holland/Metropoolregio Amsterdam: area focused allocation of industrial areas through an open area fund'.

The companies SADC and BCI received a subsidy for their initiated pilot. Their plan is to create a concept in which several parties invest in a collective area fund. This collaboration between landowners, developers, investors and users means that the development, exploitation and management of a certain large-scaled area is done integrally (vertical).

Especially the high quality and economical attractive projects around Schiphol airport are useful for the implementation of the concept. The main objective of this pilot is that a collective allocation and management of industrial areas will result in an improvement of the quality and sustainability of the entire region. The concept stimulates investing of several stakeholders in a collective area fund.

The project belongs to the development of Amsterdam Connecting Trade (ACT), a future innovative logistic node near Schiphol. In this context A4 Zone West will be developed sustainable. The focus of ACT is on multimodality, sustainability and beyond logistics. Sustainability will be applied during the whole concept, from development and realization till maintenance and park management (GEM A4 Zone West, 2011).

Ecofactorij, Apeldoorn

The project Ecofactorij near Apeldoorn is characterized by allocating land in leasehold. For the land the leasehold price will be paid at once. Advantage of this type of allocation is the required participation in park management for the user, even when the leasehold is passed on. Through a chain clause the new user is forced to participate. Without this method, collaboration for management and maintenance is hard to achieve in this area. Currently, the companies have realized an own electricity network, so that the companies themselves are able to choose the method of energy supply, in this case wind energy.

A discount on the leasehold price with a maximum of ten per cent was provided for companies that offered a sustainable building plan. Environmental points could be achieved that were turned into a discount.

The marketing was focused on Ecofactorij as business park, instead of only on the sustainable aspects. Nevertheless, the land allocation rate is currently less high than expected. A discrepancy was visible between the destinations mentioned in the zoning plan for the district and the type of companies that were interested to house in the area (Elburg, 2010).

Haven van Moerdijk & Logistiek Park Moerdijk

Since six years the Havenschap Moerdijk implements leasehold on its industrial area. Most important reason to switch to this type of land allocation is the continuation of the financial flows. The revenues of the leasehold of the plots remain in the organisation and will be therefore invested in the area. Before this measure, the revenues of the sales often were used for other projects within the municipality and the Havenschap had difficulties with financing the maintenance of the area.

Another sustainable implementation is the use of a housing policy, which matches companies that could exchange energy or waste materials. Clustering of companies is in this case required. Collective security is applied, as well as park management. A test case with public transport appeared to be unprofitable without the subsidy and is therefore finished.

In the plans for Logistiek Park Moerdijk a leasehold construction is also included. The management of the area will be done by the Havenschap and implemented directly with the realization of the project (Rentrop, 2011).

Haven VII, Waalwijk

Haven VII is a high quality and sustainable industrial area located west of the industrial area 'Haven Waalwijk'. Only companies that have a real need for space and aren't able to expand on their own land will gain a plot. A match making program is present that aims the alignment of demand and supply for new and existing industrial areas. By doing so, vacancy on existing areas is mostly avoided. Multiple use of space is preserved by stimulating semi-detached buildings.

Park management is set up by a PPP construction between the municipality and a consultancy company. Entrepreneurs are required to participate in the standard package. This package consists of collective security, mobility management, signage and a facility point. Companies first have to do an environmental scan about their construction plan before they are allowed to house in the area. Land allocation conditions are set by the municipality which the companies have to meet to gain land. Conditions are for example: type of core activity, original location, use of space and some environmental issues. A 'beeldkwaliteitsplan' is made to test the construction plans (Beco Groep, 2008).

Related to the current recession the municipality of Waalwijk has been providing a leasehold construction for the industrial area since the end of 2008. As a result more companies were able to house in the area (havenzeven.nl). The plots still could be bought or leased.

KampC, Westerlo Belgium

An example of a sustainable industrial development in Belgium is KampC. This is a former military base that is transformed into a business park, an area for model homes and an information centre about sustainable development. KampC has a leasehold construction wherein different procedures are arranged. Companies have to meet selection criteria to house in the area. Urban requirements are set to the design of the premises. A multi-tenant building of 600 m² will be realized, as well as collective facilities as collective parking, meeting rooms and a café. Currently it is also possible to buy the land plots.

6.2. Selection cases

Four cases are selected. The selection is done on several criteria. First, the cases needed to have a sustainable character. This could be measured with the aspects of the BREEAM certification. Second, special forms of land allocation have to be implemented in the cases. And third, a mixture of types of industrial areas is pursued. According to these criteria, the following cases are selected:

1. Ecofactorij, Apeldoorn
2. Haven van Moerdijk, Moerdijk
3. Haven VII, Waalwijk
4. A4 Zone West, Haarlemmermeer

Where industrial area 'A4 Zone West' is still in the plan development phase, the realization of the other projects is already finished.

The cases Klavertje Vier and Kamp C are not selected. For KampC there was a lack of available literature, so that this case was less preferred. Klavertje Vier is still in the plan development phase, which means that some decisions about the land allocation are not made yet. Because of this it is preferred to choose only one project in this phase; the project A4 Zone West is chosen because of the underlying organization.

6.3. Interview design

The interviews are constructed with the help of the source 'Interviewen' (Emans, 2002). The interviews are qualitative; this means that the interview is held using open questions that don't have unambiguous codable answers, but answers that have the form of personal stories told by the interviewee about his situation. An objective attitude of the interviewer is important to achieve the same quality level of answers as with a quantitative interview.

An interview scheme is used to create the interviews. Nine steps have been taken to reach this scheme. These steps include (Emans, 2002):

Preliminary steps

1. Establishing need for information/ definition of theoretical variables
2. From theoretical variables towards raw variables: indicating methods
Three models could be used, namely self-description, facts, and detailing
3. From theoretical variables towards raw variables: raw variables
4. From goal of the interview towards raw variables: technical variables

Realization interview

5. From raw materials towards answer- and record system
6. Instructions for asking questions: partly structured interviews, some questions could be formed dependable on the interviewed person
7. Ordering the questions: hopper pattern – from wide towards detail; taken into account salience and consistency
8. Lay-out, introduction and end
9. Testing the concept version

In table 6.1 the interview scheme is shown. The scheme includes nine theoretical variables that form the framework for the data collection. For each case these theoretical variables will be explored and compared with each other. Raw variables are determined to gain sufficient input. Technical variables are determined to gain background information about the interviewed person.

Theoretical variables	Raw variables	Technical variables
Ambition of the project	Goals set for the project, BREEAM aspects	Location
Organization of the project	Importance land allocation in whole process, using different plans for gaining ambitions	Function of the interviewed person
Planning of the area	Regional collaboration, SER ladder	Core business
Motivation land tools	Incentives for choices made	Date
Support land tools	Support within the land company, support of the users, differences between various types of users	
Feasibility land tools	Financial feasibility, juridical feasibility	
Effectiveness	Results land tools, implementation sustainability	
Risks land tools	Time frame, noticed problems, points of improvements	
Attitude towards future	Implementing land tools in new projects	

Table 6.1: Interview scheme

The interviews will be partly structured, this means that questions are made but some questions are formed dependable on the interviewed person. Not all questions are relevant for every case. Besides this, it is possible to ask questions as a response on the answers given by the interviewed person.

The questions will be ordered from wide towards detail, thus in hopper pattern. The interview ends with future possibilities. By formulating the questions salience and consistency are taken into account. In Appendix 3, the basis questionnaire for the interviews with the land user is inserted. The questionnaire could differ per case, based on the implemented land allocation policy. The questionnaire for the user is derived from the questionnaire of the land owner (Appendix 4). During the research, it became clear that planning interviews with a user of a particular industrial area required more effort than the land owner or municipality. Therefore by two users the questionnaire was send by mail instead of planning a meeting. When needed, the user was called for some additional information. The land owners are all interviewed in a meeting.

For analysing the results, the Miles and Huberman method is chosen. This method focuses on tables and networks between key issues. In this case the above mentioned management factors are considered as the key issues. It gives a clear overview of the qualitative results of the case (Swanborn, 2003). Based on Miles and Huberman, a checklist is created that represents a detailed summary for the analysis of the key issues. In the checklist the information of the different roles are inserted.

7. Reflection case studies

This chapter includes the description of the four selected cases. The description is based on the held interviews and, in a few cases, some additional literature. For every case the way in which the tools are applied is discussed first, followed by the nine management factors.

7.1. Case study: Ecofactorij, Apeldoorn

	Ecofactorij
Location	Between the highways A1 and A50, near Apeldoorn.
Status	8 companies are housed, a 9th company will be housed soon.
Type of business	Large-scaled businesses in the production sector and logistics.
Environmental category	Between scale 1 and 4.
Plot sizes	Minimum size of 1 ha, average plot is 3 ha
Plot price	± €150,- /m ²

General	
Type of ownership	Leasehold, currently about 60% of the available plots are leased. Payment in once, therefore it has the same status as sale.
Conditions	<p>Special conditions are inserted in the 'Quality plan'. Two packages are present in the quality plan: the required housing package and a plus package on voluntary base.</p> <p>Conditions are set on the following points:</p> <ul style="list-style-type: none"> ○ Land use ○ Accessibility ○ Layout ○ Energy ○ Water ○ Soil ○ Waste management ○ Nuisance <p>Besides these points, participation in park management is required for every company. An annual fee is paid for this.</p>
Pricing policy	Companies could earn discount on the land price when applying certain sustainable measures. The measures are mentioned in the 'Quality plan'. The maximum discount is 10%. The companies have three years to realize their ambitions; after realizing the ambitions the discount is paid by the municipality.

Management factor	
1. Ambition	Creating a sustainable industrial area of 100 ha. Keeping in mind both ecological and economic aspects: well-functioning and sustainable layout. The ambitions are set because of the location of the area at the borders of Apeldoorn, near rural area.
2. Organisation	<p>The municipality was the leader in the development. It has bought land for the development: active land policy.</p> <p>For two locations a PPP construction was implemented.</p> <p>Involved departments of the municipality: project development, land affairs, economic affairs, urban development and environment.</p> <p>One of the first companies that wanted to house in the area participated in the realization of the housing policy and the Quality plan.</p> <p>Land policy is considered as high potential for realizing a sustainable area. Implemented plans: zoning plan for heights and types of business, so called 'Quality plan' for measuring sustainability. The set sustainable ambitions are not possible to realize within the zoning plan. No master plan is made for the area.</p>
3. Planning	No use of regional collaboration or SER ladder.
4. Motivation	
Type of ownership	<ul style="list-style-type: none"> ○ Juridical possibilities: leasehold is considered as the only way to bind businesses on long-term. This is necessary for an ongoing membership of the park management organization and therefore the continuity of the sustainable successes. ○ Through payment in once the same status is achieved as sale which has advantages for financing the land and the involvement of the landowner.
Conditions	Gaining a sustainable area like the ambitions of the municipality.
Pricing policy	Stimulating companies to participate in sustainability ambitions.
5. Support	
Users	<p>The type of ownership hasn't delivered any problems yet. There is good communication about the motives, the user confirms the good communication. Both logistics and production companies are present in the area.</p> <p>The most important housing incentive for the users is the location. Type of ownership didn't influence the decision-making process.</p> <p>Some resistance was given by the Kamer van Koophandel (KvK)⁸ for the set conditions. Especially comments were made about the built density and green. During the project the users became more positive about sustainability, especially through the financial advantage of the discount.</p>
Land owner	Because the juridical incentive the support for leasehold was high by the land owner (=the municipality). In case of a financial incentive

⁸ 'Kamer van Koophandel' is a public instance that supports and advises the Dutch entrepreneurs.

	<p>expected is that this support would have been less high. First concept was therefore to sell the plots. This changed for juridical reasons.</p> <p>There was some doubt about the set conditions through the comments made by the KvK, especially for the set built density. After the final decisions were made, the support increased within the municipality.</p>
6. Feasibility	
Juridical	<p>The leasehold construction guarantees park management on the long-term. In the contract a required annual fee for the park management is mentioned.</p> <p>The housing conditions are mentioned in the 'Quality Plan'. This plan functions as an agreement between the landowner and the user, so that it is legally allowed to set certain conditions in it. Besides this, potential users have the possibility to house on other locations in the region. Not all conditions were legally possible, physical value of the conditions is required. Therefore conditions about employment were difficult to implement.</p>
Financial	<p>The discounts given on the land price have been taken into account in the land exploitation plan; the exploitation will be positive at the end, despite the given discounts.</p> <p>Leasehold is paid in once, so that the cash flow remains the same.</p> <p>For the users it is important that the set conditions are financially feasible.</p>
7. Risks	<ul style="list-style-type: none"> ○ Phasing of the companies resulted in a lack of energy exchange. This has to be taken into account in new projects. ○ The type of businesses allowed is changed during the time from only production towards both production and logistics. ○ The time frame is not achieved, because of the economic situation and some individual cases.
8. Effectiveness	<p>About 70/80% of the ambitions is achieved. Not achieved: closed loops for energy. Cause: phasing of the housing of the companies.</p> <p>The park management is led by several entrepreneurs and the plans and activities are growing.</p> <p>Every company finally participated in the point system for discount on the land price. Most used aspect: energy and water.</p>
9. Attitude future	<p>The municipality will use the same land allocation policy by new industrial area 'Zuid-Apeldoorn'. The land policy will be complemented with some regional appointments about planning, however the financial consequences are not shared.</p>

7.2. Case study: Haven VII, Waalwijk

	Haven VII
Location	Next to the A59, western of the industrial area 'Haven' in Waalwijk
Status	29 Companies are housed. About 6 companies are willing to house.
Type of business	High quality focus, mainly logistics, some production.
Environmental category	Between scale 2 and 6.
Plot sizes	Minimum size is 2500 m ² or a multiple of it
Plot price	<u>Leasehold</u> 4,5% of price level of 2008 <u>Sale</u> Resp. €140,-/m ² ; €178,-/m ² ; €216,- /m ²

General	
Type of ownership	Both sale of land and leasehold of land are possible: choice is for the user. Often the leasehold is transferred into sale during the years. When a canon review takes place, many entrepreneurs like to buy the land. An annual canon is paid. The leasehold price is percentage of the sale price. Only small number of the plots is currently in leasehold.
Conditions	The housing policy is more detailed than in other projects of the municipality. Avoided is the settlement of 'ugly' businesses on view locations. Segmentation also occurs on the environmental category. At the beginning of the land allocation also an environmental scan was required, but this condition resulted in resistance of the users. Other conditions set are borders as parking on own land (zoning plan) and membership of the park management with an annual fee dependable on the size of the plot. Besides, some layout requirements are included.
Pricing policy	No special pricing policy is set. Differentiation is applied towards the location of the plots, like a view location or a normal location.

Management factor	
1. Ambition	The municipality has the responsibility to ensure sufficient employment. This is the main reason for developing the area. Ambitions specific for the area are: sustainability implemented as a wide definition, the sustainable ambitions mainly focus on the use of the public and private areas and the environmental consequences. Gaining responsibility of the users for the whole area and not only

	<p>their own plot is a goal.</p> <p>No specific energy goals are set.</p>
2. Organisation	<p>Municipality has an active land policy for both living and industrial areas. This land acquiring brings some risks.</p> <p>Involved departments: Planners, architectural specialists, juridical department, public space in both design and maintenance phase.</p> <p>The members of the park management are employees of the municipality and one representative of the entrepreneurs.</p> <p>The active land policy has been a conscious choice of the municipality and offers the chance to require membership of park management. The plans are inserted in the master plan and the zoning in the zoning plan. Besides this, a quality plan is made. The environmental category is secured by a permit.</p> <p>Updates about park management are communicated per mail towards the users.</p>
3. Planning	<p>Regional collaboration is already implemented in this part of Brabant. Originally Waalwijk has a regional function for employment.</p> <p>The SER ladder is taken into account, but considered as difficult to realize. It is dependable on the willingness of the companies themselves whether or not they prefer to extend on their own land or want to move. The theory of the SER ladder is reasonable, but in practice it is more complex.</p>
4. Motivation	
Type of ownership	Leasehold is applied as economic instrument, the municipality doesn't have the intention to own the land. In the beginning only sale was offered, but as a result of the economic situation leasehold is inserted because of its financial advantages.
Conditions	The reason for applying the special conditions is the preservation of certain quality on the long-term. Park management is applied because of the desired sustainable use of public spaces.
Pricing policy	N.A.
5. Support	
Users	<p>Only some entrepreneurs prefer leasehold, mainly because of the financial situation. Users traditionally prefer sale above leasehold. An advantage of leasehold for the user is the financial feasibility.</p> <p>The housing incentive for the user was the location.</p> <p>Some doubts are made by the Waalwijkse federation of entrepreneurs about the set conditions. However, positive is the attitude of the entrepreneurs towards park management. The participation of them is good.</p>
Land owner	<p>The municipality prefers sale above leasehold, because of the risks and long-term involvement in case of leasehold.</p> <p>The housing conditions fluctuate according to the economic situation. In bad times the conditions are less stringent (e.g. the quality requirements are more flexible). For Haven VII the conditions changes therefore during the years.</p>

6. Feasibility	
Juridical	The conditions are included in the sale of the plots. For every plot the same conditions are set. A chain clause preserves the participation in park management by sale.
Financial	The projects are financed by a bank. When applying leasehold it is for the municipality not relevant if the loan is paid in once or the interest is covered by the canon. From the users' view leasing the plot may be more feasible than purchasing through the uniform distribution of the investment.
7. Risks	<ul style="list-style-type: none"> ○ A risk is setting certain conditions towards the land allocation, some conditions appeared to be unrealistic in the current economic time. ○ A risk of leasehold is, for the land owner, eventual bankruptcy of the entrepreneur. ○ The time frame of the project is not achieved, mainly through the economic situation.
8. Effectiveness	There is now the possibility to offer additional services like collective transport. Several conditions set are not realized (environmental scan). The entrepreneurs are becoming more aware of sustainability on the long-term and are committed to preserving the quality of the entire area. The user praises the good maintenance and layout of the area.
9. Attitude future	The starting points of sustainability could be reused. However, the interviewed user argues that a lot of emprises are specially constructed for the work processes and hard to reuse. Therefore stated is that fragmented ownership is hard to avoid and redevelopment difficult to implement. The user also states that their future housing will occur in the similar way; currently a new plot has been leased.

7.3. Case study: Haven van Moerdijk, Moerdijk

	Haven van Moerdijk
Location	Near the river 'Hollands Diep', next to the A59/A17.
Status	400 Business are housed in the area
Type of business	Production and logistics
Environmental category	Fluctuates per zone
Plot sizes	Fluctuates per zone
Plot price	± 6% of the actual market price (€150,- /m2)

General	
Type of ownership	A switch is made from sale towards leasehold. About 120 ha of the 1200 is currently intended for leasehold. Annual payment of the canon.
Conditions	<p>The housing policy exists of a zoning plan, environmental test and a housing advice. In this housing advice the use of the port function and the railways is desired, as well as sustainability and exchange of energy/materials. Clustering related to possibilities for exchange and collective use may occur. Mainly license related conditions are set: park management is required. The possibility to exchange energy and waste materials is stimulated and facilitated by the Havenschap.</p> <p>The Havenschap provides a 'checklist' for possible sustainable operations the companies could voluntary implement. This checklist, called 'Chances for sustainability' focuses on:</p> <ul style="list-style-type: none"> ○ Sustainable connections: exchange of energy, water, waste ○ Sustainable business processes: renewable energy, innovation ○ Sustainable layout/access: multimodal transport, collective facilities ○ Social sustainability: increasing employment, communication surrounding areas <p>More required conditions about the allocation of land are desired by the Havenschap, because this is hard to implement in later phases.</p>
Pricing policy	N.A.

Management factor	
1. Ambition	The ambition of the Havenschap is organizing sustainable development in the area. A collaboration pact is set up with different involved parties for collaboration within the area and by applying sustainability, especially focusing on synergy between the companies.
2. Organisation	<p>The municipality organizes the extension of the industrial areas, like Logistiek Park Moerdijk, but the Havenschap manages the vacant plots in the Haven van Moerdijk. The Havenschap is for 50% of the Province and for 50% of the municipality. Infill of the industrial area occurs by buying plots of companies and allocating the plots in leasehold. An example of this is the chemical area.</p> <p>The master plan includes the possibilities for heavy industry. Since 1989 a clustering has been used for the types of businesses (chemical, energy, logistics and recycling). This clustering is inserted in the zoning plan.</p> <p>The communication about the housing policy is considered by the user as good, the Havenschap does a lot for the potential users.</p>
3. Planning	The Province stimulates regional collaboration, but the municipality has reached its maximum income from the OZB so that developing

	more industrial areas is not attractive. The Province has used the SER ladder to determine the desired surface of new areas.
4. Motivation	
Type of ownership	<ul style="list-style-type: none"> ○ Continuation financial flows
Conditions	<ul style="list-style-type: none"> ○ More influence on the plots, desired is the use of the harbour function for plots located at the waterfront. ○ Spreading risks of revenues
Pricing policy	N.A.
5. Support	
Users	<p>Some companies didn't choose for this area because of the leasehold, but there is still enough support to complete the area. The housing advice given by the Havenschap is supported by the interviewed user.</p> <p>The user considers that the type of ownership is normally not decisive, but in general sale is preferred above leasehold.</p> <p>Advantage for the user:</p> <ul style="list-style-type: none"> ○ Annual canon instead of one big investment, so that the solvability remains sufficient. <p>Disadvantage for the user:</p> <ul style="list-style-type: none"> ○ An increase of the land value is not forwarded to the user <p>Housing incentives for the user:</p> <ul style="list-style-type: none"> ○ Less plots available with the desired size. ○ Location near water and client.
Land owner	<p>The municipality has a double role, they know the advantages for the quality but also want to gain revenues quickly.</p> <p>The incentive to switch to leasehold was the economic situation, in which the income of the harbour declined and no other continuous revenues were gained. Nowadays both the annual canon and the harbour revenues provide a continuous flow of income.</p>
6. Feasibility	
Juridical	The needed permissions fit in the juridical framework. Certain collective facilities could be required by a leasehold construction, provided that the prices are equal to the market prices.
Financial	Financial feasibility is very important by implementing certain measures for the area. The interest in the area is high enough to apply a specific housing policy.
7. Risks	
	<ul style="list-style-type: none"> ○ The support of leasehold could be a risk, but in this case this wasn't an issue. ○ For the development of new areas there is a financial risk that investments which normally take place in the beginning of a development couldn't be done. This industrial area already existed years before leasehold was implemented so that the start investments were already done. ○ A third risk is conflicting functions in the area. Problems could arise by implementing windmills or insufficient infrastructure.

	<ul style="list-style-type: none"> ○ Bankruptcy could be a difficult situation in case of leasehold. ○ It has to be taken into account that obsolescence rises through shortage of space and the layout of an area. This has to be kept in mind during the development.
8. Effectiveness	<p>Synergy between businesses is realised: coordinating systems on energy level.</p> <p>Revenues stay nowadays related to the project. Land allocation is considered as useful instrument for implementation park management.</p> <p>The user has the opinion that the land allocation policy is quite effective through the knowledge of the Havenschap.</p>
9. Attitude future	<p>A chance for the municipality is more focus on regional collaboration, clustering of companies and more attention for the exploitation phase. The municipality is looking at the implementation of the land allocation policy concept on a new industrial area (Logistiek Park Moerdijk).</p> <p>The user mentions leasehold as a good construction for the size of the plot and the specific financing, but generally it prefers the sale of land. This will be done in the future if possible.</p>

7.4. Case study: A4 Zone West, Haarlemmermeer

	A4 Zone West
Location	Next to the A4, near Haarlemmermeer and Schiphol
Status	Plan development phase, start land allocation expected in 2013.
Type of businesses	Logistics and related business like research and marketing
Environmental category	-
Plot sizes	-
Plot price	Probably ± €330,- /m2

General	
Type of ownership	Probably leasehold and/or an area fund as management organization will be implemented. Investors or other private parties could participate in the area fund by acquiring shares in the area. Leasehold is already implemented by one other industrial area of SADC.
Conditions	<p>Membership of park management will be required.</p> <p>An excellent BREEAM certification is pursued.</p> <p>Tough housing policy is planned, the details have not been exactly determined yet. According to the ACT philosophy the next conditions are set related to the land allocation: use of roofs for renewable</p>

	energy, compact and clustered businesses and facilities, strategic reservations for future extension (GEM A4 Zone West, 2011).
Pricing policy	N.A.

Management factor	
1. Ambition	Realizing Pilot 'commercializing' set by the government and increasing the competitive situation of the Schiphol area. High ambitions are set for sustainability by the municipality of Haarlemmermeer.
2. Organisation	SADC is the development company, and exists of the municipalities of Amsterdam and Haarlemmermeer, Schiphol Group and Province. SADC is created to avoid undesired developments within the Schiphol area. Municipality is involved in two ways: with SADC as developer and as municipality. Therefore they have two goals: a higher efficiency rate but also a sustainability goal. Land policy is seen as useful tool to achieve sustainability on the long-term. Earlier experience with different types of ownership is generated with industrial area Osdorp. For A4 Zone West a special master plan is made and the zoning plan is adapted. A guide about sustainability is created for the sustainable ambitions of three industrial areas of SADC.
3. Planning	SADC has a regional development function and therefore this industrial area is accommodated to the other current developments. The SER ladder is not used, because of a lot of demand for the location of A4 Zone West.
4. Motivation	
Type of ownership	<ul style="list-style-type: none"> ○ Leasehold is seen as possibility to ensure quality on the long-term, but it is not the only way to achieve it. ○ A differentiation of types of ownership is desired for the area. ○ With leasehold more conditions could be set towards sustainability and the investments for it. ○ Leasehold is implemented in another industrial area through the existing policy of municipality of Amsterdam ○ Park management is seen as tool to achieve a sustainable and high quality area. ○ The area fund is considered to avoid vacancy in the area and increase the involvement of the users in the industrial area.
Conditions	
Pricing policy	N.A.
Area fund	<ul style="list-style-type: none"> ○ Avoiding vacancy and obsolescence ○ Application of sustainability
5. Support	
Users	Specific for A4 Zone West this is not known because of the status. In general international companies for countries like the VS and Asian countries are less willing to leasehold meanwhile companies from the region know the principles and accept them. Crucial is therefore

	<p>to clearly mention the incentives for leasehold and other types of ownership.</p> <p>Support for sustainability is high, currently it is already more a standard condition than a unique selling point. International businesses often require certain sustainable scores or a BREEAM certification.</p> <p>The unique location will be very important for the support.</p>
Land owner	The municipality Haarlemmermeer is positive about land policy, but SADC has the opinion that the municipal apparatus has to have sufficient capabilities to insert certain tools.
6. Feasibility	
Juridical	Eventual sequence of park management will be guaranteed by a chain clause. No other juridical aspects are available yet.
Financial	<p>The municipality has to be able to set up a leasehold company, this is always more expensive than selling the land.</p> <p>For special pricing policy the GREX should be able to handle the discounts. For A4 Zone West high expenditures are done to set up the current plans. Therefore the GREX has fewer possibilities.</p>
7. Risks	<ul style="list-style-type: none"> ○ The set conditions are often dependable on the economic situation. ○ Some international parties have deals for waste and recycling, and will therefore not join the commonly organized facilities. ○ Leasehold doesn't secure a well-functioning park management. ○ The high ambitions for sustainability in the area could be a risk.
8. Effectiveness	-
9. Attitude future	SADC is looking for new land allocation instruments. They state that municipalities are willing to apply different types of ownership in the future. A trend is visible about reinvesting revenues gained from the area, especially in case of a retail project.

8. Analysing results

With the selected cases, a comparison for this research is made between two developments that are realized on a new location (Ecofactorij, Haven VII), a development that is realized in an existing area (Haven van Moerdijk) and a development that isn't realized yet (A4 Zone West).

In this chapter the nine management factors (ambition, organisation, planning, motivation, support, feasibility, risks, effectiveness and attitude future) will be compared with each other and further analysed. Complementary general information of each case will be discussed. The factors will be described qualitative or valued on a five step scale (--, -, +/-, +, ++). Detailed information per case is included in chapter 7.

8.1. General information

Project	Type of users
Ecofactorij	Production and logistics
Haven VII	Mainly logistics, some production
Haven van Moerdijk	Production and logistics
A4 Zone West	Logistics

The four cases have different target groups, but the main group on every area is the logistics. Especially A4 Zone West will be a logistic oriented industrial area, while the other industrial areas have a more mixed character.

Project	Type of ownership
Ecofactorij	Leasehold
Haven VII	Sale and leasehold
Haven van Moerdijk	Leasehold
A4 Zone West	Probably leasehold, followed by an area fund

The cases are chosen partly on their special types of ownership. Therefore they all offer leasehold constructions. Worth mentioning is the change of type of ownership within the Haven van Moerdijk. Since about six years plots have only been available by leasehold, instead of sale.

The leasehold possibility on Haven VII only covers a small part of all exploited plots, most entrepreneurs have chosen for purchasing the land.

Project	Housing conditions
Ecofactorij	“Quality plan”: required and voluntary conditions
Haven VII	Required conditions: park management, layout aspects
Haven van Moerdijk	Checklist “Chances for sustainability”: voluntary requirements. Required conditions: park management, environmental test, housing advice by Havenschap
A4 Zone West	Required conditions: park management, BREEAM certification, requirements set by ACT “Guidance sustainability” as guide for the industrial area

The municipality of Apeldoorn has a complete package of conditions for future users of the Ecofactorij and clear voluntary possibilities. The municipality rewards the users for applying voluntary applications. This is the only of the four industrial areas that implements this system. Havenschap van Moerdijk offers users the possibility for implementing sustainable measures, without requiring it. Nevertheless, a housing advice is given in which the sustainable and social effect of the housing of a company is taken into account. Within the case of Haven VII, the set conditions aren't as detailed as by the other cases. The focus is mainly on park management and the layout of the buildings.

8.2. Management factors

1. Ambition for the area

Project	Ambition
Ecofactorij	Sustainable industrial area: ecological and economic aspects
Haven VII	Sustainability in wide context, specific focus on involvement entrepreneurs in the area.
Haven van Moerdijk	Organizing and facilitating sustainable development in the area.
A4 Zone West	Sustainable development on ecological, economic and social scale, within the pilot ‘commercializing’ of the national government.

The ambitions set for the industrial areas differ from a global sustainable definition towards a specific focus on the three elements ‘people, planet, prosperity’. In this research emphasis is on preserving industrial areas on the long-term and avoiding quick obsolescence. All cases have a good score in this, because they approach sustainability by keeping in mind the life span of an area. In relation to the ambition of the land owner it is important to determine how this ambition is preserved during the years. This point will also be discussed by management factor ‘risks’.

2. Organisation of the project

Project	Organisation
Ecofactorij	Active land policy, high potential is seen in the land policy tools as stated in this research.
Haven VII	Active land policy.
Haven van Moerdijk	Havenschap manages vacant plots, the land policy tools were a conscious choice.
A4 Zone West	Municipality involved in two ways: as developer and as land owner. Land allocation tools are seen as useful tool within the research context.

The organisation for the development of the industrial areas shows some similarities and differences. Three of the four land owners have a clear opinion about the function of land allocation tools in realizing their ambitions. Municipality of Waalwijk has a less strong focus on this, but still thinks that an active land policy is necessary to achieve their goals about requiring park management. Both Ecofactorij and Haven VII are therefore organized in the traditional way (see § 4.1.3. for further explanation). In case of the Haven van Moerdijk, the municipality is only involved in the allocation of the land via the central management organisation ‘Havenschap’, a partnership between the municipality and the Province. Another construction is noted by the development of A4 Zone West. Two municipalities, the Province and Schiphol Group are joined in the Schiphol Area Development Company (SADC), which manages and develops the industrial areas surrounding Schiphol. The four parties all inserted land so that this could be developed by the company. For a part of the planned industrial areas SADC created an overall vision regarding sustainability and future approaches. This type of organisation is innovative for the Dutch market of industrial areas.

3. Planning of the industrial area

Project	
Ecofactorij	No specific use of SER ladder or regional collaboration
Haven VII	No specific use of SER ladder, regional collaboration only within the context of the regional employment function of Waalwijk
Haven van Moerdijk	SER ladder and regional collaboration is implemented by the Province.
A4 Zone West	No specific use of SER ladder, regional collaboration by SADC

The planning instruments which are available to ensure focus on life span within the development of industrial areas (see §4.1.) are the SER ladder and regional collaboration. The zoning plan is left out in this case, because of its required, and therefore standard, use in the development process. The SER ladder didn't play an important role in the development of the industrial areas, partly because of the lack of knowledge about the SER ladder in the past. However, also by the new development A4 Zone West the SER ladder is not taken into

account. SADC mentions that the importance of new areas in their region exceeds the necessity of the SER ladder. The municipality of Waalwijk and SADC mention both the difficulties of the practical implementation. The user has to be supportive towards the use of the SER ladder.

Regional collaboration occurs clearly by A4 Zone West through the vision of SADC. Municipality of Waalwijk focuses mainly on their responsibility for regional employment. Regional demand was also the reason for Apeldoorn to develop the Ecofactorij. In both cases no explicit collaboration between surrounding municipalities.

4. Motivation land tools: type of ownership

Project	Motivation land owner
Ecofactorij	Juridical incentive
Haven VII	Economic incentive
Haven van Moerdijk	Financial incentive
A4 Zone West	Environmental incentive

The motivation of the municipality for the set housing conditions is directly related towards the ambitions of the land owner. However, in the case of the chosen type of ownership this relation is less clear and needs more attention.

The incentives for choosing a particular type of ownership (in these cases leasehold) from the land owner's view seem to be quite diverse. By Ecofactorij leasehold is implemented because of its juridical advantages for preserving sustainability on long-term, by Haven VII this is done because of the economic less attractive times and the financial advantage (lower investment costs) for the companies, Havenschap van Moerdijk mainly implemented it for the financial advantages for the organisation and SADC is investigating leasehold because of the expected advantages for sustainable development. Despite of these different incentives, the underlying thought of three of the four cases seems to be preserving the area on long-term.

5. Support type of ownership

Project	Land owner	Users
Ecofactorij	+	+
Haven VII	+/-	-
Haven van Moerdijk	+	+
A4 Zone West	+	+/-

The motivation for leasehold differs, as stated above, per municipality. This is also definable for the support of the land owner. Municipality of Waalwijk has a clear opinion about applying leasehold; they do not prefer leasehold above sale. The other land owners have a

more positive view on the instrument. The support for implementing leasehold in Moerdijk increased when the economic situation deteriorated. SADC states for A4 Zone West that the support of the municipality is high, but realization is difficult because of the organisation and administration it requires.

In case of Haven VII the users have to choice between buying and leasing the land. The support under the entrepreneurs for buying is higher than for leasing, but as a result of the current economic situation some companies were willing to use leasehold. SADC expects that the support of international companies is less than the support of regional companies, mainly because they are not familiar with the concept.

When the support of the users is compared with the support of the land owners, it is noticeable that in general the land owners are more supportive towards the type of ownership than the users. Nevertheless, the type of ownership is not the main housing incentive for the user, so that their support is less relevant for the feasibility of implementing this type of ownership.

5a. Support housing conditions

Project	Land owner	Users
Ecofactorij	+/-	+/-
Haven VII	+/-	+/-
Haven van Moerdijk	+	+
A4 Zone West	N.A.	N.A.

Both municipality of Apeldoorn and potential users did have some doubts about the proposed conditions set for the future users. However, during the development process the support of the municipality increased. Municipality of Waalwijk mentions that the set conditions for Haven VII are partly dependable on the economic times, and therefore less strict than in the case of the Ecofactorij. For A4 Zone West the exact conditions are not known yet, but expected is that municipality Haarlemmermeer supports the conditions because of its strong focus on sustainability.

6. Feasibility land tools

Project	Juridical	Financial
Ecofactorij	+	+
Haven VII	+/-	+
Haven van Moerdijk	+	+
A4 Zone West	+/-	+/-

On the field of juridical feasibility the feasibility of the proposed housing conditions is most interesting to explore. By the Ecofactorij this is guaranteed by implementing them in the 'Quality plan'. Park management is guaranteed on the long-term by the leasehold construction. Municipality of Waalwijk has established the conditions for Haven VII in the sales contract of a plot, a chain clause is set to secure the park management by land sale on long-term. Havenschap Moerdijk only set conditions that fit in the general juridical framework: the zoning plan and required (environmental) permissions.

The kind of conditions implemented is quite broad. However, the case of Ecofactorij showed that only physical conditions could be set, which means that conditions about for example employment are more difficult to require.

Financially the land tools have sufficient feasibility within the four cases. It is argued by the municipality of Apeldoorn that the applied discount on land price does not influence the positive financial result. The Havenschap states that the financial feasibility by applying leasehold for new developments may be less high; new developments always require some investments at the beginning of the project. For the Haven van Moerdijk this was not the case, the Haven van Moerdijk already existed before leasehold was implemented. SADC argues that the municipality should be capable to realize a leasehold company that does all administration; not all (types of) municipalities are able to do this.

7. Risks land tools

Project	
Ecofactorij	Phasing; Economy
Haven VII	Unrealistic conditions; Time frame; Economy
Haven van Moerdijk	Support; Financing new development
A4 Zone West	Economy; Attitude international companies; High ambitions

The most mentioned risk is the economy. This has great influence on the realization of a sustainable industrial area in general as well as the application of the land allocation tools. The economy has influenced the time frame of several cases and the support of the entrepreneurs for the specific land allocation tools. A relation is visible between the economic times and setting and managing housing conditions by the municipality. The municipality Waalwijk and SADC mention this correlation. Specific for the Ecofactorij the phasing for the settlement of companies is mentioned as risk. Therefore realization of collective facilities stagnated and that part of the land allocation plan couldn't be realized.

8. Effectiveness land tools

Project	
Ecofactorij	+
Haven VII	+/-
Haven van Moerdijk	++
A4 Zone West	N.A.

The effectiveness of the land tools is considered as quite good in the four cases. A growing interest of the entrepreneurs in sustainability and area preservation after they housed on the industrial area is perceived in the cases of Ecofactorij and Haven VII. Not all set conditions are realized on the industrial areas Ecofactorij and Haven VII, however in case of Ecofactorij every company participated in the voluntary point system. The financial reward made this system attractive for every business. The goals set for the Haven van Moerdijk, namely increasing the synergy between businesses and a continuous cash flow, are achieved. Nowadays revenues do stay in the organisation for the area.

9. Attitude towards future

Project	Land owner	User
Ecofactorij	++	?
Haven VII	+	+/-
Haven van Moerdijk	++	+/-
A4 Zone West	+	N.A.

Finally, the attitude towards the future of the land owner and the user is based on the willingness to make the same choices about land allocation in a new project. The land owners are all positive about this; both municipalities of Apeldoorn and Moerdijk have a new industrial area on schedule in which they use similar land allocation (leasehold and strict conditions). SADC states that they aim to provide different types of industrial areas in their region.

The users are willing to house with leasehold construction in economic less attractive times. But as stated before, the type of ownership is not considered as decisive in the decision-making process.

8.3. Conclusions

Implemented land allocation policy

The cases show different implementations of land allocation policy. When looking at the three main instruments of this research, namely type of ownership, conditions and pricing policy, the cases all implemented one of these aspects or will be implementing one of these instruments. Not every case implemented the instruments on the same way, a difference is notable in the extent of the implementation of each instrument and the used combination of instruments. The Ecofactorij implemented every instrument, while the Haven van Moerdijk implemented leasehold and set conditions towards the housing of new businesses. Haven VII primarily focused on setting conditions; they implemented leasehold mainly because of the stagnating land allocation. A4 Zone West, which is still in the plan development phase, may be implementing leasehold and a new type of management organization. This organisation will be created in the form of an area fund, in which the investors could participate. It is also indicated that a stringent housing policy could be expected.

Differences land owner and user

Regard to the support for the performed land allocation policy, the land owners and users show a different attitude. Overall the support of the land owners for implementing leasehold and setting conditions towards the land allocation is higher than the support of the users. Their attitude towards the future is more positive than the users have, especially for leasehold. However, the municipalities often have a twofold view on the performed land allocation policy. On the one hand they have ambitions about sustainable development; on the other hand the financial feasibility is very important.

The users mainly see financial advantages of the leasehold. In some cases the economic situation has resulted in more support of the users for leasehold, while they normally would prefer sale of the land above leasehold. A growing involvement of the users in their surrounding area and in sustainable thinking is noticed by the municipalities after they've housed on the sustainable industrial area.

Lessons learned

Type of ownership:

- The relation between ambition and the implemented type of ownership seems to be weak, but indirectly this relation is visible. The underlying thought of the municipalities is often preservation of the area on the long-term.
- A relation could be noticed between the economic situation and the preferred type of ownership, especially from the view of the users. The ambitions from the land owners could fluctuate according to the economic situation.
- For the users the location is more important for housing than the type of ownership. In all three developed cases this is mentioned as decisive housing incentive.

- Feasibility of leasehold could be insufficient on financial field because a new development requires some bigger start investments. On the other hand, the municipality defines that the investments will be financed externally, so that this is not a mayor problem. By implementing a leasehold construction with payment in once at the start, the start investments are assured.

Another point of discussion is the feasibility of implementing leasehold in smaller municipalities. The municipal device should be able to handle the extra administration and necessary governance. Expected is that this is not the case in every municipality.

Conditions:

- Not all set conditions appeared to be realistic and feasible. The set conditions have to be physically underpinned for a high juridical feasibility. For gaining sufficient support by the entrepreneurs the housing conditions should preferably be financial feasible. In case of a good location of the industrial area, the entrepreneurs are more tolerant towards the conditions. This seems to be similar to the support of the type of ownership.
- The economy is considered as main risk for the proposed housing conditions. It could influence the support for the housing conditions.

General:

- The feasibility of the development of a sustainable industrial area in general is in different cases (Ecofactorij, Haven VII) dependable on the economic situation.

Part III. Results and findings

9. Reflection theory

In the theoretical framework of this research the main problems on industrial areas are described. These include the obsolescence of many industrial areas, the cluttering of the built environment and stagnating redevelopment.

The causes are joined in two aspects, namely the planning and organisation, and architecture and urban design. Table 9.1 shows these problems and causes. Important is to compare these problems and causes with the proposed ideas about land allocation within the development process. This will be done in this paragraph. Additional to this reflection, the trend of sustainability will be evaluated

	Theory
Problems	Obsolescence
	Cluttering built environment
	Redevelopment stagnates
Causes	Planning and organisation
	○ Traditional approach municipalities
	○ Lack of spatial planning on regional scale
	○ Ownership structure
	○ Lack of integral approach development
	Architecture and urban design
	○ Lack of functional blending
	○ Fragmentation
	○ Quality public areas
Trends	Sustainability

Table 9.1: Problems, causes and trends

9.1. Problems and causes

Planning

On planning scale the proposed land allocation policy has a positive influence on especially the ownership structure and the lack of integral approach of the development. Implementing other types of ownership than sale, like leasehold, means that the land owner will be involved in the project on long-term. Therefore the land owner will have to investigate and reconsider his ambitions for the development on long-term and his attitude towards future management. In this way the development is also more integrally approached. The conditions that could be set towards the future users will be dependable on the ambitions, in the research it is shown that conditions related to spatial layout, energy use and park management could be implemented. Besides, clustering of businesses towards their needs and attitude is an option for the land owner to avoid mismatching.

The traditional approach of the municipalities is still present with the proposed land allocation policy, however the ownership relations will change. Besides this, the described land allocation tools could also be interesting for private developers to implement. This is seen in the UK business parks where private developers with a strong focus on long-term quality and maintenance are active.

The cause of stagnating redevelopment is, among others, the ownership structure of many industrial areas. The plots are mainly sold towards each entrepreneur individually. This cause is partly tackled by the implementation of leasehold, because the land owner preserves its involvement on the area and is able to include some conditions about future redevelopment in the contract.

Architecture and urban design

Regarding the architecture and urban design of industrial areas, the investigated land allocation policy has influence on the fragmentation and quality of the public areas. This is the result of the ability of the land owner to create a framework for future users. The case study also showed that implementing park management is quite effective for the quality of both public and private areas.

In chapter 8 is mentioned that the entrepreneurs of two realized cases (Ecofactorij en Haven VII) are more involved in their area and became interested in sustainability after housing in the area. Specifically for leasehold it is desired by the users that revenues are reinvested in the area to keep the area up to date. The financial feasibility of the municipalities does however not always allow this recommendation. The lack of functional blending is not directly improved by the investigated land allocation tools, but the tools provide possibilities to apply a particular clustering for an area.

9.2. Trends and developments

Sustainability

The trend which is leading in this research is sustainability. Sustainability is defined in a way which emphasizes preserving an industrial area on long-term and avoiding obsolescence. Less emphasis is on the energy and material flows of an area. This definition of sustainability is used for the theory as well as the case study. Industrial areas are chosen that define itself as sustainable. Especially the land owner has in these cases strong ambitions on sustainable level. The involved entrepreneurs of the cases seem to be less active on this field, because the effect on financial and functional feasibility is not always clear.

The proposed land allocation policy, namely implementing other types of ownership, setting conditions and implementing pricing policy, is tested with the BREEAM-Gebiedsontwikkeling certification (see §5.2). There are not a lot of direct relations with this certification, however indirectly the land allocation policy has influence on several aspects of BREEAM.

10. Conclusions

After investigating the development of a sustainable industrial area, the key question of this report could be answered. Besides this, the chapter includes some conclusions about sustainable development in general. Finally, recommendations towards the land owner are given about the application of the land allocation tools in the development process.

10.1. Conclusions research context

In chapter 1 the key question of this research is formulated: ‘What is the importance of land allocation policy in the development process of a sustainable industrial area?’

Definition

For answering this key question, sustainable development is defined as ‘preserving an area on long-term and avoiding obsolescence of the area during the years’. As a result, the research is focusing on economic, social and environmental issues.

Importance

Looking at the results of the research, the statement could be made that land allocation policy could be a useful tool for achieving a sustainable industrial area in the future. Chapter 9 reflects the functionality of land allocation and the case study shows the already implemented tools and their effectiveness. However, it has to be mentioned that this functionality is closely related to the ambitions that are set by the land owner for the industrial area and its sustainability. The concept of sustainability covers a wide range of implementations, which require different planning approaches.

In this research the focus is on the life span of an industrial area and therefore providing a flexible environment wherein changes could occur. This reflects an area broad approach of the concept. In this context, land allocation is discussed on three aspects:

- type of ownership: especially leasehold is proposed in the theory as interesting type of ownership
- (housing) conditions
- pricing policy

Applying a different type of ownership and setting conditions towards the housing of businesses is mainly useful for the aspects ‘people’ and ‘prosperity’: keeping the work environment on a certain level and value, being able to redevelop and avoiding undesired switches of companies during the years. Land allocation policy is not the only useful tool for achieving these goals; while land allocation is focusing on a specific project, on global planning scale regional planning and applying the SER ladder could avoid overcrowd and value decrease of industrial areas.

Of the three mentioned land allocation tools especially pricing policy, e.g. giving a discount on the land price when certain measurements are taken, stimulates the users to create their own sustainable building. Therefore this tool focuses most on the 'planet' aspect.

Support

For a successful implementation of the land allocation tools by developing a sustainable industrial area the support of the main stakeholders should be sufficient. The research shows the incentives of the land owner to choose for the proposed land allocation policy. The ambitions of the land owner are relevant for the chosen land allocation policy. However, the financial feasibility stays in most cases the decisive factor for the land owner because of the importance of the (short-term) financial result. The economic situation is also a highly influencing factor. This is nowadays seen by the interviewed persons as a risk for especially the set conditions for the land allocation. The support for these conditions fluctuates according to the economic situation.

For the user the sustainable character of the area and the implemented type of ownership seem to be secondary to the location of the industrial area (see §8.2: 'support type of ownership'). Regarding the support for specifically leasehold, the negative image of it and the unfamiliarity with this type of ownership was supposed to be leading in theory. In practice, entrepreneurs do prefer sale above leasehold.

Concerning the housing conditions, on the one hand the implemented stringent housing conditions influence in some cases the housing choice of the users. On the other hand, it is noticed that on the investigated industrial areas participation in park management (a required condition) has a positive effect on the involvement of the entrepreneurs in the area and their support towards sustainable implementations (see §8.2: 'effectiveness land tools') during the years.

There is not a lot of literature available about the support for the pricing policy. In practice, this tool is used by one of the four cases. It is therefore difficult to link conclusions to this tool. It is relevant to mention that in the applied case every entrepreneur participated in it. Keeping in mind the statements made about the financial incentive by the users, the assumption could be made that from the users view pricing policy could be an attractive option. The land owner, on the other hand, should be able to compose the land exploitation in such a way that financial feasibility is secured.

Pros and cons

Pros and cons are mainly interesting to discuss for implementing a different type of ownership. The land owner will choose leasehold primarily because of the preservation of influence in the area and financial aspects like a continuous cash flow and possibility for value capturing. For land owners it could be interesting to reinvest the revenues in the area, because of the potential value increase of the owned land and their possibility to cash this

value increase by leasehold. The entrepreneur sees the financial feasibility of the investment as biggest advantage of choosing leasehold.

Some disadvantages for the land owner are the increase of risk-carrying and the lack of cash flow at the beginning of the project. Mainly this last con is emphasized in the case study. The main con for the user is the fact that the user will never be the owner of the land. This could result in uncertainty about the future; the entrepreneur depends on the owner and value increase of the land is not automatically for the entrepreneur.

Proposed (housing) conditions

The following conditions for developing a sustainable industrial area are proposed to implement based on the theory and practical test:

- Requirements clustering of businesses: e.g. clustering same quality requirements, exchange of energy
- Requirements park management and maintenance
- Requirements preserving situation: tackling vacancy, ensuring specific function of land
- Requirements layout : zoning plan related conditions, e.g. parking, land use

There are also some conditions that are suggested to implement, but they appeared to be juridical difficult to require:

- Sustainability score buildings: sustainable design, energy consumption, material use
- Non-physical aspects: increase of regional employment

For implementing the housing conditions, a leasehold contract is preferred above sale, especially for requirements to do. The case study shows that leasehold is often mentioned as a possibility to require participation in park management on long-term, even when new businesses settle on a certain plot.

10.2. General conclusions sustainable development

Some conclusions could be made about the development of sustainable industrial areas in general.

Traditional land allocation

The case study shows that traditional land allocation is mainly used by municipalities. The municipalities implemented an active land policy for developing the industrial areas. However, also a new form of allocation is shown, in which several public and private parties share their owned land to optimize the development of an industrial area. It is expected and desired that in the future these kinds of new land allocation will occur more often.

Planning

The SER ladder is not implemented in the cases by the municipality. Especially the practical implementation of the SER ladder is a bottleneck; the ambitions of the user should connect with the starting points of the SER ladder. Regional collaboration is in the cases mainly implemented for meeting the regional demand about employment, collaboration between municipalities for the development of an area isn't evidently present in the cases, except the case of A4 Zone West.

Risks

Economy is seen as main risk for the development of a new industrial area. The demand for new areas is less when the economy turns down. The sustainability of an industrial area is also influenced by the economy. In less economic times the ambitions for sustainability may reduce.

Avoiding obsolescence

Park management is seen as a very important measure for avoiding obsolescence and achieving a sustainable industrial area on long-term. In all cases park management is implemented. Positive effects, as preservation of quality and involvement in the area, are noticed by both user and land owner.

10.3. Recommendations land allocation tools

As a result of the conclusions about land allocation policy within the sustainable development of an industrial area, recommendations for the land owner are made about the application of the proposed land allocation tools in the future. The next aspects have to be taken into account by the land owner when focusing on the land allocation tools:

- Ambitions

Questions to ask: Which ambitions are set by the land owner? Do the ambitions focus on short-term or long-term results? Are the ambitions related towards each other?

To do: Set ambitions on long-term for both the realization and the financial feasibility.

- Financial value

Questions to ask: Do the investments and costs meet the (social and financial) benefits? Does the land exploitation allow a financial stimulant for the user? Is a continuous cash flow preferred or a traditional cash flow?

To do: Investigate whether or not a less traditional cash flow is desired. Include a fee for maintenance of the area in the land allocation.

- Support

Questions to ask: Does the ambition level of the land owner meet the requirements of the entrepreneurs? On which sector will be focused? Is there sufficient support within the land owner's organisation, what is the main incentive for choosing a particular land allocation tool?

To do: Give a clear description of the proposed land allocation and its incentives to the (future) users. Focus on the financial advantages for the user.

- Feasibility

Questions to ask: Is the capacity of the land owner sufficient to implement the land allocation policy? How will the land allocation juridical be implemented? What are the unique selling points of the industrial area? Do these points meet the housing criteria of the potential user?

To do: Ensure that the ambitions meet the possibilities of the stakeholder, sufficient knowledge increases the feasibility.

- Risks

Questions to ask: Economy is seen as main risk for developing a sustainable industrial area, how is this risk taken into account in the development process?

To do: Link the economic situation to the financial aspects for the user. The economy may increase the support for leasehold, while it could diminish the support for certain housing criteria.

11. Discussion

By doing this research, boundaries are set to limit the research context. Nevertheless, there are some subjects that are interesting for future research:

- A growing demand for involvement of the private sector in the development of industrial areas is visible. The roadmap 'verzakelijking van de bedrijventerreinenmarkt' from the Ministry of VROM (2010) mentions this aspect. This research could be seen as a first step towards this new focus. The ideas of this research about sustainability, namely focusing on preserving the area and value of the real estate, and the implementation of specific land allocation tools could also be interesting for private developers. For the involvement of private parties in the development process of industrial areas, business parks in the UK could function as example.
- The SER ladder is a planning tool to avoid unstructured development. However, this research has shown that implementing the SER ladder is difficult and not yet generally applied by new developments. Further research towards the SER ladder should be done to improve this instrument. The relation between the SER ladder and sustainable development could also be investigated in more detail.
- The proposed land allocation tools may be interesting to implement by redevelopment. The pros and cons of this implementation have to be further analysed to come to conclusions.

For this research, also some comments could be made:

- In this research an overview of the number of existing sustainable industrial areas allocated in sale and leasehold, and sustainable industrial areas on schedule is missing. There were no data found that provide this information, while it is interesting to know how the number of sustainable industrial areas in leasehold relate to the number of sustainable industrial areas sold.
- For a more detailed underpinning of the ideas, it is advised to do more interviews with stakeholders. In this research for every case two stakeholders are interviewed about their opinions and knowledge about the land allocation and the sustainability of the industrial area. Especially the users were hard to approach, while they can provide important information.

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Appendices

Appendix 1 Planning task

Remaining planning task 2008-2020 in ha, source: BLM, IBIS

	Strong Europe	Transatlantic Market	Regional Communities	Global Economy
Groningen	80	350	-130	430
Friesland	130	460	-120	610
Drenthe	-160	60	-360	140
Overijssel	-310	210	-740	420
Flevoland	-20	210	-170	320
Gelderland	-370	240	-930	520
Utrecht	-190	10	-370	220
Noord-Holland	-460	-130	-790	220
Zuid-Holland	-530	-80	-1.010	350
Zeeland	-250	-90	-400	40
Noord-Brabant	260	1.380	-620	1.760
Limburg	-110	420	-570	550
Nederland	-1.930	3.040	-6.210	5.580

[†] Er is bepaald wat op 1 januari 2008 het terstond uitgifbare, ofwel bouwrijpe, areaal aan bedrijventerreinen was en wat de harde plannen voor bedrijventerreinen op dat moment waren. Harde plannen vormen dat deel van het niet terstond uitgifbare areaal dat tot een van de volgende fasen behoort van de procedure die kan leiden tot een bestemmingsplan: bindend plan, goedgekeurd plan of vastgesteld plan. Als een plan een ontwerpplan of ingetrokken plan is of als de fase geheel niet bekend is, is het een zogenaamd zacht plan. Harde plannen maken een grotere kans om tot een bindend bestemmingsplan te geraken dan zachte plannen, of ze zitten al in de eindfase tot bestemmingsplan. Het terstond uitgifbare areaal en de harde plannen van het niet terstond uitgifbare areaal in IBIS vormen samen het harde aanbod, dat naar verwachting de komende jaren tot bedrijventerrein zal worden ontwikkeld.

* Exclusief zeehaventerreinen.

Assessment of demand, source: CPB , IBIS

Provincie	Behoefteraming BLM per 1-1-2008			
	Strong Europe	Transatlantic Market	Regional Communities	Global Economy
Groningen	420	690	210	770
Friesland	520	850	270	1.000
Drenthe	300	520	10	600
Overijssel	450	960	20	1.180
Flevoland	480	710	330	820
Gelderland	630	1.240	70	1.520
Utrecht	70	270	-110	480
Noord-Holland	740	1.070	410	1.420
Zuid-Holland	330	780	-150	1.210
Zeeland	180	340	30	470
Noord-Brabant	980	2.100	100	2.480
Limburg	560	1.090	100	1.220
NEDERLAND	5.650	10.620	13.70	13.160

Appendix 2 BREAAAM Gebiedsontwikkeling certification

Category	Aspect	Leasehold	Conditions	Pricing policy
Synergie	Gebiedsaard			
	Gebiedsvisie			
	Adaptief Vermogen			
	Duurzaam Rendement			
Bronnen	Beperk Primair Energiegebruik			
	Opwekken hernieuwbare energie			
	Watergebruik			
	Reductie materiaal gebruik			
	Milieubelasting materialen			
	Onderbouwde herkomst materialen			
	Voedsel			
Ruimtelijke ontwikkeling	Landgebruik			
	Ruimtegebruik			
	Stedebouwkundig programma			
	Cultureel erfgoed			
	Abiotische structuren			
	Biotische Natuur			
	Mobiliteit			
	Ondergrondse infrastructuur			
	Duurzaamheidsprestatie gebouwen			
Welzijn & Welvaart	Sociale veiligheid			
	Sociale cohesie			
	Omgevingsbeleving			
	Eigenaarschap			
	Regionale werkgelegenheid			
	Regionale bedrijvigheid			
	Versterken regionale economie			
	Sociale voorspoed			
Gebiedsklimaat	Thermisch buitenklimaat			
	Windklimaat			
	Luchtkwaliteit			
	Waterkwaliteit			
	Bodemkwaliteit			
	Geluid en trillingen			
	Lichttoetreding- en hinder			
	Lichthinder			
	Stralingsrisico			

Externe veiligheid			
Management	Management		
	Participatie		

Appendix 3 Interview land owner

Introductie

Toelichting afstudeeronderzoek

Het ontwikkelen van een duurzaam bedrijventerrein, waarbij de levensduur wordt verlengd en dus veroudering wordt tegengegaan. Door middel van recente gebiedsontwikkelingen worden de mogelijkheden en de eventuele knelpunten onderzocht. De insteek van het onderzoek is van breed naar specialistisch, uiteindelijke focus ligt op het instrument gronduitgiftebeleid.

Relatie ARCADIS

ARCADIS heeft verschillende projecten in ontwikkeling of ontwikkeld die als input voor mijn onderzoek kunnen dienen. Daarnaast stel ik een model op dat inzicht geeft in de huidige ontwikkelingen op het gebied van bedrijventerreinen en de relevantie aantoon van verschillende ingrepen. Zowel ARCADIS als de TU zijn betrokken bij de begeleiding en voortgang van het onderzoek.

Algemeen

1. Welke partijen zijn allemaal betrokken geweest bij de ontwikkeling van het bedrijventerrein?
2. Op welke manier bent u betrokken geweest bij de ontwikkeling van dit bedrijventerrein?

Duurzaamheid

Tegenwoordig is er zowel vanuit de overheid als het bedrijfsleven steeds meer aandacht voor duurzame gebiedsontwikkeling en energiezuinige maatregelen in de bouw. De term duurzaamheid is natuurlijk een vrij ruim begrip en kan door iedere partij weer anders worden opgevat. In mijn onderzoek benadruk ik het belang van het verlengen van de levensduur van een gebied en daarmee het tegengaan van veroudering en disfunctioneren.

Ambitie

1. Zijn er bepaalde doelen geformuleerd voor het bedrijventerreinen?
 - I. In hoeverre zijn deze doelen behaald met de realisatie van dit project?

Organisatie

2. Welke rol heeft de gemeente gespeeld bij de realisatie van het bedrijventerrein?
Welke afdelingen zijn betrokken geweest bij de ontwikkeling?

3. De voorbereiding kent twee fasen: initiatieffase en de planvormingsfase. In de initiatieffase wordt een masterplan opgesteld en een visie geformuleerd, in de planvormingsfase worden het stedenbouwkundig plan, inrichtingsplan en bestemmingsplan opgezet of aangepast. Kunt u aangeven of en welke plannen u heeft gebruikt om uw duurzaamheidsambitie te bewerkstellen?
4. In het convenant bedrijventerreinen 2010-2020 is aangegeven dat de planning van bedrijventerreinen regionaal dient te worden aangepakt. In hoeverre is er bij dit project sprake geweest van regionale samenwerking en/of regionaal onderzoek?
5. Ook de SER ladder speelt sinds 2009 een belangrijke rol in de gebiedsontwikkeling. Heeft de gemeente gebruik gemaakt van deze toetsing?
6. In mijn onderzoek bekijk ik het belang van de grondbeleid en het gronduitgifteplan voor de implementatie van duurzame maatregelen op zowel terrein als gebouwniveau. Welk belang heeft de gemeente gehecht aan dit onderdeel van het bouwproces?
 - I. Heeft de gemeente al eerder ervaring opgedaan met instrumenten gerelateerd aan het grondbeleid?

Instrumenten grondbeleid

Erfpacht

7. Welke typen eigendom zijn gebruikt voor de uitgifte van de gronden?
8. Wat waren de redenen om voor een bepaald type te kiezen?
 - I. Hoe is er omgegaan met een (mogelijke) veranderende cash flow?
 - II. Indien uitgegeven in erfpacht, hoe worden de inkomsten van de erfpacht besteed?
 - III. Wat zijn de nadelige effecten van deze vorm van uitgifte?
9. Wat was het draagvlak voor de uitgifte?
 - I. Hoe stonden de ondernemers tegenover dit type gronduitgifte? Heeft u verschil gemerkt tussen gebiedsontwikkeling in koop en in erfpacht? Is er een bepaald type bedrijf waarbij meer draagvlak is?
 - II. De grondeigenaar (=gemeente)?
 - III. De projectontwikkelaar?
10. Is de gemeente genooddaakt geweest middelen in te zetten om dit draagvlak te creëren?
 - I. Zo ja, wat was er intern noodzakelijk? En extern?
11. Welke duurzaamheidsmaatregelen zijn in het gebied genomen?
 - I. Zijn de maatregelen gerelateerd aan de uitgifte in erfpacht?

Voorwaarden stellen

12. Aan de uitgifte van gronden zijn bepaalde voorwaarden gesteld. Welke voorwaarden zijn dit?
- I. Waarom is er voor deze vorm van uitgifte gekozen/ doorslaggevende aspecten?
 - II. Wat zijn de nadelige effecten van deze vorm van uitgifte?
 - III. Hoe zijn de voorwaarden juridisch geregeld?
 - IV. Worden voor iedere kavel dezelfde voorwaarden gesteld?
13. Wat was het draagvlak voor deze speciale vorm van uitgifte?
- I. Hoe stonden de ondernemers hier tegenover?
 - II. De grondeigenaar (=gemeente)?
 - III. De projectontwikkelaar?

Prijsbeleid

14. Is er speciaal prijsbeleid gevoerd? Zo ja, welk beleid is gevoerd?
- I. Wat zijn de motieven om hiervoor te kiezen?
 - II. Zijn er ook nadelige effecten aan het idee?
 - III. Wat zijn de financiële gevolgen van de maatregel?
15. Wat was het draagvlak voor de maatregel?
- I. Hoe stonden de ondernemers tegenover deze maatregel? Is er verschil in animo te constateren tussen typen ondernemers?
 - II. De grondeigenaar (=gemeente)?
 - III. De projectontwikkelaar?

Tijd

16. Wat was het verwachte tijds kader voor totale bezetting?
- I. Is dit kader behaald?
 - II. Wat zijn mogelijke oorzaken van wel/niet bepalen van het tijds kader?

Risico's

17. Het toepassen van grondbeleid als instrument brengt verschillende risico's met zich mee, hoe is hier bij de gemeente mee omgegaan?
18. Het gebied is nu een aantal jaar gerealiseerd, zijn er bepaalde problemen te benoemen waar u bij de ontwikkeling geen of te weinig rekening mee hebt gehouden? Zijn er verwachte problemen te benoemen die juist minder of helemaal geen hinder gaven?
19. Zijn er verbeterpunten te benoemen naar aanleiding van de ontwikkeling van het bedrijventerrein? Zo ja, welke zijn dit?
- I. Zijn er verbeterpunten specifiek voor het grondbeleid te benoemen (type eigendom, voorwaarden, prijsbeleid, SER ladder)?

Afsluiting

1. Bent u geneigd om bij nieuwe ontwikkelingen deze grondinstrumenten opnieuw te gebruiken?
2. Heeft u nog verdere opmerkingen in het kader van dit onderzoek?
3. Wat vond u van het interview?

Appendix 4 Interview user

Introductie

Toelichting afstudeeronderzoek

Het onderzoek focust zich op het ontwikkelen van een duurzaam bedrijventerrein. In dit kader wordt gekeken naar de levensduur van een bedrijventerrein en het tegengaan van veroudering. Door middel van recente gebiedsontwikkelingen worden de mogelijkheden en de eventuele knelpunten onderzocht. De insteek van het onderzoek is van breed naar specialistisch, de uiteindelijke focus ligt op het instrument gronduitgiftebeleid. Hoofdvraag van het onderzoek is: 'Welke rol speelt het grondbeleid bij de duurzame ontwikkeling van een bedrijventerrein?'

Relatie Arcadis

ARCADIS heeft verschillende projecten in ontwikkeling of ontwikkeld die als input voor mijn onderzoek dienen. Daarnaast stel ik een model op dat inzicht geeft in de huidige ontwikkelingen op het gebied van bedrijventerreinen en de relevantie aantoon van verschillende ingrepen. Zowel Arcadis als de TU Eindhoven zijn betrokken bij de begeleiding en voortgang van het onderzoek.

Algemeen

1. Wat zijn de kernactiviteiten van het bedrijf?
2. Sinds wanneer is het bedrijf gevestigd op het bedrijventerrein?
3. Wat waren de belangrijkste redenen om te kiezen voor deze locatie?
4. Welk type eigendom is van toepassing voor de gronden: koop, erfpacht, huur?

Proces duurzame ontwikkeling case studie

Tegenwoordig is er zowel vanuit de overheid als het bedrijfsleven steeds meer aandacht voor duurzame gebiedsontwikkeling en energiezuinige maatregelen in de bouw. De term duurzaamheid is een vrij ruim begrip en kan door iedere partij weer anders worden opgevat. In mijn onderzoek benadruk ik het belang van het verlengen van de levensduur van een gebied en daarmee het tegengaan van veroudering en disfunctioneren. Gekeken wordt naar een gebiedsbrede aanpak.

Ambitie

1. Wat zijn uw ervaringen met het bedrijventerrein?
 - I. Welke rol speelt duurzaamheid hierin?
2. Recentelijk is de BREEAM Gebiedsontwikkeling certificering ontwikkeld. Welke punten van deze certificering zijn aanwezig op het bedrijventerrein?

- Synergie (gebiedsvisie, gebiedsaard, duurzaam rendement, adaptief vermogen)
- Bronnen (Beperken primair energieverbruik, opwekken hernieuwbare energie, watergebruik, reductie materiaalgebruik, milieubelasting materialen en herkomst, voedsel)
- Ruimtelijke ontwikkeling (landgebruik, ruimtegebruik, stedenbouwkunde, cultureel erfgoed, abiotische structuren, biotische natuur, mobiliteit, ondergrondse infra, duurzaamheidsprestatie gebouwen)
- Welzijn & Welvaart (Sociale veiligheid en cohesie, omgevingsbeleving, eigenaarschap, regionale werkgelegenheid en bedrijvigheid, versterken regionale economie, sociale voorspoed)
- Gebiedsklimaat (Thermisch buitenklimaat, windklimaat, lucht-, water en bodemkwaliteit, geluid en trillingen, lichttoetreding en hinder, stralingsrisico, externe veiligheid)
- Management (management, participatie)

Communicatie

3. De gemeente streefde naar een duurzaam bedrijventerrein en heeft hiervoor dan ook een speciaal grondbeleid gevoerd. Hoe was de communicatie over deze visie naar u toe?
4. Waren de gevolgen van deze visie voor u duidelijk?
5. Waren er mogelijkheden om van de voorgestelde paden af te wijken?

Instrumenten grondbeleid

Erfpacht

6. De gronden zijn verkregen in erfpacht. In welke mate heeft deze vorm van eigendom de locatiekeuze beïnvloed? Waren er motieven om specifiek voor erfpacht te kiezen? Zo ja, welke?
7. Erfpacht heeft invloed op de financiële cash flow van de gebruiker. Wat zijn de effecten hiervan voor jullie?
 - I. Weet u hoe de inkomsten van de erfpacht worden besteed?

8. Zijn er nadelige effecten te benoemen?
9. Hoe denkt u dat het draagvlak is voor erfpacht onder de ondernemers?
 - I. Is er een bepaald type bedrijf te noemen dat hiervoor wel of juist niet geïnteresseerd is?

Voorwaarden stellen

10. Aan de uitgifte van gronden zijn bepaalde voorwaarden gesteld over bijvoorbeeld de bebouwingsdichtheid, architectuur en energievoorziening.
 - I. Ervaart u positieve gevolgen van deze voorwaarden?
 - I. Zijn er nadelige effecten te benoemen van deze maatregel?
 - II. Hoe staat u tegenover deze voorwaarden?
11. Wat was het draagvlak voor deze speciale vorm van uitgifte onder de ondernemers?
12. Op het terrein is een coöperatie gesteld voor parkmanagement. Weet u wat de taken zijn van deze coöperatie?
 - I. Wordt u op de hoogte gehouden van de stand van zaken van deze coöperatie? Hoe?

Prijsbeleid

13. Is er op het bedrijventerrein gebruik gemaakt van speciaal prijsbeleid? Wat is de exacte beschrijving hiervan?
 - I. Heeft u gebruik gemaakt van deze mogelijkheid? Waarom wel/niet?
 - II. Zo ja, Welke duurzaamheidsimplementaties zijn door uw bedrijf toegepast om de korting te behalen?
14. Wat was het draagvlak voor de maatregel onder de ondernemers?

Effectiviteit

15. Hoe effectief vindt u het toegepaste grondbeleid ten aanzien van duurzaamheid?

Risico's

16. Het gebied is nu een aantal jaar gerealiseerd, zijn er bepaalde problemen te benoemen die bij de ontwikkeling hebben gespeeld? Hebben de problemen invloed gehad op uw bedrijfsvoering?
17. Zijn er verbeterpunten te benoemen naar aanleiding van de ontwikkeling van het bedrijventerrein? Zo ja, welke zijn dit?
 - II. Zijn er verbeterpunten specifiek voor het grondbeleid te benoemen (planning, type eigendom, voorwaarden, prijs)?

Afsluiting

1. Zou u hetzelfde vestigingsbeleid hanteren bij een mogelijke toekomstige verhuizing?
2. Heeft u nog verdere opmerkingen in het kader van dit onderzoek?
3. Wat vond u van het interview?

Appendix 5 Dutch management summary

Dit onderzoek benadrukt het belang van gronduitgiftebeleid bij de ontwikkeling van een duurzaam bedrijventerrein. Wat betreft duurzame ontwikkeling is de focus gelegd op het behouden van een bedrijventerrein op lange termijn en het voorkomen van veroudering op bedrijventerreinen.

De onderzoeksvraag luidt: 'Wat is het belang van gronduitgiftebeleid in het ontwikkelingsproces van een duurzaam bedrijventerrein?'

Om de onderzoeksvraag te beantwoorden is een literatuurstudie gedaan naar de huidige situation op bedrijventerreinen, de ontwikkeling van een duurzaam bedrijventerrein en de mogelijkheden van gronduitgifte als instrument om deze ontwikkeling te bevorderen. De theoretische bevindingen zijn onderbouwd met een case studie, waarvoor vier duurzame bedrijventerreinen zijn geselecteerd. Voor iedere case zijn interviews gehouden met de grondeigenaar en een gebruiker. Hun ervaringen met gronduitgifte als instrument zijn opgenomen in de resultaten en conclusies.

Het theoretisch kader beschrijft de huidige problemen op bedrijventerreinen, namelijk veroudering, verrommeling van de bebouwde omgeving en stagnerende herontwikkeling. De waargenomen problemen kunnen vaak worden voorkomen door het verbeteren van de voorbereidingsfasen van het ontwikkelingsproces. De meest relevante stakeholders zijn de gemeente als grondeigenaar en de ondernemers als gebruiker van het gebied. Gerelateerd aan de trend duurzaamheid zijn de factoren die ontwikkeling van een duurzaam bedrijventerrein mogelijk maken weergegeven. Drie hoofd factoren worden onderscheiden: beleid en organisatie, ruimtelijke indeling en energie- en materiaalgebruik. Ruimtelijke indeling en energie- en materiaalgebruik zijn fysieke factoren welke sterk verband houden met het geïmplementeerde beleid en de organisatie.

De toegepaste gronduitgifte is een interessant instrument om te bespreken in relatie tot de ontwikkeling van een duurzaam bedrijventerrein op projectniveau. Een gronduitgifte plan kan worden opgesteld in de planvormingsfase van het bouwproces. Gronduitgifte is onderzocht op drie aspecten: (1) type eigendom: koop of erfpacht (2) vestigingsvoorwaarden (3) prijsbeleid: bijvoorbeeld het geven van korting op de grondprijs wanneer er aan bepaalde voorwaarden is voldaan.

Bij het type eigendom is voornamelijk erfpacht beschouwd als kansrijk middel. Voor de grondeigenaar levert erfpacht voordelen op met betrekking tot de financiën en de betrokkenheid in het gebied. Voor de gebruiker is de financiële haalbaarheid een reden om voor erfpacht te kiezen. Relevante voorwaarden die gesteld kunnen worden aan de uitgifte zijn: clustering van bedrijven, verplichten van parkmanagement, behouden van de situatie en instellen van verplichtingen omtrent de uitstraling en ruimtegebruik. Over de toepassing van speciaal prijsbeleid is weinig literatuur beschikbaar. De case studie wijst echter uit dat

prijsbeleid een bruikbaar stimulatiemiddel kan zijn, mits de grondeigenaar de financiële mogelijkheid heeft om dit middel in te zetten.

Het onderzoek toont aan dat het voorgestelde gronduitgiftebeleid verschillende problemen op bedrijventerreinen aanpakt. Een succesvolle toepassing van het gronduitgiftebeleid is voornamelijk afhankelijk van de gestelde ambities door de grondeigenaar, de locatie van het bedrijventerrein en de economische tijd.