

THE MUNICIPAL LAND SUPPLY: RISK OR SUSTAINABLE OPPORTUNITY?

An explorative research on possible sustainable policy solutions in land use policy in order to create more financial continuity for municipalities in Noord-Brabant

Graduation thesis

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PREFACE

This graduation thesis forms the endpoint of the intensive process of scientific research to finish the master track Real Estate Management and Development at the Eindhoven University of Technology. The last six months of the master track were dominated by this research, conducted under the authority of the KENWIB foundation, which contributes to the goal of the KENWIB foundation: performing research for the province of Noord-Brabant to support the energy neutral ambition. This research is conducted in cooperation with Eindhoven University of Technology, Brink Groep and the KENWIB foundation.

In the preparation phase of this research, the literature study, my attention was triggered by the actuality of many municipalities who experience major losses on their acquired land. The thought of different possible sustainable solutions to minimize these losses and implement sustainability gained my interest. From the different courses in the master the interdependency of land development and real estate development became clear and I was enthused to search for innovative new forms of land use policy. The combination of the scientific knowledge of my supervisors from the Eindhoven University of Technology and the experience in the practical field of Brink Groep resulted in this relevant, actual and interesting research.

Firstly I want to thank my supervisors from the Eindhoven University of Technology. Paul Masselink for your expertise in municipal politics and sustainability applications; our interesting and extensive discussions gave me clear insight and you always came up with new innovative ways to implement sustainability. Brano Glumac for your scientific knowledge and help with the used research methods and structure of the research design; we have had some intensive discussions but you always gave me insight in the proper way to structure my research design and helped me find the proper research methods. Secondly I want to thank my supervisors at Brink Groep for the chance they gave me to do my research with the access to their provided facilities, broad network and practical knowledge in the field of area development. Ernst van der Leij for your knowledge regarding energy cooperatives, local renewable energy initiatives and enormous professional network. Furthermore I want to thank you for your sharp insights during our discussions; it helped me to structure my thoughts and resulted in specific further steps in the research. And Alfred van 't Hof for your expertise in land developments, municipal finances and creativity to help substantiate the innovative, sustainable policy solutions. You were always available for feedback and we discussed intensively during this process about the following steps of the research. You helped me when certain decisions had to be made, always with a critical view and positive feedback. With the help of all, this thesis results in a perfect balance between conceptual thinking, research, and practical 'real-life' business.

Last but not least I want to thank my friends and family who supported me during this intensive process of graduation. I want to thank them for their help and support. But you especially gave me peace and distraction when it was necessary. In particular I want to thank Iris for your extreme support, patience and listening ear in (some)times of stress.

I hope you, as reader, will enjoy and experience the intensive, pleasant process of this research which resulted in this graduation thesis.

Gijs Kant
March 2013

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MANAGEMENT SUMMARY

During the exploration of the transformation process of land, the actuality of major losses among municipalities on land development was evident. This research tries to provide insight in the financial situation of *Noord-Brabantse* municipalities due to losses on their land developments. Subsequently possible sustainable policy solutions are explored and applied. This resulted in more insight and knowledge in the transformation process of (municipal) land and should eventually stimulate municipalities to look for sustainable, innovative new forms of land use (policy) to minimize the losses and ensure financial continuity. This resulted in the following main research question: *What possible sustainable policy solutions are applicable (and to what extent) to improve municipal land use policy in order to create a continuous healthier financial situation for municipalities in Noord-Brabant?*

Firstly the theoretical context of this subject is given by desk research. Municipal land use policy and its position in spatial planning, politics and area development is explored. The historic overview gives insight in the active role on the land market of municipalities in the Netherlands. Land use policy is always used as instrument to control spatial development. But due to the economic crisis the financial risks of municipal (active) land use policy become painfully clear. Area and thereby land developments are delayed, book values are increasing due to interest costs, land prices are under pressure and there is uncertainty about projected revenues. This results in significant losses on land developments for numerous municipalities. The documentation of municipal finances and land developments is furthermore discussed to gain insight in the possibilities to analyse these financial risks.

In this research a multi criteria analysis is used to analyse the financial danger among all *Noord-Brabantse* municipalities. The most recent public data from the annual reports of 2011 is used. The multi criteria analysis resulted in twenty municipalities which are significantly at more financial risk due to their land supply and reserve position than the other *Noord-Brabantse* municipalities. These municipalities are contacted for additional information to give a more detailed indicator of the actual financial risks. In general the smaller municipalities with large land supplies and less reserves are significantly more at danger.

Based on publications and expert meetings, two possible sustainable policy solutions (PSPS) are selected to determine their applicability in municipal land use policy. The determining factors for the application of these PSPS are derived from three case studies with three different *Noord-Brabantse* municipalities. The applicability and the determining factors of the two PSPS are tested with a questionnaire among municipal, consultancy and academic experts. The results of the questionnaire are analysed with the Fuzzy Delphi method. The experts are acknowledging the possibilities and find the regional approach of land use policy the most applicable. For the suggested PSPS with regional and financial settlement the financial factors and political context are of high importance for the actual application. The PSPS of temporary use of the land by placement of solar panels is feasible and interesting. However, there are significant risks regarding legislation and uncertainty in the possibility of collectively net metering. Overall, municipalities are in need of more regional cooperation in land use policy and stimulation to look for more sustainable land use.

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TABLE OF CONTENTS

PREFACE	3
MANAGEMENT SUMMARY.....	5

CHAPTER 1 RESEARCH FRAMEWORK

1.1	Context	11
1.2	Problem definition	13
1.3	Research limitations	15
1.4	Research questions	16
1.5	Research approach and design	16

PART 1 - THEORETICAL FRAMEWORK

CHAPTER 2 SPATIAL PLANNING AND MUNICIPAL LAND USE POLICY

2.1	Introduction.....	19
2.2	Definitions	19
	2.2.1 Land.....	19
	2.2.2 Land market.....	20
	2.2.3 Land value	21
2.3	Spatial planning in the Netherlands	22
	2.3.1. Historic overview	22
	2.3.2. Instrumentation in spatial planning per governmental layer.....	24
	2.3.3. Conclusions	26
2.4	Municipal land use policy in the Netherlands	26
	2.4.1. Municipal land use policy.....	26
	2.4.2. Types of municipal land use policy	28
	2.4.3. Instrumentation of municipalities	29
	2.4.4. Conclusions	32

CHAPTER 3 THE CONTEXT OF AREA DEVELOPMENT

3.1	Introduction.....	33
3.2	Land development as part of area development.....	33
	3.2.1. The process of area development.....	33
	3.2.2. The process of land development.....	34
	3.2.3. Land development	36
3.3	Land valuation methods.....	38
	3.3.1. Used valuation methods	38
	3.3.2. Focus of municipalities.....	39
3.4	Actors in area development.....	40
3.5	Economic crisis and impact on municipal land use policy.....	42
	3.5.1. Change in role of actors in residential development.....	42
	3.5.2. Economic situation.....	45
	3.5.3. Impact on municipal land use policy	46

CHAPTER 4 DOCUMENTATION OF MUNICIPAL FINANCES

4.1	Introduction.....	49
4.2.	Municipal land supply	50
	4.2.1. Book value of land supply	50
	4.2.2. Land not in development (LNID).....	50
	4.2.3. Land in development (LID)	51
4.3	Risk management	52
4.4	Reserves and provisions.....	53
4.5	Overview of losses on land developments in the Netherlands	54

PART 2 - CURRENT SITUATION OF MUNICIPALITIES IN NOORD-BRABANT

CHAPTER 5 ANALYSIS OF MUNICIPALITIES IN FINANCIAL DANGER

5.1	Introduction.....	57
5.2	Multi Criteria Analysis (MCA) on municipalities in <i>Noord-Brabant</i>	57
	5.2.1. Methodology – Multi Criteria Analysis	57
	5.2.2. Used criteria in MCA	59
	5.2.3 Results of MCA.....	60
	5.2.4. Conclusions	61
5.3	Validation of Multi Criteria Analysis through questionnaire 1.....	62
	5.3.1. Questionnaire 1 among twenty Noord-Brabantse municipalities	62
	5.3.2. Process and response	63
	5.3.3. Conclusions	64

PART 3 - POSSIBLE SUSTAINABLE POLICY SOLUTIONS

CHAPTER 6 POSSIBLE SUSTAINABLE POLICY SOLUTIONS

6.1	Introduction.....	67
6.2	Determination of possible sustainable policy solutions	67
6.3	Possible sustainable policy solutions	68
	6.3.1. Regional settlement of residential developments.....	68
	6.3.2. Temporary use by the placement of solar panels	73

CHAPTER 7 APPLICABILITY AND DETERMINING FACTORS OF PSPS

7.1	Introduction.....	79
7.2	Case studies among three Noord-Brabantse municipalities	79
	7.2.1. Methodology of case studies.....	79
	7.2.2. Scenarios	81
	7.2.3. Results as input for questionnaire 2	83
7.3	Questionnaire 2 and data analysis	85
	7.3.1. Methodology - Fuzzy Delphi Method.....	85
	7.3.2. Questionnaire 2 design	87
7.4	Results of Fuzzy Delphi Method	90
	7.4.1. Applicability of three PSPS	90
	7.4.2. Ranking of determining factors for two PSPS	91

PART 4 - CONCLUSIONS

CHAPTER 8 CONCLUSIONS AND RECOMMENDATIONS

8.1	Conclusions.....	95
	8.1.1. Current financial situation of municipalities.....	96
	8.1.2. Applicability and determining factors of PSPS.....	97
8.2	Discussion and reflection	98
8.3	Recommendations	99

REFERENCES	101
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APPENDICES	107
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Appendix 1: Flow chart symbols.....	108
Appendix 2: List of used definitions	109
Appendix 3: Expert meeting	111
Appendix 4: List of interviewed municipal experts	117
Appendix 5: Research on land developments by province Noord-Brabant.....	118
Appendix 6: Overview of results from Multi Criteria Analysis.....	122
Appendix 7: Questionnaire 1.....	124
Appendix 8: Results of questionnaire 1	126
Appendix 9: Data files.....	130
Appendix 10: Applicability and determining factors per respondent group	131

ENGLISH SUMMARY	137
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DUTCH SUMMARY	147
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10

CHAPTER 1 RESEARCH FRAMEWORK

1.1 Context

“All economic development depends to some degree on the availability of land. Industries need sites for factories, distribution or retail centres, while in agrarian societies, the quality of the land is a key factor in creating a livelihood. Every citizen needs somewhere to eat and somewhere to sleep and families require a defensible space in which they can find peace and privacy.” – Dale et al (2011) in Land Markets, a report for the Royal Institution of Chartered Surveyors.

Introduction

The characteristics named by Dale et al (2011) have made land into a precious commodity and land is even more distinctive in comparison with other commodities because of its immovability. In the course of time, lawyers tried to bring order into the management of land by viewing it as an abstract set of property rights instead of a physical commodity. Thereby, the use of the land was governable and gave the owner the ability to acquire or dispose these rights. The management of land was the beginning of the land market as we know it nowadays. The market transfers the rights between users and owners. The ultimate owner of land is the state as they have the expropriation right to enforce ownership ultimately. And the use rights of land in the form of physical planning restrictions are administrated by the local government.

Human population is expanding, but the land is a finite resource and hence there is ever-increasing pressure on living space. See figure 1.1 for the growing population of the Netherlands and the growing population density in the Netherlands (scarcity of space). The state needs to facilitate the allocation of rights to use the land in a way that ensures sustainable development, providing a social and economic benefit for the present as well as for future generations. In doing so, there needs to be a balance between free market forces and State intervention that is normally set by political agendas.

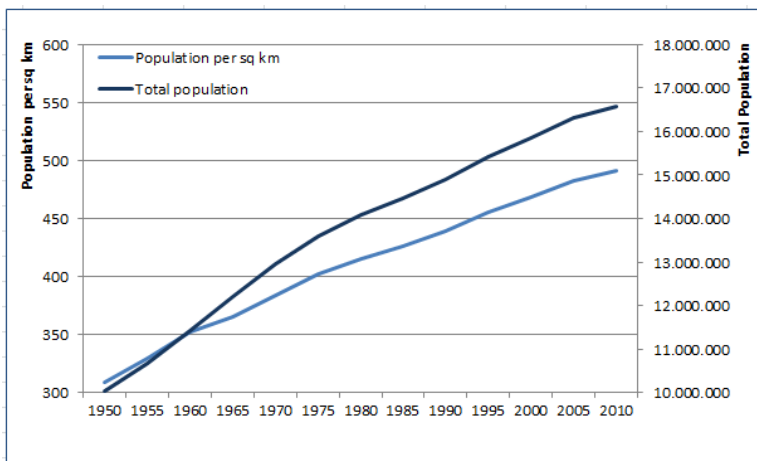


Figure 1.1: Growth of total Dutch population and population density from 1950-2010 (based on CBS, 2012)

Speculation on land

The balance between free market forces and State intervention made it possible to speculate on land; speculators try to buy agricultural land on positions where expansion of cities are expected. This is a risky business, but when the expected expansion actually happens the land value increases enormously because of the change in land use (to dwellings, industries etc.).

In the early 1990s the announcement of the locations of future *Vinex-wijken* by the *Ministerie van Volkshuisvesting en Ruimtelijke Ordening* made clear a residential construction output was wanted by the State. These *Vinex-wijken* were planned on the outskirts of cities, mainly on agricultural land. This governmental policy made the speculation on land more popular again among commercial actors and municipalities. Also, the economic climate was very good (from the 90's until the credit crunch in 2007) whereby the available capital grew; a possible investment was land. Land was mainly invested in by municipalities but also on large scale by developers, housing associations, contractors and investors.

In areas where a high construction output was demanded by governmental policy, the municipalities searched for commercial partners to help them reach their construction quota. For the commercial actors it was helpful to secure their future construction output as with the ownership of the land also comes the right to self-realization on this land (subparagraph 2.2.1.). Hereby, municipalities often bought the raw land and were responsible for the land development (transformation of raw land to building land) and commercial actors had the intention to buy the building land for the real estate development. The municipalities acquired the raw land with the expectation of future development; the acquirement price for this land is between the value in the current use (mostly agricultural) and the value in the future use (residential). After the transformation to building land and the change in land use the municipality sells the building land to the developer and gained profit from this increase in land value (paragraph 3.2.2.). Research by the EIB (van Hoek et al, 2011) showed this profit from the land developments is used in the municipal funds; the fund *Bovenwijkse voorzieningen* is a part of these municipal funds. As the *Vinex-wijken* are at the outskirts of cities there were no existing social facilities and infrastructure. The fund *Bovenwijkse voorzieningen* is mainly used to finance the newly constructed infrastructure and sometimes also to finance social facilities as swimming pools, libraries or theatres. In the 1990s and 2000s many intention plans were signed between commercial actors and municipalities for future area developments.

Financial crisis and the consequences on land possession

In the summer of 2007 a crisis in the financial markets arose and within two years the consequences revealed itself in the real estate market. A drop in demand and overplanning resulted in uncertainty about the scheduled plans; when will they be developed or will they

be developed at all. The acquirement of the raw land is already partly done by developers, housing associations and municipalities. This is financed with loans; the delay results in increasing interest costs. In addition, the sale of the building land stays out because of the delay. It is uncertain how the price for building land will develop and if the projected revenues will be achieved. Before the economic crisis much land is acquired for a high price because of the projected future value due to the change in land use (from agricultural to residential). The book value is the price the land is acquired for, but because of the economic crisis it is uncertain what the real market value of the land is nowadays. Is it enough to cover the acquirement price and the transformation costs? In addition, it is uncertain whether the projected revenues will be achieved and in some cases the profit is already evaporated and turned into losses on land developments. This uncertainty about the market value, projected revenues and the increasing interest costs of the land result in pressure on the balances of developers, housing associations and municipalities. See paragraph 3.5 for further substantiation of the arguments stated above.

Research by Bouwteam (2012) made clear that developers and housing associations have much building land in possession at this moment (respectively €3 billion and €2 billion) but for the municipalities it is an even bigger problem: in total €13 billion. This land, with increasing interest costs and the uncertainty of the market value and projected revenues, has a huge impact on the financial situation of municipalities. The postponed area developments result in losses on the land and a great strain on the budgets of municipalities. Due to these losses municipalities need to economize and thereby are shrinking in personnel, investing less in social facilities and postponing their ambitions on sustainability.

1.2 Problem definition

The financial situation of Dutch municipalities is worsening partly because of losses on land developments. Ten Have et al (2011) did research on behalf of Deloitte commissioned by the Vereniging Nederlandse Gemeenten (VNG) on this subject and estimated the losses on €2.4 billion for all Dutch municipalities by extrapolation of data from 35 municipalities. After that, Vakberaad Gemeentefinanciën (2012) did this research with data of all municipalities in the Netherlands and estimated the total losses on €3.2 billion. The research also concluded that 64 of the total of 415 municipalities (approximately 15 percent) in the Netherlands will come in financial danger due to their land supply. The financial problems have already resulted in six municipalities which are under pre-emption of the province and two municipalities with an *artikel-12 status*. An *artikel-12 status* is assigned when a municipality has structural financial problems; the municipality is then placed under trusteeship of the state. The municipalities under pre-emption of the province in 2012 are: Bellingwedde, Apeldoorn, Beuningen, De Ronde Venen, De Utrechtse Heuvelrug, Muiden, and the two *artikel-12 status* municipalities are Boarnsterhim and Millingen aan de Rijn (Spies, 2012).

Differentiation in financial situation

However, there is a nuance necessary, as stated by de Zeeuw et al (2012a) the financial situation of municipal land use companies (*grondbedrijven*) in the Netherlands vary strongly. This mainly depends on the type of land use policy (paragraph 2.4) applied whereby the invested capital in land between municipalities differs strongly. Municipalities in shrinking areas were already confronted with a declining demand before the crisis, therefore they have on average less invested capital in land. Also, the financial perspectives differ: in some parts of the Netherlands there is still future demand possible and in other parts there is less overplanning / drop in demand. Not all the municipalities suffer major losses in the land developments and many municipalities have financial buffers to cover these losses.

The actuality (figure 1.2; the national news, research, professional literature) about the losses on the municipal land supply is enormous. At this moment there is much land vacant and land/area developments are delayed. The municipal land is acquired with the purpose of development but due to the economic crisis is still vacant. There are significant annual interest costs because the acquisition of the land is already done (financed with loans). As a result, some municipalities try to allocate the land in every possible way to gain (a part of) the expected revenues. This is done by adjusting current area developments in building program, quality of the public space, or even the quality in housing. This shows a short term and non-sustainable focus of municipalities and is therefore not the proper solution for the financial problems. The research aims on possible sustainable policy solutions to help municipalities in financial problems look sustainable to the future again. As example: governmental policy is stimulating the use of renewable energy sources. From that perspective is interesting to look at the sustainable energy potential of the vacant land. As a contribution to the energy efficiency improvement and as revenue to cover losses on land developments.



Figure 1.2: Overview of news on municipal land supply
(based FD, 2013a; FD, 2013b; Binnenlands bestuur, 2013; Vastgoedmarkt, 2012)

Social relevance

The subject of the research regards a social problem because municipalities are financed by public resources (money provided by the entire population of the Netherlands) and are supposed to use this public money carefully. Fifteen percent of all Dutch municipalities are close to financial danger because of the (future) losses on their land supply. The number of municipalities in financial danger is estimated to grow because of missing revenues and growing interest costs on land developments (ten Have et al, 2012). In the recent past (paragraph 2.3.1.) municipalities used the profit from land developments to invest in social facilities (e.g. infrastructure, theatres, libraries, swimming pools) (van Hoek et al, 2011). But because of the economic situation the profit from land developments evaporates and turns into losses whereby municipalities need to economize and can invest less in social facilities and sustainability (e.g. energy efficiency improvements or renewable energy resources).

The transformation process of vacant land, the applicability of possible sustainable (renewable energy sources) policy solutions, the enormous (financial) size, the actuality of the subject and the social side of this problem make it a very relevant research. The aim of this research is to help the municipalities in financial danger find possible sustainable policy solutions to minimize losses on their land supply and look sustainable towards the future again. This resulted in the following **problem definition**:

Municipalities have bought much land with the expectation of area development. Because of the economic crisis area developments are delayed and in some cases even cancelled. The stay out of the allocation of building land and the uncertainty about the market value and projected revenues result in significant losses. Some municipalities are already in, while others are close to, financial danger due to the losses on their land supply.

1.3 Research limitations

The total problem (from a developers', housing association', investor' and municipal' point of view) of losses on land supply is too complex and extensive to research all. Therefore this research will limit itself to the financial problems of municipalities due to the losses on their land supply and the possible sustainable policy solutions to solve/minimize these financial problems. Throughout this thesis area developments on the outskirts of cities (*uitleggebieden*) with (future) residential land use are subject of research. There is a lot of diversification of area developments (forms, sizes, land uses) and when aiming on this specific kind of area developments the problem can be more clearly defined and the policy solutions were more specifically applicable. The theoretical framework is limited on a national scale (of the Netherlands) because of the unique Dutch situation. Thereafter the analyses done on the current situation of municipalities and the applicability of the possible sustainable policy solutions are done specifically on provincial scale (the province *Noord-Brabant*). The province *Noord-Brabant* is taken as specific research field to ensure a manageable research size.

1.4 Research questions

The problem definition and research limitations form the basis for the research objective. The research wants to determine the applicability of the policy solutions and what factors are important for the implementation of these policy solutions. This resulted in the following research question which consist of **research objective** (1) and **research goal** (2):

(1) What possible sustainable policy solutions are applicable (and to what extent) to improve municipal land use policy (2) in order to create a continuous healthier financial situation for municipalities in Noord-Brabant?

The following sub questions will integrally help give more insight in the problem definition and form the answer on the research question:

- How is spatial planning and land use policy currently organised in the Netherlands? (chapter 2)
- What is the role of municipalities in the process of area and land development? (chapter 3)
- Which municipalities in the province of *Noord-Brabant* are in or close to financial danger due to losses on their land supply? (chapter 4-5)
- What is the situation (and are the problems) of the selected municipalities in the province of *Noord-Brabant* which are in or close to financial danger? (chapter 5)
- What possible sustainable policy solutions are there to improve the land use policy of municipalities to create a healthier financial situation? (chapter 6)
- What is the applicability and are determining factors for the implementation of these possible sustainable policy solutions? (chapter 7)

1.5 Research approach and design

In figure 1.3 the research concept is shown whereby the numbers indicate the chapters where that part is documented. Generally, the research consists of four parts: (1) theoretical framework, (2) different analyses to determine current municipal situation because of losses on land developments, (3) different analyses to determine the applicability of possible sustainable policy solutions to minimize the losses on the municipal land supply and look sustainable towards the future again, and (4) the conclusions and recommendations.

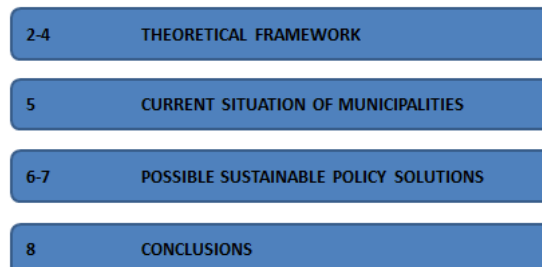


Figure 1.3: Research concept

In the **theoretical framework** (chapter 2-4) the substantiation of used definitions, the development of spatial planning and land use policy in the Netherlands and the context of area and land development are discussed. Furthermore the documentation of municipal finances is discussed to give the introduction on the financial situation of municipalities. This is done by desk research by means of comparison of the existing literature on this subject. Thereafter the **current municipal situation because of losses on land developments** is explored (chapter 5). Firstly, the annual reports 2011 of all municipalities in the province *Noord-Brabant* are analysed to determine which *Brabantse* municipalities are close to financial danger due to losses on their land supply. Different criteria are determined and the financial situation of *Brabantse* municipalities is analysed by means of Multi Criteria Analysis (MCA). As validation of the MCA the twenty highest scoring *Brabantse* municipalities are contacted to get a more detailed insight in their current situation regarding their land supply and land use policy. This will be done by means of questionnaire 1.

Subsequently **different possible sustainable policy solutions (PSPS) to minimize losses on the municipal land supply and look sustainable towards the future again are explored**. This is done by means of expert meetings and exploration of publications by academics and experts (chapter 6). After the overview of policy solutions there are two PSPS selected which are further analysed. As last the **applicability and determining factors of the PSPS are determined** (chapter 7). This is done, on the one hand, by means of three case studies which result in the determining factors for the applicability of these PSPS. On the other hand the general applicability of the PSPS is determined. The two PSPS and their determining factors are randomized for the questionnaire among (A) municipal experts of twenty *Brabantse* municipalities and (B) experts from consultancy companies and universities. The results from the questionnaire are analysed with the Fuzzy Delphi Method. This results in the weighing and ranking of the determining factors and the overall applicability of these policy solutions among the two groups of respondents. Ultimately, this research will help to create more insight in new forms of land use policy and to improve financial continuity for municipalities in the future. This all will be ended with the conclusions and recommendations from this research in chapter 8.

There are different research methods, quantities and levels used. Because of the complexity of the research design for part 3 and 4 (chapter 5-7) this in more detail overviewed in a flow-chart system (figure 1.4). The description of different used symbols can be found in appendix 1. During the research the research levels are from globally to detailed: first the MCA on the municipal finances level, than the short questionnaire on the land supply and land use policy level, than the case studies on land development level and as last the feedback loop to land use policy to determine the applicability of the policy solutions. The structure of the research design is the same as the structure of the thesis.

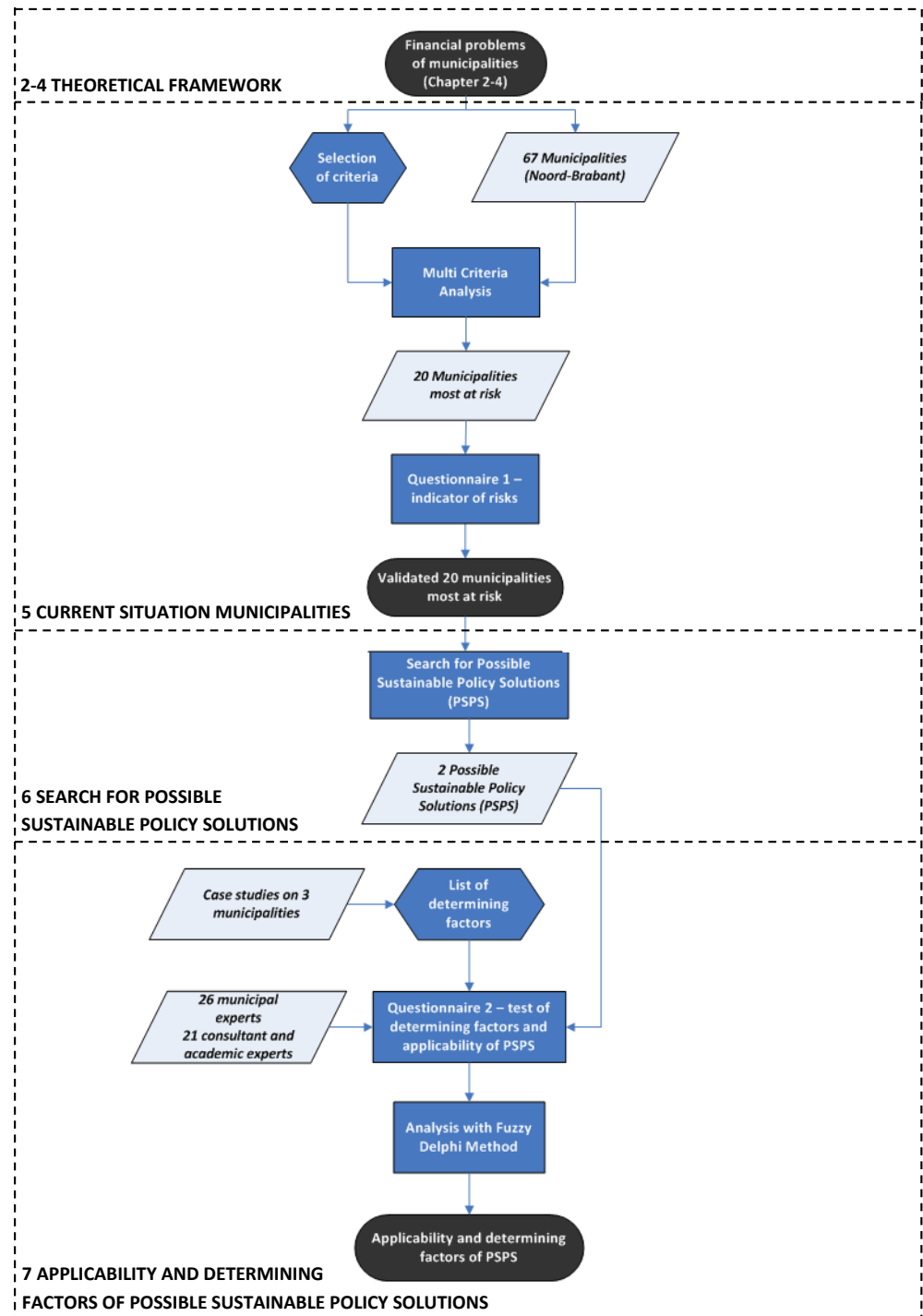


Figure 1.4: Detailed research design

CHAPTER 2 SPATIAL PLANNING AND MUNICIPAL LAND USE POLICY

2.1 Introduction

“The field of land use policy is changing fast. Through adjustments in the law on spatial planning and the implementation of the land development law municipalities have the possibility to make a renewed consideration between active of facilitating land use policy.” – F. ten Have et al (2010) in the publication of *Gemeente Governance Grond(ig) beleid* on the developments in land use policy through changing legislation.

In this chapter an overview will be given of the governmental interference on the land market. First some definitions of important terms in this thesis are substantiated from a municipal point of view (paragraph 2.2). Then the historic development of the governmental regulations in spatial planning and the instrumentation in spatial planning of the different governmental layers are discussed (paragraph 2.3). And because of the importance of the municipal role in spatial planning the municipal land use policies (different types and instrumentation) are further scrutinized (paragraph 2.4). This chapter forms the basis to understand the role of municipalities on the land market and in area development.

2.2 Definitions

As an introduction to the research topic the most important terms are defined from a municipal point of view. These definitions are used throughout this thesis and are substantiated in this paragraph. For more used definitions and the translations from English to Dutch, see appendix 2.

2.2.1 Land

As stated by Dale et al (2011) land is a commodity but it is distinctive in comparison to other commodities that can be bought and sold; land is immovable. Buildings upon it can be dismantled and moved elsewhere but the land on which they stand cannot be moved. Also, land is a finite resource and is not makeable. Although this general definition is less applicable for the Netherlands because with the reclamation of land a big part of our country is made liveable. Still, this solution has a limited applicability so generally land remains not makeable.

From a legal perspective, only the rights of land can be bought and sold. When zooming in on the legal perspective which gives the land its distinctive character, Wilkie et al (2011) give a clear definition for land: *“Land is not simply something physical. In the law the word ‘hereditament’ implies the nature of the right involved in the ownership of land. So not the land (the soil, the grass, the trees, the buildings) is important, but the rights that people may have in land.”*

The following two Latin maxims by Accursius, a professor at the University of Bologna in the thirteenth century, are still used in modern law to define land:

- *Cuius est solum eius est usque ad coelum et ad inferos.*

“The owner of the land owns everything up to the sky and down to the centre of the earth”;

- *Quicquid plantatur solo, solo cedit.*

“Whatever is attached to the land becomes part of the land”.

If we come to the more practical use of land. The government provides the rules to control the manner in which the land is used. There are two ways in which land can be allocated:

- Free hold: in most of the cases land is in possession of a stakeholder, e.g. a homeowner normally owns the land his house is on. The owner has a limited freedom with the land, as long as it is consistent with the land use imposed by the local government. When the land use is changed by the government the owner of the land has the right of self-realization (*zelfrealisatie*) of this land use. This is a reason commercial actors also got involved on the land market (will be further discussed in paragraph 3.2).
- Lease hold: in some cases the land is in possession of a stakeholder (in most cases the local government, sometimes a private stakeholder) which leases the land for a certain annual rent to the user of the land. In the Netherlands there are some large municipalities with a lease hold system. Amsterdam is the best known example because of their extensive lease hold system. Other municipalities have used the lease hold system in the past, in total about forty municipalities, but since 1990 the number of municipalities which allocate their land with lease holds is decreased (de Jong and Ploeger, 2008).

2.2.2 Land market

The land market is a special market: every piece of land has its unique location and unique quality. The land market is thereby a heterogeneous market; every good is different. Land is necessary for the development of villages, cities and the country. For the public interest it is important, especially for the Netherlands where the land is scarce, to use the land by providing a social and economic benefit for the present as well as for future generations. These characteristics of land make the intervention of the government on the land market clear; as ultimate owner and as policy maker to decide what happens to the land.

A free market characterizes itself by demand and supply, and the relation between these two factors determines the price for the good or service. But because of the governmental intervention which structures the market forces, the land market is not a completely free market. A better description of the land market is a regulated market. In this way the duality of the government becomes clear on the land market. On the one hand they make the rules for the market and on the other hand they are an active stakeholder on this market as they use the network and hierarchy of this market to achieve their goals and ambitions with spatial planning (Buitelaar 2003; Needham & De Kam 2004). A general definition of the land market is given by Segeren et al (2005): *'The land market is the set of transactions of land, whereby the transactions are done voluntarily and are accessible for everyone.'*

2.2.3 Land value

Land is a special good. The value depends specifically on two characteristics: **land use and location**. Ricardo stated in 1821 the importance of the land use already: “Corn is not high because rents are high, rents are high because corn is high” (Ricardo, 1821). In this sentence Ricardo summarizes the most important characteristic of land: the value of the land is derived from what is happening on the land (the land use). There are many different methods to determine the land value, but first the development of the term land value is stated by means of two location theories.

The first land rent theory which gave insight in land value in relation to the location is the theory of von Thünen (1826). He noticed the importance of distance and location of land. His ideas were based on the agricultural land market. The theory shows the relation between land costs and transportation costs.

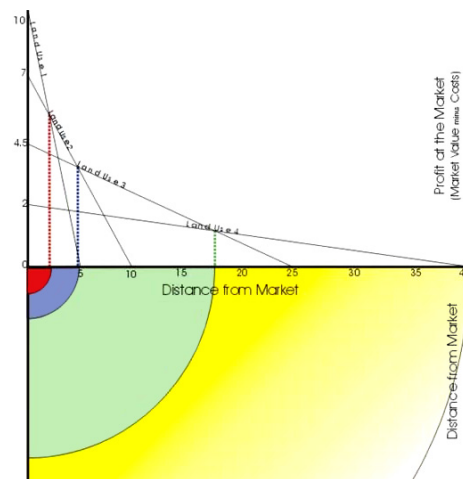


Figure 2.1: Von Thünen's land use model (1966)

The profit which is gained from a certain land use (e.g. for the production of grain) is the market value minus the (production) costs. At the market the product is sold, but to get the product to the market it needs transportation. The costs for transportation are for every land use different (e.g. grain is easier to transport than wood). Assuming that land is equally fertile everywhere and every farmer is capable of gaining the same profit it is possible to state the land rent decreases when transportation costs increase. The horizontal axis shows the distance from the market, the vertical axis the land rent which can be paid. The land rent curve shows per land use the maximum land rent a user can pay. Figure 2.1 shows the different land use types as distance from the market (von Thünen, 1966).

Alonso (1960) developed his theory based on the land rent theory of von Thünen. But Alonso his bid rent theory is applicable on the urban context. Land is scarce and not unlimitedly available; especially in urban areas. He developed a theory where the land rent which people are willing to pay depends on the distance of the land from the city centre. The bid-rent curve shows the land rent which people are willing to pay for a certain land use (Alonso, 1960). These two theories form the basis for the relation between land use, location and land value. In paragraph 3.3 different land valuation methods will be discussed.

2.3 Spatial planning in the Netherlands

Spatial planning is the distribution of space for different uses. Space is scarce in the Netherlands; therefore well-advised decisions need to be made in the desired land uses. The government organises the spatial planning and thereby weighs the different spatial aspects and interests for a certain land use. In this paragraph firstly an historic overview of spatial planning will be given, subsequently the different actors and their role in spatial planning will be discussed.

2.3.1. Historic overview

In order to understand the current governmental interference in land use policy and land allocation it is important to have a short historic overview. The governmental interference started in 1901 with the implementation of the *Woningwet*. The bad living and housing conditions in the cities were a danger for public health. The government obliged the municipalities to make expansion plans and requirements were set regarding the quality of the residential construction output (van der Cammen en de Klerk, 1993). In this period the government had a controlling role. From this period, for the further development of urban and rural areas in the Netherlands the governmental role remained important. But different periods can be distinguished, with a different role, degree of interference and different use of instruments by the government.

50s and 60s: After World War II, in the reconstruction period, the government steered on the necessary construction output. In this period the first policy notes for the spatial planning were composed (*De Eerste Nota* in 1960, *de Wet op de Ruimtelijke Ordening (WRO)* in 1965 and *De Tweede Nota* in 1966). The governmental interference was significant; commercial actors (housing associations, developers and builders) worked commissioned by the government (van der Cammen en de Klerk, 1993).

70s: In this period the regulation by the government increased further. The government wanted to overcome the expected population growth in the so called *groeikernen*. Many people moved from rural areas to the urban areas which would eventually result in congestion in the western part of the Netherlands. Therefore a dispersal policy was instituted. The *groeikernen* were locations, designated by the government, at some distance from the urban centres, where the construction of single family dwellings in an urban area were combined with the benefits of a quiet residential area. Also, this policy stimulated the development of rural areas near urban centers (Sociaal Cultureel Planbureau, 2001). In the late seventies the oil crisis led to a high vacancy rate of new constructions and a high demand for payable dwellings. In this period the government consulted with commercial actors about the lowered governmental grants and the necessary residential construction output because of the shortage of dwellings. This was the first step of the government to increase the involvement of the commercial actors (Putman, 2010).

80s: In the early eighties the economy slowly recovered. The government obliged sober construction with the *Derde Nota (1973)* and the old historical city centres gained more focus to make sure the cities would not empty. In 1985 the *stadsvernieuwingsfonds* was introduced to stimulate the rental sector and a high construction output was realised. In the late eighties the government withdrew increasingly and the market was given more space. This arose from the necessity to cutback budgets and the increasing focus on less governmental interference and more space for free market forces.

90s: The notification of the new law *Wet op de ruimtelijke ordening (Wro)* and the task of construction at expansion locations stimulated the commercial actors to focus on the outskirts of cities (*uitleglocaties*). With the *Vierde Nota Ruimtelijke Ordening Extra (VINEX)* in 1988 the focus changed from the *groeikernen* to an urbanization policy aiming on a cluster of live, work and facilities in cities. In this period the commercial actors mingled on the land market as the *uitleglocaties* were announced. On these expansion locations the land was relatively cheap (agricultural use) and in the future the land use will be changed to commercial/residential use. This was seen as an attractive investment as with the acquirement of the land also came the right of self-realization. The market was given more space in this period thereby the commercial actors got more involved on the land market to secure their construction output. With more actors on the land market the competition increased and thereby also the land prices increased rapidly (Segeren, 2007).

2000 - 2008: The urbanization policy from the *Vierde Nota* was further continued with the *Nota Ruimte (2006)*; the policy aimed on densification, transformation and redevelopment. Inner-city building gained more interest as the *uitleglocaties*. In this policy the market was given more space and the government has a less active role in area development. The government sets the framework for spatial planning and the lower governmental layers can, in cooperation with commercial actors, implement it. The controlling role in the *toelatingsplanologie* was transformed to the *ontwikkelingsplanologie*. The times of large-scale governmental grants belong to the past and municipalities and commercial actors cooperated in public-private partnerships (PPP). In 2008 the *Wet ruimtelijke ordening (Wro)* was implemented, this resulted in some changes in the responsibilities of the different governmental layers (subparagraph 2.3.2.).

2008 - present: The financial crisis lead in 2008 to an economic recession. New developments faltered and started developments are delayed due to decline of sales (de Zeeuw, 2012a). The government tries with stimulating, countercyclical measures to keep construction output high by means of the *Crisis- en Herstelwet*. This is tried by structuring legislation and reducing the transfer tax. But until now the stimulating measures did not have the expected result; the economic climate is still worsening.

2.3.2. Instrumentation in spatial planning per governmental layer

The rules regarding spatial planning are defined in laws and further substantiated in *Algemene maatregelen van bestuur*. The Planning Laws (*Ruimtelijk Bestuursrecht*) are drafted by the government (*regering*) and approved by the Upper and Lower Chamber (*Eerste en Tweede Kamer*). These Planning Laws are implemented by the three governmental layers: State, provinces and municipalities. Since the *Nota Ruimte (2006)* the motto of the spatial planning policy is: 'decentralize where possible, centralize where necessary'. This summarizes the national spatial planning policy; most of the planning instruments are in hands of the municipalities. Municipalities have the knowledge of the local situations therefore they are the most capable of setting rules for spatial planning. By means of the law *Wet op ruimtelijke ordening (Wro)* the different instruments of the different governmental layers are defined. In this law is defined which governmental layer makes which kind of plans for spatial planning (type of plan and instruments per governmental layer).

State

On a national level the State globally defines the spatial policy in the *Structuurvisie*. The *Structuurvisie* enables the State to approach the living environment (environmental, liveability, sustainability) broadly and integrally. In broad lines the development of the Netherlands on spatial policy is defined. However it is not legally binding; the *Structuurvisie* is a strategic policy document. The *Structuurvisie* needs to be further elaborated in a legally binding plan. The zoning plan (*bestemmingsplan*) is the central normative document for spatial planning but is composed by the municipalities. The legally binding instruments the State has, are the following:

- Order in Council (*Algemene Maatregel van Bestuur*): this instrument includes the 'hard' parts of the *Structuurvisie*. It contains the general rules regarding the content of e.g. zoning plans and project decisions.
- Integration plan (*Inpassingsplan*): the State has no approval authority on the zoning plan, but with the integration plan the State can determine a part of a municipal zoning plan when necessary. An integration plan excludes a zoning plan and a provincial integration plan.
- Project decision (*Projectbesluit*): this makes it possible for the State to determine, on project level, an exemption on the zoning plan. The province and municipalities are obliged to exempt the project from the currently active zoning plan.
- Proactive indication and reactive indication (*Proactieve aanwijzing en Reactieve aanwijzing*): the State has the ability to 1) give an indication beforehand with certain regulations which should be implemented in the zoning plan or 2) block the implementation of a draft zoning plan. The State can point this indication directly to the municipality or via the province.
- Judgement (*Zienswijze*): the State has the ability to express municipalities the conflicts of their zoning plan in comparison to provincial policy and obligate municipalities to revise the zoning plan (Kamphorst et al, 2008).

Province

The spatial policy is also globally defined in the provincial *Structuurvisie*. In broad lines the development of the province on spatial policy is defined. The province can also use a Judgement (*Zienswijze*) to indicate conflicts of municipal zoning plan with the provincial policy. The *Structuurvisie* and the *Zienswijze* are not legally binding on provincial level. The legally binding instruments the province has, are the following:

- Regulation (*Verordening*): this instrument includes the 'hard' parts of the *Structuurvisie*. It contains the general rules regarding the content of e.g. zoning plans and project decisions.
- Integration plan (*Inpassingsplan*): the province has lost the approval authority on the zoning plan, but with the integration plan the province can determine a part of a municipal zoning plan when necessary. An integration plan excludes a zoning plan and a provincial integration plan.
- Project decision (*Projectbesluit*): this makes it possible for the province to determine, on project level, an exemption on the zoning plan. The municipalities are obliged to exempt the project from the currently active zoning plan.
- Proactive indication and reactive indication (*Proactieve aanwijzing en Reactieve aanwijzing*): the province 1) give an indication beforehand with certain regulations which should be implemented in the zoning plan or 2) block the implementation of a draft zoning plan (Kamphorst et al, 2008).

Municipality

The spatial policy is also globally defined in the municipal *Structuurvisie*. In broad lines the development of the municipality on spatial policy is defined. As legally binding instruments the municipalities have the central normative document to use: the zoning plan (*bestemmingsplan*). This forms the legal basis for the application of a building or demolition permit and the establishment of an expropriation right (*onteigeningsrecht*) and emptive right (*voorkeursrecht*). The validity of a zoning plan is ten years and the zoning plan need to be fixed for every part of the municipality. For the parts of the municipality where spatial development is planned a zoning plan is needed and for the parts where no spatial development is planned a management regulation is sufficient (*beheersverordening*). The municipality also has the ability to make an exemption on the zoning plan with a project decision (*projectbesluit*) (Kamphorst et al, 2008).

Overheid	Instrument	Juridisch karakter	Eerste bevoegdheid
Rijk	Structuurvisie	Alleen zelfbinding	Minister
	AMvB	Bindend	Regering
	Pro-actieve aanwijzing	Bindend	Minister
	Reactieve aanwijzing	Bindend	Minister
	Projectbesluit	Bindend	Minister
	Inpassingsplan	Bindend	Minister
provincie	Structuurvisie	Alleen zelfbinding	Provinciale Staten
	Zienswijze	Alleen zelfbinding	Gedeputeerde Staten
	Verordening	Bindend	Provinciale Staten
	Pro-actieve aanwijzing	Bindend	Gedeputeerde Staten
	Reactieve aanwijzing	Bindend	Gedeputeerde Staten
	Inpassingsplan	Bindend	Provinciale Staten
gemeente	Projectbesluit	Bindend	Provinciale Staten
	Structuurvisie	Alleen zelfbinding	Gemeenteraad
	Beheersverordening	Bindend	Gemeenteraad
	Bestemmingsplan	Bindend	Gemeenteraad
	Projectbesluit	Bindend	Gemeenteraad

Figure 2.2: Overview of Instruments, legal character and competence per governmental layer from Wro (Kamphorst et al, 2008)

2.3.3. Conclusions

The historic overview shows the development of the governmental interference in spatial planning. Different periods are distinguished and generally the government strongly directed the spatial planning until the 1970s. From the 1980s the governmental interference decreased. This resulted in the 1990s, by the announcement of the *Vinex-locaties*, in an increase of involvement of commercial actors on the land market. Due to this increasing number of actors the competition increased and thereby also the land prices increased rapidly (Segeren, 2007). This resulted in large land supplies among municipalities as well as commercial actors. Furthermore the instrumentation of the different governmental layers is discussed. The *Wro* (2008) and *Nota Ruimte* (2006) define the current instrumentation and due to decentralization the municipalities gain more and more responsibilities and instruments.

2.4 Municipal land use policy in the Netherlands

The State and province have a controlling, directing role in the spatial planning. The implementation of the actual spatial policy is mainly done by municipalities by means of the zoning plan. As the research aims on the municipal point of view and because of the importance of municipalities in spatial planning it is necessary to get a more detailed view on the municipal role. Municipalities have in absolute sense the most prominent role on the land market (actor on land market with the largest supply of land) and also in an institutional sense (the most instruments and knowledge for the purpose of spatial planning). In this paragraph municipal land use policy will be scrutinized and the instruments of municipalities in land use policy are discussed.

2.4.1. Municipal land use policy

For many municipal activities land is necessary. Municipal plans, e.g. in the field of demographical development, employment and recreation have consequences on the municipal land use. In many cases the intended development of the municipality results in the necessity to change the land use. With land use policy the municipality tries to steer on these changes in land use. A formal definition: '*Land use policy is a conscious governmental interference on the land market (Groetelaers, 2004)*'.

A municipality is able to secure the achievement of their spatial ambitions by the interference on the land market. But the way to secure this achievement and what spatial ambitions the municipalities have can differ strongly between municipalities. Generally municipalities have the following goals with land use policy:

- Encouraging the socially desirable land use and spatial quality. In this way land use policy is directly linked to spatial planning. By land use policy the municipality is able to achieve certain spatial ambitions.
- Encouraging an equitable distribution of costs and revenues. With a land development different actors are involved and the municipality tries to distribute costs and revenues equally (Ministerie VROM, 2001).

These goals need to be clearly defined on project level to make sure the progression can be measured and ultimately the goals can be achieved. In the municipal politics these tasks are, generally, divided between the city council (*gemeenteraad*) and mayor and executive board (*college van burgemeester en wethouders*). Regarding land use policy there are three tasks within municipal politics divided thus: (1) the city council defines the frameworks of land use policy, (2) the mayor and executive board implements the policy, (3) and the city council controls the implementation (figure 3.2).

- (1) **Define frameworks:** the *Nota Grondbeleid* defines the ‘rules’ of land use policy for the municipality. The general goals are made more specific for a certain period and the council and executive board agreed on what information (in what form and on what time) is shared with the council.
- (2) **Implementation:** annually the executive board submits the policy goals for the coming year in a paragraph of the municipal budget. In the *Meerjarenprognose Grondbedrijf (MPG)* the executive board presents an overview of the spatial plans. The plans which are in development or in preparation, the planning, program and degree of involvement of the municipality in these plans. And the executive board is also obliged, in the context of the active information obligation between council and executive board, to inform the council when major deviations (e.g. in planning, financial result, program) in plans occur.
- (3) **Control:** the council controls the executive board on the predefined frameworks from the *Nota Grondbeleid*. The implementation of the land use policy needs to stay within the predefined frameworks. The executive board reports periodic (in managements reports) and annually (in the annual report) in the *Paragraaf Grondbeleid*. In the *Besluit begroting en verantwoording (BBV)* are the regulations defined how to report the annual (financial) results in the municipal budget and annual report. A specific paragraph is dedicated to the accountability of the land use policy (ten Have et al, 2010).

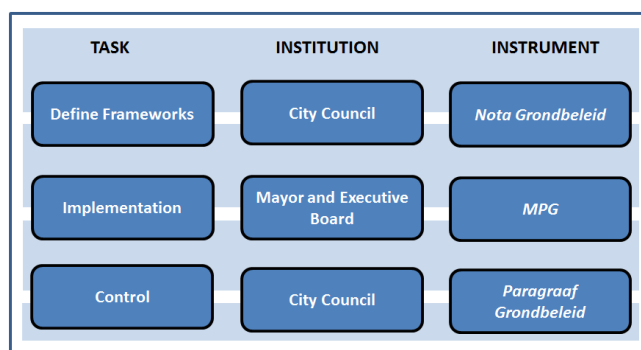


Figure 2.3: Land use policy in the context of municipal politics
(based on ten Have et al, 2010)

2.4.2. Types of municipal land use policy

The different types of municipal land use policy depend on the existing land possession and the degree of control a municipality wants to have in spatial planning. In general there are two forms of land use policy:

- With **active land use policy** the municipality acts as a commercial actor and acquires the land (or already possesses it), transforms it and sells it (or uses it themselves). The municipality has public as well as private instrumentation and aims on the acquisition and sale of land. Active land use policy makes it (in some cases) possible for municipalities to fulfil the directing role more efficient: organizational, legal and financial the municipality has more control. Also, the community can benefit from the increase in value of the land (through the change in land use) because the profit is used to invest in public facilities (infrastructure, public space and social facilities). But as major drawback, the municipality is taking more financial risks with active municipal land use policy.
- With **facilitating land use policy** the municipality leaves the acquisition and development of land with others (developers, builders, housing associations, speculators). The municipality has only public, facilitating instrumentation and limits itself to their regulating task. The instrumentation of this land use policy aims on cost recovery (Ministerie VROM, 2001).

The boundary between active and facilitating land use policy is diffuse. More and more a **directing land use policy** is applied where active as well as facilitating land use policy is combined in order to realize the spatial development. In many area developments this results in the municipality which acquires (a part of) the land and subsequently a commercial actor develops the area development further. This cooperation between municipality and commercial actors is called a public-private partnership (PPP) and we will discuss the three most applied forms:

- **PPP concessie-model:** In this partnership the area development is developed by commercial actors. In the initiative phase the municipality controls the tender and defines, in cooperation with the selected commercial actors, the output and quality level. The municipality and the commercial actors divide the risks and secure these agreements in a concession contract. In the realisation phase the municipality hands on the authorities and tasks regarding the realization of the public facilities to the commercial actors; the municipality grants a concession. Thereafter the municipality controls the predefined output and quality level.
- **PPP bouwclaim-model:** In this partnership the municipality and commercial actors divide the activities, the responsibilities, risks of development, operation and management. These factors are secured in a cooperation agreement (*samenwerkingsovereenkomst; SOK*). In this form the land is divided between different actors. The land is handed over to the municipality for a reasonable price

and the municipality is responsible for the land development. With this transfer of land the commercial actors gain the development rights (*bouwclaim*) e.g. for a certain amount of houses, sometimes on the location, sometimes somewhere else in the municipality. When the land development is done, the transformed building land is redelivered to the commercial actors in order to start the real estate development. The public area stays in possession of the municipality. At the time of acquisition of the raw land (from the commercial actors) agreements are made on the price level of the sale of the building land (back to the commercial actors). For municipalities this gives certainty in an early stadium.

- **PPP joint-venture:** In this partnership the municipality and commercial actors do not divide but share the activities, responsibilities, risks of land development, operation and management. All of this is transferred to a shared organization where municipality and commercial actors participate in the land development. There are different forms of this shared organization whereas the legal base of the organization defines the 'strength' of the partnership. When a different legal entity is formed for the land development (*Gemeenschappelijke (grond)exploitatie maatschappij, GEM*) the share is dependent of the contributed land and the partnership can cover the risks and benefits from fiscal advantage (ten Have et al, 2010).

In the context of the historic development of spatial planning the mainly applied active land use policy of municipalities is explicable. In that way it was always possible for municipalities to strongly control the spatial development. But with the risks of active land use policy are becoming more and more clear because of the economic crisis and due to new instrumentation introduced with the planning law in 2008 (*Wro*) there are more aspects of importance when considering the type of land use policy used. Per spatial plan this consideration has to be done:

- What does the municipality wants to achieve?
 - What can the municipality manage (organizational and financial)?
 - What risk is the municipality able to take?
 - What is the current land supply and the planned spatial development of the municipality?
- (Bots, 2012; ten Have et al, 2010)

2.4.3. Instrumentation of municipalities

The different types of land use policies have different instrumentation to intervene in the land market. All instrumentation is discussed but divided in instrumentation in active or facilitating land use policy. Because the directing land use policy is a combination of these two it depends on the type of PPP used which instrumentation is applicable. Furthermore, because of the specific Dutch context of the land use policies in figure 2.4 an overview of the instrumentation (Dutch and English) with a short description is given.

Type of instrument	Instrument (English)	Instrument (Dutch)	Description
Active land use policy			
Active Acquisition	Strategic land acquisition	<i>Strategische grondverwerving</i>	In anticipation of an area development the municipality acquires land with the purpose of initiating a spatial development.
Active Acquisition	Amicable acquisition	<i>Minnelijke verwerving</i>	The municipality acquires the land directly from the owner whereby the market value is determined by an independent valuator.
Active Acquisition	Expropriation	<i>Onteigening</i>	Legal instrument the municipality can use to oblige the owner to sell the land to the municipality.
Passive Acquisition	Emptive right	<i>Voorkeursrecht</i>	When the owner of land or real estate decides to sell the land the municipality can use this right to get the first option to buy the real estate or land.
Sale of building land	Land allocation agreement	<i>Gronduitgifte overeenkomst</i>	Agreement which is used in order to secure qualitative and quantitative conditions of the area development with the developing party.
Sale of building land	Land price policy	<i>Grondprijnsbeleid</i>	The land prices are annually documented and the underlying frameworks, principles and preconditions are defined.
Facilitating land use policy			
Provides framework	Zoning plan	<i>Bestemmingsplan</i>	The planned spatial development on a specific location is documented in this plan (e.g. land use)
Cost recovery	Land development law	<i>Grondexploitatie wet</i>	It ensures cost recovery through a private agreement with commercial actors, the building permit or site requirements in the zoning or development plan.
Cost recovery	Development plan / agreement	<i>Exploitatie plan / overeenkomst</i>	Detailed overview of costs for public facilities which can result in an agreement between commercial actors and municipality.
Cost recovery	Benefit tax	<i>Baatbelasting</i>	Cost recovery for public facilities when it can not be done via area development; the benefited area is taxed.

Figure 2.4: Overview of instrumentation in active and facilitating land use policy for municipalities.

Active land use policy

The core of active land use policy is **strategic land acquisition**. The instrument was very popular in times of upward economic development, but in the current times of economic crisis the big risks of strategic land acquisition become painfully clear. It is, after all, not certain when and if the municipality can start with the spatial planning and if the planned development will cover the costs (of acquisition, interest and management) (ten Have et al, 2010). The current regulations from the *Commissie BBV* increase the problems for the strategically acquired land: the land has to be valued on the current use and can no longer be valued on the future use (Commissie BBV, 2012a). In paragraph 4.2 the regulations regarding the municipal budgets and balances are described in more detail.

In order to acquire the land which municipalities want to spatially develop there are three instruments municipalities can use. With **amicable acquisition** the market value of the land forms the maximum price the municipality is willing to pay. Subsequently the municipality

negotiates with the owner about the price of the land.

But when the owner does not want to sell the land, the municipality can use the right of **expropriation** on the owner of the land. The acquirement of the land is done forcibly. The rules regarding this expropriation right are defined in the law: the *Ontheiginingswet*. In the Dutch practice expropriation is not common. This is partly related to the Dutch culture of *polderen*; the ability of Dutch people to eventually come to a compromise. As well as the fact that municipalities, before they can use the expropriation right, are obliged to do serious attempts of amicable acquirement.

As last acquirement instrument, there is the municipal **emptive right** on land. The rules regarding the municipal emptive right are defined in the law: the *Wet Voorkeursrecht Gemeenten*. With this right the municipality is able to secure their controlling role on spatial planning and undesirable sales to third parties are avoided. An important aspect is the fact that the emptive right needs to be established before the zoning plan is fixed and in a relatively short period the planning procedures of the location need to be started (Bots 2012; Lahpor, 2010).

The active land use policy is based on the transformation process of the acquired land to building land and subsequently sell the building land. There are two instruments which can help ensure/define the sale of building land. In the **land allocation agreement** the agreements between commercial actors and municipality are defined. The allocation price of the land is determined; this price also consist of the costs for infrastructure and public space. It is important the allocation price is objectively determined by a certified valuator to be sure the price is in line with the market value. And also a fair and equal tender needs to be guaranteed in order to prevent state aid (*staatssteun*) (ten Have et al, 2010). The land allocation agreement can exist in many different forms because it depends on the land ownership and involvement of different actors (paragraph 2.4.2.).

In the basis there are two approaches for the **land price policy**: the cost approach and the market value approach. With the cost approach the allocation price is determined by means of the incurred costs. In that way in the end all costs are covered, but no profit is made. With the market value approach municipalities aim to gain profit from land development (Scheele-Goedhart et al, 2009).

Facilitating land use policy

With facilitating land use policy the municipality does not participate at risk in the spatial development and is limited to their regulating role: i.e. the determination and control on frameworks, principles and preconditions for the area development. The most important public instrument municipalities is the **zoning plan**. This plan is determined for every location within the municipal borders where spatial development is wanted. With a facilitating land use policy municipalities are able to control the area development in the form of the building permit. The spatial plans developed by the commercial actors need to be in line with the zoning plan, otherwise municipalities will not give out a building permit.

In the past, when municipalities had no ownership of land in area developments they had little possibilities for cost recovery for the construction of public facilities (such as social facilities, infrastructure and public space). Since the implementation of **the land development law** in 2008 as part of the new *Wro*, municipalities have more possibilities for cost recovery. The land development law enables municipalities to oblige commercial actors to (partly) compensate the costs municipalities made. In the new *Wro* (2008) is assumed that commercial actors and municipalities first negotiate to what extent cost recovery takes places. A **development plan** is composed. It gives a detailed overview (and is annually revised to make it more accurate) of the costs for public facilities. After completion of the area development when costs are 5% lower than expected, the municipality is obliged to refund this compensation to the commercial actors. This development plan forms the basis for the negotiation between municipality and commercial actors and results eventually in a land development agreement. In that way the cost recovery is legally fixed (van de Klundert, 2008). The last public instrument of municipalities in land use policy is **the benefit tax** (*baatbelasting*). The cost recovery is at first done through the building permit but for facilities that are not indicated as *Bovenwijkse voorzieningen* (such as sewerage in a newly built outskirt of the city or the public space in a shopping centre) this is not possible. In such cases municipalities are able, when it is specifically possible to determine the benefited area, to tax this benefited area for the costs made (ten Have et al, 2010).

2.4.4. Conclusions

In general there are two forms of municipal land use policy: active and facilitating land use policy. The different forms of land use policies have different instruments. The active land use policy is mostly applied and from the historic overview explicable. With this form of land use policy the municipality is able to control the spatial development strongly. And the municipality has the possibility to gain profit from the land developments. With this form of land use policy the duality in the municipal role on the land market becomes clear: 1) on the one hand the municipality sets the rules for the land market and 2) on the other hand the municipality is an active stakeholder in the market as they use the network and hierarchy of this market to achieve their goals and ambitions with spatial planning (Buitelaar 2003; Needham & De Kam 2004).

The facilitating land use policy is aiming solely on the regulating task and therefore only has public instrumentation. With this policy the municipality has less control on the spatial developments but on the other hand there are no financial risks taken. And due to the implemented land development law in 2008 the financial influence is improved by new instruments for cost recovery. There is also a third combined form of land use policy: the directing land use policy. In this form municipalities and commercial actors cooperatively undertake the area development (mostly because of fragmented land ownership). Due to the economic crises the financial risks of active land use policy become painfully clear and municipalities are shifting towards facilitating and directing land use policy.

CHAPTER 3 THE CONTEXT OF AREA DEVELOPMENT

3.1 Introduction

“Corn is not high because rents are high, rents are high because corn is high.” – D. Ricardo (1821) in *Principles of political economy and taxation* on the fact that the value of land is derived from what is happening on the land.

The vision and policy of the government are originally at the point of focus in spatial planning. The social issues related to an area are at the point of focus in area development. These broad issues are undertaken by the natural participation of stakeholders and commercial actors in area development. The different governmental layers set the frameworks and commercial actors, inhabitants and users have, within these frameworks, a right to initiate. The quality of the (living) environment is a shared responsibility and a shared interest of public and private stakeholders. In that way area development is the implementation of two forms of spatial planning: *toelatingsplanologie en ontwikkelingsplanologie* (subparagraph 2.3.1.) (van Rooy et al, 2006).

In paragraph 2.4 area development was introduced and on a global level discussed as part of municipal land use policy. This research limits to area developments on outskirts of cities (*uitleggebieden*) with (future) residential land use. Every land use has its own segmented land market and different factors influencing it, therefore all land uses and locations are too extensive to discuss in this research. The process of area development and more specifically land development as part of area development (paragraph 3.2) is discussed. Furthermore there will be zoomed in on the different methods of land valuation which are used in area development (paragraph 3.3) and the different actors in area development and their role (paragraph 3.4). Finally, based on the developments in the economic situation, spatial planning, land use policy and area development, the current problems for municipalities regarding their land supply are explained (paragraph 3.5). What changes did result in losses on land developments?

3.2 Land development as part of area development

In this paragraph the close relationship between area development and land development will become clear. First the process of area development is looked at to subsequently zoom in on land development.

3.2.1. The process of area development

In general the process of area development has four phases (figure 3.1): initiation, feasibility, realization and operation phase. In the **initiation phase** a stakeholder (public or private) presents a plan for the spatial development of an area. It is possible the stakeholder has a land or real estate position in the area or there are policy intentions with the area from a governmental layer (State, province or municipality).

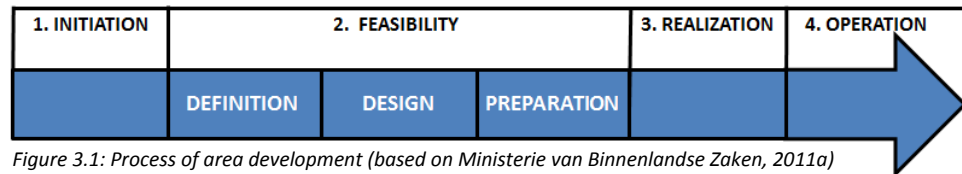


Figure 3.1: Process of area development (based on Ministerie van Binnenlandse Zaken, 2011a)

After the intention plan is determined the **feasibility phase** is started. This is a complex phase because of the diversity possible and is generally divided in three phases: (1) in the *definition phase* the public and planning preconditions (zoning plan, building permit etc.) are determined by the responsible government (mostly municipality). (2) In the *design phase* the commercial actors (and in a PPP in cooperation with the municipality) come to a design for the area development which fits the results of the definition phase. And also the public part of the area development (public space, infrastructure, social facilities) is added to the design. (3) In the *preparation phase* the design is further elaborated in a realization plan which consist of the actual plans and phasing of the area development. Because of the size of area developments it is important these three phases are passed to determine which actor is responsible for what activities. Also the feasibility phase is an iterative one; it is a repeating process. After all, the first design will probably not be feasible and needs to be adapted several times. With 'calculating and drawing' the plans are reevaluated and made feasible eventually.

In the **realization phase** the actual plans determined in the feasibility phase are realized; this regards the land and real estate development. The land needs to be acquired (or is in possession of the involved actors), needs to be transformed to building land (*bouwrijp*), land as public space and infrastructure (*woonrijp*) and the real estate needs to be developed on this land. At the start of this phase it is clear which actor is responsible for what activities and on what time. The allocation of responsibilities, organisation of the (risk)management and a smooth realisation is of great importance to stay within budget and planning. The basis for a successful area development lays within these factors.

In the **operation phase** the area development is completed. The real estate is transferred for the operation and maintenance to the users or owners: with dwellings to the home owner, housing association or investor, with commercial real estate to the owner or investor, with industrial real estate to the owner or investor and with the public space and social facilities to the municipality (Ministerie van Binnenlandse Zaken, 2011a).

3.2.2. The process of land development

In the Netherlands since the 1990s the majority of the municipalities have administered an active land use policy (subparagraph 2.3.1.). With the active land use policy municipalities want to control the spatial development plans. In an area development the land possession is the basis on which actors participate, this can be in different forms:

- The municipalities strategically acquired land on which spatial developments for the future were foreseen. The municipality is the owner of the land and searches for commercial actors for the real estate development.
- The land possession can be scattered and different commercial actors can possess parts of the area. But when the municipality foresees spatial development on this area they can still partly control the development by their public instrumentation (e.g. zoning plan) and sometimes fully control it by acquiring the raw land of the commercial actors for the land development.

These are the two basic forms: full possession and control of the municipality and no possession and partial control (by public instrumentation) of the municipality. There are many intermediate forms possible; every area development is unique because of its location, preconditions and involved actors. But in every form the municipality is an important actor; especially in the land development process.

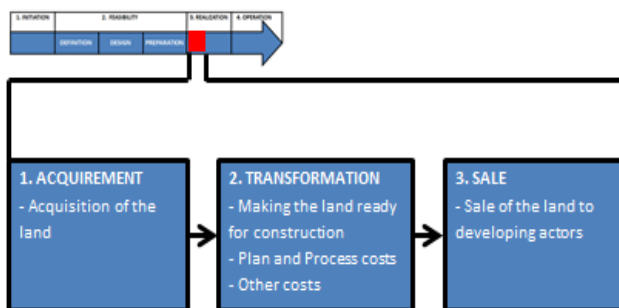


Figure 3.2: Land Development Process (based on Needham et al, 2000; Buitelaar en Witte 2011)

The land development process is the transformation process of land in the following three steps (figure 3.2): (1) **acquisition** of the land: this phase depends of the form of area development and the land possession of the different actors. The following situation is used as simplified example: the land is

strategically acquired by the municipality when the spatial development was not planned yet. It is acquired as agricultural land on the outskirts of the city where in the future a residential area is foreseen by the municipality. In the feasibility phase the spatial plans are determined, the land use is changed and the developing actors are contracted. Then the realization phase starts and (2) the **transformation** of the land. The raw (agricultural) land is made ready for construction as land with a residential land use. Subsequently the municipality is able to (3) **sell** the building land to the developing actor which will start the real estate development (Needham et al, 2000; Buitelaar and Witte, 2011).

The transformation process of the land is based on the increase in value due to the transformation of land use. The land value depends on the land use and the location; agricultural land is €5 per m² lot, while residential land on outskirts of cities is €100-400 per m² lot (dependent of location) and inner-city housing land can be up to €3500 per m² usable surface area in Amsterdam (*gebruiksoppervlakte*) (Scheele-Goedhart et al, 2009; Gemeente Amsterdam, 2012). The factors and different methods to determine the value of land are further substantiated in paragraph 3.3.

The land development process starts with costs for acquirement (*verwerving*), the land transformation costs (*bouw en woonrijp maken*) and as last the allocation of the building land (*gronduitgifte*) gains the needed revenues. Figure 3.3 shows the composition of the land development costs and figure 3.4 shows the general development of costs and revenues over time. The acquirement of the land results in a significant pre investment and

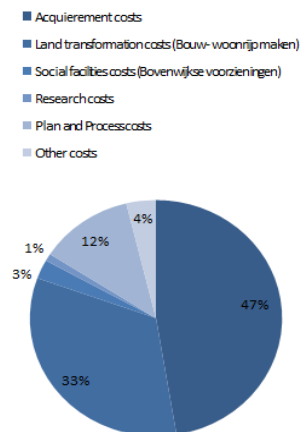


Figure 3.3: Composition of land development costs.(based on Buitelaar and Witte, 2011)

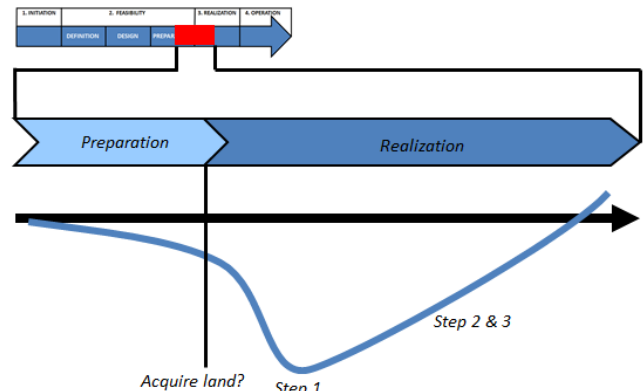


Figure 3.4: Costs and revenues of land development process schematically plotted in time.

the transformation of the land increases the costs to make. This all is recouped by the allocation of the building land. Area developments are phased because of the complexity and long run-time, this results in revenues by allocation of building land and in costs made to transform the raw land at the same time.

3.2.3. Land development

The land development (*grondexploitatie*) is as stated by ten Have et al (2010) 'the financial interpretation of a spatial plan in time'. A land development gives insight in the feasibility of a spatial plan and is used to manage the risks. Due to the complexity and significant size of area developments there are different factors influencing the feasibility of the land development. It is important to cautiously compose a land development and use carefully chosen and substantiated parameters because the development of these factors over time is uncertain and can influence the financial result enormously. The following factors form the input of a land development¹:

- **Program:** the number of planned housing units, the quality of the housing units, the amount of square meters allocable land (*uitgeefbare grond*), the amount of square meters water and green, the social facilities and the quality level of the public space.
- **Actors:** the municipality can cooperate with commercial actors to minimize or to transfer risks. Examples are a type of PPP or even a separate legal entity for the land development (*grondexploitatiemaatschappij, GEM*).

¹ Note: Every (mix of) land use and location is conceivable but in order to simplify the situation an area development on the outskirts of the city with the land use housing is used as example.

- **Physical environment:** the current state of the area (soil conditions, pollution), the current real estate in the area and planned actions and the possibilities to enlarge or reduce the area development.
- **Finances:** the development of the cash flow over time, used interest rate and the ratio between liabilities and private equity.
- **Phasing:** the planning over time of costs and revenues; this influences the eventual financial result. Because of the significant size of area developments the planning is very important to make sure a realistic sale of real estate is achieved.
- **Parameters:** costs and revenues development over time, interest rate and the run-time of the development (ten Have et al, 2010).

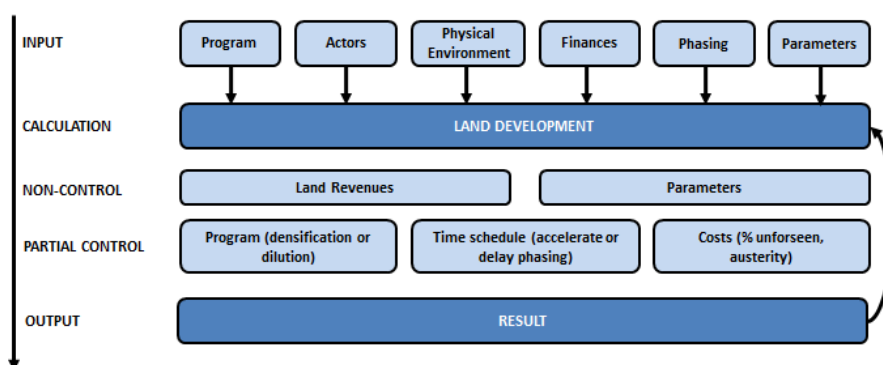


Figure 3.5: Municipal land development, schematically shown (based on ten Have et al, 2010)

In figure 3.5 the land development is schematically shown. With the different factors, discussed above, it is possible to construct a land development. As the run-time is normally about 10 years or more, it is necessary to reevaluate the estimations of the different factors constantly. Economic, social and spatial developments on global, national, regional and municipal level can influence the land developments. Constant risk management is very important to control the finances of land developments (subparagraph 4.2.1.).

It should also be clear that the development of these different factors over time is difficult to estimate beforehand. The different factors have various degrees of controllability for municipalities. The land revenues and parameters are not controllable because these factors fully depend on the economic development. To determine the land revenues the residual land valuation method is used (paragraph 3.3); this method depends of the housing prices and these depend of the economic development. The parameters are also highly dependent of the economic development. Therefore it is important for municipalities to estimate and monitor the land revenues and used parameters constantly. For that reason municipalities normally reevaluate and adjust their land developments one or two times per year.

The time schedule (phasing) is partly controllable: on the one hand municipalities are dependent of the economic development for the amount of building land allocated and on

the other hand municipalities are able to adjust the allocation of building land when demand is high or low. The program and costs are also partly controllable: to a certain degree municipalities are able to adjust the program to densify or dilute the number of housing units and the costs can be adjusted by e.g. changing the percentage unforeseen costs or economizing the public space or quality of the housing units.

3.3 Land valuation methods

An important aspect of the land development process is the land value. It is important for municipalities (with an active land use policy) to acquire land for the realistic market value and after transformation sell it for a realistic market value to the developing actor. As substantiated in paragraph 2.2. the land value is derived from the location and the land use. Nowadays generally three land valuation methods are used: the residual valuation method, the comparative method and the land quote method.

3.3.1. Used valuation methods

The **residual valuation method** can be traced back to David Ricardo' theory of land rents, as discussed in subparagraph 2.2.3. The value of the land is derived from the land use, and not vice versa: 'Corn is not high because rents are high, rents are high because corn is high' (Ricardo, 1821). Although Ricardo' theory is related to agricultural land, it is also applicable

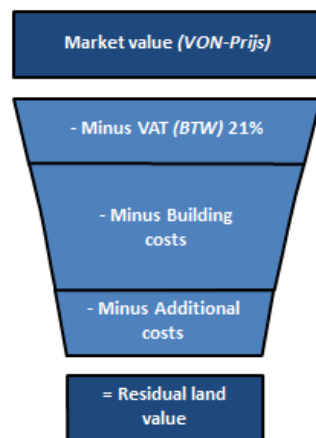


Figure 3.6: Residual valuation method

on the urban land market where the profitability of the land use determines the land value (Buitelaar and Witte, 2011).

With the residual valuation method the value of the land is derived from the revenues and costs of the land use realized on the location. As example, the casus of one dwelling is used. The difference between the market value of the dwelling (*VON-prijs*) and building costs including the VAT and additional costs is the residual value of the land for the residential land use (figure 3.6). For this method it is very important to have insight in and knowledge of (the development of) building costs and housing prices. After all, a minor change in the building costs or the market value of a dwelling significantly changes the residual land value. This valuation method is preferred by the commercial actors,

Ministerie VROM and Vereniging Nederlandse Gemeenten (VNG) and is most commonly used and generally accepted by municipalities and commercial actors. In paragraph 3.5 the weaknesses of this method will be discussed (Ministerie VROM, 2001; ten Have et al, 2010).

With the **land quote method** the land value is determined as a percentage of the market value of the real estate. This method is mainly used with large scale area developments on outskirts of cities (*uitleggebieden*) with a large construction output of dwellings. A residual valuation of reference projects and a comparison of land quotes used in adjacent

municipalities underlies the used land quote. It is important to take account of differences in market values and building costs in adjacent municipalities when the land quote is determined (Ministerie VROM, 2001).

With the **comparative method** the land value is determined by means of comparison of similar area developments in adjacent municipalities. This method is commonly used as complementation on the land quote or residual valuation method; as a test of the correctness of the valuations (Ministerie VROM, 2001).

3.3.2. Focus of municipalities

These valuation methods form the basis of the used land price policy of municipalities. In the *Nota Grondbeleid* the municipality annually states the used land prices for different land uses. It gives municipalities protection when negotiating with commercial actors on land prices. And it is a control instrument for the city council; it helps them to determine whether the agreed land prices in area development between executive board and commercial actors are the realistic market value. Also, when deviations of the land price policy occur the executive board is obliged to substantiate this deviation. A general deviation can occur e.g. when social housing is developed. Social housing is not profitable but is one of the social tasks of the government; to provide every citizen affordable housing. This results in a lower land price than the market value. It is also possible to have a specific project deviation, this is normally the result of negotiations between municipality and developing actors. Because of shared interest of municipality and developing actors a lower land price can be necessary. It is of great importance the actors are able to substantiate the deviation from the original land price in order to prevent state aid (*staatssteun*) and to give the council the possibility to judge the correctness of the specific deviation.

The commonly used and generally accepted land valuation methods are all based on the real estate development. This shows the interdependency of land development and real estate development. The land value is based, in every method, to some degree on the real estate value/development. Therefore municipalities need to be aware of the development of land costs as well as building costs and market value of real estate. The knowledge of these factors needs to be present in the governmental organization.

3.4 Actors in area development

In this paragraph the different actors and their role in area development will be shortly described. In the previous paragraph the terms commercial, developing, public and private actors are used. Here will be further substantiated which actor is meant and what their role in area development is.

The **government** is the public actor in area development and is active in three public figures: the State, the province and the municipality. Their public tasks and history is discussed in paragraph 2.3. The municipality is the most important public actor in area development. They have the responsibility and the mandate of spatial planning and need to find the political support and secure legitimacy. The initiators of major area developments are often municipalities, sometimes encouraged and controlled by the higher governmental layers. Municipalities have in general three reasons for their involvement in area development, as stated by Putman (2010):

- Area developments often contain land use and zoning plan changes and the municipality needs to approve these spatial changes.
- The municipality is often owner of the land (due to active land use policy) and therefore controls the choice of the developing actors.
- Area developments are more than real estate developments; infrastructure, social facilities and public space need to be realized by the municipalities.

At this moment municipalities have the largest land supply of all actors in area development; in total this land supply represents a book value of € 13 billion for all Dutch municipalities (Bouwteam, 2012).

Developers (are developing and commercial actors and) develop real estate at own expense and risk. They are often initiator in area developments and elaborate the spatial concepts and plans for the area development. The developers invest in the area development with the aim of gaining profit by selling the developed real estate. Their main goal is to fasten the process from feasibility phase to realization; in that way it is possible to make the maximum profit with the minimum capital requirement. Developers normally finance the developments by loaned capital and are therefore dependent of the developments on the capital market. Also they take the risk of developing real estate and try to find buyers for the real estate and therefore are dependent of the developments on the real estate market (Weerd, 2007). At this moment developers in the Netherlands have a significant land supply; in total the land supply of developers represents a book value of € 3 billion (Bouwteam, 2012).

Housing associations (are developing, semi-public actors and) develop housing at own expense and risk with a social goal. The primary task of housing associations is to provide the disadvantaged good quality and affordable housing. Housing associations can be involved in area developments in different ways: because of owned real estate or land in the area,

because of the planned purchase of housing in the area or because of the intrinsic wish to develop social housing in the area. Because of the historic importance of housing associations in the Netherlands they have a large supply of housing in cities and have significant private equity. Also, because of their semi-public character they are able to attract loaned capital via the *Waarborgfonds Sociale Woningbouw* with a relatively low interest rate (Ministerie VROM, 2006). Therefore they are an interesting and important actor in area developments. At this moment housing associations in the Netherlands have a significant land supply; in total the land supply of housing associations represents a book value of € 2 billion (Bouwteam, 2012).

Investors (are commercial actors and) buy and operate (*exploiteren*) real estate with a the long-term vision at own expense and risk. An investor buys real estate, rents it to the end-users and sees the annual cash flow as a continuous, safe investment. Investors are mainly active in area developments because of their owned real estate in the area. Their primary goal is to improve the return of the investments on the real estate portfolio for their investors. Investors can participate by revitalizing their property or by adding new property. The long-term vision, market demand and quality of the location and real estate determine the possible participation in the area development of the investor (Ministerie van Binnenlandse Zaken, 2011a).

The eventual **users** of the real estate are more and more involved in area developments. In the recent past the users were only involved after the realization phase to sell or rent the developed property. Nowadays the users are involved in earlier phases (initiation and feasibility, figure 3.1) of the area development to match the needs of users more. For housing an example is the growing interest of users in *Collectief particulier opdrachtgeverschap (CPO)*, in this form of development users buy (in a group) certain building lots directly from the municipality or commercial actor and do the real estate development themselves.

3.5 Economic crisis and impact on municipal land use policy

In the early 1990s the announcement of the locations of future *Vinex-wijken* by government made clear a construction output of housing was wanted by the State. Before this period the majority of newly built dwellings were in the (subsidized, riskless) social sector, but in the *Vinex-wijken* 70% of the newly built dwellings needed to be in the free (nonsubsidized, free market) sector. Thereby the dependency of commercial actors became bigger. This governmental policy made the acquirement of land more popular among commercial actors. In 1997 70% of the building land on *Vinex-locaties* was not in hands of municipalities anymore (Kolpron, 1998; de Regt, 2003).

This changed the roles of the different actors in area development and land development, this is further discussed in subparagraph 3.5.1. Subsequently the economic situation from 2000 until now is discussed in subparagraph 3.5.2. and as last the impact of all these changes on municipal land use policy are determined.

3.5.1. Change in role of actors in residential development

Before the announcement of the *Vinex-locaties* **the traditional way of residential development** was: the municipality acquires the raw land, transforms it into building land and sells it to commercial actors for the real estate development. The price for the raw land is negotiated with farmers and is substantiated by a taxation. The price for the building land is determined with the residual valuation method and is influenced directly by the building program on the land (e.g. number of dwellings, type of dwellings, lot size). The municipality can maximize the land revenues as the land transformation costs stay significantly lower than the revenues from the allocation of building land. This result in profit which can be used by municipalities to cover losses on other land developments: as example 1) the profit from these easy projects on outskirts of the cities can be used to cover losses on more complex, urban (inner city) developments or 2) the profit from the development of free sector dwellings can be used to cover the losses on the development of social sector dwellings in the same project (Segeren, 2007). When after this settlement (*verevening*) still profit is made, this is used in the fund *Bovenwijkse voorzieningen* to finance the newly constructed infrastructure and sometimes also to finance social facilities as swimming pools, libraries or theatres (van Hoek et al, 2011). In this traditional way not only municipalities made their margin but in every part of the process an actor made a margin; this is shown in figure 3.7. The amount of profit depended on the market situation, local circumstances, negotiations between actors and the efficiency of the process (Segeren, 2007).

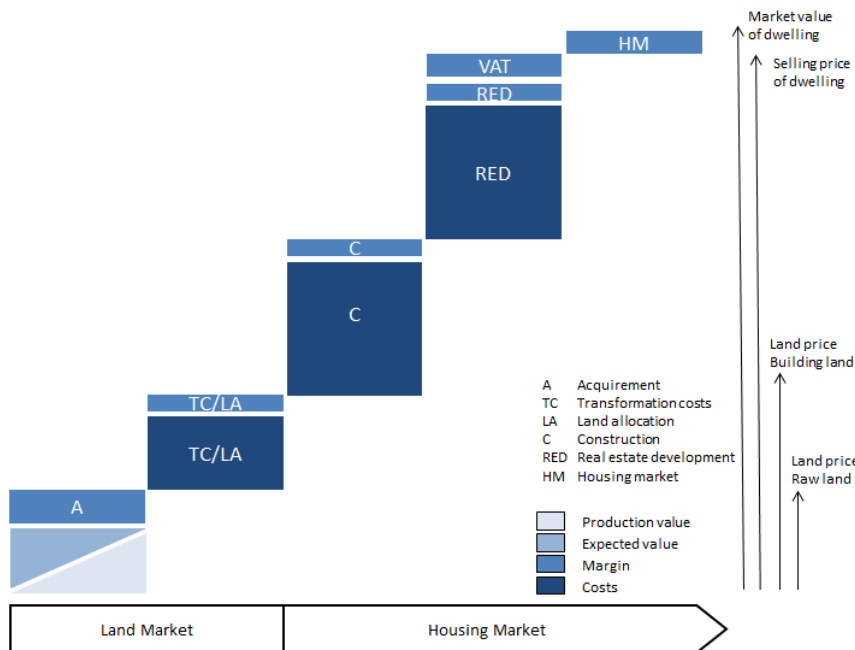


Figure 3.7: Production of land and real estate in traditional situation (based on: Segeren, 2007 and de Greef, 1997)

Because of the announcement of the *Vinex-locaties* the role of the different actors in the residential development changed. The announcement made the acquirement of raw land by commercial actors more popular for three reasons, as stated by Segeren (2007):

1. It was financially attractive to acquire raw land on these locations. This was due to the rapid increase in value of free sector dwellings and thereby the land value (due to used residual valuation method) also increased rapidly. And there was a 70% requirement of free sector dwellings on *Vinex-locaties* which made clear a construction output was wanted by the government.
2. With the ownership of the raw land (designated for future residential land use) commercial actors had the self-realization right; the owner had the right, when he was able to, to develop the dwellings.
3. Municipalities stimulated commercial actors to acquire raw land as they did not have enough capital available to acquire all *Vinex-locaties*. Most commonly intention plans between commercial actors and the municipality were signed to develop the area in cooperation (as the municipality does the land development and the developer the real estate development). See PPP *bouwclaim* in subparagraph 2.4.2.

The involvement of commercial actors did increase the complexity in area developments. Traditionally, the margins were divided between the different actors in the land and housing market. The municipality made its margin with the land development, the contractor with the construction, the developer with the real estate development, and the eventual user with the increase in housing value (assuming the housing prices only increased).

There were now different intermediate forms of land development possible as the municipality was no longer the dominant player on the land market. This resulted, together with the used residual valuation method, in the increasing mix of land development and real estate development. Developers and contractors started to influence, participate and even do the land developments as well as the real estate developments. As traditionally the price of the building land was only determined with the residual valuation method; now the price (at the start of the land development) of raw land was also more and more residually determined. This resulted eventually in an increase in value of raw land as well as building land by means of the ever increasing housing prices.

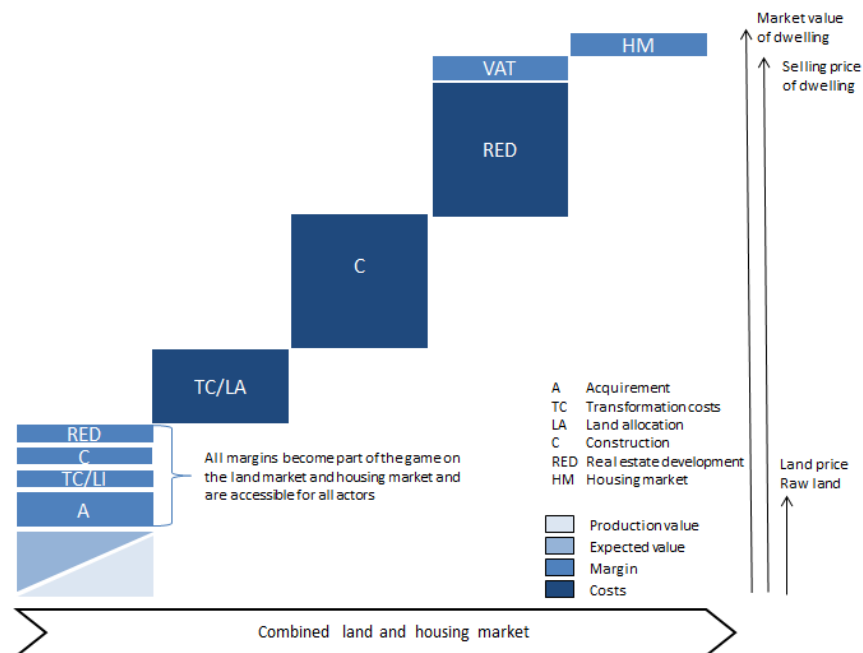


Figure 3.8: Production of land and real estate in changed situation (based on: Segeren, 2007)

All margins in the residential developments are accessible for all actors; but more and more only the seller of the raw land and the buyer of the raw land (which did the land as well as the real estate development) benefited from these margins (Segeren, 2007). This new situation is shown in figure 3.8.

3.5.2. Economic situation

The construction sector is always been highly dependent of economic developments. From 1990 until 2000 there was a boom of annual economic growth of 3.5% and an annual housing price growth of 11%.

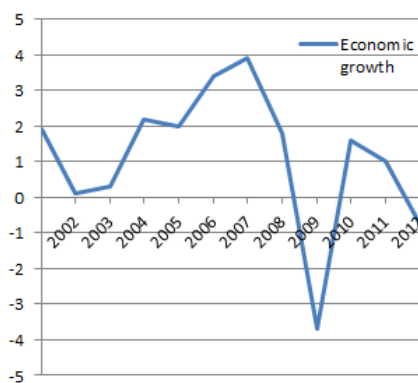


Figure 3.9: Economic development 2001-2012
(based on: CBS, 2012)

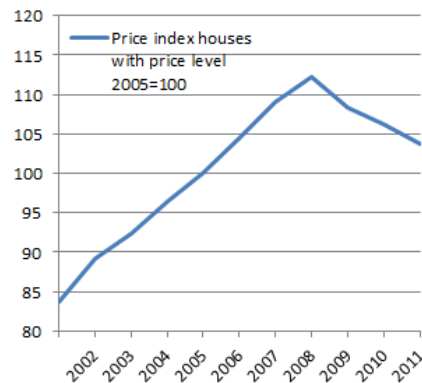


Figure 3.10: Price index development of dwellings
(based on: Kadaster, 2012)

This resulted also in higher investment costs but not in the same degree as the housing prices increased. If we look back at the residual land valuation method (paragraph 3.3), which is used in the area development process, this bigger increase in housing price (than increase in investment costs) results in a significant higher land value. Although the 'internet bubble' did shrink the economic growth in 2002 and 2003, the economy recovered and grew further until 2008. In the period of 2002-2008 the housing prices still increased almost with 5% annually. Figure 3.9 and 3.10 show the economic and price index development from 2001 until the most recent available data.

The economic crisis in 2008 made the credit bubble snap. Hence the requirements to acquire loaned capital are stricter, there is uncertainty about the transfer tax and mortgages and this resulted in uncertainty in the field of residential developments. Eventually in 2010 a major decline in construction output in dwellings appeared.

The construction sector is characterized by the long (planning) procedures, therefore there were still projects 'in the pipeline'. The granted building permits form as indicator of projects 'in the pipeline' (figure 3.11). There is a significant mismatch in granted permits and newly built dwellings, this can be

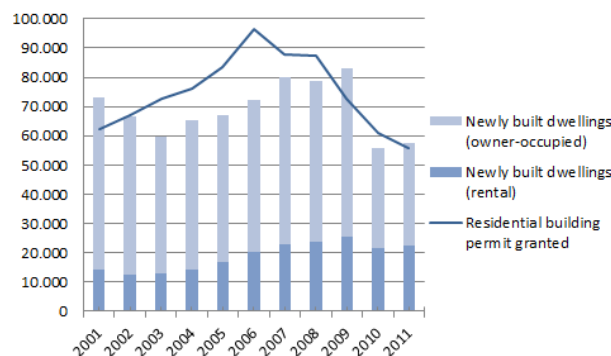


Figure 3.11: Construction output of newly built dwellings and development of residential building permits (based on: CBS, 2012)

an indicator of overplanning of residential projects (CBS, 2012). This indication is further confirmed in the expert meetings (appendix 3) and research by ABF research (2011). However, there are great differences in areas in the Netherlands; some parts face significant oversupply of spatial plans other parts face significant shortage in spatial plans.

In 2012 a total stagnation of area developments is estimated by the EIB (2012); there is no capital available to finance area developments and no consumers are found for the real estate. The EIB (2012) further estimates that the construction sector will land the lowest point in 2013 and thereafter a period of slow recovery will occur. From a demographical point of view there is high demand for housing but due to the economic crisis it is less attractive and possible to change of dwelling in the housing market. This results in a further temporary drop in demand as long as the economic crisis continues and therefore started area developments are delayed² (Vliegenberg, 2011).

3.5.3. Impact on municipal land use policy

The continuing economic crisis has great impact on the financial position of municipalities. **Municipalities face a reduction and/or delay in revenues from land developments.** The land developments as cash cow in the 1990s made it possible for municipalities to increase their reserves, cover losses on unprofitable land developments and invest in social facilities (van Hoek, 2011). But nowadays municipalities face bigger losses on land developments, an evaporation of the reserves and it becomes more difficult to invest in social facilities. Due to the economic crisis the risks on land developments for municipalities further increase, in short because of three reasons:

1. Because of the economic crisis the area developments are delayed. Hereby the allocation of building land in current projects stagnates and revenues stay out. This results in **increasing interest costs on current land developments**. Land developments are for a large part financed with loaned capital so these costs can be significantly high.
2. The residual land valuation method is the generally accepted method to determine the land value. Because of the economic crisis the available capital for land decreases significantly. As stated in figure 3.8 the housing prices are decreasing the last four years. This has major consequences on the residual land value as shown in figure 3.12. If we take a housing price decline of 5% and an investment costs decline of 2% this results in a residual land value decline of 12%. This shows the dependency of the land value on the housing price development; this will result in **a probable land price decline by municipalities**. On the cost side a decline also takes place: the building costs of real estate can also decline due to the economic development and increasing

² Note: The impact of the economic crisis on commercial actors is considerable, but this research limits on the impact on municipalities.

competitiveness, therefore it is uncertain what the decrease in land value will be. But it is probable the land value will decrease more than the total cost side of the land developments.

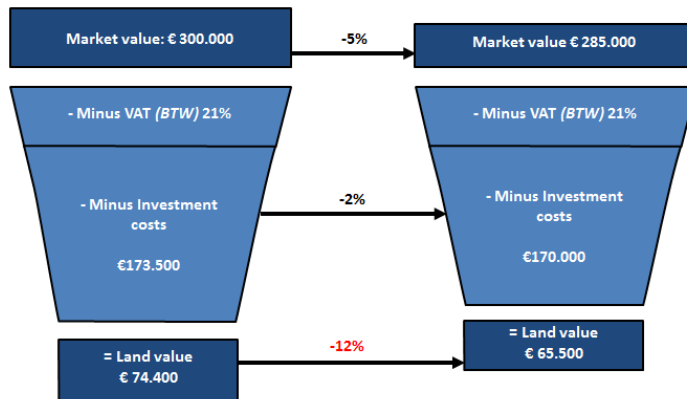


Figure 3.12: Example of impact of housing price decline on residual land value

3. As coverage of the risks of land developments municipalities normally put the projected revenues from these land developments. But because of the delay in area developments and probable decline in land values there is **more uncertainty about these projected revenues**.

Municipalities have a large supply of building land with spatial plans in possession. For the part of the land supply with spatial plans a land development is obligatory by regulations of the *Commissie BBV (2012a)*. This land development is updated at least once a year. With the prognosis of the financial result of land developments assumptions are made for costs, phasing, land revenues and tempo of land allocation (figure 3.5). These assumptions can be annually adjusted based on economic, regional and demographic developments. The current economic situation shows the assumptions made in the past were too positive. Because of changes in the economic situation the municipal land developments show initially an evaporation of the profit and eventually a negative result more often. Thereby it is uncertain whether the projected revenues will be realised in the future because of uncertainty about economic and spatial development.

When the profit is evaporated and the negative results occur municipalities are obliged to cover these losses on land developments with the arrangement of provision or amortization of the book value directly from the reserves. This results in a shrinkage of the reserves of municipalities. When the losses on land developments annually last the municipality can run short of reserves. This can endanger the financial continuity of municipalities because they have no financial space to cover losses in the budget anymore. This will be further substantiated in detail in chapter 4.

Financial continuity of municipalities in danger?

When a municipality experiences major losses on land developments this can result in deficits on the municipal budget. However, municipalities are obliged to annually present a balanced budget. If a municipality is not able to cover the losses made anymore (because the reserves are not sufficient) they are placed under pre-emption of the province. The province normally monitors the financial situation of municipalities after every book year. But when a municipality is not able to present a balanced budget the province will intervene and increase the amount of supervision on this municipality. Extensive cutbacks in budget and increasing taxes are imposed by the province and help the municipality to become financially stable again.

When losses will still occur and the financial situation of the municipality is structurally worsened the municipality can be placed under trusteeship of the State. This *artikel 12*-status is the last possibility for municipalities. The municipality is not able to recover the financial situation and therefore appeals to the State for help. The State will first implement major cutbacks and will, when necessary, provide extra financial resources to ensure a financial healthy situation for the municipality again. Losses will be covered and debts will be cancelled but on the other hand the State takes over all municipal finances and the municipality has lost its own control. Also, the municipalities are obliged to return all the financial resources the State provided after the municipality is financially stable again (Ministerie van Binnenlandse Zaken, 2011b).

CHAPTER 4 DOCUMENTATION OF MUNICIPAL FINANCES

4.1 Introduction

“The government as active actor on the land market results in risk capital invested in land. The economic crisis affects the municipal land use companies thus heavily and is not surprising, nor to condemn.” – prof. mr. Friso de Zeeuw (2012b) in the publication *Grondbedrijven in zwaar weer* on the current financial problems at municipal land use companies due to the economic crisis.

As stated in subparagraph 2.4.1. the tasks regarding municipal land use policy and spatial development of municipalities are divided between city council and the mayor and executive board. We discussed the three documents in which the policy is determined: *Nota Grondbeleid*, *Meerjarenprognose Grondbedrijf (MPG)* and the *Paragraaf Grondbeleid* in the annual municipal budget and report. The *MPG* gives the most detailed overview of the municipal land developments. However, municipalities are not obliged to make this document public. Because the information in the *MPG* could harm the competitiveness of the municipality in area developments the *MPG* is in most cases kept confidential. The limited accessibility of the *MPG* made this research limit itself to the municipal balance and *Paragraaf Grondbeleid* in the budget and annual report of municipalities. In these documents the link between municipal finances and municipal land supply is found and this will help to analyse the financial situation of municipalities regarding their land supply.

The different balance sheet items in the municipal balance regarding land supply and land developments are the book value of the land supply divided in (1) *LID*, (2) *LNID*, (3) other supply, the general reserves of a municipality (freely disposable) and the reserves which are not freely disposable (*reserve grondbedrijf*). In paragraph 4.2 until 4.5 these different balance sheet items are discussed and in figure 4.1 a short overview of the different balance sheet items is giving according to the regulations of the *Commissie BBV (2012b)*. Based on these balance sheet items the Multi Criteria Analysis in chapter 5 will be conducted. As last the size of the problem will become clear in paragraph 4.5 by means of already conducted studies.

Assets	Liabilities
Fixed assets	Fixed liabilities
Intangible fixed assets Tangible fixed assets Financial fixed assets	Equity <i>General reserves (freely disposable)</i> <i>Reserves (non-freely disposable)</i> Provisions Financial long term liabilities
Current assets	Current liabilities
Supply <i>LID</i> <i>LNID</i> <i>Other supply</i> Cash Short term financial assets	Financial short term liabilities

Figure 4.1: Example of municipal balance sheet (based on: Commissie BBV, 2012b)

4.2. Municipal land supply

As stated by Bouwteam (2012) and ten Have et al (2012) the land supply of all Dutch municipalities represents a book value of € 13 billion in the annual reports of 2011. The provincial supervisors annually check the municipal finances and since 2011 (the annual report of 2010) specific research is done on the land developments. In this research by van Dixhoorn-Hoogenboom et al (2012) the land supply of all Dutch municipalities represents a book value of even € 14.5 billion. There are two types of land: 1) the land where a land development is active on (land in development: *LID*) 2) land where the land development is not started; the land development is not administratively determined yet (land not in development: *LNID*).

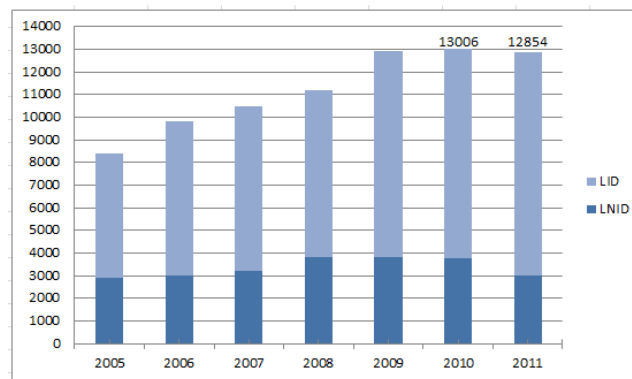


Figure 4.2: Total invested capital (in millions €) in land by Dutch municipalities 2005-2011³
(based on: CBS, 2012 and ten Have et al, 2012)

Municipalities are taking a risk by the invested capital in land because these investments need to be covered by the allocation of building land in the future. In figure 4.1³ an overview of the development of the invested capital in land is given from the most recent research of Ten Have et al (2012).

4.2.1. Book value of land supply

This invested capital in land regards land which is in transformation and is documented in the municipal balance; specified under the category current assets and subcategory supply. The supply of a municipal balance consists of *LNID*, *LID* and other supply (figure 4.1). The book value consists of the acquisition price plus additional costs made in the transformation process; thus the book value changes over time (in line with the land development). At the end of the transformation process the cost price can be determined as the acquisition price plus the eventual additional costs. This cost price in comparison to the allocation prices determined in the annual land price policy (or specifically negotiated on project level with the commercial actors) determines whether the land development is profitable or not. See also (the figures in) subparagraph 3.2.2. in order to understand these accounting definitions in the context of the land development process.

4.2.2. Land not in development (*LNID*)

The land not in development (*LNID*) is mostly strategically acquired by municipalities; they have the expectation of development on this land in the future. Therefore this land is often acquired for a price between the current value (mostly agricultural use) and the future value (e.g. residential use). A financial estimate of the land development is not yet applicable but there should be the firm assumption to start this development in the near future. This firm

assumption should be based on a council decision wherein the ambition and planning period of the development is stated. When no council decision is determined the land is not categorized as *LNID* but as other supply. *LNID* is seen as land in the beginning of the transformation process hence it is possible to activate the plan, process and interest costs; these costs will be added to the book value annually.

In 2012 the regulations regarding the *LNID* are tightened by the *Commissie BBV*. The valuation of the *LNID* should be based on the current land use and not on the future land use is stated more specifically. As stated above the acquisition price is sometimes based on the change in land use and therefore in some cases the book value is too high. This resulted in 2011 in devaluation of the *LNID* by writing off the book value to the market value in current use or in the transfer of the *LNID* to the *LID* as the planning procedures are then forced to completion. With the completion of the planning procedures the land use is changed (e.g. from agricultural to residential) and in that way the book value is not higher than the market value in current land use anymore. These two reasons clarify the decrease in share of *LNID* as shown in figure 4.2.

4.2.3. Land in development (*LID*)

The land in development (*LID*) is land whereof the financial estimate of the land development is determined by the city council (and all planning procedures are finished). All (transformation) costs from the land developments can be activated on the municipal balance and are annually updated. As the different factors which function as input for the land development can change over time (subparagraph 3.2.3.) it is possible the financial estimate of the land development shows a negative result during the process. When a negative result occurs municipalities are obliged to cover these losses directly from the municipal budget. The characteristics of *LID*, *LNID* and other supply are shown in figure 4.3.

	LID (IEGG)	LNID (NIEGG)	Other supply
Valuation based on	Future land use	Current land use	Current land use
Administrative status	All planning procedures finished (determined in zoning plan)	Council decision for future development	No council decision
Status of book value	Activated on municipal balance and financial estimate of land development is at least once a year updated	Activated on municipal balance and process and interest costs are annually added	Not activated
Actions when losses occur	A provision is arranged or amortized directly from book value when losses in land development occur	Amortized directly from book value or transferred to <i>LID</i> when book value is higher than market value	-

Figure 4.3: Overview of characteristics of *LID*, *LNID* and other supply

4.3 Risk management

Land development is a risky activity for municipalities. These risks occur because of the long run-time of land developments, difficulty of the determination of the parameters and uncertainty in market development. At the start of the development the plans are in contents and financially quite 'rough' and as the run-time passes it becomes more and more clear in detail. All these factors which form the input of land developments (figure 3.5) are risks as they can positively or negatively influence the financial outcome of the land development. In the *paragraaf Grondbeleid* municipalities are obliged to determine what their capacity is to cover possible losses on land developments. This resistance capacity (*Weerstandsvormogen*) consists of the present resistance capacity (reserves and provisions) and the required resistance capacity (coverage of losses and risks). The required resistance capacity is generally determined in one of the following two ways:

- *IFLO-norm*: this method is determined by the *Ministerie van Binnenlandse Zaken* to globally calculate the risks municipalities are taking regarding their land developments. The total resistance capacity should minimally cover 10% of the book value of the *LID* and 10% of the future transformation costs in this *LID*. This method is very global and roughly covers two years of delay and 10% of range in difference in predicted costs and revenues. It does not include the specific risks per land development, the risks regarding the *LNID* and the risks over time (as it is an overview of the current situation).
- *Quantification of risks per land development*: this method is used to quantify the risks (probability times impact) per land development. It is possible to make different scenarios of the future development with regard to the specific project risks (e.g. phasing, program, market development, cooperation of actors, claims and subsidies). This can be done by determining three different scenarios wherein the specific project risks are adjusted in a 'best case scenario', 'neutral scenario' and a 'worst case scenario'. In that way the range between the different project risks can be determined in three scenarios (best possible, normal, worst possible). The sum of all land developments give insight in the risks of the total land supply.

The most detailed method to determine the resistance capacity is by means of a statistical model/simulations (sensitivity analysis/monte carlo analysis) as a probability distribution of the outcomes of many different scenarios with different parameters.

In order to quantify the risks per land development the different forms of risk management mentioned above can be used. These methods of risk management are used to gain insight in the risks of land developments. Risk management is a continuous process where at first the risks are determined and thereafter are constantly monitored. The continuous management of these risks is important because during the land development process more and more information is known and estimations made at the start of the process can become more clear (ten Have et al, 2010; RIGO, 2012).

4.4 Reserves and provisions

The general reserves of municipalities are freely disposable and used to cover possible financial setbacks. In some municipalities a specific reserve for land development (*reserve Grondbedrijf*) exists. This reserve specifically covers the risk of land development and can, when necessary, be supplemented by the general reserves. Other municipalities do not have a specific reserve for land development but cover possible losses directly from the general reserves. In figure 4.4³ is shown how

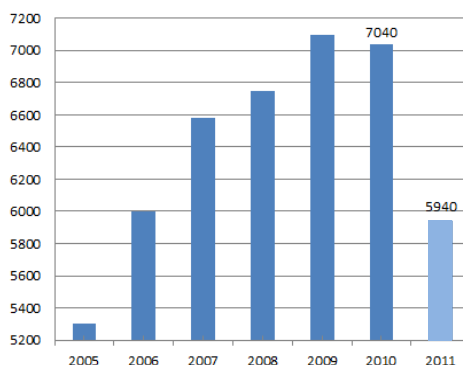


Figure 4.4: Total general reserves (in millions €) 2005-2011³ (based on: CBS, 2012; ten Have et al, 2012)

the total of general reserves of all Dutch municipalities increased in times of economic growth. But since 2010 the general reserves are decreasing. The decrease in general reserves can partly be assigned to the losses on land developments (ten Have et al, 2012).

The economic crisis caused delay in the allocation of building land for area developments and this results (due to increasing interest costs and possible lower projected revenues) firstly in the evaporation of the profit in land developments and can eventually turn into losses on these land developments. At least once a year municipalities update their land developments; in the annual report. When losses on land developments occur, as stated above, the municipality is obliged to cover this by the use of their reserves. This can be done in two ways:

- by taking the losses by amortizing these losses from the book value with the reserves (*direct afboeken van verlies*). With this solution the book value decreases with the size of the estimated losses directly.
- by arranging provisions from the reserves to cover these losses. This way is most often used because these provisions can annually be adjusted and therefore it is possible to recover a certain book loss over time. Although the land development is estimated as best as possible it is variable over time and the result can change over time. With the arrangement of provisions the possible losses are covered and over time can be adjusted on the most recent developments.

In both ways firstly the specific reserve for land developments (*reserve Grondbedrijf*) is used to cover the losses and when this reserve is not sufficient this is supplemented with the general reserves. In some municipalities with mostly a large land supply and active land use policy the losses on their land developments can be significant. This has a great impact on the size of the general reserves and in some cases nowadays results in a rapid reduction of the size of the reserves.

³ Note: The data in figure 4.2, 4.4, 4.5 of the year 2011 is based on extrapolation and is thereby not the actual result of 2011. The actual result is not published yet. The general reserves of Amsterdam (€ 4.5 billion) are excluded in figure 4.4; these reserves consist for the vast majority of the land value itself because of the lease hold system and therefore is not freely disposable.

4.5 Overview of losses on land developments in the Netherlands

From the perspective of all Dutch municipalities there are different studies conducted to determine the total size of the estimated losses on the land developments. The most commonly referred to is the research done by Deloitte (ten Have et al 2010, 2011, 2012) where in 2010 the annual reports until 2009 of municipalities are analysed and in 2011 and 2012 an update was given for the situation regarding the annual reports of respectively 2010 and 2011. The complete overview of municipal finances is published on CBS Statline (2012) but this data is delayed. In May 2013 the data from municipal annual reports of 2011 will be updated. In the research of Deloitte they used the data from the most recent annual reports of all their municipal clients and extrapolated the data to the level of all Dutch municipalities. Therefore the research has limited validation but due to an equal distribution in size of municipalities in the Netherlands in comparison to the Deloitte municipalities it gives a representation of the situation in the Netherlands. Thereby the results on the level of all Deloitte municipalities is extrapolated to the level of all Dutch municipalities based on number of inhabitants. In total the research of Deloitte is based on 145 municipalities whereas the total of Dutch municipalities is 408.

The development of the total land supply in figure 4.2 and the total development of the general reserves in figure 4.4 is based on the most recent research (ten Have et al, 2012). The actual losses on land developments can be determined by analysis of the difference

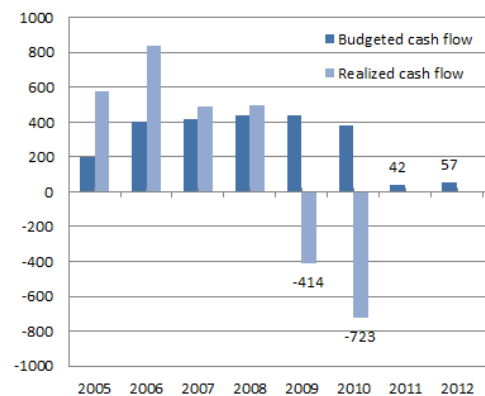


Figure 4.5: Results on land developments (in millions €) 2005-2012³
(based on: CBS, 2012 and ten Have et al, 2012)

between the budgeted cash flow in land developments (in the municipal budget) and the actual cash flow on land developments (in the municipal annual report). This is shown in figure 4.5³. This shows municipalities made significant less revenues in 2009 and 2010 than budgeted and as the economic situation has only worsened it is uncertain the predicted revenues will be achieved in 2011 and 2012. The negative cash flows of 2009 and 2010 can influence the eventual result of certain land developments. This depends on the phasing, already made transformation costs and interest costs of the specific land development. If so, the profit can evaporate or provisions need to be arranged if a negative result occurs.

The CBS (2012) estimates a further delay in building land allocation and decrease in housing prices and as result, in contrast to the budgeted positive cash flows, a negative cash flow over 2011 and 2012. This is an estimation on the level of all Dutch municipalities; it is still possible for individual municipalities with specific circumstances to realize a positive cash flow. In figure 4.6 an overview is given from the research done by Deloitte (ten Have et al, 2012) and by Fakton (2012) about the estimated losses and evaporation of the profit of land

developments in 2011. The expectation of already conducted research is the losses on land developments are partly taken but there is still a significant loss that needs to be taken. The research by Fakton (2012) also includes spatial plans with PPPs in their research; this type of spatial plans is frequently used but not included in the research by Deloitte (2012). The research by Fakton (2012) states there is still two to four times too much supply of land. Therefore the number of spatial plans needs to be further adjusted and this results in more losses in the future; their research gives no insight in the currently taken and still to be expected losses.

(in billions €)	2009	2010	2011 (Deloitte)	2011 (Fakton)
Estimated losses (cumulative)	€ 2.4	€ 2.9	€ 3.9 – € 4.4	€ 5.7
Directly taken losses		€ 0.8	€ 1.5	
Directly taken profit evaporation		€ 0.1	€ 0.5	
Already taken losses		€ 0.9	€ 2.9	
Still to be expected losses			€ 1.0 - € 1.5	

Figure 4.6: Estimated losses on land developments by all Dutch municipalities (in billions €) 2009-2011 (based on: Fakton, 2012 and ten Have et al, 2012)

It becomes clear the results on land developments are under pressure as the bad economic situation is continuing. Further losses (€ 1.0 - € 1.5 billion) need to be covered and can partly be covered by profit evaporation but the profit in land developments is already becoming less and less due to previous losses. This will eventually result in more arrangements of provisions from the specific reserve (*bestemmingsreserve Grondbedrijf*) or the general reserves of municipalities. Figure 4.4 shows the general reserves are significantly decreased in 2011 and this decrease can partly be assigned to losses on land developments. As the cash flow estimations for land developments for 2011 and 2012 are estimated to show further negative cash flows, a further decrease in general reserves is likely in the coming years. This decrease can result in municipalities with no availability of reserves to cover losses and thereby weakens the financial continuity of municipalities (ten Have et al, 2012).

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CHAPTER 5 ANALYSIS OF MUNICIPALITIES IN FINANCIAL DANGER

5.1 Introduction

“Fifteen per cent of all Dutch municipalities are close to financial danger because of the (future) losses on their land supply.” – F. ten Have et al (2011) in the research by Deloitte Real Estate Advisory commissioned by Vereniging van Nederlandse Gemeenten (VNG) *‘Financiële effecten crisis bij gemeentelijke grondbedrijven’*.

In this chapter the financial situation of municipalities due to losses and probable future losses on their land developments will be analysed. In paragraph 5.2 the Multi Criteria Analysis (MCA) of the annual reports is discussed which is done for all municipalities in the province *Noord-Brabant* with the most recent annual reports (from 2011). The province *Noord-Brabant* is taken as specific research field to ensure a manageable research size. The analyses are therefore limited from national scale (currently 408 municipalities) to provincial scale (67 municipalities). First the method of MCA is discussed and the used criteria, to rank the municipalities, are substantiated. The analysis will result in an overview of municipalities in *Noord-Brabant* which are in or close to financial danger because of their land supply. In paragraph 5.3 the validation of the Multi Criteria Analysis will be given, as a selection of municipalities in *Noord-Brabant* is contacted with a short questionnaire to gain more insight in the situation and problems regarding their land supply (research design: figure 1.4).

5.2 Multi Criteria Analysis (MCA) on municipalities in *Noord-Brabant*

The year 2011 is very interesting as the estimation is the losses on land developments will become more and more clear in that year and further years (figure 4.4 and 4.5). The already conducted studies have limited validity regarding the year 2011 because it is based on extrapolation. As the specific boundary of this part of the research the province of *Noord-Brabant* with its 67 municipalities is taken. The annual reports (2011) of all municipalities in *Noord-Brabant* are analysed by means of a MCA in order to determine which municipalities are in or close to financial danger because of losses on their land developments. In subparagraph 5.2.1. the method of MCA will be discussed, subsequently (in subparagraph 5.2.2.) the used criteria are substantiated and this paragraph will end with the results of the MCA.

5.2.1. Methodology – Multi Criteria Analysis

Multi criteria analyses (MCA) are used in a variety of forms and ways in qualitative and quantitative research. The basic definition is: *“Multi Criteria Analysis is a decision-making tool developed for complex multi-criteria problems that include qualitative and/or quantitative aspects of the problem in the decision-making process (Voogd, 1983).”*

The MCA in the used form consist of the ranking of the financial situation of municipalities by means of different criteria. This results in an overview of the financial situation of all municipalities in *Noord-Brabant* regarding their land supply. In this way the link between municipal finances and possible losses on land developments will become clear. In chapter 4

the different aspects in the annual reports regarding the municipal finances and land supply are discussed. These quantitative, financial aspects (book value of LID, LNID, resistance capacity and the general reserves) form the input for the determination of the used criteria.

Every municipality in *Noord-Brabant* is scored on every criteria based on the quantitative data from the annual report of 2011⁴. The maximum score of every criteria is 100 and the minimum score is 0. In that way it is possible to compare these different criteria. On the level of one criterion the municipalities are compared mutually; it is aimed to determine the financial situation of a certain municipality in comparison to the other municipalities in *Noord-Brabant*. The maximum score of 100 is given to the municipality where the specific criterion has the most financial negative influence on the financial situation. The minimum score of 0 is given to the municipality where the specific criteria has the least financial negative influence on the financial situation. All municipalities in between are scored in comparison to the relative deviation from the absolute value of the maximum and minimum. The methodology consists of the following steps:

- (1) First the minimum and maximum value of all municipalities ($a_{i,min}$ and $a_{i,max}$) for criterion i are calculated. The value per municipality for criterion i (a_{ij}) are used for criterion i of m criteria and municipality j of n municipalities where $i = 1, 2, \dots, m$ and $j = 1, 2, \dots, n$. In this Multi Criteria Analysis $m = 4$ and $n = 67$:

$$a_{i,min} = \min\{a_{ij}\}, \quad a_{i,max} = \max\{a_{ij}\}$$

- (2) Thereafter the step size (d_i) for score '1' needs to be determined for criterion i :

$$d_i = \frac{a_{i,max} - a_{i,min}}{100}$$

- (3) Thirdly the score (S_{ij}) for criterion i of municipality j can thereby be calculated, with the value per municipality (a_{ij}), the minimum value of all municipalities ($a_{i,min}$) and the step size (d_i):

$$S_{ij} = \frac{a_{ij} - a_{i,min}}{d_i} \quad \text{with } 0 \leq S_{ij} \leq 100$$

- (4) And as last the total score of municipality j (S_j) needs to be calculated by summing the scores of m criteria multiplied by the weight α_i of criteria i for municipality j :

$$S_j = \sum_{i=1}^m S_{ij} \times \alpha_i$$

⁴ Note: The annual reports of 2011 are public but not collectively retrievable. Hence all annual reports of Noord-Brabantse municipalities are manually collected from the internet and processed in Microsoft Excel (Appendix 9).

The result of this method is a total score per municipality which is the sum of the scores of the different criteria. Subsequently the criteria can be weighted on importance (subparagraph 5.2.2.). In this way all 67 *Noord-Brabantse* municipalities can be ranked based on their total score. This method gives an overview of the scores on the different determined criteria of all *Noord-Brabantse* municipalities.

5.2.2. Used criteria in MCA

The province of *Noord-Brabant* supervises the municipal finances and since 2011 also conducts an annual research specific on the municipal land developments (Provincie *Noord-Brabant*, 2011). Because of their controlling role they get insight in all municipal land developments, on the level of the financial estimate of the land development per spatial plan. But this data is not publicly accessible, therefore this research is limited to the public data from the annual reports. The used criteria in the provincial research, discussion with the experts at Brink Groep and the expert meeting with the financial controller of the province *Noord-Brabant* (see expert meetings, appendix 3) form the substantiation of the used criteria. See appendix 5 for the used format of the research on the municipal land developments conducted by the province *Noord-Brabant*.

The MCA is done with the following four criteria; all data necessary for the analysis on these criteria is publicly accessible through the annual reports:

1. **Total book value of land supply per inhabitant:** The total land supply (LID and LNID) is used as absolute value (in €) per inhabitant of the municipality. In that way it is possible to compare the different municipalities in *Noord-Brabant*. The municipality with the largest land supply per inhabitant is scored with '100', the municipality with the smallest supply per inhabitant is scored with '0'.
2. **The total book value of land supply as share of the total assets:** the total land supply (LID and LNID) as percentage of the current assets is used. This shows the share of the land supply as value of the total municipal balance. As in a municipal balance assets and liabilities are in balance it shows how big of a share the land supply represents of the total municipal budget.
3. **The total book value of land supply minus the total reserves:** in this criteria the absolute value of the total land supply (LID and LNID) minus the total reserves (free as well as non-free disposable) is shown. This can be seen as the global resistance capacity as it shows the amount of reserves there are in comparison to the total land supply. The higher the absolute value (in €) of this criteria the less reserves there are to cover possible losses on the land supply.
4. **The total book value of the land supply:** in this criteria the absolute value (in €) is given of the total land supply (LID and LNID). It is probable the larger the municipality (in number of inhabitants) the higher they would score on this criteria as the larger the municipality, normally, the larger the total land supply.

The criteria used in this MCA are tested with different weights. The different weights for the four criteria did not result in significant changes in ranking. This is explainable as a high score in criterion 1 mostly also result in a high score for criterion 2 due to the interdependency of these two criteria. In general a high book value per inhabitant results also in a high book value as share of total assets. For criterion 3 and 4 the interdependency of results also occurred. Therefore all criteria are weighted equally with $\alpha = 1.0$.

5.2.3 Results of MCA

The total book value of land supply per inhabitant (criterion 1) in the municipalities of *Noord-Brabant* differs strongly. Veghel and Maasdonk have the largest land supply with a book value per inhabitant of respectively € 4.974,- and € 4.765,-. A significant share of 44 of all (67) municipalities have a book value of land supply of < € 1.000,- per inhabitant. **The total book value of supply as share of the total assets (criterion 2)** is in 29 of all municipalities < 20% and in 29 municipalities > 20% but < 40%. In Maasdonk (70%), Veghel (64%), Boekel (56%) and Heusden (55%) the total land supply represents the biggest share in value of the total municipal budget. **The global resistance capacity (criterion 3)** shows major dispersion. In total 53 of all 67 municipalities have more reserves than land supply. It is plausible these municipalities are more able to cover possible losses on land developments. However, to state this with enough certainty further research is necessary on project level, as the possible losses depend on many different variables (figure 3.5). Of the 14 municipalities which have more land supply than reserves in book value the highest scores are for Heusden, Veghel, Maasdonk and Gemert-Bakel. These municipalities thereby have the least reserves in comparison to their total land supply. **The total book value of the land supply (criterion 4)** showed the relatively large municipalities with the highest scores. However, also other relatively smaller municipalities scored very high on this criteria e.g. Veghel, Veldhoven and Heusden. For a full overview of the results of the MCA, the ranking per criteria for all municipalities in *Noord-Brabant*, see appendix 6.

After the MCA was done the results are verified on proper dispersion of data. Possible skewness of results is retrieved and the outliers are deleted from the data. This was the case for the data from the municipalities Grave and Mill Sint Hubert in criteria 1 and 2; these data showed negative results for land supply per inhabitant and for land supply as share of total

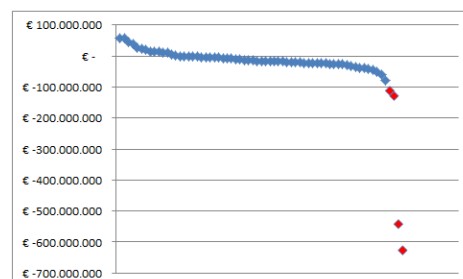


Figure 5.1: Dispersion in results from MCA in criterion 3

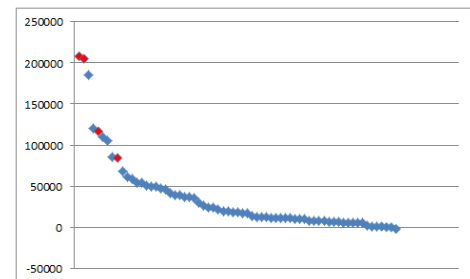


Figure 5.2: Dispersion in results from MCA in criterion 4

assets. This resulted in skewness and disturbance of equal dispersion of the data, therefore this data is not included for criteria 1 and 2. In criteria 3 and 4 the data of the municipalities Eindhoven, Tilburg, 's-Hertogenbosch and Helmond are deleted. This is also done because the data affects the dispersion in scores. This is shown in figure 5.1 and 5.2 wherein the red dotted data is deleted. There is interdependency of criteria 3 and 4 for these municipalities: a major reserves position is shown in figure 5.1 and a large total land supply in figure 5.2. But for these municipalities the size of their reserves is much larger than the size of the total land supply. There can be concluded these municipalities have relatively much reserves to cover possible losses on their land supply. It is more important to look at the municipalities that score on criterion 3 as well as criterion 4 high; these municipalities have a small reserves position and a large total supply of land. Veghel, Veldhoven and Heusden show both on criterion 3 as 4 a high score; they have in comparison to the other municipalities a large land supply and a relatively small reserves position.

5.2.4. Conclusions

The outcome of the MCA and the twenty highest scoring municipalities in *Noord-Brabant* are shown in figure 5.3. When looking at the outcome the score of the municipality Veghel is remarkable; a total score of 400 is the maximum and this municipality scored 391. Furthermore many municipalities in the south east of the province of *Noord-Brabant* scored high. And the most municipalities are relatively small as to number of inhabitants except Bergen op Zoom (65.845 inhabitants), Roosendaal (77.566) and Breda (173.299).

The twenty highest scoring municipalities in Noord-Brabant		Number of inhabitants	Total score
1	Veghel	37.303	391
2	Maasdonk	11.268	315
3	Heusden	42.995	290
4	Veldhoven	43.243	266
5	Nuenen, Gerwen en Nederwetten	22.213	216
6	Boekel	9.772	216
7	Gemert-Bakel	28.763	181
8	Bergen op Zoom	65.845	178
9	Uden	40.536	174
10	Halderberge	29.291	170
11	Dongen	25.061	161
12	Bernheze	29.655	158
13	Deurne	31.526	158
14	Gilze en Rijen	25.975	155
15	Best	28.953	151
16	Breda	173.299	148
17	Boxmeer	28.575	147
18	Geldrop-Mierlo	38.117	142
19	Bergeijk	18.061	137
20	Roosendaal	77.566	134

Figure 5.3: The twenty highest scoring municipalities in Noord-Brabant from the MCA

All municipalities are scored on the four criteria thereby it is likely the twenty highest scoring municipalities are at financial danger regarding their land supply to some extent. As they are scored in comparison to the other *Noord-Brabantse* municipalities it is clear the twenty highest scoring municipalities are more at financial danger than the other *Noord-Brabantse* municipalities. In figure 5.4 all scores of Noord-Brabantse

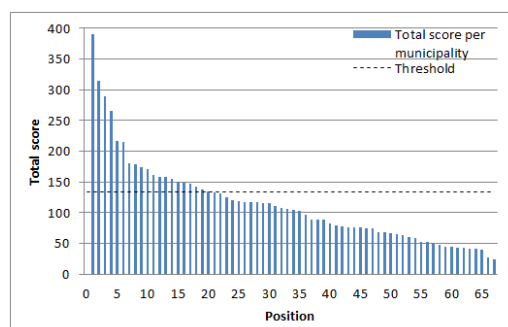


Figure 5.4: Total scores of all Noord-Brabantse municipalities from MCA and threshold=130

municipalities is shown whereas the threshold $S_j > 130$ for the twenty highest scoring municipalities is applied. However, due to the limited publicity of data on municipal finances the MCA is not comprehensive. Therefore more information on land supply and project level is needed. The absolute position (in figure 5.3 and appendix 6) in the overview is indicative as for the comprehensive overview more data is needed.

5.3 Validation of Multi Criteria Analysis through questionnaire 1

The MCA is a 'rough' analysis of the financial situation of the *Noord-Brabantse* municipalities as more data is needed on project level to determine the position comprehensively. The important aspects (besides the financial data from the annual reports) which determine the degree of financial risks *Noord-Brabantse* municipalities are exposed to regarding their land supply are stated in subparagraph 5.3.1. To gain a more detailed and substantiated insight in these important aspects questionnaire 1 regarding their land supply is sent to the twenty highest scoring municipalities from the MCA. These twenty municipalities are the most at risk because of their land supply and the questionnaire should validate their position in the MCA. The process of gaining the data from the questionnaire and the eventual response on the questionnaire are discussed in subparagraph 5.3.2. And lastly the results and conclusions from questionnaire 1 are discussed in subparagraph 5.3.3.

5.3.1. Questionnaire 1 among twenty Noord-Brabantse municipalities

The situation of the twenty highest scoring *Noord-Brabantse* municipalities from the MCA is further explored by questionnaire 1. In several meetings with experts at Brink Groep the following additional aspects are defined to determine the financial risk regarding the municipal land supply in more detail:

- **Share of book value for different types of land use:** the land market is divided in submarkets per type of land use (residential, industrial, commercial etc). The combination of land use and location determines, as stated in subparagraph 2.2.3, the land value. This makes clear it is important to view the total book value of the land supply in a municipality in relation to the land use which is designated in the zoning plan for the land. Therefore it is important to determine the share of book value for the different land uses.
- **Amount of square meters of land uses:** in addition to the share of book value of the different land uses it is also important to know the amount of square meters of the different types of land use. In that way it is possible to calculate the average book value per m² lot per land use. These can be compared to the average land prices per land use to determine whether these book values are (too) high. The land price e.g. for industrial use in *Noord-Brabant* in 2011 was on average between €77 - €230 per m² lot and for residential use was on average €354 per m² lot (bouwkosten.nl, 2013).
- **The actual resistance capacity:** in the MCA the global resistance capacity was determined. This was calculated roughly by the book value of their land supply minus the total reserves (freely disposable and non-freely disposable). In order to get a more detailed view on the resistance capacity the general reserves plus the specific reserve for

land developments (*bestemmingsreserve grondbedrijf*) need to be analysed in relation to the total land supply of the municipality.

- **The already arranged provisions (*al getroffen voorzieningen*) to cover losses on land developments:** in the MCA this aspect is not included. This aspect shows to what extent the land developments of municipalities are already realistic; possible losses are taken into account by the arrangement of provisions. In relation to the reserves this also has major consequences; when a provision is arranged it is directly deducted from the general or specific reserve. So when some municipalities show a relatively small reserve position it is possible they used it to arrange provisions to cover possible losses and thereby the financial risk is significantly less.
- **The already taken losses on land developments by amortizing these losses from the book value (*direct afboeken van verlies*):** in the MCA this aspect is not included. This aspect shows to what extent the land developments of municipalities are already realistic; municipalities can annually decide to amortize these losses from the book value. This resulted in already taken losses on certain land development and thereby less financial risk (paragraph 4.3).
- **Possible cooperation between municipalities in land developments:** it is also possible municipalities cooperate on a certain land development. The book value is added to the balance of one municipality while different municipalities have a share in this land development as well. This can give a skewed view of the total book value of the specific municipality as a (significant) part is done in cooperation with other municipalities.

These additional aspects are important as it gives a more detailed overview of the financial situation on land supply level. But also aspects on land development level (figure 3.5; parameters, phasing, program, etc) determine the realism in the municipal land developments and thereby the financial risks. However, these aspects on land development level are not publically accessible. Furthermore, this all takes place in the context of land use policy and the municipal politics; another barrier in that way is the sensitivity of this information. As not all this information is public, municipalities are not eager to share it. With this bearing in mind questionnaire 1 tries to encourage transparency of information by municipalities, with specifically inquiring public information.

This all resulted in questionnaire 1 (seven questions) which is sent to the twenty municipalities (appendix 7). The questionnaire consist of two questions (Q1-Q2) about size and land use of the total land supply, two questions (Q3-Q4) to determine the resistance capacity more in detail, two questions (Q5-Q6) about already taken losses on land developments (in the budget of 2012 and in the budget of 2013) and as last a question (Q7) about the taken actions to minimize the losses and look towards possible solutions.

5.3.2. Process and response

The process of contacting the twenty municipalities for the questionnaire was not easy. The actuality of the theme, time of the year and political interests made the cooperation of the municipalities differ strongly. Because of the negative publicity some municipalities recently

gained, municipalities were in general reluctant on cooperation. Furthermore, for the civil servants the last months of the year are dominated by the financial update of the land developments for the new budget and therefore time was sometimes scarce. Several municipalities needed to be convinced of the fact that their response would stay confidential and not be made public in order to secure their cooperation. But there were also some municipalities very cooperative and aware of the importance of the research.

All together it resulted in a time intensive and difficult process. Some municipalities were contacted many times and many different civil servants were spoken before they responded on the questionnaire. In some cases the municipalities still refused to respond on the questionnaire. In the end there were two municipalities that did not respond at all and four other municipalities were not able to respond on all questions in the questionnaire (figure 5.5). For the municipalities of Veghel, Maasdonk and Nuenen, Gerwen en Nederwetten it was unfortunate they did not want to respond (or not completely). These municipalities scored relatively high and were very interesting to investigate further.

The intensive contact with several municipalities also resulted in a better judgement to what extent municipalities were willing to be transparent about information regarding land developments, to what extent they are acknowledging problems regarding their land supply, what actions they are taking now to minimize losses and ultimately what possible solutions they see to look sustainable to the future again. It eventually helped to make the selection of municipalities for the next phase in the research (case studies; figure 1.4).

5.3.3. Conclusions

The results from the questionnaire from the 18 respondents, and thereby 90% response rate, are documented in appendix 8. The data collected from the questionnaire and the interviews done with several municipalities (appendix 4) gave more insight in the financial situation of the responded *Noord-Brabantse* municipalities. However, it is difficult to give a comprehensive overview of the financial risks on the municipal land supply. From the additional financial and spatial data can be concluded it is not possible to draw reliable conclusions from only public documentation (which is used in the questionnaire). To be able to draw reliable conclusions, information on project level regarding e.g. used parameters, phasing, program (figure 3.5) need to be included. Therefore questionnaire 1 did not validate the positions of the municipalities in the MCA but it functioned as detailed indicator for the financial situation of the twenty contacted municipalities.

Response on questionnaire	Reaction
1 Veghel	±
2 Maasdonk	X
3 Heusden	V
4 Veldhoven	V
5 Nuenen, Gerwen en Nederwetten	±
6 Boekel	V
7 Gemert-Bakel	V
8 Bergen op Zoom	V
9 Uden	V
10 Halderberge	V
11 Dongen	V
12 Bernheze	V
13 Deurne	X
14 Gilze en Rijen	V
15 Best	V
16 Breda	±
17 Boxmeer	V
18 Geldrop-Mierlo	V
19 Bergeijk	V
20 Roosendaal	±

Figure 5.5: Response on questionnaire

Details regarding book value of land supply (Q1-Q2)

Firstly the book value of the land supply divided in the land in development (*LID*) and not in development (*LNID*) is analysed. The municipalities which did not respond on all questions gave no (reliable) insight in the land supply per land use (in number of square meters); this results in 70% response rate for this part. There are many municipalities with a large supply of *LNID*. From the questionnaire and contact with municipalities can be concluded that in most cases the vast majority of *LNID* is agricultural land with a low book value. In the annual reports of 2011 municipalities were forced to reconsider and thereby sometimes devalue their *LNID* due to stricter regulation from the *Commissie BBV*; this resulted in more realism in their *LNID* supply. However, there are still two municipalities with a significant higher book value per m² *LNID*; for these municipalities their *LNID* supply is more risky.

For the *LID* supply the book value differs strongly between the municipalities. In most cases the received data was not categorized in *LID* / *LNID* supply, share of book value per land use and number of square meters per land use. Therefore the additional financial and spatial information was not suitable to draw detailed conclusions from as different land uses and locations influence the value of the land and thereby the realism in book values enormously. More detailed information (on project level) is needed to conclude to what extent the *LID* supply is risky. Some municipalities were unwilling to give this information (as it is not public) others did not have an overview of their land supply on that level of detail.

As last the book value of *LID* for the municipality of Bernheze gives a skewed image of their financial situation. The total book value of the development *bedrijventerrein Heesch-West* is on the balance of this municipality while it is a cooperation between four municipalities (Oss, Maasdonk, 's-Hertogenbosch and Maasdonk). The financial participation in *bedrijventerrein Heesch-West* of the municipality Bernheze is only 12%.

Resistance capacity and arranged provisions (Q3-Q6)

The response on the remaining part of the questionnaire is 90%. The detailed resistance capacity analysed with the additional information from the questionnaire is in line with the results from the MCA. The reserve position of several municipalities is decreasing quickly as the economic crisis is continuing. Losses on land developments need to be annually covered and some municipalities mentioned, if the economic crisis continues, they would run out of reserves in a short period. At the time of the annual reports of 2011 there were five municipalities with no specific reserves for land development anymore. In 2013 there are two municipalities (Nuenen, Gerwen en Nederwetten and Gemert-Bakel) in *Noord-Brabant* placed under pre-emption by the province due to a decrease of their general and specific reserves to zero. Almost all contacted municipalities (89%) mentioned they arranged provisions to cover possible losses for one or more land developments in the budget of 2012. And for the budget of 2013 72% of the municipalities were certain to arrange additional provisions to cover losses and 28% mentioned this still had to be discussed in the city council and therefore was not public information yet.

Current situation at contacted municipalities (Q7)

In Q7 the municipalities were asked to summarize the taken actions to minimize the losses on land developments and to search for possible solutions. In figure 5.6 an overview of the taken actions of the eighteen responded municipalities is shown (also appendix 8).

Action	Description	Frequency
1	Guidelines of <i>BBV</i> followed	4 municipalities
2	Actualisation of land developments more times per year	6 municipalities
3	Amortize losses directly from book value (also possible with existing provisions)	5 municipalities
4	Regional cooperation (mainly industrial and office areas)	5 municipalities
5	Interest costs are passed on to commercial actors	1 municipality
6	Proactive reaction with workgroup aimed on possible solutions	5 municipalities
7	Land developments are stretched in runtime	8 municipalities
8	Postpone land costs to make until revenues are received for land allocation	3 municipalities
9	Lowering of land prices	3 municipalities
10	Actively offer building land to developers, builders, housing associations or for private use (<i>CPO</i>)	3 municipalities
11	Reprioritize and eventually possibly cancel projects	5 municipalities
12	Adjusting to more facilitating land use policy	2 municipalities
13	Flexibilization of zoning plan to respond on market demand	3 municipalities

Figure 5.6: Results of Q7 of questionnaire 1: Taken actions by municipalities

Based on the expert meetings (appendix 3), the interviewed municipalities (appendix 4) and questionnaire 1 the current situation and handling of municipalities to minimize losses on their land supply can be summarized as:

- Municipalities are trying to monitor the risks of the land developments more constantly. In the past this was done only once a year; now municipalities update the land developments more times a year.
- Municipalities are reprioritizing and when possible cancelling developments. The *LIND* supply is more revaluated and when development is not possible in the near future the book value is devaluated to agricultural value.
- The phasing of land development is stretched and the making of land costs (*bouw- en woonrijp maken*) is postponed as much as possible in anticipation of better market conditions.
- Active land use policy is only used for locations where municipalities have land; for new locations municipalities are shifting towards facilitating land use policy to minimize risks (subparagraph 2.4.2).
- Municipalities are trying to stimulate the land allocation by actively offer the available land to contractors, developers but also individuals to stimulate *CPO* (paragraph 3.4). And some (3) municipalities have started to decrease the land prices.
- For industrial and office areas regional coordination is more and more applied to decrease the number of projects, but for residential areas this is in an early stage.

CHAPTER 6 POSSIBLE SUSTAINABLE POLICY SOLUTIONS

6.1 Introduction

“The coming years a stronger relationship will arise between spatial and economical aspects in area development, with sustainability as third pillar. This relationship has weakened in the period prior to the economic crisis.” – prof. mr. Friso de Zeeuw (2012) in the publication *Grondbedrijven in zwaar weer* on the future in area development.

In this part of the research is aimed to search for possible sustainable policy solutions (PSPS) to minimize the losses on municipal land and look sustainable to the future again. The focus is thereby on solutions which result in more financial continuity for municipalities and stimulate sustainable use of the land. First the determination of further used PSPS are defined based on the results of the current situation at municipalities from chapter 5. The PSPS are defined by means of expert meetings and existing literature on this subject and will be substantiated in paragraph 6.3.

6.2 Determination of possible sustainable policy solutions

In the recent past there has been done much research on the subject of needed changes in municipal land use policy, spatial planning and area development due to the economic crisis (Bots, 2012; van den Berg, 2011; van Dijk, 2011; Vliegenberg, 2011; Lahpor, 2010). The financial resources are less to invest in area developments (for municipalities as well as for commercial actors), municipal land developments as cash cow within active land use policy from the 1990s are from the past and the legislation regarding spatial planning changed (*Wro, Grondexploitatiewet*). This all has its impact on the municipal land developments and their financial result. This financial impact on municipalities is analysed in paragraph 4.5 for all Dutch municipalities by means of already conducted studies (ten Have et al, 2012; Fakton, 2012; Bouwteam, 2012). And in chapter 5 the financial danger is determined for all municipalities of *Noord-Brabant* by means of the MCA. Furthermore questionnaire 1 formed the partial validation of this MCA and, more importantly, resulted in the current situation and handling of municipalities regarding losses on their land developments.

In subparagraph 5.3.3. is concluded that municipalities focus mainly on minimization of losses on land developments and are aiming less on sustainable solutions or new forms of land use policy. Publications by experts in the field of area development were published regarding possible solutions. The publications by Ram and Bakkeren (2012), de Zeeuw et al (2012a;2012b), ten Have et al (2012), van der Krabben (2011) and Buitelaar (2011, 2010) all suggest possible solutions. Furthermore the expert meetings gave more insight in the suggested and possible solutions (appendix 3). The suggested possible solutions can be roughly categorized in:

- (1) **Measures to minimize the losses:** this is done by the mentioned measures in subparagraph 5.3.3. and results from questionnaire 1. The solutions are mainly found in better risk analysis and accounting measures to minimize the financial

effects on the municipal budgets on the short term e.g. by spreading the amortization of losses on land developments over several years.

(2) Regional cooperation: the delay in spatial developments and oversupply of building land result in uncertainty about project revenues from these developments. But the extent of which there is oversupply and delay depends on the region. In some regions there is still a high demand for new dwellings (*Randstad*) while for other regions (*Limburg*) there is a shrinkage of population and thereby low demand for new dwellings. Therefore it is important to regionally determine the demand for new dwellings and prioritize the (over)supply of spatial developments.

(3) Temporary use of the land: the delay in spatial developments and oversupply of building land results in (temporary) vacant land. Flexibilization of the zoning plan can help to stimulate alternative use of the land. As municipalities all have ambitions in the field of sustainability (VNG, 2012) there is the possibility to use the (temporary) vacant land for these ambitions. However due to decentralization, cutbacks and losses on land developments the investment capital of municipalities is minimal. Therefore innovative ways need to be found to achieve these sustainability ambitions.

The aim of this research is to test the applicability of possible sustainable policy solutions which aim on the comprehensive stimulation of financial continuity, sustainable use of space and sustainable forms of land use policy. Therefore two possible sustainable policy solutions are determined based on category (2) and (3) as these fit these requirements.

6.3 Possible sustainable policy solutions

Based on the expert opinions and existing literature there is chosen to elaborate two PSPS: regional settlement of residential developments (subparagraph 6.3.1.) and temporary use of the land with placement of solar panels (subparagraph 6.3.2.).

6.3.1. Regional settlement of residential developments

As stated by de Zeeuw et al (2012b) and ten Have et al (2012) there is an oversupply of spatial plans in the Netherlands. Research by Ram and Bakkeren (2012) showed that municipalities acquired over 60,000 ha of building land in the period 1993-2011. Almost a third of this land is still in possession of municipalities: 21,500 ha. Based on the demand for space until 2025 there is still 17,000 ha necessary for residential and industrial development. This results in at least an oversupply of 4,500 ha (20% of the totally acquired building land). However, there are major differences between regions in the Netherlands between the demand and supply for space. It is well possible that in the regions where there is a large land supply, there is less demand for housing units and industrial areas. As example, the future demand for space comes for 40% from the *Randstad* while 80% of all municipal land supply is outside the *Randstad*. This makes the importance clear of the exploration of the demand and supply situation on a local and regional level.

Long-term need for newly built dwellings

If we look specifically to the residential developments the prognosis of the demographical developments, household development and aging population results in a long-term continuous need for newly built dwellings. Although the population growth will weaken the coming 20 years the population will still grow until 2040, the social development of more (smaller) households and the development of the composition of the population (the bigger share of elderly people) all result in a higher demand for newly built dwellings (CBS, 2012). However, since the start of the economic crisis in 2008 the annual construction output of newly built housing units is almost halved (figure 3.11).

Prioritization of residential developments in Noord-Brabant

The situation in the province *Noord-Brabant* corresponds with the overall Dutch situation. Figure 6.1 shows the mismatch between the planned developments and the planned construction output. The housing program (number of planned dwellings) is per municipality in *Noord-Brabant* based on the provincial research (Bargeman et al, 2012) of the long-term demographical development of the population.

The construction output until the period of 2011 is based on the most recent data from the *CBS* and the planned construction output is based on all newly built dwellings where construction started 15-21 months before. In addition, the planned construction output for 2014 is an extrapolation of the number of already under construction dwelling and the number of residential building permits that are granted.

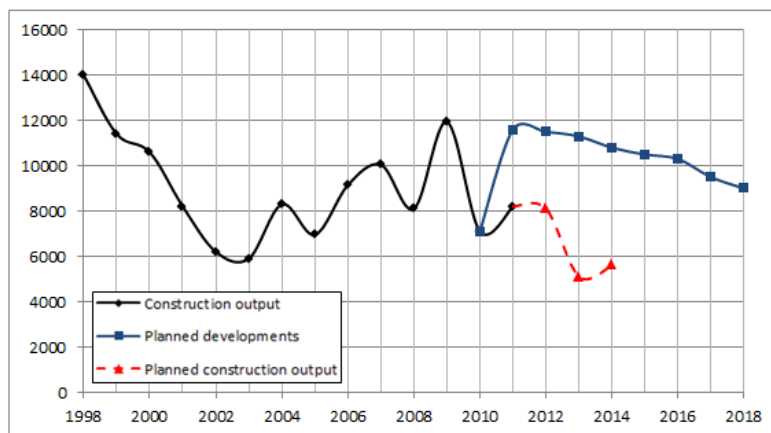


Figure 6.1: Annual growth of housing stock in Noord-Brabant from 1998-2018
(based on: Provincie Noord-Brabant, 2013)

On the short term the number of dwellings in planned developments is much higher than the number of dwellings in the planned construction output. The economic crisis has led to a situation wherein the number of planned dwellings by municipalities is significantly higher than the number of dwellings that are possible to sale within the current economic climate. There are many underlying reasons for the low number of sold dwellings e.g. difficulties and uncertainty regarding the fundability (mortgages).

It is possible the construction output will on the long term catch up to the level of the planned development. But on the short term there is an oversupply of residential developments. Simplified this can be summarized as:

CURRENT DEMAND = planned construction output (in number of dwellings)

CURRENT SUPPLY = planned developments (in number of dwellings)

In figure 6.2 schematically the demand and supply curve and the position of oversupply is shown. The number of planned dwellings (supply) is high and the planned construction output (demand) is low. This oversupply of planned developments results mainly in many residential developments which are delayed because the presale requirement of 70% is not achieved (Neprom, 2013). There can be concluded the demand is too scattered over the different (oversupply of) residential developments. In this PSPS the

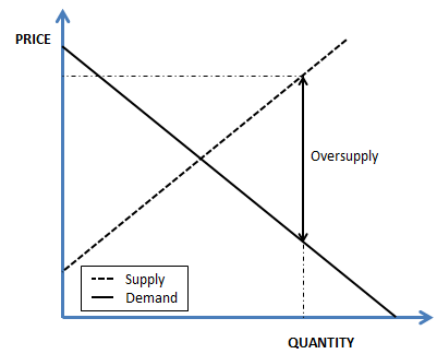
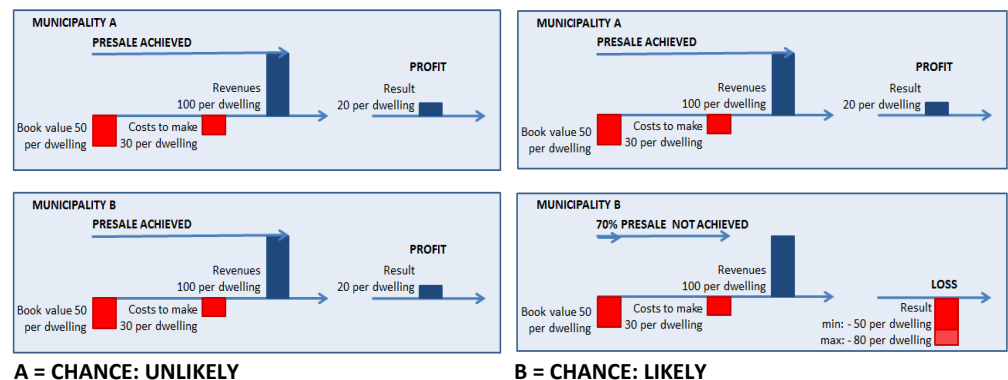


Figure 6.2: Demand and supply overview

solution is found in the prioritization of all planned developments and thereby bundling the demand in less residential developments to achieve the presale requirement. Municipalities are able to influence these aspects as they can prioritize the residential developments.

Current regional situation of residential developments

Due to the oversupply in planned residential development the projects do not reach the presale requirement and are thereby delayed. There are four different possibilities and these are schematically shown in figure 6.3. Municipality A and B both have a project with the current book value of '50' per dwelling. At this moment they both have sold 50% of the dwellings, thereby not started with the residential development yet. Possibility A, where both municipalities achieve the presale requirement, is unlikely. Interest costs accumulate and land costs might be made in the future. Possibility B and C are likely, that one of two project will achieve the presale requirement and the other will not.



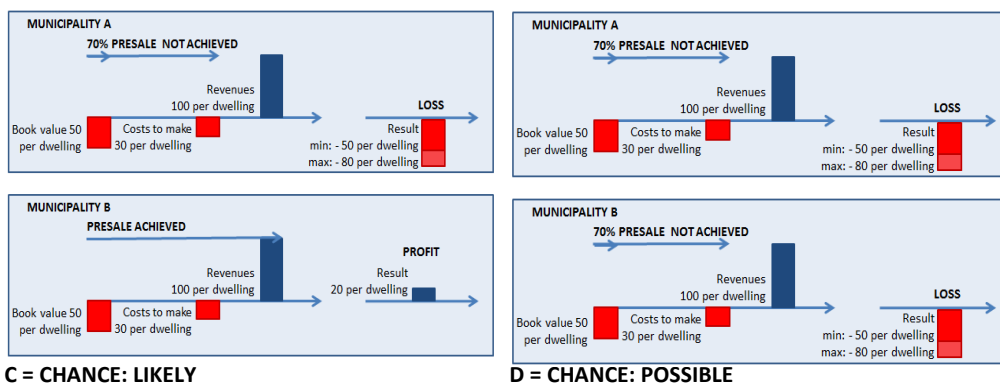


Figure 6.3: Current situation of oversupply of residential developments in a region.

In possibility D is supposed the 70% presale requirement is not achieved at all, in both cases, the total losses per municipality can be somewhere between '50-80' per dwelling. This depends on the amount of costs that are made until the moment the decision is made to take all losses and cancel both projects. Regionally in current situation (possibility B,C,D) the result is somewhere between -30 up to -60 (B,C) and -100 up to -160 per dwelling (D). the result will be Figure 6.4 shows the different possibilities in a table with the financial result.

		Municipality B	
		Presale achieved	Presale not achieved
Municipality A	Presale achieved	20, 20	20, -50 up to -80
	Presale not achieved	-50 up to -80, 20	-50 up to -80, -50 up to -80

Figure 6.4: Possibilities in current situation

Regional and financial settlement of residential developments

The different residential developments in a region need to be prioritized to induce realism in the number of residential developments; a decrease in supply to come to an equilibrium of demand and supply. In that way the number of residential developments will be more in balance with the number of (in the current economic climate) dwellings possible to sale. In this PSPS the assumption is made, a part of the developments in a region are cancelled and thereby the chance of achieving the presale requirement in the remaining developments is improved. This is, based on the expert meetings, possible in two ways:

1. The province obligates municipalities to cancel certain developments; as higher governmental layer the province takes an directing role in prioritization of residential developments.
2. Municipalities take the initiative themselves to regionally settle the number of residential developments.

Besides the prioritization in the number of residential developments there is also financial settlement. The project in municipality A is cancelled and the remaining land value is agricultural land (loss '45' per dwelling). The project in municipality B reaches the presale

requirement of 70% because of the cancelling of the project in municipality A (assuming the participants from municipality A pass on, partially, to municipality B). This project is proceeded and eventually results in a profit of '20' per dwelling.

As financial compensation for the cancelling of the project, municipality A gains a share of the profit from the project in municipality B. The total losses of the region are in this case minimized to '25' per dwelling. On a regional scale this improves the result compared to the current situation.

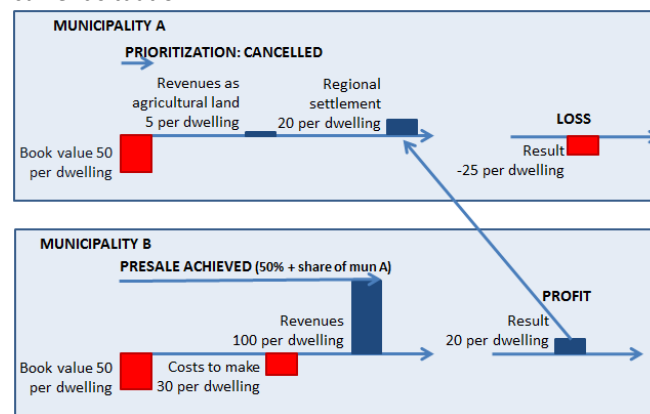


Figure 6.5: Regional and financial settlement of residential developments in a region.

Prisoner's Dilemma

The PSPS of financial settlement has similarities with the socioeconomic studies of John Forbes Nash. He was the founder of the Nash equilibrium in game theory and it is defined as: 'a situation within game theory whereby no player can improve his result unilateral, given the actions of the other players (Nash, 1949)'.

A Nash equilibrium is based on the fact that different players have different strategies, but for the choice of one strategy a player depends on the strategy of another player. The best known example is the prisoner's dilemma. It shows why two individuals might not cooperate, even if it appears that it is in their best interests to do so. The prisoner's dilemma is described by Poundstone (1992) and the payoff matrix is shown in figure 6.6:

'Two members of a criminal gang are arrested and imprisoned. Each prisoner is in solitary confinement with no means of speaking to or exchanging messages with the other. The police admit they don't have enough evidence to convict the pair on the principal charge. They plan to sentence both to a year in prison on a lesser charge. Simultaneously, the police offer each prisoner a deal. If he testifies against his partner, he will go free while the partner will get three years in prison on the main charge. And if both prisoners testify against each other, both will be sentenced to two years in jail.'

	Prisoner B stays silent	Prisoner B testifies
Prisoner A stays silent	Both 1 year	Prisoner A: 3 years Prisoner B: 0 years
Prisoner A testifies	Prisoner A: 0 years Prisoner B: 3 years	Both 2 years

Figure 6.6: Payoff matrix of prisoner's dilemma

In the case of regional and financial settlement all the municipalities have the choice to regionally settle or not. But the strategy only works when all municipalities apply the strategy. When the different payoffs are known for the different players it is able to come to a consensus. In that case it is assumed when one of the municipalities does not cooperate the result will be (on regional scale) at least ‘-100’ per dwelling (up to ‘-160’ per dwelling; figure 6.5). To ensure the losses to decrease, firstly all the municipalities need to reach consensus and all cooperate. The financial results for the different players for the different strategies are shown in figure 6.7.

		Municipality B	
		No regional settlement	Regional settlement
Municipality A	No regional settlement	-50, -50	-50, -50
	Regional settlement	-50, -50	0 or -25, 0 or -25

Figure 6.7: Payoff matrix for different choices of strategies of different players

For the eventual prioritization it is important to look critical towards the different residential developments in the region. This has to be done on regional level as well as on project level and the different important factors are e.g. size of book value, projected revenues, parameters, target group, program and type of dwellings (figure 3.5). Eventually, when regionally the municipalities have come to consensus, this will result in an equilibrium wherein all players (also possible for more than two players) are aware of the better situation they are cooperatively achieving by regional and financial settlement.

6.3.2. Temporary use by the placement of solar panels

As stated by Ram and Bakkeren (2012) the total oversupply of municipal land is about 10,000 ha and when regional settlement (in the regions where it is possible) is applied there will still be 7,700 ha oversupply of land. There seems to be no demand for housing or industrial use for this part of the land supply until 2025. In the research of Ram and Bakkeren (2012) only the municipal land supply was explored; the problem would even be bigger if the land of other parties is included on which developments are planned.

There can be concluded that for a major part of the total municipal land supply is no demand for residential development. The PSPS of temporary use by the placement of solar panels is an alternative land use for vacant building land and is used to cover the interest costs (and devaluation when possible) of the book value. It is possible to look, after the period of temporary use (in this business case: 20 years), at the residential development potential and determine whether the residential development is eligible now. As stated in research by Verdonk and Wetzels (2012) the government aims for a 14% share of renewable energy sources for the total energy generation. In 2012 the share of renewable energy sources was still only 4%. The placement of solar panels on vacant municipal land can help the achievement of these ambitions. Furthermore many Dutch municipalities have their own sustainability ambitions and research by VNG (2012) states 40% of the Dutch municipalities have plans to locally generate sustainable energy and 16% of the Dutch municipalities are

already active with the local generation of sustainable energy. This all forms the basis for the application of this PSPS as it minimizes the losses on the land and at the same time helps municipalities to sustainable use the municipal land.

Involvement of energy cooperative

There is a feasibility study done based on a pilot project in Nijmegen (Zonnepark Nederland, 2013). This pilot project is done on the roofs of public buildings, but in this case it will be done on the municipal land. Because of the difference in costs and revenues, indicators are collected from several projects of Brink Groep and contact with Pfixxsolar (a company with experience in the field of solar parks). The assumptions and principles of this PSPS are:

- An energy cooperative like 'Zonnepark Nederland' invests renewable energy sources to promote the use of renewable energy. An energy cooperative is based on the cooperation of households which invest, in this case, in 3-20 solar panels.
- The households settle the generated sustainable energy from their solar panels with their own energy bill; this is called net metering (*collectief salderen*).
- This is done for two reasons:
 1. Because of the decrease in financial resources, municipalities are less able to pre-invest in this kind of initiatives.
 2. With the energy supply to households with net metering the realised energy price is far more interesting (€0,1823 per kWh, excl VAT) than with the energy supply directly to the energy companies (€ 0,0658 per kWh, excl VAT).
- The municipality receives a lease hold for the use of the land, run-time: 20 years.
- No grants/subsidies are included.

Feasibility for energy cooperative

The feasibility of the placement of solar panels is studied for the energy cooperative in this part. The residual land value is calculated through this business case; which is the maximal lease hold that can be paid by the energy cooperative for the use of the land(to the municipality). There are different aspects influencing the feasibility of this PSPS. Therefore different scenarios are determined to calculate the residual land value of the solar panel use.

The last sixteen years the energy price is on average annually increased with 5.5% (CBS, 2012). In the feasibility study three scenarios are taken for the energy price development: low (2.5% increase per year), middle (4.5% increase per year) and high (6.5% increase per year). Figure 6.8 shows the build-up of the energy price. The energy price is nowadays determined for three different band widths of generated renewable energy (0-10.000 kWh, 10.000-50.000 kWh and 50.000 – 10.000.000 kWh). It becomes immediately clear the far more interesting energy price is achieved when it is annually generated on a small scale (0-10.000 kWh). The bandwidth of energy price depends fully of the energy taxes. Last years the share of energy tax in the energy price is significantly increased. But there is uncertainty about future legislation and development of the energy taxes.

100% renewable energy		Energy taxes	Supply rate	VAT	Energy price (excl. VAT)
kWh	10.000 kWh	0,11650	0,06580	0,03828	0,18230
10.000 kWh	50.000 kWh	0,04240	0,06580	0,02272	0,10820
50.000 kWh	10.000.000 kWh	0,01130	0,06580	0,01619	0,07710

Figure 6.8: Energy prices overview, based on rate of Essent and taxes 2013

The best case scenario is with the full energy supply to households, which have on average in 2010 an electrical energy consumption of 3480 kWh per year (ECN, 2012), and thereby the energy price of € 0,1823 per kWh is applicable. The worst case scenario is when net metering is not possible and the energy is directly supplied to the energy companies and thereby an energy price of € 0,0658 per kWh is applicable.

Furthermore, the used parameters and indicators for energy production, investment, installation and maintenance costs are based on references from the constructor Pfixxsolar of solarpark Azewijn (2012) and projects of Brink Groep. The residual land value per solar panel (for a run time of 20 years) in the different scenarios is shown in figure 6.9. A more detailed overview of the financial feasibility is enclosed in appendix 9.

Figure 6.9 shows the financial result of the run-time of 20 years per solar panel with the different energy prices (€0,07-€0,18 per kWh excl. VAT) as net present value (NPV) on price level 1-1-2013. And this is shown for the three different energy price development scenarios (low: 2,5%, middle: 4,5% and high: 6,5%). It shows at what energy price the business case is financially feasible. For energy_low the business case is only feasible with an energy price of €0,13 per kWh (excl. VAT) or higher, for energy_middle with an energy price of €0,11 per kWh (excl. VAT) or higher and for energy_high with an energy price of €0,09 per kWh (excl. VAT).

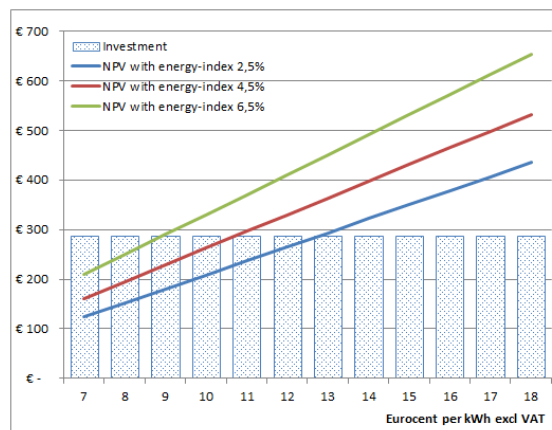


Figure 6.9: Overview of operation result per solar panel with different energy prices (€0,07-€0,18 per kWh)

Subsequently the residual land values can be determined by subtraction of the investment (€288 per solar panel) from the financial result. Hence **the maximum residual land value is € 367 per solar panel** (energy_high and € 0,18 per kWh) **and the minimum residual land value is negative - € 165 per solar panel** (energy_low, € 0,07 per kWh). In 66,66% of all scenarios (24 of 36) the investment in solar panels in this way is profitable. The dependency of the energy price development and legislation regarding energy taxes and collectively net metering are indisputable. In figure 6.10 the different risks for the feasibility are shown.

Risks	Description
Energy price development	The energy price development was enormous the last 20 years, this was mainly due to an increase in energy taxes. The future development is difficult to foresee, an increase is assumed and three realistic scenarios are used in this feasibility study (CBS, 2012)
Legislation regarding net metering	Collectively net metering is currently only allowed when the solar panels are on your own roof. However, there are pilot projects where collectively net metering is used for households without an own roof. There is uncertainty about future legislation: will it be allowed or not? (van Heemstra, 2012; Ecofys, 2011)
Legislation regarding energy taxes	The energy price consists for a large share of the energy taxes. The last 10 years this share has increased and it is uncertain how this development in the future will be (CBS, 2012; van Heemstra, 2012)
Technological development	Last two years the technological development of solar panels (energy generation and investment costs) has rapidly improved. This development is assumed to continue the coming years and thereby the investment becomes more and more profitable.
Breakeven point investment	Breakeven point on investment is now between 10 th and 11 th year (with internal rate of return of 7,5% for household). A minimum of 20 years of run time is therefore necessary but will also shorten as technological development improves.
Technical lifespan of solar panels	The technical lifespan is nowadays around the 30 years (and will improve in the future). Therefore the temporary use can be extended with ten years (or solar panels can be transported to another location) when desirable and this improves the profitability.

Figure 6.10: Overview of risks influencing feasibility

Feasibility for municipality

The municipality does not invest directly in the solar panels. The municipality receives a lease hold for the land use for a period of twenty years. There are also some costs related to the temporary use of the land by placement of solar panels. In figure 6.11 an overview of costs and revenues over time, implementation of this PSPS on a general municipal land development is shown and the schematically cash flow overview is shown. The cash flow overview is chronically schemed as in 2013 the negative cash flow arrow is shown, the costs for preparation and land costs are the second negative cash flow arrow, the residual land value is the positive cash flow arrow in 2015, the grey horizontal line is the run-time of the solar panels and has no cash flow for the municipality, and furthermore the general land development starts with the negative cash flow arrows for land costs and positive cash flow arrows for the allocation of the residential land.

Year	Description	Costs/Revenues
2013	Book value 1-1-2013	-
	<i>Temporary Use</i>	
2013-2014	Phasing and preparation of temporary use	-
2014	Land costs (to level the land; make it 'solar-panel-ready')	-
2015	Residual land value for solar panel use (lease hold for 20 years)	+
2015-2034	Temporary use of land for solar panels	0
2034	Transport costs solar panels	-
	<i>General Land Development</i>	
2035-2038	Land costs (<i>bouw- en woonrijp maken</i>) and plan costs	-
2036-2038	Sale of lots for residential use	+

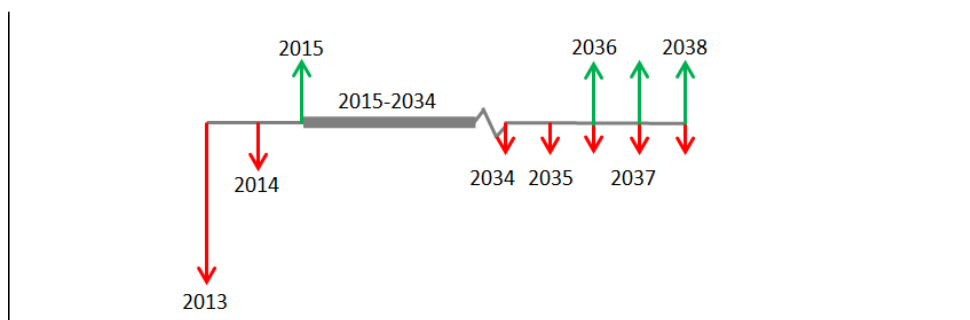


Figure 6.11: Cash flow overview of implementation of PSPS_regional on municipal land development

The assumption in this PSPS is made that collectively net metering of the generated renewable energy from the solar panels is possible and the investment in renewable energy is done by the energy cooperative. If we then look at the implementation on a general municipal land development the achieved lease hold is, in the three energy development scenarios (energy_high, energy_middle, energy_low):

- *energy_low + collectively net metering (€ 0,1823 per kWh):*
 Lease hold for 20 years per m² of municipal land NPV 1-1-2013: **€ 26,59**
 Average lease hold per year per m² of municipal land: **€ 1,33**
- *energy_middle+ collectively net metering (€ 0,1823 per kWh):*
 Lease hold for 20 years per m² of municipal land NPV 1-1-2013: **€ 44,10**
 Average lease hold per year per m² of municipal land: **€ 2,21**
- *energy_high + collectively net metering (€ 0,1823 per kWh):*
 Lease hold for 20 years per m² of municipal land NPV 1-1-2013: **€ 66,06**
 Average lease hold per year per m² of municipal land: **€ 3,30**

Currently the vacant municipal land is mostly used for agricultural use and the average annual lease hold per m² of agricultural land is only € 0,50 (Dienst Regelingen, 2012). The lease hold for the land use of solar panels has, with the guarantee of collectively net metering, at least two times and up to almost seven times more possible revenues. It becomes clear this PSPS is an interesting alternative for agricultural land use for municipal land which can be on hold for at least 20 years (with the possibility of 30 years of run-time the annual lease hold can even be increased).

The annual lease hold per m² can be used to cover the annual interest costs on the book value. In this case the interest costs (with an interest rate of 4%) of a book value from € 32,50 up to € 82,50 per m² can be covered by the temporary use of the land by the placement of solar panels.

Combination of PSPS regional settlement and temporary use

A combination of both PSPS is also conceivable. This PSPS is not further substantiated but is only tested on applicability in chapter 7. The combination of the two PSPS is based on the following thought:

‘When municipalities/region take the initiative to regionally prioritize the residential developments, they are authorized to temporary use the municipal land (from the cancelled project) by the placement of solar panels with the guarantee of the application of collectively net metering for the run-time of 20 years.’

This can be seen as an extra stimulation for municipalities to regionally prioritize the residential developments as there is the financial settlement and the guarantee of a feasible temporary use by the placement of solar panels. When an energy cooperative is found to participate, and this is even more likely when the collectively net metering is guaranteed, this ensures even a smaller loss on the municipal land. Figure 5.10 schematically shows this situation.

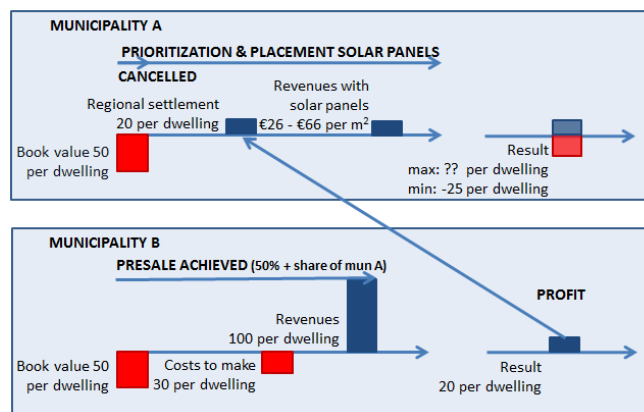


Figure 6.12: Combination of regional and financial settlement and temporary use by the placement of solar panels.

There is uncertainty in applicability of both previous PSPS (regional settlement and temporary use). This PSPS, as it is a combination of both, is thereby even more uncertain in applicability. Furthermore, in the Fuzzy Delphi analysis this PSPS was also scored as least applicable (paragraph 7.4). This PSPS is therefore in the questionnaire only scored on general applicability and the determining factors of this PSPS are not defined and scored.

CHAPTER 7 APPLICABILITY AND DETERMINING FACTORS OF PSPS

7.1 Introduction

“All science, all human thought, is a form of play.” – William Poundstone (1992) in his book *Prisoner’s Dilemma* on the benefit of presentation of solutions in the form of a play to determine the applicability.

The PSPS defined in chapter 6 are randomized and abstractly tested in this chapter on applicability (figure 1.4). And additionally, the different determining factors for the application of the PSPS are analysed.

Firstly, the PSPS are presented to three participating municipalities (Heusden, Uden and Gemert-Bakel). The response of the three participating municipalities form the input for the questionnaire to test the applicability and determining factors of the PSPS. This part of the three case studies is documented in paragraph 7.2. Subsequently in paragraph 7.3 the questionnaire design to test the applicability and determining factors of the PSPS is discussed. The Fuzzy Delphi Method (subparagraph 7.3.1) is used to analyse the results from the questionnaire. The questionnaire is sent to two types of respondents groups: (A) twenty-six municipal experts at *Noord-Brabantse* municipalities and (B) twenty-one experts in the field of land use policy, land developments and area development (consultancy companies and academics from different universities). Lastly the results from the analysis of the questionnaire are discussed whereby the applicability and determining factor of the PSPS will become clear (paragraph 7.4).

7.2 Case studies among three *Noord-Brabantse* municipalities

In this paragraph the case studies among the municipalities Heusden, Uden and Gemert-Bakel are discussed. The municipalities all provided one municipal land development to scrutinize on the condition I would not specifically publish the financial data from these land developments in this thesis. The financial estimate is sensitive information which municipalities are not willing to make public. Firstly the methodology applied on the case studies is discussed (subparagraph 7.2.1.), then the scenarios are in more detail discussed (subparagraph 7.2.2.) and as last the results from the presentations of these scenarios are discussed (subparagraph 7.2.3.). The responses/discussion from/with the three municipalities on the feedback of the case studies form the input for the questionnaire (figure 1.4). With the input from the three municipalities a list of determining factors is defined which will be weighted and ranked on importance with the questionnaire in paragraph 7.3.

7.2.1. Methodology of case studies

The case studies are primarily used **to determine the factors influencing the applicability of the PSPS**. This is done by two interviews at all three municipalities. In the first interview the current situation of municipalities were discussed: risks of land developments, current handling of these risks, projects with biggest financial risks/problems and the financial situation of these three municipalities. This helped form the ‘current situation at contacted municipalities’ in subparagraph 5.3.3. At the end of the first interview the PSPS are briefly

introduced and there is agreed to apply the PSPS on the provided land development. The three case studies had to fit the research limitations (paragraph 1.3) and for the municipality be a project with financial risks/problems. The following criteria for the case studies were stated:

- A residential development;
- On the outskirts of the municipality (*uitleggebied*);
- Presale requirement is not achieved yet;
- Land allocation is significantly delayed;
- Book value of land development is high;
- Significant annual interest costs;
- Uncertainty about projected revenues;
- High probability of negative result.

The case studies are thereby projects for the three municipalities where they encounter significant risks and problems. In that way the case studies are on the one hand a risk analysis on the provided land development and on the other hand the PSPS are presented to look for possible solutions. The municipalities were very open and interested towards solutions to minimize the losses on these land developments. As stated by Maurice Emonds, senior employee real estate of the municipality Gemert-Bakel: ‘any possible solution which shows a more positive (or less negative) result is interesting at this moment.’

For the three case studies the methodology in six steps (figure 7.1) was undertaken which are presented to and discussed with the three municipalities in the second interview. This was primarily done to obtain their response and thereby gain insight in the determining factors for the implementation of the PSPS.⁵

Step	Description	Scenario	Application level
<i>Current situation and risk analysis</i>			
1	Scrutinize provided land development and process in proper format.	Basis	Case
2	Adjust provided land development on current and projected (future) market conditions (based on market reports).	Recalibration	Case
<i>Presentation of PSPS</i>			
3	Present PSPS of regional and financial settlement and discuss determining factors for application.	Regional	Policy
4	Apply PSPS of temporary use of municipal land by the placement of solar panels on provided land development.	Temporary	Case
5	Present PSPS of combination of regional settlement and temporary use and discuss determining factors for application.	Combination	Policy
6	Discuss applicability of three PSPS and list determining factors as input for questionnaire		Policy

Figure 7.1: Methodology case studies

⁵ Note: Because of sensitivity of the information in the municipal land development there is the obligation to not publish the financial results. Therefore only the methodology in general is discussed and the financial result per case study is not.

First the provided land developments are processed in a proper format to apply the different scenarios. Thereafter the case studies are scrutinized to understand the financial estimate and its input (program, actors, physical environment, finances, phasing and parameters; figure 3.5). In that way the used criteria are determined in more detail and it becomes more clear where the risks and problems in the specific land development are (step 1). Furthermore the current assumptions (e.g. parameters, cost and revenue development, phasing) in the provided municipal land developments are revaluated by comparing the assumptions with recent market reports. There are assumptions derived from these market reports and applied on the provided municipal land development; this results in the recalibration scenario. With this scenario is indicated what continuing deteriorating market conditions will do to the financial result of the land development. Eventually it helped to discuss the possible risks in this land development and to what extent the eventual result could deteriorate (step 2). Step 1 and 2 are thereby used to determine the current situation and apply a sensitivity analysis of the risks (subparagraph 4.2.2) on the case study.

Step 3-5 are used to present the PSPS to the municipalities. However, there is only one PSPS (temporary use of municipal by placement of solar panels) which is specifically applied on land development level. The other two PSPS (*regional of residential developments* and *regional settlement and temporary use*) are presented in relation to the case study but are more abstract; on land use policy level. The case studies are thereby used to define the list of factors influencing the applicability of the three PSPS. In subparagraph 7.2.2. the methodology is discussed in more detail by given insight in the different scenarios (figure 7.1) and in subparagraph 7.3.3. the results from the case studies are discussed.

7.2.2. Scenarios

In the **basis scenario** the provided land development is scrutinized and processed in the proper format to apply the other scenarios. In figure 7.2 the project information is shown; without financial specifications of these land developments³. All




Municipality	Case	Area		Lots and land use	Average m ² per lot
Heusden		Total subarea III:	76.000 m ²	- 51 lots for spacious houses in an unique natural environment.	997 m ²
		Allocable in subarea III:	50.781 m ²		
		Non-allocable subarea III:	25.219 m ²		
Uden		Total Uden-Noord:	210.000 m ²	- 47 residential lots phase 1	982 m ²
		Allocable Uden-Noord I:	77.956 m ²	- 50 residential lots phase 2	300 m ²
		Non-allocable:		- 3 residential lots extra (north) - 3 lots for public property	1940 m ² 3.666 m ²
Gemert-Bakel		Total de Mortel-Zuidrand I:	51.150 m ²	- 11 lots for spacious houses in a natural environment.	1.727 m ²
		Allocable de Mortel-Zuidrand I:	16.472 m ²		
		Non-allocable de Mortel-Zuidrand I:	34.678 m ²		

Figure 7.2: Overview of project information of case studies

three land developments are a subarea of which is part of a bigger master plan for an area development. All three land developments have a significant book value, land allocation has to start still or is delayed and show a negative result.

In the **recalibration scenario** the input is adjusted based on the current and projected market conditions. The different aspects which form the input of a land development (figure 3.5) are partly adjusted in the case studies. Adjustments are made for 3 of the total 6 aspects of input: parameters, phasing and finances. These aspects are subject to the economic circumstances and future development thus are always to some degree uncertain. However, different market reports try to estimate the future development and the recalibration scenario can thereby be seen as risk analysis of the financial result when current market conditions will endure the coming years (until 2015). The used parameters, phasing and finances in the recalibration scenario are based on several meetings with experts at Brink Groep (and the used scenarios in their risk analyses) and on market reports.

The three adjusted parameters in the recalibration scenario are the cost index, revenue index and interest rate. First the *cost index* is determined as annual 2% increase; figure 7.3 shows the price indexes from 2005-2011 and in general the land costs develop inflationary.

Furthermore the *revenue index* is more difficult to determine because of (1) the uncertainty about the level of market-conforming land prices. Thereby the land price policy of the last years is important to explore. In that way it is possible to determine whether the prices were only raised until 2013 or whether the land prices are already lowered and thereby more market-conform. And (2) based on the projected development of the construction output based on research by the NEPROM (2012) and EIB (2012) it is clear less dwellings can be build the coming three years (subparagraph 3.5.2.). As last (3) the projected development of the housing prices is important; the forecasts of ING (2011, 2012) and Rabobank (2012) show a decrease in housing price index for 2013 of 5% and 2014 of 7%. This results (bearing in mind the residual land valuation method) in a significant decrease of the land value. However, it is uncertain to what extent the prices of newly built dwellings will decrease as the projected development by ING and Rabobank are based on all houses and the vast majority is thus the current housing stock. When taking this into account the conservative estimate is done that the revenue index over the period of 2012-2016 will decrease with 10% thereafter this will slowly recover (2017: 0%, 2018: 0,5%, 2019: 1,0%) to an inflationary growth of 2% in 2020 and further.

The *interest rate* which is advised by the province *Noord-Brabant*, the supervisor of municipal finances, is based on the current interest rate and projected development and thereby 4%.

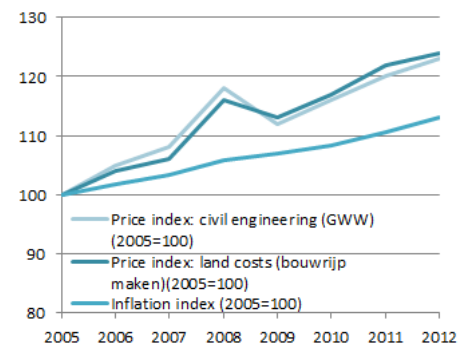


Figure 7.3: Price indexes of civil engineering and land costs in comparison to inflation (based on: CBS, 2012)

For the *phasing* in general the land allocation is delayed with one year because of the assumption of the enduring current market conditions until 2015. These adjustment are made on the financial estimate of the three case studies and gives insight in the current risks of the land developments; how would the financial result worsen when the projected developments from market reports will endure?

In the **regional scenario** the first PSPS is presented to the municipality and discussed in relation to the provided land development. This is discussed on land use policy level and was not applicable on the specific land development because therefore not enough data was accessible (only one project; not all projects in the whole region). Thereafter the **temporary scenario** is introduced which is applied on the provided land development. Based on the expert opinions of Pfixxsolar (a company which participated in the solar park in Azewijn), Eigen Energie (a company which provides solar panels) and the experts at Brink Groep the feasibility of the solar park is calculated (subparagraph 6.2.2). As shown in figure 6.11 the temporary scenario is applied on the municipal land development and for the three cases the financial result is presented. Lastly the **combination scenario** is presented; the combination of the regional settlement and temporary use is only discussed on the policy level as there was not enough data accessible to apply it on land development level.

7.2.3. Results as input for questionnaire 2

Step 3-6 (figure 7.1) are used to define the list of determining factors for the two PSPS. The presentation of the PSPS at the three municipalities in combination with different meetings with the experts at Brink Groep helped define this list of determining factors for the PSPS (1) regional and financial settlement of residential developments (figure 7.4) and (2) temporary use by the placement of solar panels (figure 7.5). The factors are categorized in financial, spatial and administrative as the factors vary strongly.

PSPS: Regional and financial settlement of residential developments			
Code	Category	Factor	Description
R01	Financial	Book value	Size of total book value of planned residential developments in a region. This depends on total size of acquired land, already made costs, interest costs and ultimately to what extent the book values pressures the municipal budgets.
R02	Financial	Compensation for the financial settlement	Financial size of the compensation when, due to prioritization, project X is cancelled
R03	Financial	Obligation to donate share of revenues for the financial settlement	Financial size of the share of profit that has to be donated for the regional settlement when, due to prioritization, project Y reaches the 70% presale requirement and is eventually completed.
R04	Spatial	Bond with current municipality	Distance people are willing to move. Of importance is to what extent people are willing to pass on from project X in municipality A (after it is cancelled) to project Y in municipality B or whether they are bonded to their current municipality.
R05	Spatial	Competitiveness in region	Degree of competitiveness between residential developments in a region.

			Similar developments in different municipalities can be competitive and thereby municipalities will attract the same target group (in same region). The presale requirement is thereby more difficult to achieve.
R06	Spatial	Sort of residential developments in a region	Size, target group, segment of residential developments in a region. The extent of which there are conflicting/unique residential developments (and thereby need for regional settlement) depends on the sort of residential developments in the region.
R07	Administrative	Role of the province	Extent to which directing role of the province influences the implementation of regional settlement. Province has the possibility to steer/oblige municipalities to regional settlement.
R08	Administrative	Politics	Extent to which political interests influence the implementation of regional settlement. Political interests in a region can stimulate or oppose regional cooperation.
R09	Administrative	Certainty	Extent to which (juridical) certainty influences the implementation of regional settlement. This certainty can be documented in a partnership (contract) but ultimately can also evolve in a regional land use policy.

Figure 7.4: Determining factors for the applicability of the PSPS_R

PSPS: Temporary use of municipal land by the placement of solar panels			
Code	Category	Factor	Description
T01	Financial	Participation of energy cooperative	Extent to which participation of energy influences the temporary use by the placement of solar panels. The municipality does not invest in the solar park; it supplies the land ('solar-panel ready') and receives a lease hold for the land use.
T02	Financial	Financial feasibility	Extent to which the implementation of this PSPS depends on financial feasibility of solar panels (technological development ↑, investment costs ↓, energy price development is uncertain). Score high when the financial feasibility is important, score low when only participation of energy cooperative is important.
T03	Financial	Run-time period	Extent to which the land can be put on hold for residential development and certainty that it can be used for the placement of solar panels.
T04	Spatial	Scale of solar park	Number of solar panels that can be placed. Scaling up can result in higher revenues, but also more households need to participate in energy cooperative.
T05	Spatial	Location	Soil (land needs to levelled), landscape (shadow), possibility to access the existing energy network. These three factors influence the efficiency of the solar park.
T06	Administrative	Ambitions in the field of sustainability	Extent to which the sustainability ambitions of municipalities influence the application of this PSPS. The placement of solar panels can contribute to the sustainable image of a municipality.
T07	Administrative	Legislation regarding collectively net metering	Extent to which legislation regarding collectively net metering influences the applicability of this PSPS. There is uncertainty regarding the future legislation of collectively net metering; as pilot project it is allowed for now.
T08	Administrative	Flexibility of zoning plan	Extent to which the zoning plan can be temporary adjusted for the placement of solar panels.

			When this is regarded to be easy to adjust, score low. When this is a possible barrier, score high.
T09	Administrative	Administrative support	Extent to which the administrative support influences the applicability of this PSPS. Score low as the administrative support is regarded high for this temporary use. Score high if the administrative support is regarded low for the temporary use.

Figure 7.5: Determining factors for the applicability of the PSPS_T

7.3 Questionnaire 2 and data analysis

In this paragraph the questionnaire is substantiated. With the questionnaire the applicability of the PSPS will be analysed and the determining factors for the application are ranked on importance. Firstly the used methodology of the Fuzzy Delphi Method (FDM) is substantiated (subparagraph 6.3.1.) thereafter the questionnaire design is discussed (subparagraph 6.3.2.). This all forms the basis of the composed questionnaire and the analysis of this questionnaire.

7.3.1. Methodology - Fuzzy Delphi Method

There are three basic types of information uncertainty, namely ambiguity, discord and fuzziness (Klir & Yuan, 1995) that are covered by numerous uncertainty theories. Due to the human factor in evaluation, in this case the importance of a certain factor, a type of the uncertainty is present. That is the fuzziness resulting from the lack of definite or sharp distinction. Therefore, the fuzzy Delphi method (FDM) will help to give an overview of the factors relevant for the applicability of the PSPS.

The FDM derived from the traditional Delphi method and fuzzy set theory. The traditional Delphi method has tendency that both the question and the answers are indistinct. Additionally, there is a notable problem to solve the fuzziness in expert consensus in group decision making. Murray et al (1985) first proposed the application of fuzzy theory to the Delphi method. Further on (Ishikawa et al, 1993) used the maximum-minimum method together with cumulative frequency distribution and fuzzy scoring to compile the expert opinions into fuzzy numbers. The expert prediction interval value was then used to derive the fuzzy numbers, resulting in the FDM. Noorderhaven (1995) indicated that applying the FDM to group decision can solve the fuzziness of common understanding of expert opinions. This method is based on group thinking of the qualified experts that assures the validity of the collected information. The benefits of using FDM underline practical matter such as saving the survey time and reduce the number of questionnaires. Even more important is that it takes into account the fuzziness that confronts every survey process assuring that there is no misinterpretation of an expert's prime opinion this genuinely reports their responses (Glumac et al, 2011). Because of the difficult process of questionnaire 1 (paragraph 5.3) among municipal experts, this method is used to be able to efficiently and qualitatively gain expert's opinions.

The triangular membership function is the most frequently used function. Although other functions like trapezoid, quadratic and Gaussian may contain more information. We decide

upon trapezoidal fuzzy number. This study uses FDM with geometric mean model (Klir and Yuan, 1995) to find a common group understanding of the importance of identified factors. The steps followed are based on Glumac et al (2011) but slightly modified. Normally the method consists of two questionnaires in step (1) and (2), but in this case step (1) is defined by means of the case studies and expert meetings. Thereby only one questionnaire is sent to the experts, in step (2). The steps followed:

- (1) *Validate predefined list of factors.* Originally, brainstorming phase consists of two questionnaires (Delbecq et al, 1975; Schmidt, 1997). The first one consists of an open-end question where all participants can suggest any attribute. The second questionnaire consists of the validation of the previously categorized and described factors. However, in this questionnaire design these two questionnaire are replaced by the case studies. As stated in subparagraph 7.2.1. the aim of the case studies is to **determine the factors influencing the applicability of the PSPS**. The interviews done with the three participating municipalities for the case studies form thereby the basis for the list of determining factors. In these interviews and by several meetings with the experts at Brink Groep the list of determining factors is intensively discussed and reevaluated. This is done to make sure all the important factors were included. Subsequently the determining factors are categorized (financial, spatial and administrative factors) and the linguistic description is clearly defined. This results in the overview in subparagraph 7.2.3. (figure 7.4 and 7.5).
- (2) *Collect opinions of expert groups A and B.* In the questionnaire (subparagraph 7.3.1.) two different groups of experts (subparagraph 7.3.2.) are asked to give the evaluation score of every factor by using three points in a row from 1 to 10 associated with the importance of that factor for the applicability of the PSPS. This is done for every expert in the two groups. First the **range of minimum and maximum** has to be given: in general, based on current market conditions and situation, to what extent this factor is of influence for the applicability of this PSPS. Additionally the expert will **score the factor**: from their field of expertise and based on their vision on the current market conditions and future market developments, to what extent this factor is of influence for the applicability of this PSPS. To recapitulate, instead of giving just one weight experts provide three weights in range. In this way, we have more information from our respondents and making our data analysis more reliable.
- (3) *Set up overall trapezoidal fuzzy number.* Calculate separately the evaluation of each factor given by experts and derive the overall trapezoidal fuzzy number of the specific factor. As the opinion of the score from the field of expertise of the expert is of greater importance and to come to an overall trapezoidal fuzzy number, the score is used as $b_j = c_j$. At first, the evaluation value of a single factor by a single expert is expressed as trapezoidal fuzzy number $\tilde{w}_{ij} = (a_{ij} + b_{ij} + c_{ij} + d_{ij})$ for the

evaluation value of factor j of m factors by expert i of n experts where $i = 1, 2, \dots, n$ and $j = 1, 2, \dots, m$. By using a general mean model (Klir and Yuan, 1995), we estimated overall value of a feature that is $\tilde{w}_{ij} = (a_{ij} + b_{ij} + c_{ij} + d_{ij})$ where:

$$a_j = \min_j \{a_{ij}\}, \quad b_j = \frac{1}{n} \sum_{i=1}^n b_{ij}, \quad c_j = \frac{1}{n} \sum_{i=1}^n c_{ij}, \quad d_j = \max_j \{d_{ij}\}$$

- (4) *Defuzzification*. The purpose is to turn overall trapezoidal numbers into a single real number. We use simple centre of gravity method (Klir and Yuan, 1995) for fuzzy weight \tilde{w}_j of each factor to derive a definite value S_j where $j = 1, 2, \dots, m$:

$$S_j = \frac{a_j + b_j + c_j + d_j}{4}$$

- (5) *Screen evaluation indexes*. At the end, a delineation of numerous factors can be achieved by setting the threshold per PSPS $\alpha_r = 7,00$ and $\alpha_t = ..$ where α_r is the threshold value for the PSPS of regional and financial settlement and α_t is the threshold value for the PSPS of temporary use of the land by the placement of solar panels. The principle follows:

if $S_j \geq \alpha$ then No. j factor is very important
if $S_j < \alpha$ then No. j factor is less important

The reasoning for setting this threshold value (α) is derived from the experts' weighting results which are shown in paragraph 7.4. By means of the threshold line for the different PSPS it is notable there are some factors which pass the line and thereby are of significantly greater importance than other factors.

7.3.2. Questionnaire 2 design

The questionnaire is used to determine the applicability of the three PSPS defined in chapter 6 where R = regional and financial settlement of residential developments, T = temporary use of the municipal land by the placement of solar panels and C = combination of regional settlement and temporary use. As stated in subparagraph 6.3.2. for PSPS_C only the general applicability is tested because of the high uncertainty of the applicability of this PSPS; this is also endorsed in the results in paragraph 7.4. Furthermore the importance of the different factors (R01-R09 and T01-T09) for the applicability of the PSPS (R and T) are ranked.

Respondents Groups

First of all the different respondent groups are determined. There is chosen to make two expert groups and all groups should have 10-15 people for homogenous groups, as recommended in Delphi literature (Delbecq et al, 1975). Within these groups the people should have knowledge in the field of land use policy and land developments. This design

will ensure the identification and invitation of the most qualified experts available.

As a result, their evaluation values will define (1) the general applicability of the PSPS (R, T and C) and (2) the importance of the different factors for the decision “to what extent this PSPS is applicable” for the PSPS (R and T). This is done among the following two respondent groups:

(A) **Municipal experts.** Employees at municipalities which are active in the field of land use policy and land developments. As all PSPS are aimed to be implemented among municipalities on land use policy level, the opinion of these municipal experts is the most important. In general the employees contacted are: financial policy advisors which document the land developments in the annual reports and municipal budgets and the planning economists (*planeconoom*) which construct the land developments and its input (figure 3.5).

The contacted municipal experts are active at the twenty *Noord-Brabantse* municipalities which are also contacted for questionnaire 1 in paragraph 5.3. These municipal experts are already intensively contacted and known with the research therefore the possible response on the questionnaire is more certain. In total 26 municipal experts are contacted.

(B) **Academic and consultancy experts.** Academic and consultancy experts which published literature about land use policy, land developments and/or are active in this field of expertise.

The academic experts are professors, associate professors and assistant professors at different universities in the Netherlands with knowledge in the field of land use policy, land development, real estate and area development. The contacted universities are: Radboud University Nijmegen, Tilburg University, University of Groningen and Delft University of Technology. The consultancy experts are managers, senior consultants and consultants at different consultancy companies: Brink Groep, Royal HaskoningDHV, Arcadis, Fakton and Stadkwadraat. In total 21 academic and consultancy experts are contacted. All experts were already contacted for expert meetings and/or were derived from the professional network of Brink Groep.

Questionnaire

The experts within each group will individually submit the weights for (1) the general applicability of the PSPS (R,T and C) and (2) to what extent per determining factor per PSPS (R and T) it influences the applicability of the PSPS. Afterwards, FDM calculation is used to assemble the opinions for the two respondents group and result in (1) the ranking list of the general applicability of the PSPS and (2) the ranking list of the determining factors per PSPS.

The **questionnaire design** is sent to the two respondents group via the online survey tool *Survey Monkey*. It is structured by first collecting the general information about the respondent (name, job, employed at) and furthermore introducing the principle of the

randomized PSPS_R as it is stated in subparagraph 6.3.1. When the principle of the PSPS is illustrated the expert is asked to rate the determining factors for the applicability of the PSPS. For every PSPS the linguistic description is given, as shown in figure 7.4. Every factor is rated three times in ordinal scale from 1 to 10 (figure 7.6, as example), indicating importance from none to extreme, whereby:

1. **Range (minimum and maximum):** in general, based on current market conditions and situation, to what extent this factor is of influence for the applicability of this PSPS.
2. **Score:** from their field of expertise and based on their vision on the current market conditions and future market developments, to what extent this factor is of influence for the applicability of this PSPS.

In hoeverre is de factor 'X' van belang voor de toepasbaarheid van deze oplossingsrichting?

	1	2	3	4	5	6	7	8	9	10
Bandbreedte: min	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bandbreedte: max	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Score	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 7.6: Ranking of determining factors per PSPS

After the rating of the factors R01-R09 (figure 7.4) this part is ended with the general applicability of the PSPS_R which is rated three times in ordinal scale from 1 to 10, indicating the applicability from none to extreme.

Subsequently the part for PSPS_T is structured in the same way (1) introduction of the PSPS_T (2) rating of determining factors based on the linguistic description (T01-T09; figure 7.5) and (3) as last the general applicability of the PSPS_T which is rated three times in ordinal scale from 1 to 10, indicating the applicability from none to extreme. As stated in subparagraph 6.3.2. the randomized PSPS_C is only introduced and rated on its general applicability in the questionnaire.

7.4 Results of Fuzzy Delphi Method

As stated in the previous (sub)paragraphs the FDM is applied to analyse the experts' opinions in the decision-making process of implementation of the PSPS. The list of determining factors is based on the qualitative insight given by the three case studies. And is subsequently tested with the questionnaire (among the two respondents groups) to give quantitative insight in the experts' opinions on the factors' importance for the application of the PSPS (R and T). Furthermore the questionnaire gave in general insight about the applicability of the PSPS (R, T and C). The total contacted experts was 47 whereof 28 did respond thus making a 59.57 percent overall response rate. If we look in more detail to the two respondents groups:

- (A) Among the municipal experts 13 of the contacted 26 experts responded thus making a 50.00 percent response rate. These respondents were 6 planning economists (46.15%), 4 municipal real estate consultants / project managers (30.77%), 2 financial policy advisors (15.38%), 1 manager of financial policy team (7.69%).
- (B) Among the academic and consultancy experts 15 of the contacted 21 experts responded thus making a 71.43 percent response rate. These respondents were 2 professors (13.33%), 2 associate professor (13.33%), 4 consultants (26.67%), 6 senior consultants (40.00%) and 1 manager (6.67%).

As recommended in Delphi literature, for homogenous groups, the expert groups should have a minimum response of 10-15 people to conclude reliable from the results (Delbecq et al, 1975). In both respondents groups (A and B) this minimum response is achieved. The methodology of the FDM is previously substantiated and in subparagraph 7.4.1. and 7.4.2. the results from analysis on the questionnaire with the FDM are discussed. The detailed overview of results can be found in appendix 10.

7.4.1. Applicability of three PSPS

In this subparagraph the results of the overall applicability of the PSPS (R,T and C; discussed in chapter 6) is shown in figure 7.7 for the two respondents groups (A and B) and in figure 7.8 for all respondents (A+B). There can be concluded the highest applicable is the PSPS of regional and financial settlement of residential developments (A=6.15, B=6.48, A+B=6.45),

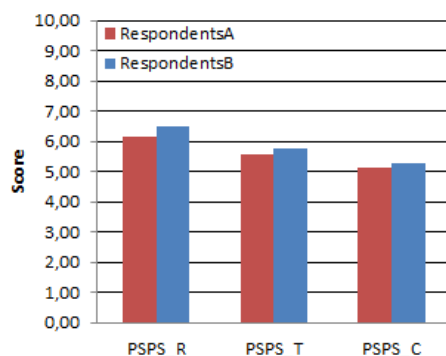


Figure 7.7: Applicability of PSPS among respondents A and B

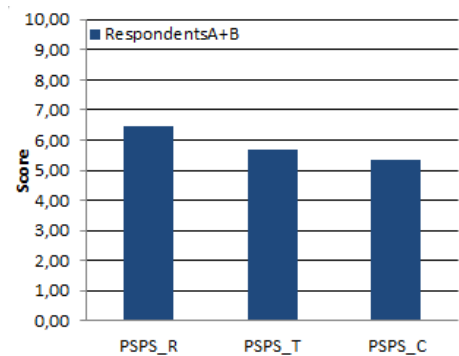


Figure 7.8: Overall applicability of PSPS among all respondents A+B

thereafter the PSPS of temporary use of municipal land by the placement of solar panels ($A=5.56$, $B=5.78$, $A+B=5.68$) and the least applicable is the PSPS of the combination of regional settlement and temporary use ($A=5.15$, $B=5.28$, $A+B=5.34$). Therefore the choice to exclude the determination of the determining factors for PSPS_C in chapter 6 is further endorsed. Remarkable is that the ranking of the three PSPS stays in the same order for every respondent group: among the municipal experts (A), academic and consultancy experts (B) and among all experts (A+B). There can be concluded the municipal experts as well as the academic and consultancy experts can be seen as comparable groups. However, there is still a noticeable difference in evaluation for all PSPS between A and B as overall the academic and consultancy experts (B) are more positive on the applicability of all PSPS.

The respondents' evaluations can also be analysed by means of the standard deviation σ ; it indicates the dispersion of the respondents' evaluations from the definite defuzzified value S_j . The highest applicable PSPS also shows the lowest standard deviation of the evaluations ($\sigma = 1.71$) of all respondents. Conclusively the experts did not only value this PSPS the highest applicable but also relatively the evaluations are the least dispersed thereby the experts valued this PSPS the most correspondingly. For the overview of trapezoidal fuzzy number \tilde{w}_{ij} , definite defuzzified value S_j and standard deviation from the evaluation per respondent group, see appendix 10.

7.4.2. Ranking of determining factors for two PSPS

For the two PSPS with the highest applicability the determining factors are derived from the case studies and therefore tested among the municipal experts (A) and the academic and consultancy experts (B).

Regional and financial settlement of residential developments

The results of the analysis on the estimation scores of the different experts (A and B) show minor differences in opinions. As threshold $\alpha_r = 7,00$ is determined and thereby we see among the municipal experts (A) that factor R08 'Politics' ($s_j = 7.27$) and R09 'Certainty' ($s_j = 7.10$) are of the greatest importance for the applicability (figure 7.9). And among the academic and consultancy experts (B) the factors R02 'Compensation for the financial settlement' ($s_j = 7.15$) and R03 'Obligation to donate share of revenues for the financial

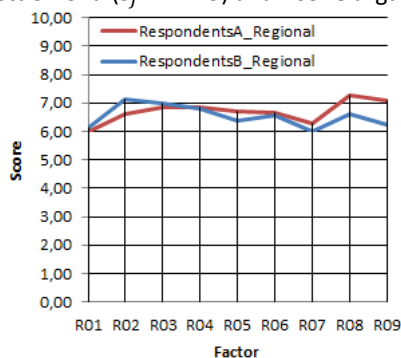


Figure 7.9: Scores of the determining factors of PSPS_R among respondents A and B.

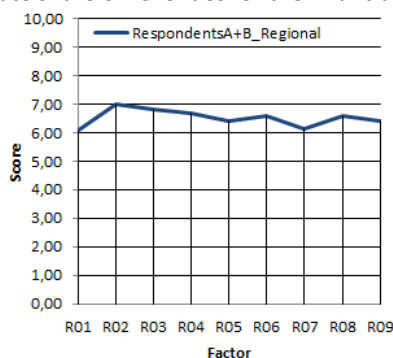


Figure 7.10: Scores of the determining factors of PSPS_R among all respondents.

settlement' ($s_j = 7.00$) are of greatest importance for the applicability of this PSPS (figure 7.10). The results show a focus on the administrative factors among the municipal experts (A) and a focus on the financial factors among the academic and consultancy experts (B). If we look in general at the different categories it is remarkable in all respondents groups (A, B and A+B) the spatial factors R03-R07 are regarded to be almost equally important.

Remarkable is the fact that in advance, from the expert meetings and interviews (appendices 2 and 3), the factor R07 'Role of province' was believed to be of great importance as it was discussed many times. However, among all respondents the factor R07 'Role of province' ($s_j = 6.18$) is not regarded to be very important. This could have two reasons: either the respondents think the initiative should come from the municipalities themselves or the province does not have the steering/directing power as presumed in the description of this factor. Furthermore factor R01 'Book value' is not regarded to be of great importance ($s_j = 6.07$) from which can be concluded that the total financial size of residential developments in a region is of less importance. In figure 7.11 the defuzzified value S_j and standard deviation σ per factor per respondent group (A, B, A+B) are shown (in more detail in appendix 10).

Analysis of the standard deviation σ shows some more remarkable results. In general the dispersion of evaluation of the different factors by the municipal experts is significantly smaller (all $\sigma < 1.90$) than the evaluations of the academic and consultancy experts. There can be concluded the municipal experts did evaluate the factors more correspondingly and agreed on the importance of the factor. Furthermore, over all respondents, the higher the rank of the factor the less dispersion of evaluation of that factor. Generally there can be concluded that when a factor is more important the respondents evaluated the factor more correspondingly and therefore agreed on the importance of the factor.

PSPS: Regional and financial settlement of residential developments								
Code	Category	Factor	S_j of A	STDEV of A	S_j of B	STDEV of B	S_j of A+B	STDEV of A+B
R01	Financial	Book value	6.02	1.86	6.12	2.62	6.07	2.29
R02	Financial	Compensation for the financial settlement	6.62	1.56	7.15	1.84	7.02	1.72
R03	Financial	Obligation to donate share of revenues for the financial settlement	6.87	1.44	7.00	1.86	6.82	1.72
R04	Spatial	Bond with current municipality	6.83	1.53	6.80	1.99	6.70	1.79
R05	Spatial	Competitiveness in region	6.71	1.50	6.37	2.42	6.41	2.04
R06	Spatial	Sort of residential developments in a region	6.67	1.41	6.55	1.89	6.61	1.69
R07	Administrative	Role of the province	6.29	1.87	6.02	2.64	6.14	2.32
R08	Administrative	Politics	7.27	1.39	6.62	1.95	6.57	1.71
R09	Administrative	Certainty	7.10	1.65	6.25	2.36	6.41	2.07

Figure 7.11: Overview of defuzzified definite value S_j and standard deviation STDEV per factor per respondent group (A, B, A+B) for PSPS_R

Temporary use of municipal land by the placement of solar panels

The results of the analysis on the evaluation of the different experts (A and B) show in general comparable results. There is difference between the evaluation scores of municipal experts (A) and academic and consultancy experts (B) for the financial factors T01-T03 (figure 7.12). The municipal experts evaluate these factors significantly higher (T01: 6.58, T02: 6.62, T03: 6.77) than the academic and consultancy experts (T01: 5.95, T02: 6.08, T03: 6.35). Remarkable is that the municipalities evaluate the financial factors of higher importance while the financial feasibility of the business case depends solely on the participation of the energy cooperative. There can be concluded the municipal experts see more barriers and uncertainty in the business case in comparison to the consultancy and academic experts.

For the factors T06 'Ambitions in the field of sustainability' and the factor T08 'flexibility of zoning plan' can be concluded that these are significantly of less importance for the applicability of this PSPS. The experts are clear that adjustments in the zoning plan for the temporary use are seen as quite an easy task and the ambitions in the field of sustainability are not the main target at this moment. The contribution on sustainability is seen as secondary while the main target is to minimize the losses on land developments.

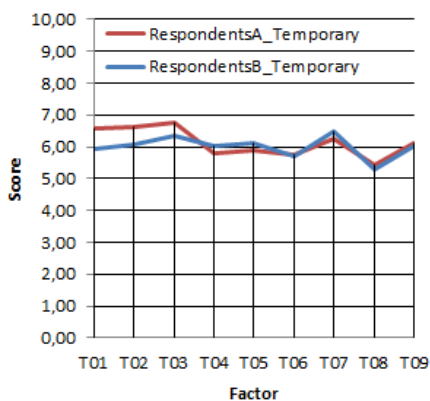


Figure 7.12: Scores of the determining factors of PSPS_T among respondents A and B.

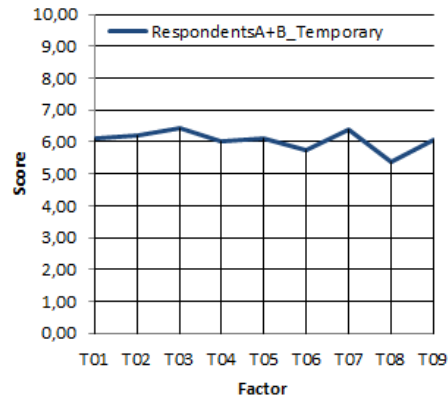


Figure 7.13: Scores of the determining factors of PSPS_T among all respondents.

The financial feasibility of the business case depends highly on legislation regarding collectively net metering and there is nowadays uncertainty about the development in legislation. The evaluation scores of all respondents, T07 'legislation regarding collectively net metering' ($s_j = 6.38$), endorse this. Furthermore T03 'run-time period' ($s_j = 6.43$) is evaluated as important, this is in line with the interviews where was stated that it can be difficult to put the residential development on hold for twenty years. The process of implementation of the temporary use may evoke resistance from municipal politics. This is endorsed by the respondents. In figure 7.14 the defuzzified value S_j and standard deviation σ per factor per respondent group (A, B, A+B) are shown (in more detail in appendix 10).

Many factors are evaluated with s_j between 5.50 and 6.50 therefore clear dispersion in the definite defuzzified value s_j is not noticed. But when looking at the different respondents' evaluations the standard deviation σ shows remarkable results. The dispersion in evaluations of the factors by the respondents is significantly higher (mainly $\sigma > 2.00$) than in the PSPS_R. Therefore the evaluations of the factors is less corresponding among the respondents and the opinions of the experts are more varied. Furthermore the opinions of the municipal experts are, similarly to the PSPS_R, more in line than the opinions of the consultancy and academic experts. The standard deviation σ of the evaluation scores of the consultancy and academic experts are all > 2.40 which shows significant dispersion in results. In appendix 10 the dispersion of the evaluation scores is shown per respondent which shows the differences in opinions among respondents.

PSPS: Temporary use of municipal land by the placement of solar panels								
Code	Category	Factor	S_j of A	STDEV of A	S_j of B	STDEV of B	S_j of A+B	STDEV of A+B
T01	Financial	Participation of energy cooperative	6.58	2.11	5.95	3.02	6.13	2.65
T02	Financial	Financial feasibility	6.62	2.11	6.08	3.02	6.21	2.65
T03	Financial	Run-time period	6.77	2.05	6.35	2.43	6.43	2.26
T04	Spatial	Scale of solar park	5.81	1.74	6.02	2.40	6.04	2.12
T05	Spatial	Location	5.88	1.99	6.12	2.93	6.13	2.53
T06	Administrative	Ambitions in the field of sustainability	5.75	2.24	5.72	2.60	5.73	2.43
T07	Administrative	Legislation regarding collectively net metering	6.25	2.53	6.48	2.84	6.38	2.70
T08	Administrative	Flexibility of zoning plan	5.44	2.54	5.28	2.80	5.36	2.68
T09	Administrative	Administrative support	6.10	2.42	6.02	2.59	6.05	2.51

Figure 7.14: Overview of defuzzified definite value S_j and standard deviation (STDEV) per factor per respondent group (A, B, A+B) for PSPS_T

CHAPTER 8 CONCLUSIONS AND RECOMMENDATIONS

In this chapter conclusions and recommendations on the results and findings of this research will be discussed. By executing literature review, a Multi Criteria Analysis and a questionnaire there is more insight gained in the current financial situation of municipalities regarding their land supply (chapter 5). Furthermore by executing literature review and arranging expert meetings possible sustainable policy solutions are determined to create more financial continuity for municipalities (chapter 6). The PSPS are tested on overall applicability and the determining factors for the applicability are scored and ranked on importance and analysed by means of the Fuzzy Delphi Method (chapter 7). This whole process (figure 1.4), its results and findings have contributed to the answering of all sub questions and the main research question.

First the conclusions from this research are discussed by answering all sub research questions (SQ1-SQ6) which will comprehensively answer the main research question (MQ) in paragraph 8.1. Furthermore in paragraph 8.2 the process, results and findings are discussed and in paragraph 8.3 recommendations for further research are given.

8.1 Conclusions

As shown in the research design (figure 1.4) the theoretical framework (chapter 2 and 3) forms the basis for the further two parts. The answers on the first two sub questions define the context of municipal land use policy:

SQ1: *How is spatial planning and land use policy currently organised in the Netherlands?*
SQ2: *What is the role of municipalities in the process of area and land development?*

The theoretical framework showed the close relationship and interdependency between municipal land use policy, spatial planning, area development and land. The playing field of area development is highly influenced by legislation of different governmental layers. In the historical context municipalities have always had an important regulating and controlling task in spatial development. This task is dual: 1) as legislator by determination of the land use to ensure sustainable development, providing a social and economic benefit for the present as well as for future generations and 2) traditionally as important actor in area development for the allocation of land. It becomes clear the municipalities set the rules (as legislator), are also beneficial of these rules and are a risk taking actor (as actor on the land market).

Traditionally municipalities have mainly applied active land use policy. With that policy municipalities acquire raw land and subsequently (after transformation of the land) sell the building land. This resulted, in times of economic growth, in an increase of value and thereby profit for municipalities. Since the change in the economic climate the financial risks of active land use policy become more and more clear. The economic crisis results in losses on land developments for municipalities because of delay in the allocation of land and interest

costs on the acquired land. Currently a shift towards the non-risk taking facilitating land use policy is noticeable. Thereby municipalities do not have land ownership (and thereby no financial risks) to ensure control on spatial development, but use their public instrumentation. Since the implementation of the *Wro* and land exploitation law (as part of the *Wro*) in 2008 the control of municipalities in spatial development is improved for facilitating land use policy.

8.1.1. Current financial situation of municipalities

On the level of the province *Noord-Brabant* the financial situation at municipalities due to losses on their land supply is explored. The defined sub research questions for this part of the research are:

SQ3: Which municipalities in the province of *Noord-Brabant* are in or close to financial danger due to losses on their land supply?

SQ4: What is the situation (and are the problems) of the selected municipalities in the province of *Noord-Brabant* which are in or close to financial danger?

The degree of exposure to financial danger due to losses on land developments is analysed with a Multi Criteria Analysis and resulted in a ranking of *Noord-Brabantse* municipalities which are most at risk of financial danger to least at risk of financial danger. This resulted (with threshold $S_j > 130$) in twenty municipalities that are most at risk in comparison to the other municipalities. The losses on land developments have resulted for two municipalities in total evaporation of the general reserves over 2012. These municipalities, Nuenen Gerwen en Nederwetten (no. 5) and Gemert-Bakel (no. 7), are now under pre-emption of the province. These municipalities are thereby directly in financial danger.

Furthermore the general opinion among municipalities, province and experts is when the current economic conditions continue (or worsen) the losses will only increase and more municipalities will come in direct financial danger. In conclusion, the MCA resulted in especially the smaller, rural municipalities with relatively large land supplies and small reserves position which are the most at risk of financial danger.

When looking at the current problems and handling of municipalities regarding the losses on their land supply the following aspects can be defined:

- Municipalities are trying to monitor the risks of the land developments more constantly. In the past this was done only once a year; now municipalities update the land developments more times a year.
- Municipalities are reprioritizing and (when possible cancelling) spatial developments. The *LIND* supply is more revaluated and when development is not possible in the near future the book value is devaluated to agricultural value.
- All municipalities have experienced losses on land developments and thereby arranged provisions. The degree on which the losses are already taken depends on the reserves position. Municipalities with large reserves positions have generally taken the vast

majority of the losses. For municipalities with smaller reserves positions this is more difficult and their reserves are decreasing quick.

- The phasing of land development is stretched and the making of land costs is postponed as much as possible in anticipation of better market conditions.
- Active land use policy is only used for locations where municipalities have land; for new locations municipalities are shifting towards facilitating land use policy to minimize risks.

In conclusion, the contacted municipalities are now mainly minimizing losses by short-term accounting measures. The need to look for sustainable, long term policy solutions is not present at municipalities. At the same time the number of municipalities in financial danger will only increase as the most recent forecasts do not show improvement in the economic conditions.

8.1.2. Applicability and determining factors of PSPS

As the financial situation of municipalities worsens due to losses on their land supply the need for different possible solutions to minimize, and eventually overcome, these financial problems is increasing. The defined sub research questions for this part of the research, and thereby comprehensively answering the main research question, are:

SQ5: *What possible sustainable policy solutions (PSPS) are there to improve the land use policy of municipalities to create a healthier financial situation?*

SQ6: *What is the applicability and are determining factors for the implementation of these possible sustainable policy solutions?*

MQ: *What possible sustainable policy solutions (PSPS) are applicable (and to what extent) to improve municipal land use policy in order to create a continuous healthier financial situation for municipalities in Noord-Brabant?*

Regional and financial settlement

The (PSPS) aim on comprehensively financial continuity, sustainable use of the space and sustainable forms of land use policy. The PSPS of regional and financial settlement of residential developments strives to achieve more balance in the possible construction output and the number of planned residential developments. At this moment the presale requirement of residential developments is not achieved and are thereby not started. The demand is too scattered and by cancellation of certain developments the demand can be bundled. This will ensure a more sustainable use of the space and help municipalities to improve the financial continuity. As for one specific municipality certain losses on land developments are difficult to cover, for a region it is possible to minimize the losses by sharing profit (of continued developments) as well as losses (of cancelled developments).

The regional and financial settlement should be initiated by the municipalities themselves is the general consensus. The municipal experts are aware of the improvement in policy with this PSPS but see the implementation in the context of municipal politics as possible barrier.

Furthermore the certainty of involvement of all municipalities with the prioritization and financial settlement is seen as crucial for the implementation of this PSPS. The academic and consultancy experts appreciated the financial aspects as most important for the implementation of the PSPS. It is important to what extent the municipality which cancels its residential development is compensated and to what extent the municipality of which its residential development is fully developed has to donate a share of the profit (and what size of this profit).

Temporary use of land by the placement of solar panels

The PSPS of temporary use by the placement of solar panels is an innovative, sustainable solution for the delay in planned residential developments. The oversupply of municipal land can be used to help achieve the ambitions in the field of sustainability (e.g. energy-neutral in 2020) and at the same time improves the revenues of the land. The revenues from the 'solar panel land use' can result in at least three times and up to seven times more revenues as the agricultural land use which it is mainly used for now. It showed in the three case studies an improvement of the financial result (depending on the book value) of 4-30%.

For this PSPS the legislation regarding collectively net metering is the biggest uncertainty. On the other hand, when an energy cooperative is willing to invest in the solar park it ensures only benefits for the municipality. The municipality does not invest in the solar panels and only receives a lease hold for the annual use of the land. Furthermore the run-time period can be a barrier as it can be difficult to put the residential development on hold for twenty years.

Applicability of PSPS

The PSPS of regional and financial settlement is regarded to be the most applicable and the PSPS of temporary use is less applicable, with an evaluation score from the FDM-analysis among all experts of respectively 6.47 and 5.69 (ordinal scale 1 to 10). The municipalities are acknowledging that temporary use of municipal land is interesting and the generation with renewable energy sources is one of these uses but still see difficulties in the financial feasibility. Furthermore, regional settlement in residential developments, as is already done for industrial areas, should be the direction of future land use policy. Both PSPS can minimize the losses on municipal land development but more importantly help using the land more sustainable. And additionally the applications in sustainability (e.g. renewable energy sources) can be part of that sustainable land use.

8.2 Discussion and reflection

When looking back on the passed process of this research there are several points of attention. In the first part of the research the analysis on the financial danger among *Noord-Brabantse* municipalities was limited with the public data from the annual results. It was thereby not possible to conduct a comprehensive analysis on the financial situation. To be able to give a comprehensive overview of the financial situation much more data on project level of the municipal land developments was necessary.

However, the MCA still gives an indicative overview of the municipalities that are probably more at risk of financial danger. The results show a precarious situation in the province of Noord-Brabant wherein several municipalities will come in danger when the current economic situation endures.

The different PSPS are tested among two homogenous groups of respondents. In the results from the analysis with the FDM is significant dispersion noticeable, especially for the PSPS of temporary use. This can be caused by difference in interpretation of the factors' description. Because of the time intensive process the reason for this high dispersion is not completely found although respondents noticed some inconsistency in factors' descriptions. With further testing among homogenous groups the analysis with the FDM can result in more significant

Personal View

This research mainly improved the awareness among municipalities for sustainable, innovative ways of land use (policy). From this research can be concluded municipalities do not exchange views on this subject; the view is mainly limited within the own municipal borders. On the short term interdisciplinary meetings among the different municipal actors are needed to exchange views on this subject and start the discussion. Cooperatively a solution can be found by sharing knowledge. In this research is shown especially the smaller municipalities, with smaller organizations and management, have limited knowledge in the field of land development. At these municipalities the risks are bigger and a proper overview of the risks on their land developments is limitedly available.

Therefore I think, fitting the development of merging of municipalities and the governmental aim of municipalities larger than 100,000 inhabitants, the solutions need to be found in more cooperation in land use policy and regionally achieve a balance in the planned residential developments and possible construction output. This can be done by sharing knowledge in the first place on administrative level thereby excluding the influence of the municipal politics. And eventually come to a regional land use policy whereby the possibility of financial settlement need to be further investigated. However, it should be prevented that the larger municipalities with knowledge and proper management have to pay for the losses and mismanagement of the smaller municipalities. But by prioritization of residential developments the losses can be minimized and eventually on a regional scale the municipalities are stimulated to look sustainable to the future again.

8.3 Recommendations

This research has been explorative in the field of sustainable, innovative forms of land use (policy). This is done with the limitation of residential developments on the outskirts of cities and from a municipal perspective. As the field of land use policy is far more extensive than these limitations further research is recommended. The following recommendations can be defined:

- The research aimed on the province of Noord-Brabant, but as stated the differences within different regions in the Netherlands differ. The demand for land in the *Randstad* will stay high while in *Limburg* and the northern part of the Netherlands there is far less demand because of the shrinkage in population. It is recommendable to explore the opinions of the decision-makers for these areas as well.
- The MCA on the current financial situation of municipalities in *Noord-Brabant* due to losses on land developments is not comprehensive because the data for all criteria is not publically accessible. However, the provinces have access to the more detailed data on project level which can result in a far more accurate and reliable analysis of the current financial situation. It is therefore recommended further research is done by/in cooperation with the provinces and more transparency of data is given by municipalities.
- Research done by van den Berg (graduation thesis CME, 2011) has contributed in the decision-making process among different stakeholders in urban development. When both this research and the research of van den Berg are combined, an overview of different opinions of stakeholders can be found (for as well urban development as development on the outskirts of cities). The two PSPS can in that way not only be tested among municipalities, but also on the other stakeholders in the area development process.
- In this research the first steps are presented for the possible modelling of the PSPS of regional settlement as a game theory. This can form the basis for further research to analyse the applicability among municipalities (and the other stakeholders) in more detail with game theory.
- The validity of the results from the analysis with the FDM can be improved by implementing the similarity aggregate method (SAM). For the implementation of that method the trapezoidal fuzzy number, valued each expert, had to overlap all as they thereby reached consensus. In this research the consensus is not reached among all experts, therefore further research is recommended to improve the validity.

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APPENDICES

APPENDIX 1: FLOW CHART SYMBOLS.....	108
APPENDIX 2: LIST OF USED DEFINITIONS	109
APPENDIX 3: EXPERT MEETINGS	111
APPENDIX 4: LIST OF INTERVIEWED MUNICIPAL EXPERTS.....	117
APPENDIX 5: RESEARCH ON LAND DEVELOPMENTS BY THE PROVINCE NOORD-BRABANT	118
APPENDIX 6: OVERVIEW OF RESULTS FROM MULTI CRITERIA ANALYSIS	122
APPENDIX 7: QUESTIONNAIRE 1 AMONG TWENTY NOORD-BRABANTSE MUNICIPALITIES	124
APPENDIX 8: RESULTS OF QUESTIONNAIRE 1 AMONG TWENTY MUNICIPALITIES	126
APPENDIX 9: DATA FILES.....	130
APPENDIX 10: APPLICABILITY AND DETERMINING FACTORS PER RESPONDENT GROUPS.....	131

APPENDIX 1: FLOW CHART SYMBOLS

Flow Chart Symbol	Name	Description
	Process	An operation or action step
	Terminator	A start or stop point in a process
	Preparation	A preparation or set-up process step
	Data	Indicates data inputs and outputs to and from a process
	Flow line	Indicates direction and flow of information

APPENDIX 2: LIST OF USED DEFINITIONS

Used Definition

acquirement
 allocable land
 amicable acquirement
 amortization of losses
 area development
 arranged provisions
 benefit tax
 building land / land ready for construction
 city council
 cooperation agreement
 development plan
 development rights
 emptive right
 evaporation (of profit)
 expropriation right
 Fuzzy Delphi Method (FDM)
 integration plan
 judgement
 land allocation
 land allocation agreement
 land (transformation) costs
 (financial estimate of) land development
 land development agreement
 land development law
 land price policy
 land use
 (municipal) land use policy
LID

LNID

 Lower chamber
 management regulation
 mayor and executive board
 Multi Criteria Analysis (MCA)
 municipal land use companies
 (collectively) net metering
 net present value (NPV)

Dutch Description

verwerving
 uitgeefbare grond
 minnelijke verwerving
 direct afboeken van verlies
 gebiedsontwikkeling
 getroffen voorzieningen
 baatbelasting
 bouwrijpe grond
 gemeenteraad
 samenwerkingsovereenkomst (SOK)
 exploitatieplan
 ontwikkelingsrechten (ivm bouwclaim)
 voorkeursrecht
 (winst)verdamping
 onteigeningsrecht
 fuzzy delphi method
 inpassingsplan
 zienswijze
 gronduitgifte
 gronduitgifteovereenkomst
 kosten voor bouw- en woonrijp maken
 grondexploitatie
 exploitatieovereenkomst
 grondexploitatie wet
 grondprijsbeleid
 bestemming
 (gemeentelijk) grondbeleid
 land in development (IEGG=
 in exploitatie genomen gronden)
 land not in development (NIEGG=
 niet in exploitatie genomen gronden)
 Tweede kamer
 beheersverordening
 College van B&W
 multi criteria analyse
 gemeentelijke grondbedrijven
 (collectief) salderen
 netto contante waarde (NCW)

operate	exploiteren
order in council	algemene maatregel van bestuur
outskirts of cities	uitleggebieden
possible sustainable policy solutions (PSPS)	mogelijke duurzame beleidsoplossingen
proactive indication	proactieve aanwijzing
project decision	project besluit
provisions	voorzieningen
raw land	ruwe bouwgrond
reactive indication	reactieve aanwijzing
regulation	verordening
resistance capacity	weerstandscapaciteit
run-time	exploitatieperiode
self-realization right	zelfrealisatie recht
selling price (of house)	vrij-op-naam prijs (VON-prijs)
settlement	verevening
spatial planning	ruimtelijke ordening
specific reserve for land developments	reserve Grondbedrijf/Grondexploitatie
state aid	staatssteun
strategic land acquirement	stragische grondverwerving
Upper chamber	Eerste kamer
usable surface area	gebruiksoppervlakte
<i>WRO</i>	spatial planning law before 2008
<i>Wro</i>	spatial planning law since 2008
zoning plan	bestemmingsplan

APPENDIX 3: EXPERT MEETINGS

Expert meeting Teco Noordegraaf

September 14th, 2012*Teco Noordegraaf - Cluster Coordinator Financial Supervision - Province Noord-Brabant*

As Cluster Coordinator Financial Supervision Teco Noordegraaf analyses the municipal annual reports specifically on the risks on their land possession. The municipalities are accountable to the province. The province carries out financial supervision on the municipalities' annual reports. Municipalities supply the province with additional, detailed information about their total land supply: the land which is in development ('*OHW = onder handen werk*') and the land that is just in possession and in the future might be brought into development ('*NIEGG = niet in exploitatie genomen gronden*').

We discussed the way the province researches the financial situation of municipalities due to their land stock. Since the economic crisis it became clear the risk on land development increased. Therefore the province saw the necessity to research the financial situation of municipalities due to their land stock. The province started with this research in 2011 and is now annually updating it. Because municipalities need to be accountable to, the additional data is provided. The criteria on which the municipalities are evaluated are shown in subparagraph 4.3.2.

The additional data to do this research is difficult to gain because municipalities are not obliged to supply it; in this research we are limited to the public data (from the annual reports). Therefore we discussed which criteria from the annual reports can be used to figure out the financial situation of municipalities in *Noord-Brabant*. It helped me to determine the four criteria used for the multi criteria analysis (see paragraph X). And it made clear the multi criteria analysis is not completely tenable, because it lacks the complete data (which the province does have). But with these criteria and the available public data, the multi criteria analysis is the most tenable as possible.

On the 4th of October we discussed the outcome of the multi criteria analysis and compared it to the results of the research done by the province. There was some discrepancy between the two outcomes but broadly there were many similarities. The differences in outcome were due to the lack of detailed information in this research. The outcome of the research done by the province is taken into account in this research. As a result, the 'top-20' of municipalities from this research are contacted with an additional questionnaire to nuance the multi criteria analysis that is not completely tenable (see paragraph X).

Expert meeting Theo Ram and Arjan Bakkeren

Theo Ram – Senior Consultant Land Use Policy and Land Development – Royal HaskoningDHV

Arjan Bakkeren – Senior Consultant Economics and Spatial Planning – Royal HaskoningDHV

Theo Ram and Arjan Bakkeren did a research for Royal HaskoningDHV in cooperation with the *Kadaster* on the relation between the acquired building land by municipalities over the last twenty years and the future need for building land. There was no overall insight in the relation between the amount of bought land by municipalities in relation to the predicted needed land in the future. We discussed the background of this research; they predicted the need for dwellings and for industrial areas based on the future demographic changes and the predicted employment rates from the *Centraal Bureau voor de Statistiek (CBS)*. For further details about the used method see (Ram en Bakkeren, 2012).

We discussed the method that is used nowadays to predict the growth of industrial areas within the municipality (need for building land). These predictions with the *Bedrijfslocatiemonitor* are still much too optimistic and the method used is substantiated with assumptions which are not fitting the current times of economic crisis (still based on assumptions from 2008). The predictions for future need of dwellings is based mostly on demographical factors with PEARL2011 (CBS) and is transformed into the need for land per municipality in new to build areas (*uitleglocaties*).

Royal HaskoningDHV concluded from the research that in certain areas regional cooperation between surrounding municipalities could solve a part of the problem. Certain municipalities are in need of land (i.e. Eindhoven) and other municipalities (i.e. Nuenen, Best, Veldhoven) have an oversupply of land. But there are some factors which oppose this cooperation:

- For industrial areas it is possible to regionally approach development of these areas, because the specific location is important. Not the municipality. For housing it is more difficult because people only want to live in a certain municipality and are less willing to move to another municipality. People who are searching for a house in Eindhoven are less willing to live in Nuenen instead.
- Municipalities are still focussing within their own borders. The autonomy of their own municipality is very important for certain municipalities. This opposes the regional cooperation.

A solution to this problem could be to merge certain municipalities. The aim of the national government is also to do this, but the municipalities are still very devoted to their autonomy. But this a solution which should be looked at in a specific situation, it is not applicable in all areas. Another solution is a stronger governmental policy from the state which encourages/obligates municipalities to predict their future developments regionally.

Expert meeting Ingrid van der BurgtNovember 26th, 2012*Ingrid van der Burgt – Urban Planner – Province Noord-Brabant*

Ingrid van der Burgt is as urban planner active in the region South-East *Noord-Brabant*. The province makes, with data from the CBS, annually prognoses of the population growth and the related need for housing. The edition from 2011 is applied as standard for the predictions of future need of housing for the municipalities in *Noord-Brabant* (Bargeman et al, 2011). These predictions are based on demographical changes: people will get older (the amount of older people in the total population will grow), population growth will smooth and in some regions the population will even decline. And based on migration: in rural areas no positive migration will appear (only based on birth and death rates) and the positive migration will appear in urban areas. The policy of the province *Noord-Brabant* is also aiming on further urbanization of urban areas, so growth (in housing stock) around urban areas is stimulated.

As urban planner in the field of housing she consults municipalities and tries to act the directing role of the province. The province tries to frame their policy with the policy of municipalities and make regional agreements. In the past i.e. Eindhoven made agreements with the surrounding municipalities (*Samenwerkingsverband Regio Eindhoven* (SRE) and the province *Noord-Brabant*) on taking over a part of the construction output needed for Eindhoven (10.000 units). These municipalities (Veldhoven, Son en Breugel, Best and Nuenen) acquired building land and made plans for area developments. Due to the economic crisis these area developments are delayed, the plans are reconsidered (are they matching future needs?) or even cancelled and municipalities need to take losses on the land. The province tries to stimulate municipalities to take these losses now and make their land developments realistic to the current situation. But still there are also some municipalities which postpone the taking of losses and only stretch their land developments with a longer lead-time. Also, it is unclear how the population growth and the related need for housing on the long-term will develop. Because of the sale which falls behind with the demand, certain experts think the housing stock will catch up somewhere along the way. Other experts think the long-term prognoses will not be reached and the economic situation will stay poor for quite some time.

Another cause of the problem, according to the province, is the role of the SRE in South-East *Noord-Brabant*. As a metropolitan region the SRE had a legal *WGR+-status*: a regional public organizational layer of 21 cooperating municipalities which got certain tasks directly imposed by the State. The goals the SRE tries to achieve are, according to the province, too ambitious. These goals are not based on prognoses and because of that, some municipalities acquired too much building land and made too ambitious plans. In the past, the province *Noord-Brabant* and the SRE did not cooperate because it was not clear which party had which tasks exactly. With the abolition of the *WGR+-status* of metropolitan areas the control

is back in hands of the province. The last years the SRE recognised the problem and tries to solve it in cooperation with the province.

On policy level the province *Noord-Brabant* tries to connect the financial side of this problem with the spatial side. The division *Ruimtelijke ordening en handhaving* is working more and more together because the province noticed municipalities struggle with both aspects and the solution should be found within these both aspects.

Expert meeting prof. dr. Erwin van der Krabben

December 5th, 2012

Erwin van der Krabben – Professor Real Estate and Area Development - Radboud Universiteit Nijmegen

Erwin van der Krabben is professor Real Estate and Area Development at the Radboud University in Nijmegen. In the process of area development in the Netherlands municipalities have always had an important role because of their active land use policy. The scientific research of this department aims on understanding the land market more; under what conditions is what amount of land issued, with what quality and for what price. Further, area development is the implementation of governmental spatial planning. In that way it is also important to research in which way the government should control area developments in the future; for instance in the past as active stakeholder on the land market. He is known as an expert on land use policy and area development.

We discussed the consequences of the active land use policy of municipalities in the Netherlands. The situation in the Netherlands is unique in the world; nowhere else in the world the government has such an active and risky role in spatial planning as they invest in land. In that way the control of the spatial planning is in hands of the municipalities, but they are also at risk if the risks of the land developments are not estimated correctly. The current economic situation showed the downside of the active land use policy; municipalities are confronted with big losses on land developments.

The aim of the interview was more on the solutions for the current problems. The area development process is changed; the time of ever increasing economic growth is from the past. Thereby, the expansion of cities will be more and more transformation/redevelopment of existing areas. The development of *VINEX-locaties*, large areas at the borders of cities where expansion is planned, will more and more come to an end. From the scientific literature and practical experience there are two new forms of area development: 1) organic area development, in small phases with a more global master plan (not a strict zoning plan) develop areas more gradually. 2) urban reparcelling, in urban areas the land ownership is fragmented, to redevelop these areas the land needs to be reparcelled. These new forms of area development will be implemented over time.

Municipalities encounter financial problems due to the losses on their land developments. There are two types of land types: 1) land which is in development now (with spatial plans) and 2) land which is strategically acquired for future developments. The solutions discussed regard the land that is development now which is at the moment the biggest problem for municipalities. In general there are four types of solutions known:

- **Accounting measures:** these measures will not solve the problem but will minimize the effects on the total budget of the municipality. The option of the annual amortization of the losses on land developments is mentioned. If the losses should be taken at once it has, in some cases, big financial consequences and will result not balanced budgets of

municipalities. To prevent this, the annual amortization of the losses on land developments is an option.

- **Increase the issuance pace of land:** a) directly issue the land to individuals and stimulate privately commissioned building (*CPO*). b) the municipality acts as housing developer and sells for cost price (Edam/Volendam), downside is the newly built houses are less expensive in comparison to the existing housing stock thus existing houses will not be sold unless they drop the demand price.

c) issue the land in leasehold; in that way the investment beforehand is not necessary and an annual price for the land is paid. This is a stimulating measure for developers, but for housing owners it is more difficult to get a mortgage when the land is issued with a leasehold. d) lower the land prices (dump price) to stimulate the sales. In that way losses still have to be covered, but at least the municipality gains some revenues from the land.

- **Forms of partnership between municipalities and commercial actors are under pressure:** For the development of the extensive *VINEX-locations* municipalities cooperated with developers and builders. At this moment these developers are not developing because of the economic situation, therefore the municipality still has the land in ownership. These partnerships need to be reconsidered and the solution might be to dissolve the contract with the commercial actors. In that way a new market situation is created and new plans for smaller development phases with different actors are made possible.

- **Regional Approach:** this solution is dual: 1) regional programming: the province is the governmental layer which should manage the programs of housing areas, industrial areas, recreational areas etc. e.g. the area developments of municipalities should be in line with the demographical development of the province, the projected housing programs of the municipalities should fit these projections of the province. Otherwise there will be an oversupply. 2) regional land use policy: to make sure the different area developments will fit the regional need. With a regional land use policy the oversupply of developments can be taken out of the market and the developments where is demand for can be started. The most important aspect is to ensure financial cooperation. If in one municipality an area development is cancelled, the losses should be in some way compensated with another area development that will be proceeded in another municipality. The solution of a regional '*vereveningsfonds*' is discussed.

APPENDIX 4: LIST OF INTERVIEWED MUNICIPAL EXPERTS

Naam	Functie	Gemeente	Datum
Ron Smolders	Beleidsadviseur grondbedrijf	Geldrop-Mierlo	26-11-2012
Martijn van Erp	Medewerker financial beleid	Bernheze	29-11-2012
Gerrit van Kleef	Teammanager Bedrijfseconomische control	Heusden	11-12-2012 24-01-2013
Jan de Laat	Financieel Beleidmedewerker	Heusden	11-12-2012 24-01-2013
Oscar van Limburg	Projectleider	Heusden	11-12-2012 24-01-2013
Leo Somers	Planeconoom	Uden	11-12-2012 24-01-2013
Jeroen van den Berg	Adviseur Vastgoed	Uden	11-12-2012 24-01-2013
Jos Poelman	Planeconoom	Veldhoven	14-12-2012
Maurice Emonds	Senior-medewerker cluster Vastgoed	Gemert-Bakel	12-12-2012 28-01-2013

Formulier toezichtsthema GRONDEXPLOITATIE

Gemeente:

Balansgegevens jaarrekening: 2011

Totale boekwaarde in exploitatie genomen grond *)

Totale boekwaarde nog niet in exploitatie genomen grond

Voorziening nadelige complexen *)

*) Brutobedragen, d.w.z. dat de voorziening nadelige complexen niet mag worden verrekend met de boekwaarden

Algemene reserve grondexploitaties

Het totaal van de overige aan grondexploitatie gerelateerde reserves

Overige gegevens op basis van art. 70 BBV

Totaal verwacht eindresultaat alle complexen

Eindresultaten berekend op contante waarde? (keuze maken)

Totaal resultaat complexen met een negatief saldo (neg. bedrag invullen)

Totaal nog te maken kosten

Totaal nog te realiseren opbrengsten

Overige informatie:

Aantal inwoners (conform CBS) per 01-01-2011:

Welk rentepercentage wordt vanuit de Alg.Dienst toegerekend aan de grondexploitatie

1. Zijn de kostprijsberekeningen actueel (keuze maken + jaar invullen)

2. Wordt aandacht besteed aan PPS const. (o.a. in \$ verbonden partijen)

3. Zijn de risico's inzichtelijk (ind. PPS, garanties en andere overeenk.)

4. Is het weerstandsvermogen voldoende ter afdekking risico's grondexpl.

5. Toelichting (beschrijvend)

31-12-2010

31-12-2011

2.959.000

2.602.000

2.305.000

1.896.000

0

0

0

0

884.199

905.913

31-12-2010

31-12-2011

496.623

529.000

0

0

19.829.595

19.408.600

23.261.000

22.561.700

23.224

23.273

4.00%

ja

ja

ja

ja

maart 2012

Exploitaties zijn in maart 2012 geactualiseerd. De grondprijzen zijn wederom naar beneden bijgesteld en variëren nu van € 200 tot € 225 (in overleg met taxateur). De te betalen resultaten zijn voorzichtig gecalculerd. Risico's zijn via risicomanagement in beeld. Weerstandsvermogen is in totaliteit voldoende ter afdekking van de risico's. Gemeente anticipeert voldoende op crisis. Geen verdieping nodig.

118

TU/e

118

Toelichting op het in te vullen format jaarrekening 2011:

Het betreft hier de gegevens van de grondexploitatie uit de jaarrekening 2011. De gegevens uit de jaarrekening 2010 zijn al eerder geïnventariseerd en op een ander format verzameld. S.v.p. de gevraagde gegevens per 31-12-2010 ook invullen op het format 2011. De gegevens per 31-12-2010 komen namelijk ook op het verzamelbestand.

1. Totale boekwaarde in exploitatie genomen grond

In de balans zijn de boekwaarden van de gronden in exploitatie en de nog niet in exploitatie genomen gronden te vinden. Een aanvankelijk winstgevend prognose kan omslaan naar een verliesgevend prognose. De tot dan toe geactiveerde grondexploitatie krijgt dan een lagere waarde. In dat geval dient er een voorziening te worden getroffen. Op grond van de voorschriften worden bij de balans de voorzieningen negatieve complexen afgetrokken van de boekwaarde van de in exploitatie genomen gronden. Alleen bij een naar verwachting duurzame waardevermindering is ook een afboeking van de boekwaarde mogelijk. Voor ons inzicht is het van belang om de bruto bedragen te hebben d.w.z. de boekwaarden zonder de in mindering gebrachte voorziening. In de toelichting op de balans wordt dit inzicht meestal gegeven.

2. Reserves grondexploitatie

In de toelichting op de balans is de informatie aangaande de reserves en voorzieningen opgenomen. Indien gemeenten geen afzonderlijke algemene reserve grondexploitatie hebben dient hier 0 ingevuld te worden, niet het bedrag van de algemene reserve (algemene dienst). De overige aan grondexploitatie gerelateerde reserves zijn reserves die betrokken worden bij het totaal van de grondexploitatie. Er zijn nog veel gemeenten die een afzonderlijk Grondbedrijf hebben. De aan de grondexploitatie gerelateerde reserves zijn dan die reserves die verantwoord worden bij het Grondbedrijf. In dat geval zou de vraag dus eenvoudig te beantwoorden moeten zijn. Wanneer er geen sprake is van een afzonderlijk Grondbedrijf, kun je de vraag stellen: wanneer het Grondbedrijf afgezonderd zou worden, welke reserves behoren dan tot het Grondbedrijf? Voorbeelden zijn:

- Risicoreserve grondexploitatie
- Reserve rentever verschillen grondexploitatie
- Reserve bovenwijkse voorzieningen

3. Verwacht eindresultaat

Op grond van art. 70 BBV dient in de toelichting op het onderhanden werk grondexploitatie het verwacht eindresultaat van de grondexploitatie opgenomen te worden. Deze uitkomst is vaak per complex gespecificeerd zodat de complexen met een negatief eindresultaat hier uit gehaald kunnen worden, waarna de relatie met de voorziening negatieve complexen gelegd kan worden. Op grond van art. 26 BBV kan deze informatie ook terug te vinden zijn in de paragraaf grondbeleid.

Het heeft de sterke voorkeur om het verwacht eindresultaat op contante waarde te berekenen. Indien dit niet het geval is kan dit worden aangegeven (ja/nee) en kan hier rekening mee worden gehouden voor de eindconclusie. Het totaal verwacht eindresultaat van alle complexen is het netto resultaat van de complexen met een positief en een negatief verwacht eindresultaat.

Het onderdeel complexen met een negatief eindresultaat betreft het totaalbedrag van alle complexen met een negatief eindresultaat, dus niet het aantal complexen met een negatief eindresultaat.

4. Totaal nog te maken kosten en nog te realiseren opbrengsten

Op grond van art. 70 B.B.V dient in de toelichting op het onderhanden werk grondexploitatie het totaal nog te maken kosten en te realiseren opbrengsten opgenomen te zijn. Deze cijfers geven een indruk van hetgeen nog op de gemeente afkomt en kan in relatie met het vermoedelijke eindresultaat worden gebracht. Het geeft inzicht in het realiteitsgehalte van de te verwachten eindresultaten.

5. Welk rentepercentage wordt toegerekend?

Bij de beoordeling van de begrotingen 2013 wordt o.a. beoordeeld of er een reëel rentepercentage toegerekend wordt vanuit de 'Algemene Dienst' aan de grondexploitatie. Het rentepercentage voor 2013 is in het algemeen gesteld op maximaal 4%. Het betreft de rente die als opbrengst verantwoord wordt in de exploitatie van de 'Algemene Dienst'. Het betreft dus niet de rente die binnen de grondexploitatie gehanteerd wordt binnen de diverse exploitatieopzetten.

Door het rentepercentage bij de jaarrekening 2011 te inventariseren ontstaat er in een vroeg(er) stadium duidelijkheid welke gemeenten het rentepercentage eventueel bij moeten stellen.

NB

Dit is een aanvullende vraag die alleen in Noord-Brabant wordt geïnventariseerd en maakt dus geen onderdeel uit van het gemeenschappelijk toezichtthema.

6. Actuele kostprijsberekeningen

Er dienen actuele prognoses van de te verwachten resultaten te zijn. Deze resultaten blijken uit kostprijsberekeningen. Een kostprijsberekening is actueel indien deze niet ouder is dan een jaar ten opzichte van de datum van vaststelling van de jaarstukken.

7. PPS-constructies

Niet iedere gemeente heeft PPS-constructies. Bij de vraag of in de jaarrekening aandacht wordt besteed aan PPS-constructies kan in dat geval ook het antwoord 'niet van toepassing' gegeven worden. De formule in de cel kan in dat geval overschreven worden met nvt.

8. Voldoende weerstandsvermogen?

Dit is een vraag waar een oordeel van de toezichthouder wordt gevraagd. Geconstateerd is dat deze vraag zonder enige verdieping niet (goed) beantwoord kan worden. De jaarrekening geeft namelijk in veel gevallen onvoldedige informatie. Tevens is gebleken dat deze vraag verschillend geïnterpreteerd wordt. Om deze (subjectieve) vraag zoveel mogelijk uniform te beantwoorden volgen onderstaand enkele aandachtspunten die bij deze vraag betrokken kunnen worden:

- Doet de gemeente aan risicomanagement?
- Doet de gemeente zelf een uitspraak of het weerstandsvermogen voldoende is om de risico's te kunnen dekken? (minimale ratio weerstandsvermogen)
- Onderschrijft de toezichthouder de uitspraak van de gemeente?
- Is volledig inzicht gegeven in grondexploitaties die in exploitatie zijn?
- Is de nota grondbeleid actueel?
- Zijn de exploitatieopzetten actueel?
- Zijn de bouwplannen afgestemd met gemeenten uit de regio en/of provinciale prognoses?
- Zijn voor negatieve complexen voorzieningen getroffen van gelijke omvang?
- Worden risico's benoemd bij nog niet in exploitatie genomen gronden?
- Wordt aandacht besteed aan PPS?

Het bepalen of het weerstandsvermogen voldoende is om de risico's van alleen de grondexploitatie af te kunnen dekken gebeurt op basis van het totaalbeeld van de gemeente, dus inclusief de algemene reserve(s) algemene dienst. Er zijn immers gemeenten zonder een afzonderlijke algemene reserve grondexploitatie.

In het Vakberaad is afgesproken, dat wanneer bij de inventarisatie in eerste instantie geconcludeerd wordt dat het weerstandsvermogen onvoldoende is, er bij deze vraag (gelijk) een verdieping plaatsvindt. De 'nee' wordt op deze manier een 'onderbouwde nee'. Indien na deze verdieping nog steeds de conclusie is dat het weerstandsvermogen onvoldoende is, wordt deze conclusie afgestemd met de gemeente. Op deze manier kan er een meer onderbouwde uitspraak worden gedaan over het aantal gemeenten dat (mogelijk) in financiële problemen komt.

Een aandachtspunt is nog de situatie waarbij het weerstandsvermogen kennelijk niet bepaald kan worden (risico's niet geïnventariseerd en/of gekwantificeerd) er zodoende geen uitspraak gedaan kan worden of er voldoende of onvoldoende weerstandsvermogen is om de risico's van de grondexploitatie af te kunnen dekken. In dat geval kan het antwoord 'niet te bepalen' (ntb) gegeven worden. De formule in de cel wordt overschreven met ntb.

9. Toelichting

In het onderdeel 'Toelichting, beschrijvend' kan facultatief tekstueel nog wat (relevante) toelichting worden gegeven.

10. Ontbrekende informatie

De gegevens die geïnventariseerd worden betreffen gegevens die in de jaarrekening staan of hadden moeten staan. Indien de jaarstukken (jaarverslag + jaarrekening) de gevraagde informatie niet leveren, dien je de informatie op te vragen bij de gemeente. Je kunt natuurlijk ook eerst zelf nog een poging doen om de gegevens via nota's grondbeleid, meerjarenplanningen en geactualiseerde exploitatieopzetten op te vragen. Let daarbij wel op, dat de gegevens aansluiten op de jaarrekening 2011.

11. Verdieping

Naast de verdieping bij de beantwoording van de vraag of er voldoende weerstandsvermogen is om de risico's binnen de grondexploitatie af te kunnen dekken, zijn er nog andere redenen om een verdieping uit te voeren. De toezichthouder/provincie trekt zelf de conclusie of er een (aanvullende) verdieping voor de bewuste gemeente moet worden uitgevoerd. Deze verdieping is met name bedoeld voor de eigen provincie en wordt niet betrokken bij de landelijke inventarisatie.

In Noord-Brabant wordt een relatie gelegd naar de inventarisatie 'meer dan 100% harde plancapaciteit' die de collega's van de cluster wonen en werken hebben gemaakt. Ongeveer 20% van de Brabantse gemeenten heeft meer dan 100% plancapaciteit en lopen daardoor een groter risico op stagnerende of zelfs verliesgevendende grondexploitatie. Voor deze gemeenten (zie de bijlage van de notitie) vindt een verdieping plaats door FT. Tevens is afgesproken, dat er bij de collega's van de cluster wonen en werken informatie opgevraagd wordt voor de gemeenten waarvoor op basis van financiële gronden een verdieping plaatsvindt. Met het uitwisselen van gegevens ontstaat er een nog beter beeld over de grondexploitatie in Noord-Brabant.

APPENDIX 6: OVERVIEW OF RESULTS FROM MULTI CRITERIA ANALYSIS⁶

1. The total land supply per inhabitant	Absolute value	Score	2. The total land supply as share of the total assets	Percentage	Score
1 Veghel	€ 4.974	100,00	1 Maasdonk	70%	100,00
2 Maasdonk	€ 4.765	95,78	2 Veghel	64%	92,02
3 Veldhoven	€ 2.790	55,89	3 Boekel	56%	80,20
4 Boekel	€ 2.690	53,86	4 Heusden	55%	78,99
5 Heusden	€ 2.552	51,08	5 Veldhoven	49%	70,32
6 Nuenen, Gerwen en Nederwetten	€ 2.235	44,68	6 Nuenen, Gerwen en Nederwetten	48%	68,08
7 Best	€ 1.868	37,28	7 Halderberge	43%	61,28
8 Gemert-Bakel	€ 1.734	34,57	8 Landerd	43%	60,81
9 Deurne	€ 1.489	29,62	9 Dongen	40%	56,35
10 Uden	€ 1.449	28,81	10 Best	39%	55,40
11 Bernheze	€ 1.396	27,73	11 Son en Breugel	36%	51,84
12 Gilze en Rijen	€ 1.386	27,52	12 Bernheze	36%	51,34
13 Boxmeer	€ 1.355	26,91	13 Gilze en Rijen	36%	51,07
14 Helmond	€ 1.321	26,23	14 Laarbeek	34%	48,37
15 Bergen op Zoom	€ 1.304	25,88	15 Bergeijk	34%	48,31
16 Halderberge	€ 1.237	24,51	16 Uden	31%	44,17
17 Son en Breugel	€ 1.190	23,57	17 Aalburg	30%	43,05
18 Dongen	€ 1.174	23,25	18 Reusel-De Mierden	30%	42,07
19 Landerd	€ 1.159	22,94	19 Boxmeer	30%	41,93
20 Oirschot	€ 1.087	21,49	20 Heeze-Leende	29%	41,48
21 Waalwijk	€ 1.018	20,09	21 Roosendaal	28%	39,88
22 Tilburg	€ 1.016	20,05	22 Werkendam	27%	37,49
23 Reusel-De Mierden	€ 1.003	19,80	23 Geldrop-Mierlo	26%	36,17
24 Bergeijk	€ 983	19,39	24 Etten-Leur	25%	35,53
25 Laarbeek	€ 980	19,34	25 Haaren	25%	35,44
26 Geldrop-Mierlo	€ 962	18,97	26 Eersel	25%	35,15
27 Eindhoven	€ 960	18,92	27 Deurne	25%	34,77
28 Etten-Leur	€ 940	18,52	28 Bergen op Zoom	24%	34,12
29 Oosterhout	€ 939	18,50	29 Gemert-Bakel	24%	33,86
30 Eersel	€ 933	18,38	30 Oisterwijk	24%	33,67
31 Werkendam	€ 900	17,71	31 Oirschot	24%	33,36
32 Aalburg	€ 859	16,89	32 Helmond	24%	33,24
33 Oss	€ 805	15,80	33 Oosterhout	23%	32,57
34 Roosendaal	€ 793	15,56	34 Sint-Michielsgestel	22%	30,67
35 Valkenswaard	€ 767	15,03	35 Woudrichem	22%	30,36
36 Woudrichem	€ 765	14,99	36 Valkenswaard	21%	29,34
37 Oisterwijk	€ 745	14,58	37 Eindhoven	20%	28,28
38 Heeze-Leende	€ 737	14,43	38 Oss	20%	27,67
39 Someren	€ 664	12,95	39 Waalwijk	18%	24,49
40 Sint Anthonis	€ 622	12,10	40 Waalre	17%	23,92
41 Breda	€ 607	11,80	41 Zundert	17%	23,81
42 's-Hertogenbosch	€ 605	11,75	42 Tilburg	17%	23,78
43 Haaren	€ 573	11,11	43 Loon op Zand	17%	23,21
44 Loon op Zand	€ 558	10,80	44 Sint Anthonis	15%	21,32
45 Schijndel	€ 482	9,26	45 Schijndel	15%	21,13
46 Goirle	€ 463	8,89	46 Goirle	15%	20,57
47 Asten	€ 422	8,07	47 Breda	13%	18,61
48 Vught	€ 414	7,90	48 Someren	13%	18,27
49 Sint-Michielsgestel	€ 404	7,70	49 Asten	12%	16,82
50 Moerdijk	€ 355	6,71	50 Vught	11%	15,41
51 Boxtel	€ 348	6,57	51 Bladel	11%	15,31
52 Waalre	€ 348	6,56	52 Sint-Oedenrode	11%	14,54
53 Hilvarenbeek	€ 346	6,52	53 Moerdijk	11%	14,50
54 Zundert	€ 340	6,40	54 Cranendonck	10%	13,92
55 Sint-Oedenrode	€ 322	6,05	55 Steenbergen	10%	13,04
56 Bladel	€ 319	5,98	56 Boxtel	10%	12,94
57 Cuijk	€ 304	5,68	57 Cuijk	9%	12,18
58 Rucphen	€ 267	4,92	58 Hilvarenbeek	9%	12,05
59 Cranendonck	€ 250	4,58	59 's-Hertogenbosch	9%	11,71
60 Steenbergen	€ 222	4,02	60 Rucphen	8%	10,83
61 Geertruidenberg	€ 103	1,61	61 Geertruidenberg	4%	4,69
62 Alphen-Chaam	€ 89	1,34	62 Alphen-Chaam	3%	4,09
63 Woensdrecht	€ 53	0,61	63 Woensdrecht	2%	1,75
64 Drimmelen	€ 32	0,17	64 Drimmelen	1%	0,94
65 Baarle-Nassau	€ 23	0,00	65 Baarle-Nassau	1%	0,00
66			66		
67			67		

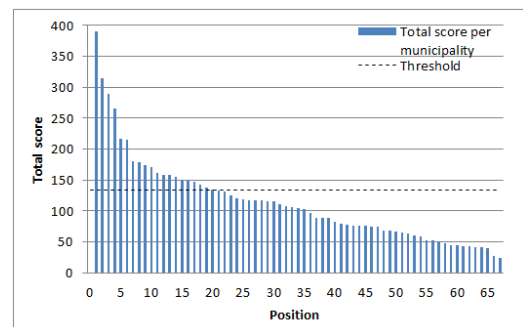
⁶ Note: The annual reports of 2011 are public but not collectively retrievable. Hence all annual reports of Noord-Brabantse municipalities are manually collected from the municipal internet sites and processed in Microsoft Excel. The results of the MCA are shown in the tables above. For the data file, see appendix 9.

3. The total land supply - total reserves	Absolute value	Score
1 Heusden	€ 58.701.000	100,00
2 Veghel	€ 56.687.000	98,52
3 Maasdonk	€ 44.040.000	89,23
4 Gemert-Bakel	€ 37.579.000	84,49
5 Nuenen, Gerwen en Nederwetten	€ 25.381.000	75,53
6 Veldhoven	€ 24.019.000	74,53
7 Bergen op Zoom	€ 19.359.000	71,11
8 Uden	€ 15.358.000	68,17
9 Deurne	€ 14.528.000	67,56
10 Boekel	€ 12.928.000	66,39
11 Dongen	€ 10.374.000	64,51
12 Halderberge	€ 9.782.000	64,08
13 Breda	€ 5.112.000	60,65
14 Bergeijk	€ 2.686.000	58,87
15 Oisterwijk	€ -256.000	56,71
16 Gilze en Rijen	€ -387.000	56,61
17 Geldrop-Mierlo	€ -698.000	56,38
18 Bernheze	€ -854.000	56,27
19 Boxmeer	€ -1.217.000	56,00
20 Heeze-Leende	€ -3.028.000	54,67
21 Reusel-De Mierden	€ -3.233.000	54,52
22 Zundert	€ -4.038.000	53,93
23 Aalburg	€ -4.301.000	53,74
24 Woudrichem	€ -5.151.000	53,11
25 Alphen-Chaam	€ -6.545.000	52,09
26 Haaren	€ -8.095.000	50,95
27 Bladel	€ -8.244.000	50,84
28 Sint-Oedenrode	€ -9.884.000	49,64
29 Landerd	€ -11.741.000	48,27
30 Werkendam	€ -13.154.000	47,23
31 Loon op Zand	€ -14.944.000	45,92
32 Hilvarenbeek	€ -15.092.000	45,81
33 Schijndel	€ -15.693.000	45,37
34 Oirschot	€ -16.290.000	44,93
35 Son en Breugel	€ -16.874.000	44,50
36 Roosendaal	€ -16.938.000	44,46
37 Vught	€ -16.952.000	44,45
38 Eersel	€ -17.629.000	43,95
39 Baarle-Nassau	€ -17.991.000	43,68
40 Sint-Michielsgestel	€ -18.530.000	43,29
41 Geertruidenberg	€ -19.492.000	42,58
42 Boxtel	€ -19.802.000	42,35
43 Mill en Sint Hubert	€ -20.446.000	41,88
44 Waalre	€ -21.557.000	41,06
45 Cranendonck	€ -22.013.000	40,73
46 Goirle	€ -22.715.000	40,21
47 Grave	€ -22.845.000	40,12
48 Etten-Leur	€ -23.338.000	39,76
49 Laarbeek	€ -24.100.000	39,20
50 Sint Anthonis	€ -25.146.000	38,43
51 Woensdrecht	€ -25.650.000	38,06
52 Valkenswaard	€ -26.131.000	37,70
53 Asten	€ -26.483.000	37,45
54 Oss	€ -28.368.000	36,06
55 Waalwijk	€ -30.905.000	34,20
56 Steenbergen	€ -34.909.000	31,26
57 Cuijk	€ -38.582.000	28,56
58 Best	€ -38.885.000	28,34
59 Someren	€ -41.466.000	26,44
60 Drimmelen	€ -44.331.000	24,34
61 Rucphen	€ -50.169.000	20,05
62 Moerdijk	€ -59.050.000	13,53
63 Oosterhout	€ -77.476.000	0,00
64		
65		
66		
67		

4. The total land supply	Absolute value (x €1000)	Score
1 Veghel	185540	100,00
2 Veldhoven	120648	65,40
3 Heusden	109728	59,58
4 Breda	105217	57,18
5 Bergen op Zoom	85884	46,87
6 Oss	68014	37,34
7 Roosendaal	61532	33,89
8 Uden	58740	32,40
9 Best	54097	29,92
10 Maasdonk	53689	29,71
11 Oosterhout	50841	28,19
12 Gemert-Bakel	49884	27,68
13 Nuenen, Gerwen en Nederwetten	49651	27,55
14 Deurne	46953	26,12
15 Waalwijk	46555	25,90
16 Bernheze	41387	23,15
17 Etten-Leur	39036	21,89
18 Boxmeer	38724	21,73
19 Geldrop-Mierlo	36674	20,64
20 Halderberge	36220	20,39
21 Gilze en Rijen	35990	20,27
22 Dongen	29427	16,77
23 Boekel	26283	15,10
24 Werkendam	23725	13,73
25 Valkenswaard	23563	13,65
26 Laarbeek	21155	12,36
27 Oirschot	19290	11,37
28 Oisterwijk	19230	11,34
29 Son en Breugel	18495	10,94
30 Bergeijk	17753	10,55
31 Landerd	17251	10,28
32 Eersel	16936	10,11
33 Moerdijk	12981	8,00
34 Loon op Zand	12836	7,93
35 Reusel-De Mierden	12596	7,80
36 Someren	12106	7,54
37 Sint-Michielsgestel	11370	7,15
38 Heeze-Leende	11251	7,08
39 Schijndel	11071	6,99
40 Woudrichem	11044	6,97
41 Aalburg	10839	6,86
42 Boxtel	10543	6,70
43 Goirle	10536	6,70
44 Vught	10522	6,69
45 Haaren	7809	5,25
46 Cuijk	7429	5,04
47 Sint Anthonis	7367	5,01
48 Zundert	7145	4,89
49 Asten	6900	4,76
50 Bladel	6117	4,34
51 Rucphen	5992	4,28
52 Waalre	5753	4,15
53 Sint-Oedenrode	5701	4,12
54 Hilvarenbeek	5176	3,84
55 Steenbergen	5150	3,83
56 Cranendonck	5076	3,79
57 Geertruidenberg	2162	2,24
58 Woensdrecht	1152	1,70
59 Alphen-Chaam	844	1,53
60 Drimmelen	839	1,53
61 Baarle-Nassau	154	1,17
62 Grave	-88	1,04
63 Mill en Sint Hubert	-2033	0,00
64		
65		
66		
67		

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The twenty highest scoring municipalities in Noord-Brabant		Total score
1	Veghel	391
2	Maasdonk	315
3	Heusden	290
4	Veldhoven	266
5	Nuenen, Gerwen en Nederwetten	216
6	Boekel	216
7	Gemert-Bakel	181
8	Bergen op Zoom	178
9	Uden	174
10	Halderberge	170
11	Dongen	161
12	Bernheze	158
13	Deurne	158
14	Gilze en Rijen	155
15	Best	151
16	Breda	148
17	Boxmeer	147
18	Geldrop-Mierlo	142
19	Bergeijk	137
20	Roosendaal	134
21	Landerd	127
22	Son en Breugel	127
23	Reusel-De Mierden	124
24	Aalburg	121
25	Laarbeek	119
26	Heeze-Leende	118
27	Oss	117
28	Oisterwijk	116
29	Werkendam	116
30	Etten-Leur	116
31	Oirschot	111
32	Eersel	108
33	Woudrichem	105
34	Waalwijk	105
35	Haaren	103
36	Valkenswaard	96
37	Zundert	89
38	Sint-Michielsgestel	89
39	Loon op Zand	88
40	Schijndel	83
41	Oosterhout	79
42	Sint Anthonis	77
43	Bladel	76
44	Goirle	76
45	Waalre	76
46	Vught	74
47	Sint-Oedenrode	74
48	Boxtel	69
49	Hilvarenbeek	68
50	Asten	67
51	Someren	65
52	Cranendonck	63
53	Helmond	59
54	Alphen-Chaam	59
55	Steenbergen	52
56	Cuijk	51
57	Geertruidenberg	51
58	Eindhoven	47
59	Baarle-Nassau	45
60	Tilburg	44
61	Moerdijk	43
62	Woensdrecht	42
63	Mill en Sint Hubert	42
64	Grave	41
65	Rucphen	40
66	Drimmelen	27
67	's-Hertogenbosch	23



⁶ Note: The annual reports of 2011 are public but not collectively retrievable. Hence all annual reports of Noord-Brabantse municipalities are manually collected from the municipal internet sites and processed in Microsoft Excel. The results of the MCA are shown in the tables above. For the data file, see appendix 9.

APPENDIX 7: QUESTIONNAIRE 1 AMONG TWENTY NOORD-BRABANTSE MUNICIPALITIES

Financiële situatie van gemeenten in Noord-Brabant ten gevolge van de grondvoorraad

Vragen met betrekking tot de grootte en bestemming van de grondvoorraad

1. Hoeveel vierkante meters gronden had uw gemeente in bezit ten tijde van de jaarrekening 2011?

	m ² niet in exploitatie genomen gronden (NIEGG)
	m ² in exploitatie genomen gronden (IEGG)

2. Hoeveel vierkante meters gronden van de voorraad hadden de volgende bestemming ten tijde van de jaarrekening 2011?

NIEGG	IEGG	Totaal	
			m ² met de bestemming wonen
			aantal woningen
			m ² met de bestemming bedrijventerrein
			m ² met de bestemming kantoren
			m ² met de bestemming winkel
			m ² met de bestemming overigen

Vragen met betrekking tot weerstandscapaciteit van de gemeente

3. Hoe groot was de bestemmingsreserve/risicoreserve ten behoeve van de grondexploitaties/ grondbedrijf in uw jaarrekening van 2011?

€

4. Worden de rente inkomsten op de bestemmingsreserve/risicoreserve grondexploitaties/ grondbedrijf ingezet ten behoeve van deze bestemmingsreserve of voor andere doeleinden?
5. Werden er voorzieningen opgenomen voor lopende grondexploitaties in uw begroting van 2012? U kunt verwijzen naar de begroting en/of deze stukken doorsturen.
6. Worden er voorzieningen opgenomen voor lopende grondexploitaties in uw begroting van 2013? U kunt verwijzen naar de begroting en/of deze stukken doorsturen. Indien de begroting 2013 nog niet gepresenteerd is, is deze vraag van toepassing op de meest recente kadernota.

Vragen met betrekking tot oplossingsrichting

7. Hoe gaat uw gemeente op dit moment om met de problematiek rondom grondposities? U kunt hierbij verwijzen naar nota's of andersoortige vastgelegde stukken en/of deze stukken doorsturen.

APPENDIX 8: RESULTS OF QUESTIONNAIRE 1 AMONG TWENTY MUNICIPALITIES

A: Financial and spatial additions (question 1)

Boekwaarde totaal NIEGG, OHV x €1000	Aantal Inwon.	Boekwaarde Totaal voorraden	Boekwaarde NIEGG	Aantal m2 NIEGG	Boekwaarde per m2 NIEGG	Boekwaarde OHV	Aantal m2 IEGG	Boekwaarde per m2 OHV
Veghel	37.303	185540	114303	18883	71238	18883	361660	102,42
Maasdonk	11.268	53689	35005	37042	3622517	3622517	361660	102,42
Heusden	42.995	109728	72679	1275350	56,99	102709	3622517	28,35
Veldhoven	43.243	120546	17839	283028	66,93	37460	3622517	28,35
Nuenen, Gerwen en Nederwetten	22.213	49851	12176	19024	125,42	23887	206459	115,75
Boekel	9.772	26283	2386	140000	123,99	32516	490000	68,36
Gemert-Bakel	28.763	49884	17358	223285	21,18	77011	736749	104,53
Bergen op Zoom	65.845	85884	4730	888758	21,62	39305	633980	62,00
Uden	40.536	58740	19435	832397	32,43	9206	108851	68,16
Halderberge	29.291	36220	26994	377691	40,05	12494	182206	68,57
Dongen	25.061	27621	15127	73306	7,75	20290	225744	88,88
Berghem	29.655	23327	568	478882	36,97	37494	251068	72,84
Deurne	31.526	46953	9450	650000	46,08	32476	425000	76,41
Geuze en Rijen	25.975	35990	17703	1780000	54,25	8542	393000	2,17
Best	28.953	62427	29851	0	-	39370	508324	77,30
Breda	173.299	105217	98586	371101	19,79	35245	360876	97,67
Boxmeer	28.575	38724	626	160000	29,34	13058	96000	136,02
Geldrop-Mierlo	38.117	36674	7345	160000	29,34	13058	96000	136,02
Bergeijk	18.061	17753	4695	160000	29,34	13058	96000	136,02
Rosendaal	77.586	61532	8514	160000	29,34	13058	96000	136,02

LEGENDA	Niet in exploitatie genomen gronden
NIEGG	Onder handen werk / n exploitatie
OHV	Verrezen uit enquête
	Compleet ingevulde enquête
	Geen of onbetrouwbare reactie

A: Financial and spatial additions (question 2&3)

WEEERSTANDSCAPACITEIT					RUIMTELIJKE PLANNEN						
Reserves, voorzieningen en weerstandcap. x €1000	Aantal invcon.	Algemene Reserves	Eestimingsreserve Grondbedrijf	Weerstands capaciteit Voorzieningen	aantal m2 wonen	aantal woningen	aantal m2 bedrijven/erren	aantal m2 kantoren	aantal m2 landbouw/ruggronden	aantal m2 commercieel	
Maasdonk	37.303	60005	43800	61735	799847	2641	531545	25161	249498	6320	
Veijnel	11.266	1269	0	86609	799847	2641	531545				
Heusden	42.996	23119	0	90252	763138	2901	591836				
Veidhoven	43.243	28720	1676	90252							
Fluieren, Gerwen en Nederwetten	22.213	0	0	62382							
Boekel	9.772	8058	4427	13798	71110	124	8025				
Gemert-Bakel	28.763	0	0	0	185000	variabel	235000				
Bergen op Zoom	65.845	10465	0	75419	501425	3153	235324				
Uden	40.536	12289	3485	42986	342414	900	291566				
Halderberge	29.291	11156	6382	18682	368333	578	36220	900	535000		
Dongen	25.061	6835	1094	19682	127403	496	54803		44000		
Bermeze	29.655	30589	8300	-15562	2257444	1651	38468				
Deurne	31.526	7752									
Gilze en Rijen	25.975	14553	0375	11082	65407	165	135661				
Best	28.953	44884	4400	13143	450000	2000			257000		
Breda	173.296	34421	0	70786		2800	680000	160000			
Boxmeer	28.575	13956	178	24590	175996	665	333328				
Geldrop-Mierlo	38.117	17256	8777	12639	152896	263	10798		385940		
Bergelijk	18.061	5007	3432	9314	70000		185000			39042	
Roosendaal	77.586	11163	2600	47789							

LEGENDA

NIJGG	Niet in exploitatie genomen gronden
OHW	Onder handen werk / in exploitatie
	Verkegen uit enquête
	Compleet ingevulde enquête
	Geen of onbetrouwbare reactie

B: Resistance Capacity (question 3&4)

	ANTWOORD	ANTWOORD	BESTEMMINGSRESERVE
Veghel	Ja, ter hoogte van circa 1 miljoen		€ 43.800.000
Maasdonk	-		
Heusden	nee, want bestemmingsreserve is 0.		€ 0
Veldhoven	nee, andere doeleinden.		€ 1.676.000
Nuenen, Gerwen en Nederwetten	nee, want bestemmingsreserve is 0.		€ 0
Boekel	nee, toegeschreven aan algemene reserve		€ 4.427.000
Gemert-Bakel	nee, überhaupt geen reserves		€ 0
Bergen op Zoom	nee, want bestemmingsreserve is 0.		€ 0
Uden	nee, toegeschreven aan algemene reserve		€ 3.485.000
Halderberge	ja		€ 6.382.000
Dongen	nee, onderdeel en dus toegeschreven van algemene reserve		€ 1.094.000
Bernheze	nee, onderdeel en dus toegeschreven van algemene reserve		€ 8.300.000
Deurne	-		
Gilze en Rijen	nee, toegeschreven aan algemene reserve		€ 10.375.000
Best	nee, toegeschreven aan algemene reserve		€ 4.400.000
Breda	nee, onderdeel en dus toegeschreven van algemene reserve		€ 0
Boxmeer	nee, want bestemmingsreserve is (bijna) 0.		€ 178.000
Geldrop-Mierlo	ja		€ 6.777.000
Bergeijk	onbekend		€ 2.400.000
Roosendaal	nee, nu algemene reserves maar voorgaande jaren wel		€ 2.600.000

C: Already covered losses (question 5&6)

	ANTWOORD BEGROTING 2012
Veghel	Ja, voor circa 1 miljoen
Maasdonk	-
Heusden	Ja
Veldhoven	Ja, voor 3 van de 26 grexen
Nuenen, Gerwen en Nederwetten	Ja, voor 8 grexen maar niet mogelijk door onvoldoende eigen vermogen.
Boekel	Nee
Gemert-Bakel	Ja
Bergen op Zoom	Ja, voor 4 van de 8 grexen
Uden	Ja, 4 van de 18 grexen
Halderberge	Ja, voor 7 van de 25 grexen
Dongen	Ja, voor 1 grex
Bernheze	Ja
Deurne	-
Gilze en Rijen	Nee, wel klein deel van boekwaarde afgewaardeerd
Best	Ja
Breda	Ja, voor 16 van de 27 grexen
Boxmeer	Ja, voor 6 grexen
Geldrop-Mierlo	Ja
Bergeijk	Ja, voor 3 van de 10 grexen
Roosendaal	Ja, voor 1 van de 5 grexen

	ANTWOORD BEGROTING 2013
Veghel	Ja, naar circa 10,8 miljoen en afwaardering van 7,8 miljoen
Maasdonk	-
Heusden	Ja, maar grootte nog niet bekend
Veldhoven	Ja, maar grootte nog niet bekend
Nuenen, Gerwen en Nederwetten	8 november te behandelen
Boekel	Ja, 4 grexen
Gemert-Bakel	nog niet openbaar
Bergen op Zoom	nog niet openbaar
Uden	Ja, maar grootte nog niet bekend
Halderberge	Ja
Dongen	Ja, maar grootte nog niet bekend
Bernheze	bestaande voorzieningen inzetten om verliezen gelijk van boekwaarde af te boeken
Deurne	-
Gilze en Rijen	Ja
Best	Ja
Breda	Ja, maar grootte nog niet bekend
Boxmeer	Ja, maar grootte nog niet bekend
Geldrop-Mierlo	nog niet openbaar
Bergeijk	Ja, voor 3 van de 10 grexen
Roosendaal	nog niet openbaar

D: Taken actions / possible solutions (question 7)

	1	2	3	4	5	6	7	8	9	10	11	12	13
Veghel													
Maasdonk													
Heusden													
Veldhoven													
Nuenen, Gerwen en Nederwetten													
Boekel													
Gemert-Bakel													
Bergen op Zoom													
Uden													
Halderberge													
Dongen													
Bernheze													
Deurne													
Gilze en Rijen													
Best													
Breda													
Boxmeer													
Geldrop-Mierlo													
Bergeijk													
Roosendaal													

- 1: richtlijnen van het BBV volgen.
2: grexen meermaals per jaar actualiseren
3: verliezen direct afboeken van boekwaarde. Ook mbv bestaande voorzieningen.
4: regionale afstemming/samenwerking
5: vergoeding rentekosten (door vertraging) door marktpartijen
6: binnen gemeente proactief gereageerd (werkgroep oid)
7: grexen temporiseren (uitspreiden over langere periode)
8: uitstellen van het maken van kosten
9: grondprijzen verlagen
10: actiever kavels aanbieden
11: heroverwegen / stopzetten projecten
12: overstappen op meer faciliterendere rol
13: bestemmingsplannen flexibeler om in te spelen op vraag

APPENDIX 9: DATA FILES

See enclosed DVD with excel files for:

1. Data file of multi criteria analysis + additional data from questionnaire 1
2. Data file of financial feasibility of PSPS temporary use of municipal land by the placement of solar panels
3. Data file of applicability and determining factors of PSPS analysed with the Fuzzy Delphi Method

APPENDIX 10: APPLICABILITY AND DETERMINING FACTORS PER RESPONDENT GROUPS

A: Applicability of the three PSPS with FDM

Code	PSPS	a	b	c	d	s_j	STDEV	Rank
<i>Municipal Experts (A)</i>								
PSPS_R	Regional and financial settlement of residential developments	3.00	6.31	6.31	9.00	6.15	1.44	1
PSPS_T	Temporary use of municipal land by the placement of solar panels	1.00	5.62	5.62	10.00	5.56	2.26	2
PSPS_C	Combination of regional settlement and temporary use	1.00	5.31	5.31	9.00	5.15	1.96	3
<i>Academic and Consultancy Experts (B)</i>								
PSPS_R	Regional and financial settlement of residential developments	3.00	6.47	6.47	10.00	6.48	1.91	1
PSPS_T	Temporary use of municipal land by the placement of solar panels	1.00	6.07	6.07	10.00	5.78	2.31	2
PSPS_C	Combination of regional settlement and temporary use	1.00	5.07	5.07	10.00	5.28	2.37	3
<i>All respondents (A+B)</i>								
PSPS_R	Regional and financial settlement of residential developments	3.00	6.39	6.39	10.00	6.45	1.71	1
PSPS_T	Temporary use of municipal land by the placement of solar panels	1.00	5.86	5.86	10.00	5.68	2.28	2
PSPS_C	Combination of regional settlement and temporary use	1.00	5.18	5.18	10.00	5.34	2.18	3

B: PSPS_R Ranking of determining factors with FDM

PSPS: Regional and financial settlement of residential developments										
Municipal experts (A)			W = (a,b,c,d)							
Code	Category	Factor	a	b	c	d	s_j	STDEV	Rank	
R01	Financial	Book value	2.00	6.54	6.54	9.00	6.02	1.86	9	
R02	Financial	Compensation for the financial settlement	3.00	7.23	7.23	9.00	6.62	1.56	7	
R03	Financial	Obligation to donate share of revenues for the financial settlement	3.00	7.23	7.23	10.00	6.87	1.44	3	
R04	Spatial	Bond with current municipality	3.00	7.15	7.15	10.00	6.83	1.53	4	
R05	Spatial	Competitiveness in region	3.00	6.92	6.92	10.00	6.71	1.50	5	
R06	Spatial	Sort of residential developments in a region	3.00	6.85	6.85	10.00	6.67	1.41	6	
R07	Administrative	Role of the province	1.00	7.08	7.08	10.00	6.29	1.87	8	
R08	Administrative	Politics	4.00	7.54	7.54	10.00	7.27	1.39	1	
R09	Administrative	Certainty	3.00	7.69	7.69	10.00	7.10	1.65	2	

PSPS: Regional and financial settlement of residential developments										
Academic and Consultancy experts (B)			W = (a,b,c,d)							
Code	Category	Factor	a	b	c	d	s_j	STDEV	Rank	
R01	Financial	Book value	1.00	6.73	6.73	10.00	6.12	2.62	8	
R02	Financial	Compensation for the financial settlement	3.00	7.80	7.80	10.00	7.15	1.84	1	
R03	Financial	Obligation to donate share of revenues for the financial settlement	2.00	8.00	8.00	10.00	7.00	1.86	2	
R04	Spatial	Bond with current municipality	2.00	7.60	7.60	10.00	6.80	1.99	3	
R05	Spatial	Competitiveness in region	2.00	6.73	6.73	10.00	6.37	2.42	6	
R06	Spatial	Sort of residential developments in a region	3.00	6.60	6.60	10.00	6.55	1.89	5	
R07	Administrative	Role of the province	1.00	6.53	6.53	10.00	6.02	2.64	9	
R08	Administrative	Politics	1.00	7.73	7.73	10.00	6.62	1.95	4	
R09	Administrative	Certainty	1.00	7.00	7.00	10.00	6.25	2.36	7	

PSPS: Regional and financial settlement of residential developments										
All respondents (A+B)			W = (a,b,c,d)							
Code	Category	Factor	a	b	c	d	s_j	STDEV	Rank	
R01	Financial	Book value	1.00	6.64	6.64	10.00	6.07	2.30	9	
R02	Financial	Compensation for the financial settlement	3.00	7.54	7.54	10.00	7.02	1.73	1	
R03	Financial	Obligation to donate share of revenues for the financial settlement	2.00	7.64	7.64	10.00	6.82	1.65	2	
R04	Spatial	Bond with current municipality	2.00	7.39	7.39	10.00	6.70	1.79	3	
R05	Spatial	Competitiveness in region	2.00	6.82	6.82	10.00	6.41	2.03	6	
R06	Spatial	Sort of residential developments in a region	3.00	6.71	6.71	10.00	6.61	1.66	4	
R07	Administrative	Role of the province	1.00	6.79	6.79	10.00	6.14	2.31	8	
R08	Administrative	Politics	1.00	7.64	7.64	10.00	6.57	1.64	5	
R09	Administrative	Certainty	1.00	7.32	7.32	10.00	6.41	2.07	6	

C: PSPS_T Ranking of determining factors with FDM

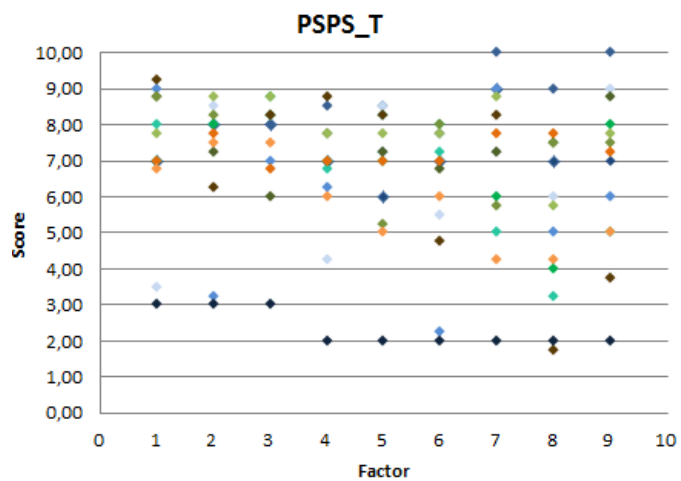
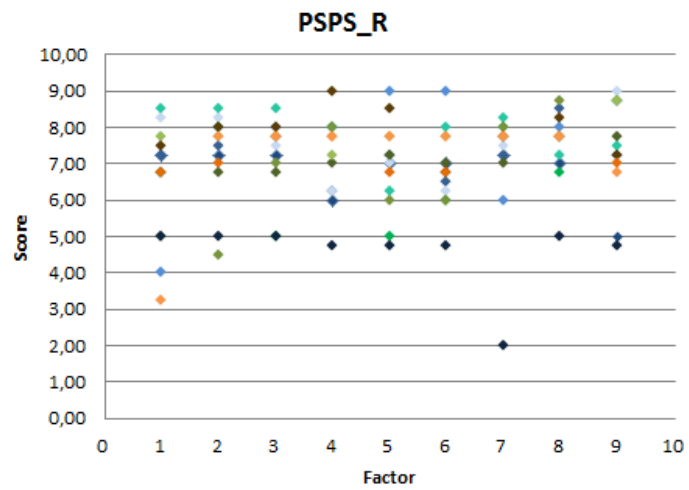
<i>PSPS: Temporary use of municipal land by the placement of solar panels</i>									
Municipal Experts (A)			W = (a,b,c,d)						
Code	Category	Factor	a	b	c	d	s_j	STDEV	Rank
T01	Financial	Participation of energy cooperative	2.00	7.15	7.15	10.00	6.58	2.11	3
T02	Financial	Financial feasibility	2.00	7.23	7.23	10.00	6.62	2.11	2
T03	Financial	Run-time period	2.00	7.54	7.54	10.00	6.77	2.05	1
T04	Spatial	Scale of solar park	1.00	6.62	6.62	9.00	5.81	1.74	7
T05	Spatial	Location	1.00	6.77	6.77	9.00	5.88	1.99	6
T06	Administrative	Ambitions in the field of sustainability	1.00	6.00	6.00	10.00	5.75	2.24	8
T07	Administrative	Legislation regarding collectively net metering	1.00	7.00	7.00	10.00	6.25	2.53	4
T08	Administrative	Flexibility of zoning plan	1.00	5.38	5.38	10.00	5.44	2.54	9
T09	Administrative	Administrative support	1.00	6.69	6.69	10.00	6.10	2.42	5

<i>PSPS: Temporary use of municipal land by the placement of solar panels</i>									
Academic and Consultancy Experts (B)			W = (a,b,c,d)						
Code	Category	Factor	a	b	c	d	s_j	STDEV	Rank
T01	Financial	Participation of energy cooperative	1.00	6.40	6.40	10.00	5.95	3.02	7
T02	Financial	Financial feasibility	1.00	6.67	6.67	10.00	6.08	3.02	4
T03	Financial	Run-time period	1.00	7.20	7.20	10.00	6.35	2.43	2
T04	Spatial	Scale of solar park	1.00	6.53	6.53	10.00	6.02	2.40	5
T05	Spatial	Location	1.00	6.73	6.73	10.00	6.12	2.93	3
T06	Administrative	Ambitions in the field of sustainability	1.00	5.93	5.93	10.00	5.72	2.60	8
T07	Administrative	Legislation regarding collectively net metering	1.00	7.47	7.47	10.00	6.48	2.84	1
T08	Administrative	Flexibility of zoning plan	1.00	5.07	5.07	10.00	5.28	2.80	9
T09	Administrative	Administrative support	1.00	6.53	6.53	10.00	6.02	2.59	5

<i>PSPS: Temporary use of municipal land by the placement of solar panels</i>									
All respondents (A+B)			W = (a,b,c,d)						
Code	Category	Factor	a	b	c	d	s_j	STDEV	Rank
T01	Financial	Participation of energy cooperative	1.00	6.75	6.75	10.00	6.13	2.65	4
T02	Financial	Financial feasibility	1.00	6.93	6.93	10.00	6.21	2.65	3
T03	Financial	Run-time period	1.00	7.36	7.36	10.00	6.43	2.26	1
T04	Spatial	Scale of solar park	1.00	6.57	6.57	10.00	6.04	2.12	6
T05	Spatial	Location	1.00	6.75	6.75	10.00	6.13	2.53	5
T06	Administrative	Ambitions in the field of sustainability	1.00	5.96	5.96	10.00	5.73	2.43	8
T07	Administrative	Legislation regarding collectively net metering	1.00	7.25	7.25	10.00	6.38	2.70	2
T08	Administrative	Flexibility of zoning plan	1.00	5.21	5.21	10.00	5.36	2.68	9
T09	Administrative	Administrative support	1.00	6.61	6.61	10.00	6.05	2.51	6

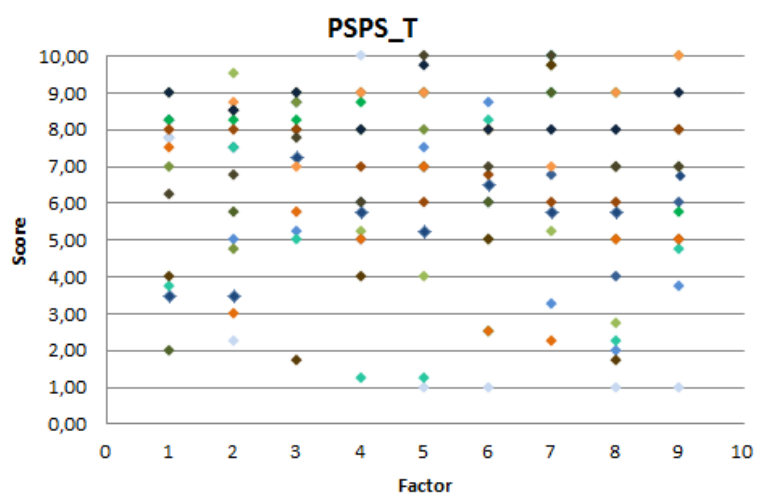
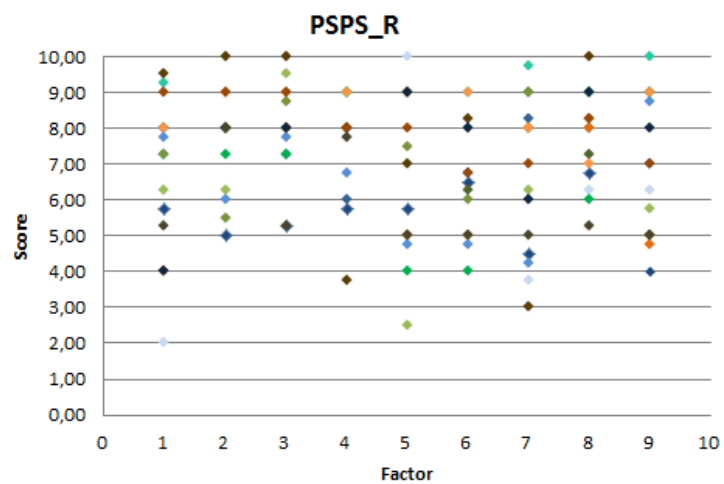
D: Dispersion in evaluation scores per respondent⁷

Respondent group A (municipal experts)



⁷ Every color represents one respondent and shows the evaluation scores per respondent per factor

Respondent group B (consultancy and academic experts)



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THE MUNICIPAL LAND SUPPLY: RISK OR SUSTAINABLE OPPORTUNITY?

An explorative research on possible sustainable policy solutions in land use policy in order to create more financial continuity for municipalities in Noord-Brabant

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ABSTRACT

Dutch municipalities have an important role on the land market. On the one hand municipalities are an active stakeholder in land developments and on the other hand they set the rules for the land market. Municipalities in the Netherlands have the largest land supply of all stakeholders on the land market. In this paper the impact of the economic crisis on the municipal land supply and thereby financial situation of municipalities is discussed. All municipalities in the province Noord-Brabant are analysed by means of a Multi Criteria Analysis on the degree of financial danger they are exposed to due to their land supply. Furthermore possible sustainable policy solutions (PSPS) are discussed and tested among municipal, consultancy and academic experts. By means of the Fuzzy Delphi Method the results are analysed and the applicability and determining factors are ranked on importance. All in order to comprehensively stimulate financial continuity, sustainable use of space and sustainable forms of land use policy among municipalities.

Keywords: municipalities, land development, land use policy, sustainable land use, multi criteria analysis, fuzzy Delphi method.

INTRODUCTION

Land acquirement by municipalities

In the early 1990s the announcement of the locations of future *Vinex-wijken* by the *Ministerie van Volkshuisvesting en Ruimtelijke Ordening* made clear a residential construction output was wanted by the State. These *Vinex-wijken* were planned on the outskirts of cities, mainly on agricultural land. This governmental policy made the acquirement of land popular among commercial actors and municipalities. Also, the economic climate was very good whereby the available capital grew; a possible investment was land. Land was mainly invested in by municipalities but also on large scale by developers, housing associations, contractors and investors.

In areas where a high construction output was demanded by governmental policy, the municipalities searched for commercial partners to help them reach their construction quota. For the commercial actors it was helpful to secure their future construction output as with the ownership of the land also comes the right to self-realization on this land. Hereby, municipalities often bought the raw land and were responsible for the land development (transformation of raw land to building land) and commercial actors had the intention to buy the building land for the real estate development. The municipalities acquired the raw land with the expectation of future development; the acquirement price for this land is between the value in the current use (mostly agricultural) and the value in the future use (residential). After the transformation to building land and the change in land use the municipality sells the building land to the developer and gained profit from this increase in land value.

This results in profit which can be used by municipalities to cover losses on other land developments: as example 1) the profit from these easy projects on outskirts of the cities can be used to cover losses on more complex, urban (inner city) developments or 2) the profit from the development of free sector dwellings can be used to cover the losses on the development of social sector dwellings in the same project (Segeren, 2007). When after this settlement still profit is made, this is used in the fund *Bovenwijkse voorzieningen* to finance the newly constructed infrastructure and sometimes also to finance social facilities as swimming pools, libraries or theatres (van Hoek et al, 2011).

Economic crisis

In the summer of 2007 a crisis in the financial markets arose and within two years the consequences revealed itself in the real estate market. A drop in demand and overplanning of spatial developments resulted in uncertainty about the scheduled plans; when will they be developed or will they be developed at all. The acquirement of the raw land is already partly done by developers, housing associations and municipalities. This is financed with loans; the delay results in increasing interest costs. In addition, the sale of the building land stays out because of the delay. It is uncertain how the price for building land will develop and if the projected revenues will be achieved. In some cases the profit is already evaporated and turned into losses on land developments. This uncertainty about the market value, projected revenues and the increasing interest costs result in losses on the land and a great strain on the budgets of municipalities. Due to these losses municipalities need to economize and thereby are shrinking in personnel, investing less in social facilities and postponing their ambitions on sustainability.

Problem definition

In the times of economic growth the municipality was an active stakeholder on the land market. Thereby invested extensively in land. Due to the economic crisis the financial risks are becoming more clear and result in losses on land developments. This resulted in the following problem definition:

Municipalities have bought much land with the expectation of area development. Because of the economic crisis area developments are delayed and in some cases even cancelled. The stay out of the allocation of building land and the uncertainty about the market value and projected revenues result in significant losses. Some municipalities are already in, while others are close to, financial danger due to the losses on their land supply.

Research Questions

The total problem (from a developers', housing association', investor' and municipal' point of view) of losses on land supply is too complex and extensive to research all. Therefore this research will limit itself to the financial problems of municipalities due to the losses on their land supply and the possible sustainable policy solutions to solve/minimize these financial problems. Throughout this thesis area developments on the outskirts of cities with (future) residential land use are subject of research. And the province Noord-Brabant is taken as research field to make the number of analysed municipalities a manageable size. Within this stated boundaries, and whereas the problem definition forms the basis, this resulted in the following main research question:

What possible sustainable policy solutions are applicable (and to what extent) to improve municipal land use policy in order to create a continuous healthier financial situation for municipalities in Noord-Brabant?

Research Design

Generally, the research consists of four parts (figure 1): (1) theoretical framework, (2) different analyses to determine current municipal situation because of losses on land developments, (3) different analyses to determine the applicability of possible sustainable policy solutions to minimize the losses on the municipal land supply and look sustainable towards the future again, and (4) the conclusions and recommendations.

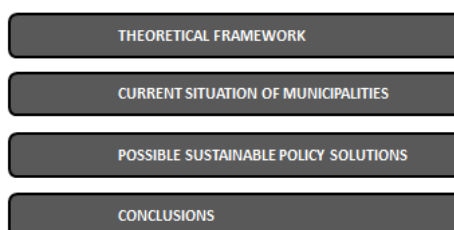


Figure 1: research design

1. In the theoretical framework the land market, spatial planning, municipal land use policy, area and land developments are explored by means of desk research.
2. In the current situation of municipalities the financial danger regarding their land supply of all municipalities in Noord-Brabant are analysed by means of multi criteria analysis. This analysis is done on the most recent quantitative data, the municipal balances and budgets of 2011 from their annual reports. Furthermore for the twenty municipalities most at risk of financial danger their situation is further explored with questionnaire 1 as indicator for the current problems and handling of these municipalities close to or in financial danger.
3. The possible sustainable policy solutions (PSPS) are determined by means of expert meetings and desk research. The PSPS are firstly presented in three case studies to define the determining factors for applicability. Furthermore the PSPS are evaluated with questionnaire 2 among municipal, consultancy and academic experts on determining factors and applicability. These results are analysed with the fuzzy Delphi method and result in the weighing and ranking of determining factors and the weighing and ranking of the applicability of the PSPS.
4. In the last part the conclusions and recommendations are determined and the research question (and sub research questions) is answered. The research is evaluated and recommendations for further research are done.

CURRENT SITUATION AT MUNICIPALITIES IN NOORD-BRABANT

Theoretical framework

In this research the municipal land supply of all municipalities in Noord-Brabant is analysed in more detail from manually collected data from annual reports of 2011. The most important aspects which can be derived from the annual reports regarding land supply and the municipal financial situation are:

- The invested capital in land regards land which is in transformation and is documented in the municipal balance. The supply of a municipal balance consists of LNID, LID and other supply. In figure 2 the different characteristics of land not in development (LNID), land in development (LID) and other supply is given.

	LID	LNID	Other supply
Valuation based on	Future land use	Current land use	Current land use
Administrative status	All planning procedures finished (determined in zoning plan)	Council decision for future development	No council decision
Status of book value	Activated on municipal balance and financial estimate of land development is at least once a year updated	Activated on municipal balance and process and interest costs are annually added	Not activated
Actions when losses occur	A provision is arranged or amortized directly from book value when losses in land development occur	Amortized directly from book value or transferred to LID when book value is higher than market value	-

Figure 2: characteristics of municipal land supply in annual report

- The general reserves of municipalities are freely disposable and used to cover possible financial setbacks. In some municipalities a specific reserve for land development exists. This reserve specifically covers the risk of land development and can, when necessary, be supplemented by the general reserves. Other municipalities do not have a specific reserve for land development but cover possible losses directly from the general reserves.
- At least once a year municipalities update their land developments; in the annual report. When losses on land developments occur, as stated above, the municipality is obliged to cover this by the use of their reserves. This can be done in two ways:
 - o by taking the losses by amortizing these losses from the book value with the reserves. With this solution the book value decreases with the size of the estimated losses directly.
 - o by arranging provisions from the reserves to cover these losses. This way is most often used because these provisions can annually be adjusted and therefore it is possible to recover a certain book loss over time. Although the land development is estimated as best as possible it is variable over time and the result can change over time. With the arrangement of provisions the possible losses are covered and over time can be adjusted on the most recent developments.

Methodology

Multi criteria analyses (MCA) are used in a variety of forms and ways in qualitative and quantitative research. The basic definition is: "Multi Criteria Analysis is a decision-making tool developed for complex multi-criteria problems that include qualitative and/or quantitative aspects of the problem in the decision-making process (Voogd, 1983)."

The MCA in the used form consist of the ranking of the financial situation of municipalities by means of different criteria. This results in an overview of the financial situation of all municipalities in *Noord-Brabant* regarding their land supply. Every municipality in *Noord-Brabant* is scored on every criteria based on the quantitative data from the annual report of 2011. The maximum score of every criteria is 100 and the minimum score is 0. In that way it is possible to compare these different criteria. On the level of one criterion the municipalities are compared mutually; it is aimed to determine the financial situation of a certain municipality in comparison to the other municipalities in *Noord-Brabant*. The maximum score of 100 is given to the municipality where the specific criterion has the most financial negative influence on the financial situation. The minimum score of 0 is given to the municipality where the specific criteria has the least financial negative influence on the financial situation. All municipalities in between are scored in comparison to the relative deviation from the absolute value of the maximum and minimum.

After the MCA on all municipalities in Noord-Brabant the ranking of the twenty highest scoring municipalities is validated with questionnaire 1.

Results

Results MCA

The total book value of land supply per inhabitant (criterion 1) in the municipalities of *Noord-Brabant* differs strongly. Veghel and Maasdonk have the largest land supply with a book value per inhabitant of respectively € 4.974,- and € 4.765,-. A significant share of 44 of all (67) municipalities have a book value of land supply of < € 1.000,- per inhabitant. The total book value of supply as share of the total assets (criterion 2) is in 29 of all municipalities < 20% and in 29 municipalities > 20% but < 40%. In Maasdonk (70%), Veghel (64%), Boekel (56%) and Heusden (55%) the total land supply represents the biggest share in value of the total municipal budget. The global resistance capacity (criterion 3) shows major dispersion. In total 53 of all 67 municipalities have more reserves than land supply. It is plausible these municipalities are more able to cover possible losses on land developments. However, to state this with enough certainty further research is necessary on project level, as the possible losses depend on many different variables. Of the 14 municipalities which have more land supply than reserves in book value the highest scores are for Heusden, Veghel, Maasdonk and Gemert-Bakel. These municipalities thereby have the least reserves in comparison to their total land supply. The total book value of the land supply (criterion 4) showed the relatively large municipalities with the highest scores. However, also other relatively smaller municipalities scored very high on this criteria e.g. Veghel, Veldhoven and Heusden. In figure 3 the twenty highest scoring municipalities are shown.

When looking at the outcome the score of the municipality Veghel is remarkable; a total score of 400 is the maximum and this municipality scored 391. Furthermore many municipalities in the south east of the province of *Noord-Brabant* scored high. And the most municipalities are relatively small as to number of inhabitants except Bergen op Zoom

(65.845 inhabitants), Roosendaal (77.566) and Breda (173.299).

As all municipalities are scored in comparison to the other *Noord-Brabantse* municipalities it is clear the twenty highest scoring municipalities are more at financial danger than the other *Noord-Brabantse* municipalities. In figure 4 all scores of Noord-Brabantse municipalities is shown whereas the threshold $S_j > 130$ for the twenty highest scoring municipalities is applied. However, due to the limited publicity of data on municipal finances the MCA is not comprehensive. Therefore more information on land supply and project level is needed. Questionnaire 1 is applied to validate the positions of the twenty highest scoring municipalities.

The twenty highest scoring municipalities in Noord-Brabant		Number of inhabitants	Total score
1	Veghel	37.303	391
2	Maasdonk	11.268	315
3	Heusden	42.995	290
4	Veldhoven	43.243	266
5	Nuenen, Gerwen en Nederwetten	22.213	216
6	Boekel	9.772	216
7	Gemert-Bakel	28.763	181
8	Bergen op Zoom	65.845	178
9	Uden	40.536	174
10	Halderberge	29.291	170
11	Dongen	25.061	161
12	Bernheze	29.655	158
13	Deurne	31.526	158
14	Gilze en Rijen	25.975	155
15	Best	28.953	151
16	Breda	173.299	148
17	Boxmeer	28.575	147
18	Geldrop-Mierlo	38.117	142
19	Bergeijk	18.061	137
20	Roosendaal	77.566	134

Figure 3: Highest scores MCA of twenty municipalities

Results questionnaire 1

Due to the limited publicity of data on land developments and the sensitivity of this information for municipalities it was difficult to validate the positions of the municipalities. It generally gave more insight in the situation and handling of municipalities in Noord-Brabant. Based on the expert meetings, the interviewed municipalities and questionnaire 1 the current situation and handling of municipalities to minimize losses on their land supply can be summarized as:

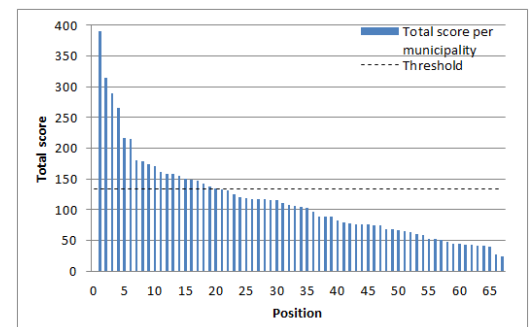


Figure 4: All scores from MCA

- Municipalities are trying to monitor the risks of the land developments more constantly. In the past this was done only once a year; now municipalities update the land developments more times a year.
- Municipalities are reprioritizing and when possible cancelling developments. The *LIND* supply is more revaluated and when development is not possible in the near future the book value is devaluated to agricultural value.
- The phasing of land development is stretched and the making of land costs is postponed as much as possible in anticipation of better market conditions.
- Active land use policy is only used for locations where municipalities have land; for new locations municipalities are shifting towards facilitating land use policy to minimize risks.
- Municipalities are trying to stimulate the land allocation by actively offer the available land to contractors, developers but also individuals. And some (3) municipalities have started to decrease the land prices.
- For industrial and office areas regional coordination is more and more applied to decrease the number of projects, but for residential areas this is in an early stage.

POSSIBLE SUSTAINABLE POLICY SOLUTIONS

In general, from the MCA and questionnaire 1, there can be concluded municipalities are solely minimizing the losses on land developments and are not looking for sustainable, innovative possible solutions. From scientific publications and expert meetings two possible sustainable policy solutions (PSPS) are derived:

1. *Regional and financial settlement*: due to the oversupply in planned residential development the projects do not reach the presale requirement and are thereby delayed (De Zeeuw et al, 2012). The different residential developments in a region need to be prioritized to induce realism in the number of residential developments; a decrease in supply to come to an equilibrium of demand and supply. In that way the number of residential developments will be more in balance with the number of (in the current economic climate) dwellings possible to sale.

In this PSPS the assumption is made, a part of the developments in a region are cancelled and thereby the chance of achieving the presale requirement in the remaining developments is improved. Also, the profit from the completed residential developments is used to compensate the cancellation of the other residential development. This is schematically shown in figure 5. Municipality A cancels its development and municipality B achieves its presale requirement. Furthermore in figure 6 the payoff matrix in the different situations is shown. The assumption is made when no regional settlement is implemented the presale requirement is not achieved. It shows that for the region the regional settlement is the situation with the least losses.

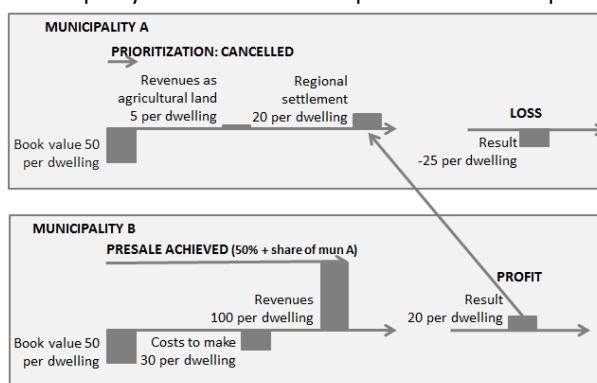


Figure 5: Regional settlement

		Municipality B			
		No regional settlement		Regional settlement	
Municipality A	No regional settlement	-50	-50	-50	-50
	Regional settlement	-50	-50	0 or -25	0 or -25

Figure 6: Payoff matrix of regional settlement

2. *Temporary use of the land by the placement of solar panels*: the temporary vacant land can be used for the placement of solar panels. For different scenarios the feasibility of the placement of solar panels is calculated. The investment in the panels is done by an energy cooperative therefore the municipality only gains a lease hold for the use of the land. This lease hold is residually calculated and can be €1,30 per m² up to € 3,30 per m² land and results thereby in at least two times and up to almost seven times more possible revenues than agricultural use. The annual lease hold per m² can be used to cover the annual interest costs on the book value. In this case the interest costs (with an interest rate of 4%) of a book value from € 32,50 up to € 82,50 per m² can be covered.

Methodology

The two PSPS as described before are tested on applicability and determining factors among two respondents groups. Among the municipal experts (expert group A) 13 of the contacted 26 experts responded thus making a 50.00 percent response rate. Among the academic and consultancy experts (expert group B) 15 of the contacted 21 experts responded thus making a 71.43 percent response rate.

There are three basic types of information uncertainty, namely ambiguity, discord and fuzziness (Klir & Yuan, 1995) that are covered by numerous uncertainty theories. Due to the human factor in evaluation, in this case the importance of a certain factor, a type of the uncertainty is present. That is the fuzziness resulting from the lack of definite or sharp distinction. Therefore, the fuzzy Delphi method (FDM) will help to give an overview of the factors relevant for the applicability of the PSPS. As recommended in Delphi literature, for homogenous groups, the expert groups should have a minimum response of 10-15 people to conclude reliable from the results. In both respondents groups (A and B) this minimum response is achieved. The steps taken are:

1. Validate predefined list of factors: this done by means of three case studies and resulted in the determining factors for PSPS_R (regional and financial settlement) and PSPS_T (temporary use by the placement of solar panels).
2. Collect opinions of expert groups A and B with questionnaire 2: the two PSPS are described and subsequently the experts are asked to score (ordinal scale 1 to 10) these factors and conclusively determine the applicability of each PSPS.
3. Analyse results of questionnaire with FDM: by means of the calculation of the trapezoidal fuzzy number and subsequently defuzzification of the experts' scores eventually the definite value (s_j) is derived per factor and per PSPS.

Results

Overall applicability of PSPS

There can be concluded the highest applicable is the PSPS of regional and financial settlement of residential developments (A=6.15, B=6.48) and less applicable is the PSPS of temporary use of municipal land by the placement of solar panels (A=5.56, B=5.78).

Determining factors for applicability of PSPS

For the regional and financial settlement the municipal experts see the administrative aspects such as political cooperation ($s_j = 7.27$) and certainty that all municipalities will cooperate ($s_j = 7.27$) as the most important factors for applicability. Among the consultancy and academic experts the most important factors for applicability were the financial aspects. The share of the profit that should be donated by municipality B ($s_j = 7.00$) and the compensation which is gained by municipality A for cancellation of the development ($s_j = 7.15$) are evaluated as most important. As threshold for this PSPS $s_j > 7.00$ is used and the other factors are scored lower and therefore less important.

For the temporary use by the placement of solar panels the financial factors are evaluated as important by the municipalities. The financial feasibility of the business case depends highly on legislation regarding collectively net metering and there is nowadays uncertainty about

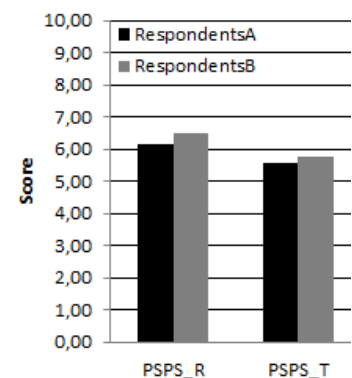


Figure 7: Applicability of PSPS

the development in legislation. The evaluation scores of the respondents, on legislation regarding collectively net metering ($s_j = 6.38$), endorse this. Furthermore the run-time period ($s_j = 6.43$) is evaluated as important, this is in line with the interviews where was stated that it can be difficult to put the residential development on hold for twenty years. The process of implementation of the temporary use may evoke resistance from municipal politics. Overall the dispersion in evaluations of the factors by the respondents is significantly higher (mainly $\sigma > 2.00$) than in the PSPS_R. The opinions of the experts differ more for this PSPS.

CONCLUSIONS AND DISCUSSION

Current situation

The MCA resulted in a ranking of Noord-Brabantse municipalities which are most at risk of financial danger to least at risk of financial danger. This resulted (with threshold $s_j > 130$) in twenty municipalities that are most at risk in comparison to the other municipalities. The losses on land developments have resulted for two municipalities in total evaporation of the general reserves over 2012. These municipalities, Nuenen Gerwen en Nederwetten (no. 5) and Gemert-Bakel (no. 7), are now under pre-emption of the province. These municipalities are thereby directly in financial danger. Furthermore the general opinion among municipalities, province and experts is when the current economic conditions continue (or worsen) the losses will only increase and more municipalities will come in direct financial danger. In conclusion especially the smaller, rural municipalities with relatively large land supplies and small reserves position are the most at risk of financial danger.

Thereby the municipalities are now mainly minimizing losses by short-term accounting measures. The need to look for sustainable, long term policy solutions is not present at municipalities. At the same time the number of municipalities in financial danger will only increase as the most recent forecasts do not show improvement in the economic conditions.

Applicability of PSPS

The experts are acknowledging that temporary use of municipal land is interesting and the generation with renewable energy sources is one of these uses but still see difficulties in the financial feasibility. Furthermore, regional settlement in residential developments, as is already done for industrial areas, should be the direction of future land use policy is the general consensus. This also resulted from the questionnaire among all experts as the regional and financial settlement is evaluated as the most applicable ($s_j = 6.45$) followed by the temporary use of the land by the placement of solar panels ($s_j = 5.68$). Both PSPS can minimize the losses on municipal land development but more importantly help using the land more sustainable. And additionally the applications in sustainability (e.g. renewable energy sources) can be part of that sustainable land use.

Recommendations

Further research can be done by modelling the PSPS in a game theory model and thereby explore the decision making process in more detail also among the other stakeholders. Also, to come to a comprehensive overview of the financial danger among municipalities different areas in the Netherlands can be explored (other research field) and in cooperation with provinces and municipalities more data needs to be collected to do the MCA in more detail.

This research mainly improved the awareness among municipalities for sustainable, innovative ways of land use (policy). From this research can be concluded municipalities do

not exchange views on this subject; the view is mainly limited within the own municipal borders. Therefore it is recommended to cooperatively, by sharing knowledge, learn from the different situations. It is necessary the municipalities share their knowledge to cooperatively limit the losses and look sustainable to the future again. This can be done by sharing knowledge in the first place on administrative level thereby excluding the influence of the municipal politics. And eventually come to a regional land use policy whereby the possibility of financial settlement needs to be further investigated.

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GIJS KANT

This master thesis is the result of a half year of hard work. It was interesting to see the actuality regarding the chosen subject in the media. Many municipalities are struggling financially with their acquired land at this moment. My research contributes to the awareness of the problems and stimulation of looking for new innovative and sustainable forms of land use policy.

2006-2010	Bachelor Architecture Building and Planning
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DUTCH SUMMARY

DE GEMEENTELIJKE GRONDVOORRAAD: RISICO OF DUURZAME KANS?

Een exploratief onderzoek naar duurzame oplossingsrichtingen in grondbeleid om meer financiële continuïteit voor Noord-Brabantse gemeenten te creëren.

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12-03-2012

KORTE SAMENVATTING

Nederlandse gemeenten hebben belangrijke rol op de grondmarkt. Aan de ene kant zijn gemeenten een actieve stakeholder op de grondmarkt en aan de andere kant stellen ze regelgeving voor deze markt op. Verder hebben gemeenten de grootste grondvoorraad van alle stakeholders op de grondmarkt. In dit onderzoek wordt de impact van de economische crisis op de gemeentelijke grondvoorraad en daarmee op de financiële situatie van gemeenten onderzocht. Alle gemeenten in de provincie Noord-Brabant zijn geanalyseerd aan de hand van een multi criteria analyse in hoeverre ze in financieel gevaar verkeren ten gevolge van verliezen op hun grondvoorraad. Vervolgens worden mogelijk duurzame beleidsoplossingen (DBO) besproken en getest op toepasbaarheid onder gemeentelijke, consultancy en academische experts. Met behulp van de fuzzy Delphi methode zijn de resultaten geanalyseerd en toepasbaarheid en bepalende factoren gerangschikt. Om in zijn geheel financiële continuïteit, duurzaam gebruik van ruimte en duurzame vormen van grondbeleid bij gemeenten te stimuleren.

Trefwoorden: gemeenten, grondexploitatie, grondbeleid, duurzaam grondgebruik, multi criteria analyse, fuzzy Delphi methode.

INTRODUCTIE

Met de aankondiging van de Vinex-locaties in de jaren '90 was duidelijk dat er een bouwproductie in woningen gewenst was door de overheid. Deze Vinex-locaties waren gepland aan de randen van de steden, voornamelijk op gronden die tot dan toe bestemd waren voor agrarisch gebruik. Gemeenten en commerciële partijen verworven grote hoeveelheden grond met de gedachte daar in de toekomst gebiedsontwikkelingen op te realiseren. Daarbij was het economisch klimaat rond die periode erg gunstig en was er veel kapitaal beschikbaar; er werd op grote schaal door gemeenten grond verworven.

Vaak verworven de gemeenten de grond en werden er intentieovereenkomsten getekend met commerciële partijen voor de ontwikkeling van woningen. De gemeente nam het transformatieproces van ruwe bouwgrond naar bouwrijpe grond voor haar rekening en zorgde voor de bestemmingswijziging naar 'wonen'. Na deze transformatie verkocht de gemeente deze grond, die in woningbouw bestemming veel meer waard was dan in de agrarische bestemming, met winst door aan commerciële partijen die op hun beurt met de vastgoedontwikkeling winst maakten.

De winsten op de grondexploitaties werden door gemeenten gebruikt om: 1) de winsten van de gemakkelijke projecten op uitleglocaties werden gebruikt om de verliezen op complexe binnenstedelijke ontwikkelingen te dekken 2) of in hetzelfde project werden de winsten op de vrije sector woningen gebruikt om de verliezen op de corporatiewoningen met onrendabele top te dekken (Segeren, 2007). Wanneer er na deze verevening nog winst overbleef, werd deze gebruikt in het fonds 'Bovenwijkse Voorzieningen' om de nieuw aan te leggen infrastructuur of sociale voorzieningen zoals zwembaden, bibliotheken of theaters op de uitleglocaties te financieren (van Hoek et al, 2011).

Probleemstelling

Economische crisis

In de zomer van 2007 ontstond een crisis op de financiële markten die binnen twee jaar ook zichtbaar werd in de vastgoedmarkt. Een dalende vraag naar woningen en een overaanbod aan ruimtelijke ontwikkelingen resulteerden in onzekerheid in plannen. De plannen zijn vertraagd en de ruwe bouwgrond is (deels) aangekocht. Dit is gefinancierd met leningen wat rentekosten tot gevolg heeft, daarbij zorgt vertraging in afzet van kavels dus voor een toename van kosten. Verder is de toekomstige ontwikkeling van de grondprijzen onzeker en daarmee is er onzekerheid over de geprojecteerde opbrengsten in grondexploitaties. Aangezien gemeenten jaarlijks hun grondexploitaties updaten, en verplicht zijn om verliezen af te dekken, heeft dit in veel gevallen al geleid tot winstverdamping en in sommige gevallen tot verliezen op grondexploitaties. Deze onzekerheid over grondprijzen, geprojecteerde opbrengsten en oplopende rentekosten resulteren in verliezen op grondexploitaties en in sommige gevallen tot tekorten op de gemeentelijke begrotingen. Gemeenten moeten bezuinigen, inkrimpen van hoeveelheid personeel, investeren minder in sociale voorzieningen en stellen hun ambities op het gebied van duurzaamheid uit.

In deze economisch zware tijden worden de financiële risico's van de actieve rol van de gemeenten op de grondmarkt duidelijk. Dit heeft geleid tot de volgende probleemstelling: *Gemeenten hebben veel grond gekocht met de verwachting van toekomstige gebiedsontwikkeling. Door de economische crisis zijn gebiedsontwikkelingen vertraagd en in sommige gevallen zelfs stopgezet. De vertraging in de kaveluitgifte en de onzekerheid over de marktwaarde en geprojecteerde opbrengsten van de grond resulteren in significante verliezen. Sommige gemeenten zijn hierdoor al in financieel gevaar, terwijl andere in de gevarezone raken.*

Onderzoeksopzet

In het algemeen bestaat dit onderzoek uit vier onderdelen: 1) het theoretisch kader waarin de verwevenheid tussen ruimtelijke ordening, de grondmarkt, grondbeleid, grondexploitaties en gebiedsontwikkeling duidelijk wordt, 2) een Multi criteria analyse en vragenlijst ter validatie



Figuur 1: Onderzoeksopzet

hiervan om de huidige financiële situatie bij Noord-Brabantse gemeenten te testen ten gevolge van verliezen op de grondexploitatie, 3) de analyse van de toepasbaarheid en bepalende factoren van duurzame beleidsoplossingen om duurzame vormen van grondgebruik en financiële continuïteit te creëren 4) en afsluitend worden er conclusies getrokken uit dit onderzoek en aanbevelingen gedaan voor verder onderzoek. De hoofdonderzoeksvraag die centraal staat in dit onderzoek is:

Welke duurzame beleidsoplossingen zijn (en in hoeverre) toepasbaar om het gemeentelijk grondbeleid te verbeteren om uiteindelijk een continue, gezonde financiële situatie voor gemeenten in Noord-Brabant te creëren?

HUIDIGE SITUATIE VOOR NOORD-BRABANTSE GEMEENTEN

De financiële situatie van gemeenten in de provincie Noord-Brabant is onderzocht aan de hand van de kwantitatieve data uit de jaarrekeningen 2011. Het jaar 2011 is op dit moment de meest recent, beschikbare data.

Methode

Multi criteria analyses (MCA) worden in een variëteit aan vormen toegepast in zowel kwalitatief als kwantitatief onderzoek. De algemene definitie is: "Multi criteria analyse is een beslissingsondersteunende tool voor complexe multi-criteria problemen welke bestaan uit kwalitatieve en/of kwantitatieve aspecten van een probleem in het besluitvormingsproces (Voogd, 1983)."

In dit onderzoek zijn aan de hand van een viertal criteria alle gemeenten in de provincie Noord-Brabant gescoord in vergelijking met elkaar. Per criteria geldt voor de score (S_{ij}): $0 \leq S_{ij} \leq 100$. De totaalscore (S_j) voor een gemeente is daarmee dus: $0 \leq S_j \leq 400$. De vier criteria, welke uit de gemeentelijke balans van de jaarrekening 2011 komen, zijn:

1. *Totale boekwaarde grondvoorraad per inwoner (€/per inwoner)*: Hiermee kan de boekwaarde van de grondvoorraad vergeleken worden tussen gemeenten. Per inwoner zijn de gemeenten meer vergelijkbaar.

2. *Totale boekwaarde grondvoorraad als percentage van totale activa (%)*: Hiermee wordt het aandeel van de grondvoorraad van de gehele gemeentelijke balans/begroting duidelijk.

3. *Globale weerstandscapaciteit (€)*: Hiermee wordt de verhouding tussen de absolute waarde van alle reserves en de boekwaarde van de grondvoorraad duidelijk. Indicatie in hoeverre verliezen opgevangen kunnen worden.

4. *Totale boekwaarde van grondvoorraad (€)*: absolute waarde grondvoorraad; over algemeen horen de grotere gemeenten een grotere grondvoorraad te hebben.

Resultaten

De resultaten van de MCA laten voor gemeente Veghel een opmerkelijke uitkomst zien: deze gemeente scoorde 391 bij een maximum score van 400. Verder zijn veel gemeenten uit het zuidoosten van Noord-Brabant meer in financieel gevaar dan de andere gemeenten. Verder zijn het veelal kleinere landelijke gemeenten, met grote grondvoorraden en een kleine reservepositie die hoog scoren. Vervolgens zijn aan de hand van

De twintig hoogstscorende gemeenten in Noord-Brabant	Aantal inwoners	Totale score
1 Veghel	37.303	391
2 Maasdonk	11.268	315
3 Heusden	42.995	290
4 Veldhoven	43.243	266
5 Nuenen, Gerwen en Nederwetten	22.213	216
6 Boekel	9.772	216
7 Gemert-Bakel	28.763	181
8 Bergen op Zoom	65.845	178
9 Uden	40.536	174
10 Halderberge	29.291	170
11 Dongen	25.061	161
12 Bernheze	29.655	158
13 Deurne	31.526	158
14 Gilze en Rijen	25.975	155
15 Best	28.953	151
16 Breda	173.299	148
17 Boxmeer	28.575	147
18 Geldrop-Mierlo	38.117	142
19 Bergeijk	18.061	137
20 Roosendaal	77.566	134

Figuur 2: 'top-20' gemeenten MCA

‘vragenlijst 1’ de ‘top-20’ gemeenten verder onderzocht. Hieruit wordt geconcludeerd dat, wanneer de huidige economische situatie aanhoudt, er meerdere gemeenten in financieel gevaar zullen komen. Op dit moment staan de gemeenten Nuenen, Gerwen en Nederwetten en Gemert-Bakel onder verscherpt toezicht van de provincie ten gevolge van niet-sluitende begrotingen. Verder richten de gemeenten zich puur op het minimaliseren van de verliezen door korte termijn (boekhoudkundige) maatregelen.

DUURZAME BELEIDSOPLOSSINGEN

Een tweetal duurzame beleidsoplossingen (DBO) zijn getest op toepasbaarheid en bepalende factoren door 26 gemeentelijke experts (13 reacties: 50% respons) en 21 consultancy en academische experts (15 reacties: 71% respons). De twee onderzochte DBO zijn:

1) *regionale en financiële verevening*: door een overaanbod aan geplande ruimtelijke ontwikkelingen worden de voorverkoop percentages niet gehaald. Door regionale prioritering van de plannen en verevening van verliezen (door het stopzetten van plannen) en winsten (door doorgang van plannen) worden de verliezen regionaal beperkt.

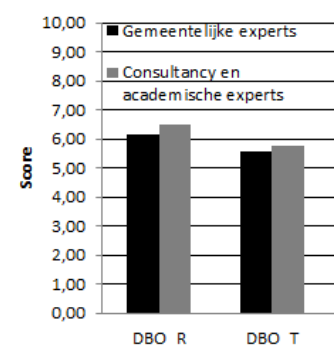
2) *tijdelijk gebruik van de grond door het plaatsen van zonnepanelen*: door een energie coöperatie wordt er geïnvesteerd in zonnepanelen en daardoor ontvangt de gemeente enkel erfpacht voor de gebruik van de grond. Deze erfpacht is residueel bepaald voor de energie coöperatie en is, afhankelijk van de energieprij(s)ontwikkeling, ze erfpacht is residueel bepaald voor de energie coöperatie en is, afhankelijk van de energieprij(s)ontwikkeling, € 1,30 per m² - € 3,30 per m².

Methode

De fuzzy Delphi methode (FDM) is gebruikt om de toepasbaarheid en bepalende factoren van deze twee DBO te bepalen. De methode volgens Klir en Yuan (1995) is hiervoor gebruikt. Hierbij zijn de volgende drie stappen ondernomen: 1) de lijst met bepalende factoren per DBO is opgesteld aan de hand van drie uitgevoerde case studies bij Noord-Brabantse gemeenten (Uden, Heusden, Gemert-Bakel), 2) De meningen van de twee groepen experts zijn verzameld door middel van ‘vragenlijst 2’: de experts hebben de bepalende factoren en algemene toepasbaarheid van de DBO gescoord (ordinaire schaal 1 tot 10) en 3) de resultaten zijn geanalyseerd met de FDM: door middel van de berekening van het trapeziumvormig fuzzy nummer en vervolgens de ‘defuzzification’ van de experts’ scores is de definitieve waarde (S_j) per factor en per DBO bepaald.

Resultaten

De resultaten van de FDM laten zien dat de DBO_R (regionale verevening) als het best toepasbaar wordt gezien ($s_j = 6.15, 6.43$) en de DBO_T (tijdelijk gebruik) als minder toepasbaar wordt gezien ($s_j = 5.56, 5.78$). De experts onderkennen dat tijdelijk gebruik van grond interessant is en dat de opwekking van duurzame energie daar een van de mogelijkheden voor is. Wel zijn er nog moeilijkheden met de financiële haalbaarheid door onduidelijkheden in regelgeving omtrent collectief salderen en de energieprij(s)ontwikkeling) en voornamelijk het aandeel van de energiebelasting daarin. Verder onderkennen de experts de noodzaak voor regionale afstemming van woningbouwplannen; dit kan de eerste aanzet zijn tot een meer regionaal georiënteerd grondbeleid. Beide DBO kunnen de verliezen verminderen op grondexploitatie



Figuur 3: Toepasbaarheid DBO

maar veel belangrijker stimuleren innovatief en duurzaam ruimtegebruik waarbij toepassingen in duurzaamheid (bijv. hernieuwbare energie bronnen) een rol kunnen spelen.

CONCLUSIES EN AANBEVELINGEN

Dit onderzoek heeft voornamelijk de bewustwording onder gemeenten gestimuleerd om te kijken naar duurzame innovatieve manieren van grondbeleid. Er kan geconcludeerd worden dat gemeenten hierover minimaal met elkaar van gedachte wisselen; vaak is de kijk beperkt tot de gemeentelijke grenzen. Het delen van kennis en in samenwerking de toepasbaarheid van andere vormen van grondbeleid verkennen, kan de opstap zijn tot een meer regionaal georiënteerd grondbeleid. Op deze manier kunnen de verliezen op grondexploitaties beperkt worden en kan er duurzaam naar de toekomst gekeken worden.

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