# Willingness to pay for climate adaptive infrastructure

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# Colophon

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# Preface

This report is the result of four months of researching the willingness to pay for climate adaptive infrastructure in England. This report was written to complete the master's degree in Spatial Planning at Radboud University in Nijmegen. The specialization I took was Planning, Land and Real Estate Development. The question of: “why there is no more investment in climate?” Is one that I wanted to answer. In addition, I was also curious about the side of developers, but as shown later in this study, little is known about this. Hence, the combination of these two aspects led to this research topic.

The opportunity I had to do the research in England at the University of Liverpool has been enriching, not only on personal level, but it has also provided new insights and knowledge about spatial planning, land development and the interaction between developers and local authorities.

Writing this thesis is not possible without the help of others. First of all, I would like to thank the interviewees for their time and contribution with their knowledge and insights for my research. I would also like to thank Erwin van der Krabben for guiding my thesis process and with the suggestion to do the research in Liverpool. I would like to thank my supervisor in Liverpool Alex Lord for the guidance, feedback and network to conduct my research. Lastly, I would like to thank my family and friends, many of them visited me in Liverpool, which feels like an honour and in addition had the patience during the many video calls to support me to complete the research.

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## Summary

Investments in climate adaptive infrastructure need to be made to combat climate change. Local authorities are expected to make these investments, but local authorities often lack the revenue to finance all public services, including public infrastructure. In addition, a shift has taken place whereby developers often own the land. Land value capture is recognized worldwide as an equitable way to capture value from developers to be used for investment in public infrastructure. In England, this value is captured through developer contributions, Section 106 (negotiable developer obligations) and Community Infrastructure Levy (non-negotiable developer obligations), both can be used to invest in climate adaptive infrastructure. Developers might invest in climate adaptive infrastructure because it increases the value of the land, however, this rational connection has not been made. It may also be that developers invest in climate adaptive infrastructure because they feel socially responsible. The research question is:

*'What is the willingness of local authorities and developers in England to pay for climate adaptive infrastructure?*

To answer the main question, interviews were conducted with developers, local authorities and experts in the field of negotiations, planning and investments. From the theoretical framework the concepts: willingness to pay, behavioural economics, corporate social responsibility, land value capture and climate adaptive policies were examined and in the operationalization scheme the concepts have been further elaborated and from there the questions for the interview emerged. To investigate the willingness of developers and local authorities, questions were asked from the following concepts: willingness to pay (prioritization), economic responsibility, legislative responsibility, social awareness (ethical responsibility and philanthropic responsibility) and negotiations.

The interviews show that for developers, money and viability are important aspects of investing in infrastructure. Developers can ask for an environmental social governance fund when investing in a development, this fund is paid out but the development has to meet sustainability requirements. In addition, developers notice that investors are willing to finance a project, on the condition that the finance is used for a sustainable project. Also, the buyers of the homes and/or offices influence what developers invest in, buyers want to buy a sustainable home or office. Finally, some developers invest in climate adaptive infrastructure, because they feel responsible for societal problems.

The English planning system suffers from many economic geographical differences, which makes it difficult to come up with a one size fits all answer. Developers would like to see uncertainties and risks removed during negotiations. Local authorities would like to see more equality in England so that each local authority can charge the same amount. The local authorities interviewed are located in an area of low viability. As a result, they can ask for fewer contributions from developers. The negotiations are based on the policy, the local plan of the local authority. The traditional issues still have the highest priority, but there is a shift taking place and there is also a greater demand to invest in climate adaptive infrastructure.

Money and viability are the main priorities for both developers and local authorities to pay. In addition, it is important that the policy of the local authorities specifically includes the subject of climate, so that during negotiations, climate contributions can be discussed. Finally, what is striking about the research is that the behaviour of developers to invest in climate adaptive infrastructure is influenced from outside, by buyers and investors. They expect developers to invest in climate adaptive infrastructure during development.

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# 1. Introduction

Despite visions and goals that governments, companies and institutions have, climate change is still happening. The consequences are being scientifically revealed, affecting every part of the world, with sea levels rising, extreme weather conditions, impact on biodiversity and ecosystems, but also our own health, safety, food security and economic growth is put at risk (IPCC, 2018). To make the world resilient and counteract the effects of climate change, climate adaptive infrastructure can be used. In particular local authorities are expected to invest in this (IPCC, 2014a). However, local authorities are already struggling with tight budgets that require them to make other investments as well (Root, 2016). Birch & Rodas (2022), Bor & Mesters (2021) and Heurkens & Verheul (2021) also indicate that funding for cities for climate adaptation is a fiasco. To make the financing possible, other ways to fund climate adaptive infrastructure should be explored.

In the context of limited public funding, some have suggested that land value capture (LVC) could provide policymakers with an important source of revenue to invest in climate adaptation (Dunning & Lord, 2020). Land value capture is internationally recognised as an equitable way of financing public infrastructure (Hong & Needham, 2007). It is well known that urbanisation and developments in cities lead to the emission of greenhouse gases and other pollutants that then have global implications, often far beyond the site of their emission (Bulkeley, 2013). Land value capture potentially offers a micro, urban scale solution to this global problem with local origins. However, how the proceeds of land value capture are invested may be affected by a host of locally specific variables: the scale of environmental degradation (such as air pollution), long-term expectations regarding the effects of climate change (such as sea level rise) and the kinds of investment that are prioritised by policymakers. It is therefore important to know the connection between investments in climate adaptive infrastructure and land value capture.

These connections between climate adaptation infrastructure and land values are not made in the literature or national policies on land value capture. This raises several important questions regarding how land value capture policies are designed and implemented. Whilst it is clear that land value capture could play an important role in funding infrastructure to support climate change adaptation there is currently no evidence on the degree to which it does play this role, in addition, land value capture can be considered on a large urban scale. In short, there is no evidence on the degree to which land value capture is being used to support climate resilience and the degree to which developers can contribute (Dunning & Lord, 2020).

In recent years, there has been a shift in the urban development arena from the public sector to the private sector, and the financial arrangements involved have changed. To make the public infrastructure investments in the area feasible, developers and landowners are contributing to developer obligations, in exchange for the investments the economic value of their land is increased and receiving the planning permission (Muñoz Gielen & van der Krabben, 2019). But the question is what is the willingness of developers to pay for climate adaptive infrastructure?

The definition of Willingness to Pay (WTP) is "*what is the maximum price to pay for a product or service"* (Stobierski, 2020). On the one hand, looking at it rationally, developers would invest in climate adaptive infrastructure because property values increase, but as Dunning & Lord (2020) point out in the study "Viewpoint: Preparing for the climate crisis: What role should land value capture play?", this is uncertain. On the other hand, developers may be willing to invest in climate adaptive infrastructure because they feel socially responsible. In addition, society also expects companies to take responsibility for solving problems in the public domain (Carroll, 2016) (Chen & Lee, 2017) (Orlitzky et al., 2011).

Globally, nationally and locally, many countries are working on policies and vision documents to deal with climate change. The willingness to pay can be applied anywhere in the world. This research focuses on England, which has a national, regional and local vision to combat climate change (Climate Change and Energy - GOV.UK, 2021). As the Committee on Climate Change (2016) has explored following the Paris Agreement that England faces flooding, risks especially near the coast, health risks and agricultural productivity declining. For England, it is important to invest now in climate adaptive infrastructure.

## 1.1 Research aim and research question

The aim of the study is to understand the willingness of developers and local authorities to make contributions to the provision of public infrastructure in England. The focus is on climate adaptive infrastructure, as climate change is one of the biggest threats facing the world today. The fact that the government has traditionally been able to recoup all or part of the increase in land value resulting from the granting of building permits forms the basis for contributions by developers to finance public infrastructure. In England, as in most other countries, the specific nature of the public goods, services and/or affordable housing for which land value capture could be used is determined by local priorities. Local authorities have the right to ask for land value capture as a "developer's contribution" in return for the local authority providing planning permission. This raises several interesting questions about the priorities that local authorities assign to land value capture investment and the information and evidence they use to arrive at these assessments. In addition, there are parallel questions about the willingness of developers to fund different types of infrastructure through their contributions; for example, it is conceivable that some public goods and infrastructure create more value to a development than others. There is also the question of what the increase in value is investing in climate adaptive infrastructure. Do developers feel socially responsible to invest in climate adaptive infrastructure and if so, how does this influence the willingness to pay for climate adaptive infrastructure.

To examine the willingness of developers and local authorities to invest in climate adaptive infrastructure, it is important to understand if there is any variation in developers' preferences with regard to how their contributions are invested and, similarly, if local authorities regularly request developer contributions for climate adaptive infrastructure. In other words, are developers willing to provide climate adaptive infrastructure or is the existing system resulting in outcomes that are producing sufficient climate adaptive infrastructure and, if not, why not?

The study aims to understand the willingness of developers to invest in climate adaptive infrastructure and whether local authorities are asking for climate adaptive infrastructure. In relation to this, the research question for this study is: *'What is the willingness of local authorities and developers in England to pay for climate adaptive infrastructure?*

The following questions help to answer the research question:

1. Which factors influence the willingness to pay for climate adaptive infrastructure, as well as for developers as local authorities?
2. Does the current English planning system allow for investment in climate adaptive infrastructure?

## 1.2 Societal relevance

The effects of climate change are being felt by everyone to some extent. Action must be taken to counteract this, for the society it is important to invest in climate adaptive infrastructure. Governments are the party that has to stand up for the inhabitants, but investments are now also often made by developers. Studies have already been conducted into what kind of climate adaptive solutions can be implemented in area development. It is therefore important for society that the willingness of developers is made clear (Dunning & Lord, 2020).

This research focuses on England, Root et al. (2014) indicate that local governments often do not have enough budget to build all public infrastructure. To generate more revenue and use it to invest in public infrastructure, it is possible to explore negotiations between local authorities and developers. As the Department for Environment Food and Rural Affairs (2018) points out, there needs to be a collaboration between governments, private parties and infrastructure providers to make adjustments for climate adaptive infrastructure. England has the imposition of plan obligations, Section 106 (negotiable developer obligations) and Community Infrastructure Levy (CIL) (non-negotiable developer obligations) as a key funding model. Section 106 agreements arise from negotiations between local authorities and developers. For local authorities, funding from these plan obligations can be used to invest in a new development in the area to be developed, or in the surrounding area. The local authorities can also apply CIL, these non-negotiable developer contributions are prepared in advance. It is relevant to investigate the relationship between Section 106, CIL and climate adaptive infrastructure and how negotiations between local authorities and developers take place (Ministry of Housing, Communities and Local Government et al., 2020), as this will explore what investments local authorities and developers prefer, whether they are willing to pay for climate adaptive infrastructure, what they base these choices on. To summarise all these questions what determines the willingness to pay for climate adaptive infrastructure.

This research can help match the English planning system with developers' behaviour to invest in climate adaptive infrastructure. This should lead to more informed choices in investing in climate adaptive infrastructure. The social importance of this is that investments in climate need to be made, and everyone needs to contribute.

## 1.3 Scientific relevance

As argued by Grafakos et al. (2019), the biggest challenge for national and local governments worldwide is the financing of climate adaptive infrastructure. A lot of research has been done on (local) governments to take action on climate change (see for example the following sources: Aguiar et al., 2018, Averchenkova et al., 2020, Nolon, 2009), this shows that the process of policy implementation, execution and monitoring is complex. Different research methods are used to investigate how the process works, interviews, surveys, case studies and experimental game theory. Remarkably, the studies do not address the financial benefits of investing in climate adaptive infrastructure in relation to land value capture (Dunning & Lord, 2020). This is important to investigate because financial benefits make it more attractive to invest in climate adaptive infrastructure (Koppenjan & Enserink 2009). In addition, studies have mainly investigated from the government's perspective rather than from the developer's side. According to Dunning & Lord (2020), land value capture could play an important role in urban adaptation to climate change. There is only a need for more theoretical and empirical evidence about land value capture and what it can finance, but also how land value capture interventions can change land values.

As described earlier in developer willingness to pay, developers can rationally invest in climate adaptive infrastructure if it provides financial benefits, i.e., property values go up. However, as Dunning & Lord (2020) point out, there is a knowledge gap when it comes to what are the financial benefits of climate adaptive infrastructure. This is now uncertain and unknown. It may also be the case that companies feel socially responsible to invest, but there is no information on this either. The

knowledge gap is therefore what considerations developers make to invest in climate adaptive infrastructure.

To get planning permission as a developer, negotiations with local authorities take place. The negotiations are an important part of the willingness to pay because here the arrangements for public infrastructure are made. Municipalities set conditions that can be negotiated (NDO), but there are also non-negotiable conditions (N-NDO). For municipalities, research has been done on the financial feasibility of different land value capture instruments and which ones they can use to invest in public infrastructure (Root, 2016) (Muñoz Gielen & van der Krabben, 2019). But it is not yet known what is discussed during the negotiations, how the conditions are determined and what priorities both developer and local authorities have. In addition, there is a knowledge gap in that no research has been done on the side of developers and what motivation and prioritisation they have during the negotiations about investing in public infrastructure (Dunning & Lord, 2020).

In response to these issues, van der Krabben et al. (2019) and Candel (2021) wonder how much value is currently secured, how much value could potentially be secured and what is the effectiveness of land value capture. However, their research does not directly answer these questions. Similarly, Lord et al. (2019) asks in their research virtuous or vicious circles, what priorities do local authorities and developers have. What conditions do developers have to invest in climate adaptive infrastructure? However, the literature does not directly address these questions, meaning that there is no evidence on the nature of negotiations or how developers and planning professionals collectively determine investment priorities for developer contributions. These questions are fundamental to other questions related to developer contributions, but they are largely absent from the literature.

Peterson (2008) in his study about land value capture and urban investment noticed that there is a lack of public accountability for how revenues are used from land value capture and how local authorities make choices regarding climate adaptive infrastructure investments. It can provide important insights if it is clear what the income from land value capture is now primarily made in. In addition, it is interesting for this research to know whether local authorities take climate into account in their choices during the negotiations.

## 1.4 Reading guide

The structure for this thesis is as follows, in chapter 1 the reason for the research was presented, the purpose of the research, the research questions and the social and scientific relevance. Chapter 2 discusses the theoretical framework, this discussed the main concepts and theories, namely willingness to pay, behavioural economics inspired approach, corporate societal responsibility, land value capture and the policy framework of England. Chapter 2 concludes with a conceptual framework that shows the connections between the different concepts. Chapter 3 explains the methodology, it explains why there is chosen to collect data for this study with interviews, it also presents the operationalization scheme from which the interview questions were created. Chapter 4 presents the results of the interviews. Interviews with developers and local authorities were analysed and are presented in this chapter. Chapter 5 discusses the results of Chapter 4 and compares the data with each other and the literature. In the final chapter, chapter 6, the research questions are answered, the contribution to theory is discussed, but also the limitations of the study and recommendations for follow-up research.

# 2. Literature review and theoretical framework

The purpose of this chapter is to expand further knowledge on the important definitions for this research. The four definitions explained are firstly willingness to pay, then behavioural economics inspired approach in relation to corporate social responsibility and finally land value capture. Finally, the theoretical framework explains the policy framework of England. In order to connect the definitions, a conceptual framework is created.

## 2.1 Willingness to pay

The main question indicates that it is about the willingness of both developers and local authorities to pay for climate adaptive infrastructure. Willingness to pay (WTP) is about how much someone is willing to pay for a particular product or service (Stobierski, 2020). This willingness varies from person to person and/or company to company, and there are several factors influence the willingness to pay.

The willingness of the private sector to pay for climate adaptive infrastructure can be explained in two ways. First in this chapter, the rationale side is explained further, in section 2.2.1 the social responsibility of developers is discussed further. As Koppenjan and Enserink (2009) point out in their research on public-private partnerships in urban infrastructure, it is often assumed that the private sector acts from the rational aspect, namely short-term profit. In addition, it is also indicated that investments in climate are often complex. The public sector needs the private sector to make these investments. The society expects the private sector to take responsibility for climate change (Carroll, 2016).

Koppenjan & Enserink (2009) further elaborate on the rationality of developers to pay. They argue that public-private partnerships can create sustainable urban infrastructure because local governments often do not have the financial means to finance this infrastructure collaboration is necessary, this is also indicated by Root et al. (2014). Looking at the rationality of developers to pay in general, the aim of companies is to pursue profit. If a company wants to invest, it must be convinced that there is profit potential. To increase the willingness of developers' other challenges also must be met. First, the prospect of a return on investment must be offered; according to Koppenjan & Enserink (2009), projects must generate a positive cash flow, which means that the investments made (expenditure) must be recouped (income). Second, management of scope and externalities, a project or investment by itself can be unprofitable, but by combining more of the projects, the unprofitable projects can be financed with profitable projects, this is known as value capturing (Koppenjan & Enserink, 2009). Zhang et al. (2018) confirm that financial strength and profitability are important in measuring the private sector's intention to participate. Third, managing private parties' risk perception, according to Nisar (2013) and Harris (1993), cooperation between public and private parties is important, for governments to know which party they are dealing with and for private parties to decide whether or not to invest. Finally, by reducing political uncertainty, investments in urban infrastructure can mainly be earned back in the long-term. For companies, it is important that the political situation is stable so that the investment can be earned back (Koppenjan & Enserink, 2009).

According to Koppenjan and Enserink (2009), these four aspects are important for private parties to invest in, but because there is no connection made between investments in climate adaptive infrastructure and land value increase, it is difficult to say why developers are willing to invest in climate adaptive infrastructure. Therefore, an attempt is made from the perspective of behavioural economics to see what the motivations may be.

## 2.2 Behavioural economics inspired approach

Behavioural economics is about the psychology behind the economy. Neo-classical economics assumes that companies make rational choices and are driven by profit maximization. However, behavioural economics questions this, and looks behind the motivations of firms and individuals why certain choices are made and not always the rational "best" choice. The financial benefits of investments in climate adaptive infrastructure are not known (Kenton, 2020) (Dunning & Lord, 2020), yet these investments are made. That is why from a behavioural economics perspective is examined why certain choices are made regarding to investments in climate adaptive infrastructure. The English planning system is first discussed in relation to behavioural economics.

The English planning system is based on the discretionary development system and negotiations between local authorities and developers vary from project to project, it is necessary to understand how these negotiations work because what is being invested in is determined during negotiations. Behavioural economics is more commonly used in the English planning system by decision-makers to support their planning process (Dunning, 2016). As Adams & Tiesdell (2010) point out, in most Western countries the built environment is financed by the private sector. Negotiations take place between the developer and the local authorities, which influence what the developer has to pay and contribute. Hence, behavioural economics is suitable for analysing negotiations with the ultimate aim of increasing willingness. As Lord & Gu (2018) point out, it is possible to modernise the current planning system and view developers as market players (Adams & Watkins, 2014). This is possible, but then, before new planning policies are made, the market aspects should be considered. Adams and Tiesdell (2010) also indicate that planners (public sector) have a detached view of the market and through behavioural economics, the planning system can become more efficient.

As Schulze Bäing and Webb (2020) point out in the discretionary development system is that the main feature of this English planning system is that it is flexible. The policy does not specify specific terms and as Jowell (1975) says *"what is gained in uniformity may be lost in flexibility"*. This requires the planning professional to consider many factors in the decision, which are not specifically set out in the policy. This causes the planning professional to be more flexible with the policy rules in each planning application. This leads to the need to renegotiate any contribution from developers to fund public goods and infrastructure with each planning application.

The zoning planning system you see in the Netherlands and Germany, for example, works with a masterplan and zoning plans, this has direct legal consequences for the landowners or developers. In England, a masterplan, a long-term strategy for the local authority is set up, but this is not legally binding. The advantage of a zoning planning system is that it provides certainty for landowners and developers, but because of this, it is less flexible than the discretionary development system (Schulze Bäing & Webb, 2020).

The national government of England recognises that the current planning system is overly complex leading to uncertainty and delay, in addition, planning decisions are made at liberty (discretionary) and are not based on rules (Ministry of Housing, Communities and Local Government, 2020). In relation to this research, it is notable that the national government's research shows that the procedure for negotiating developers' contributions to affordable housing and infrastructure is complicated, long and unclear. As a consequence, the results from this developer's contribution are uncertain, and local authorities have less ability to deliver other infrastructure. The national government's response to this problem in the new "Levelling Up and Regeneration Bill", section 2.4 discusses this bill in greater detail (Government UK & Ministry of Housing, Communities and Local Government, 2022).

Since the English planning system is based on the discretionary development system and negotiations between local authorities and developers vary from project to project, it is necessary to understand how these negotiations work, the negotiation process is further explained in section 2.3.2.1. Behavioural economics is based on neo-classical economics, namely that everyone makes rational choices and strives for maximum profit, but behavioural economics questions whether this is really the case, and looks at the psychological underpinnings that are made, the considerations and choices that individuals make. As Watkins and McMasters (2011) point out, behavioural economics is not an isolated theory. According to behavioural economics, the process is important because the information during the process is not always known and must be collected and weighed. As a result, the various factors that influence WTP must be examined

It does not yet emerge from this why developers would want to invest in climate adaptive infrastructure beyond the rational. If companies feel socially responsible, this may lead to other choices. The next section explores this in more detail.

### 2.2.1 Corporate societal responsibility

From behavioural economics itself, it is not possible to say what the underlying rationale is for developers to pay for climate adaptive infrastructure. Since climate is seen as a public good (Root et al, 2016), it is possible that companies feel socially responsible to invest in climate adaptive infrastructure. The definition of corporate societal responsibility (CSR) is to take responsibility for the impact the company has on society, environment and economy. Taking responsibility can be by providing solutions to minimize the impact, or making investments (Carroll, 2016).

Carroll's pyramid is used for why companies invest in social problems. The pyramid takes into account how businesses operate, as well as government, society, and any altruism that may play a role. Carroll's definition of the pyramid is as follows: *"this set of four responsibilities creates a foundation or infrastructure that helps to delineate in some detail and to frame or characterize the nature of businesses' responsibilities to the society of which it is a part"* (Carroll, 2016). Theories by, for example, Ditlev-Simonsen & Midttun, (2011) and LaGore et al., (2011) are similar to Carroll's but are more specific about the four themes, such as, for example, the business structure of a company. Since this is an exploratory study, Carroll's four categories were used as the basis for the study, in addition, Carroll assumes that the contributions made maintain and improve the quality of life, and does not assume doing the "right" thing. The question that may arise is what corporate societal responsibility provides for developers, according to Kurucz et al. (2008) corporate societal responsibility provides cost and risk reduction, improved competitiveness, corporate legitimacy and reputation and creating a win-win situation for both the company and society.

In figure 1 the pyramid is shown below; the explanation for each responsibility.

*Economic responsibility*

It is important that a company functions economically, this is also expected from society. Profit is needed to continue a business, but also to reward investors/owners.

*Legal responsibility*

Governments play an important role as they set the laws and regulations that companies must adhere to. The laws and regulations should be based on what society considers important.

*Ethical responsibilities*

Legal responsibility is essential, but it is not enough to solve social, economic and environmental problems. Businesses are expected to fulfil their 'ethical responsibilities'.

*Philanthropic responsibilities*

This is about what the company itself wants to add, doing something good for society. Sometimes there is an altruistic motivation from companies, but it may also be that companies do it for a good reputation. The difference with ethical responsibilities is that the extra contributions are not necessarily expected from society.

In summary, the following can be said about the responsibilities: economic is *required*, legal responsibility is *demanded* from society, ethical is *expected* and philanthropic is *desired*.

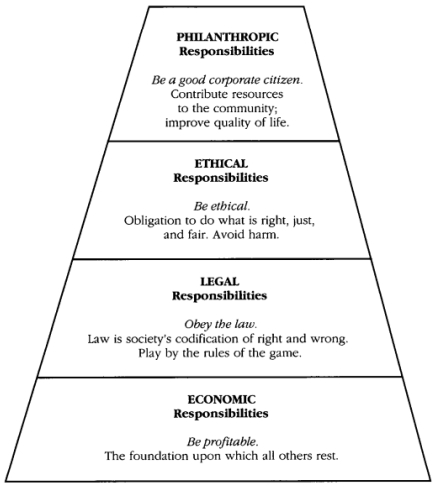


*Figure 1: The pyramid of corporate social responsibility (Carroll, 1991).*

Friedman (1970) criticizes the concept of corporate societal responsibility and looks from the neo-classical model, the rational thinking of companies. According to Friedman (1970), companies want to make as much money as possible, individuals can take responsibility for social problems, but organizations and companies cannot at all, and lastly, Friedman believes that social problems should be solved by the government.

Friedman's critical attitude is taken into account in this research, as it may indeed be the case that developers think rationally and do not feel socially responsible. In recent decades, companies have been expected to be socially responsible. In addition, there is little information on the financial benefits of investing in climate adaptive infrastructure.

The willingness of developers to pay for climate adaptive infrastructure is influenced because companies feel socially responsible to invest, rather than looking at climate adaptive investments in a purely rational way.

## 2.3 Land value capture

This section further examines land value capture. First, land value capture in general is studied, then the focus on England in relation to the negotiation, and finally opportunities for land value capture for climate adaptation infrastructure.

### 2.3.1 Land value capture in general

Section 2.2.1 gives motivations for developers to pay for public infrastructure, however, the government also has a role to invest in public infrastructure. In addition, they can generate revenue with land value capture. Governments now often do not have sufficient revenue to meet all legal obligations and the provision of public goods, it is difficult to generate revenue and have to distribute the revenue across many aspects (Root, 2016). Land value capture is the increase in value created by efforts of government agencies or efforts of others than the landowner or government agency (Muñoz Gielen & van der Krabben, 2019). It is a process where cash payments and/or in-kind contributions are made by the development industry and delivered to a specific development. The contribution made ensures that the development industry receives planning permission (Lord et al., 2021).

This principle of land value capture was originated by John Stuart Mill (1848) and Henry George (1879), who saw the increase in land value arising in an unjust manner. The increase in land value arises without any effort on the part of the owners, the increase in land value arises because of society and the activities that society does. The value that is extra created, by the society, should be captured and shared/invested back into the society. According to Henry George, the unearned increment in the value of landowners should be taxed, and this should be used to finance poverty in the public sector (Lawrence & Walters, 2012).

According to the Lincoln Institute of Land Policy [UN-Habitat worldwide] (2014), the following four aspects are important when it comes to the implementation of land value capture policies:

- Efficient: marginal benefits for individual plots cover the marginal costs imposed on the whole city.
- Equity: some landowners benefit more than others from public intervention.
- Sustainable: finances urban development with the resulting increase in the value of land.
- Pragmatic: generates necessary local revenue - high potential.

There are different approaches to applying land value capture. According to Whitehead et al. (2016), there are three different approaches to recovering part of the increase in land value in new developments:

1. Taxing of the development following completion;
2. Statutory acquisition of land at the value of existing use prior to the provision of infrastructure and planning permission as a precursor to selling on the open market, and;
3. The imposition of a planning obligation, such as a levy or negotiated settlement, at the point of permission.

In addition to these three approaches, there are various instruments for collecting the value increase. Direct and indirect instruments are available to collect or tax the appreciation of land. Direct instruments are instruments that motivate that the unearned land value needs to be redistributed to the public. Indirect instruments are common that landowners should internalize negative externalities development (Candel, 2021). Some examples of these instruments are transferable development rights (indirect), betterment contributions (direct) and public land leasing (direct). The aim of the instruments is the same when public investment succeeds, the public also benefits (Lincoln Institute of Land Policy, 2021). According to van der Krabben et al. (2019), indirect value capture is the most effective form of value capacity because it is flexible to adapt. However,

due to this flexibility, Candel (2021) indicates that this can come with additional risk and uncertainty for developers.

Peterson (2008) studied the different ways in which land values can be used for urban infrastructure. Peterson not only looked at the theoretical side of land value capture but also at the practical side and what can be learned from this. The countries studied by Peterson apply land value capture mainly through public-private partnerships. The benefit according to Peterson of capturing land value is as follows. The revenue generated from land value capture can be used to invest in public infrastructure. Provided there is a good and efficient system. This can be established when it is clear what the cost of the investment is, what infrastructure is to be invested in and what the costs and returns of this are. There are risks and limitations associated with land financing. Land prices are highly variable and land sales often lack transparency and accountability. Finally, there is little public accountability for how revenues are used. Looking at Peterson's system and investments in climate adaptive infrastructure, there is now a lack of what the revenues are from climate adaptive infrastructure are and the understanding of how choices are made by local authorities in terms of investments in climate adaptive infrastructure.

### 2.3.2 Land value capture in England

Land value capture is internationally recognised as an equitable way of financing public infrastructure (Hong & Needham, 2007). The English planning law system is based on the principle that local planning authorities negotiate compulsory contributions with developers; this was established in the Town and Country Planning Act 1990 as Section 106. Subsequently, the Planning Act 2008 established a local fixed charge called the Community Infrastructure Levy (CIL). Local planning authorities could choose to apply this CIL and use it alongside Section 106, but it is not mandatory. These negotiations are also known as developer obligations, looking at the three approaches set out by Whitehead et al. (2016) this falls under category three, for the value of developments a levy/tax must be paid, in order to obtain planning permission.

There are two types of developer obligations. The first is the negotiable developer obligations (NDO), which take place at the negotiating table and are the most common in practice. The second is the non-negotiable developer obligations (N-NDO), which are fixed in advance (Muñoz Gielen & van der Krabben, 2019). Section 106 are planning obligations agreed between developers and local authorities (NDO). The contributions resulting from the negotiations do not always have to be monetary, often there are in-kind contributions as well. Negotiable Conditions Section 106 is a legal agreement to mitigate the impact of a development proposal.
CIL is a locally determined fixed charge, (N-NDO). Local authorities, after conducting a survey, must determine the levy and set the resulting rates in a CIL levy schedule. CIL is always a monetary amount. Since 2008, the Community Infrastructure Levy has been introduced in the Planning Act of the United Kingdom. CIL is applied by local authorities because each area has different needs, and the land and property markets are regionally different (Lord, 2009). Nationally, CIL can be used if the local authority first identifies what infrastructure is required and how much it will cost, and works this out for each development. This is the English institutional policy framework for planning (Ministry of Housing, Communities and Local Government, 2021). There are three criteria for establishing CIL:

1. Necessary to make the development acceptable in planning terms;
2. Directly related to the development; and
3. Fairly and reasonably related in scale and kind to the development.

Developer obligations is used as a land value capture tool to make investments in public infrastructure. The question that follows from this is should the investments be made ndo or n-ndo? If developers are not willing to pay for climate adaptive infrastructure, then this infrastructure should

become non-negotiable (CIL). If developers feel societal responsible for climate it maybe can be negotiable Section 106 agreements.

#### *2.3.2.1 Negotiations*

As mentioned in section 2.2, negotiation is an important part of the cooperation between private and public parties. In addition, negotiations determine what is ultimately delivered in the Section 106 agreements. Negotiation is an important part of this research because little is known about public-private sector negotiations in the planning system. Besides, negotiation is an important aspect of behavioural economics to establish the social link in the planning system between the public and private sectors. In Lord et al. (2019) research, the aim is to establish a link between the process of developers and local authorities and what is required of each other for an agreement. Because the process is iterative, they conducted a qualitative study to examine the behaviour of the relationship between developer and local authority. The purpose of developer contributions is to get the building permit with the funding, this can be a direct payment or in-kind. The aim of the local authority is to invest in public purposes, for example, infrastructure, affordable housing, education and green spaces. A striking feature of land value capture is the aim that public investment also benefits the public, as shown by (Lord et al., 2019) in figure 2. This should also be the case for investments in climate adaptive infrastructure. The governments are responsible for solving societal problems, but as mentioned in corporate societal responsibility, society also increasingly expects companies to solve the problem. In addition, in a partnership between the public and private sectors, the private sector can bring in money, knowledge, creative innovations and solutions (Koppenjan & Enserink, 2009). As Koppenjan and Enserink (2009) point out, it depends on the government what the private party can invest in. If this does not include the possibility of investing in climate, it becomes more difficult for the developer to invest in this, if they still want this. It is notable that the developer party questions the viability of the development. If the local authority imposes conditions this is an argument for the developer to argue that it is not viable. It is a trade-off to create a positive cycle (see figure 2). To maintain or improve the viability of a plan requires investment in public purposes, the amount that can be invested depends on contributions from developers, who in turn take into account the viability and profit of the plan. It is remarkable that after planning permission is given, renegotiation takes place, the research by the Ministry of Housing, Communities and Local Government et al. (2020) shows an increase over the years, namely 46% of all local authorities renegotiated in 2019/2019. This involved negotiating fewer obligations for the developer. The behaviour of the developer and local authorities influences the negotiations, also indicates by the research of Lord et al,. (2019).

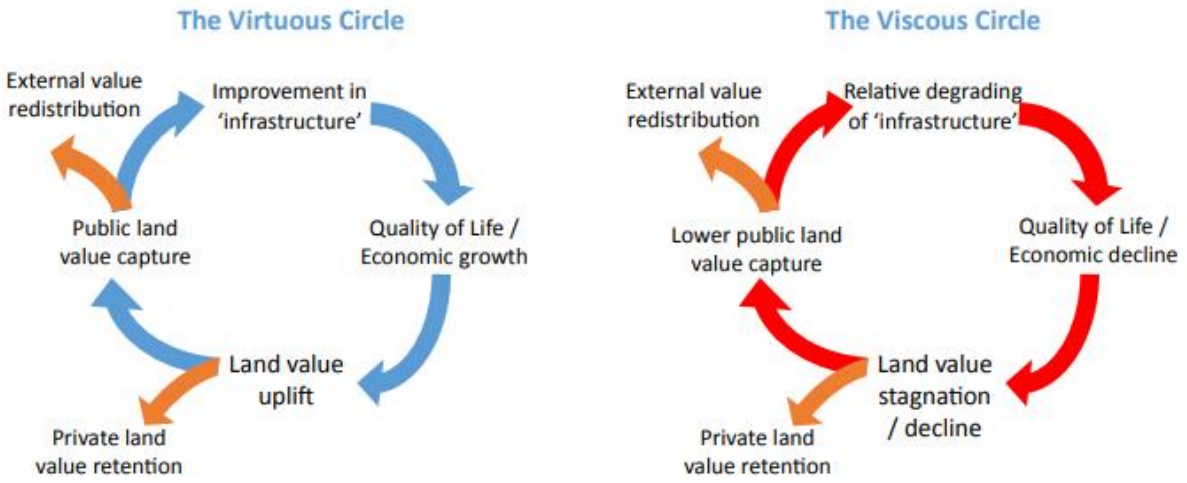


*Figure 2: Schematic form of the logic that underpins the virtuous and vicious circles (Lord et al., 2019).*

The English planning system is based on the discretionary development system. This gives local authorities flexibility in what they can ask of developers, but more importantly what local authorities ask of developers influences the creation of the development cycle see figure 2 (Lord et al. 2019). What also influences in England are economic geographical disparities, areas with high demand and where viability is 'reliable, local authorities can ask for more developer contributions from developers, than in areas with lower demand (Lord et al. 2019) (Ministry of Housing, Communities and Local Government et al. 2020). Figure 3 clearly shows that average land values vary greatly among local authorities, particularly in London and the rest of England. Table 1 supports this by showing how much developer contribution can be charged by region (Ministry of Housing, Communities and Local Government et al., 2020). As indicated, it often happens that developers renegotiate after they have received planning permission. This of course influences how much the local authority can invest in public goods and infrastructure.

The question remains, what do local authorities ask developers to contribute and what do they base their priorities on? As Campbell et al. (2020) point out in their research on "planning obligations, planning practice, and land-use outcomes", the political system influences what is asked for, but the downside is that, according to the Campbell et al. (2020) research, it is mainly organised on an ad hoc basis. A professional planner (public sector) should therefore combine these different sectors and make a prioritisation from there. In order to test this assumption, the qualitative research will have to ask about this.

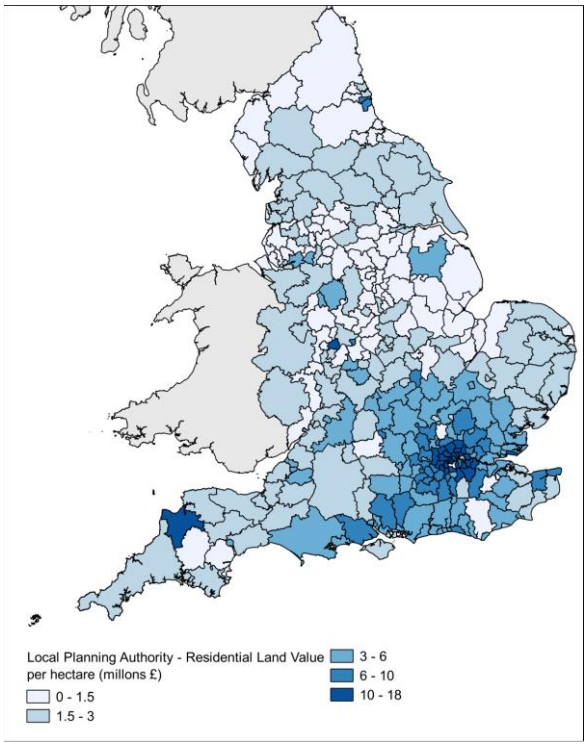


*Figure 3: English Local Planning Authorities average residential land value per hectare in 2017 (Ministry of Housing, Communities and Local Government et al., 2020).*

*Table 1: The number of authorities that can raise developer contributions within each region and those charging CIL in March 2019 (Ministry of Housing, Communities and Local Government et al., 2020).*

| | **CIL** | | **Non-CIL** | | **Total** | |
|---|---|---|---|---|---|---|
| **Region** | No. | % | No. | % | No. | % |
| East | 18 | 11% | 29 | 16% | 47 | 14% |
| East Midland | 11 | 7% | 29 | 16% | 40 | 12% |
| London* | 30 | 19% | 3 | 2% | 33 | 10% |
| North East | 3 | 2% | 9 | 5% | 12 | 4% |
| North West | 8 | 5% | 31 | 17% | 39 | 12% |
| South East | 40 | 25% | 27 | 15% | 67 | 20% |
| South West | 26 | 16% | 11 | 6% | 37 | 11% |
| West Midlands | 13 | 8% | 17 | 9% | 30 | 9% |
| Yorkshire and Humber | 9 | 6% | 12 | 7% | 21 | 6% |
| National Parks | 1 | 1% | 9 | 5% | 10 | 3% |
| Developme nt Corp. | 2 | 1% | 2 | 1% | 2 | 1% |
| Mayoral CIL | 1 | 1% | 0 | 0% | 1 | 0% |
| **Total** | 161 | 47% | 179 | 53% | 339 | |

### 2.3.3 Land value capture for climate adaptive infrastructure

Different research indicates that financing cities for climate adaptation is a fiasco (Birch & Rodas 2022) (Bor & Mesters, 2021) (Heurkens & Verheul, 2021). There are several possibilities to use land value capture for investments in climate adaptive infrastructure. In this chapter, some international researches are discussed to investigate finance for climate adaptive infrastructure.

First, we briefly outline what scientists currently know about climate adaptive infrastructure in relation to land value capture. Investing in climate adaptive infrastructure is important because it adapts to the actual or expected climate, mitigating the resulting impacts and exploiting favourable opportunities (IPCC, 2014b). As argued by Dunning and Lord (2020) and Grafakos et al. (2019), no link has yet been made between land value capture and urban adaptation and climate change. However, studies have been done on the impact of climate change on property values. Shahid et al. (2017) confirms that the negative impacts of climate affect property value, but that this cannot be seen in the short-term because climate change is a slow process. Most importantly, according to them, the issue of climate change should provide more insight for policymakers, developers and investors, as the buildings being built now will also last over the long-term.

Grafakos, Tsatsou, D'Acci, Kostaras, Lopez, et al. (2019) has researched land value capture tool for green infrastructure, they investigated whether green infrastructure can lead to higher property and land value. The findings are that there is indeed a positive relationship, so investing in green infrastructure leads to higher land and property value. They also calculated this at a specific location, with which several solutions also were calculated. It lacks the perspective of the developers, but it does give a good representation of the relationship between green infrastructure and property value. However, it should be noted that green infrastructure is not the same as climate adaptive infrastructure.

Birch & Rodas (2022) have investigated the five steps to financing climate infrastructure. The first step to be taken is a map is needed that clearly shows the consequences of climate change. Then the adaptation and mitigation infrastructure need to be coordinated, for example by setting up a special department to finance climate infrastructure. Step 3 is to identify appropriate policy instruments. Climate adaptation is not only about financing but also about regulating. Step 4 is government support for subsidiarity measures, some functions can be better performed by local governments than by national governments. The 5th and final step is to establish a new financing model. For example, strengthening decentralisation with clear definitions of the competencies of cities. Create a better credit system for local authorities by making it more transparent. Interesting is the proposal of linking public and private philanthropic efforts. This could be done by public investment stimulating private investment. Or using techniques to link public investment to capture higher property values.

Bor & Mesters (2021) has done the research for the province of Zuid-Holland in the Netherlands and inventoried nine financial instruments to build climate adaptive infrastructure with the possible positive and negative consequences. They say that there is a financial benefit when it comes to climate adaptive building, as the property value increases and structural costs decrease. The idea behind the financing models is that public values are linked to private returns. This increases the interest of the private party in delivering better quality projects. Possibilities are land exploitation, residual land value, allocation of surcharges/area development, incentives and funds.

By using land exploitation, climate adaptive infrastructure costs can be included in the area to be developed. The investments made can lead to a higher property value. It leads to a clear financial plan of what it will all cost but the amount in the land exploitation will be higher, because additional costs are included, the costs are calculated in advance and the plan is fixed (Deloitte Real Estate, 2020).

Residual land value, the land value is the amount that the landowners receive when building land is sold to a party, such as a developer. The value of the land depends on what is realised on the land. The residual land value is the total revenue value of the property to be realised minus the construction costs. Small changes in the yield value or construction costs can have a relatively large effect. For example, the application of climate adaptive infrastructure can provide a higher yield (Deloitte Real Estate, 2020).

Allocation of surcharges/area development. The construction of, for example, a park as climate adaptive infrastructure need not only have a direct effect on the area to be developed but can have a positive effect on a larger area. The costs can therefore be spread more evenly, the municipality can write them off (Deloitte Real Estate, 2020).

In addition to the possibility of other financing models, financial incentives can also make developers want to invest. For example, a one-off exemption from fees when investing in climate adaptive infrastructure, providing a subsidy for the construction of, for example, green roofs, or the disconnection of rainwater from the sewerage network. Structural financial incentives can also be given, this is more common for the preservation and maintenance of certain infrastructure. For example, someone who invests in climate adaptive infrastructure, such as the construction and maintenance of a water reservoir, will have to pay less tax (Bor & Mesters, 2021).

Finally, the use of funds is also a possibility. It may be that the government sets up a fund so that public and private interests can be reconciled. The money that is invested from the fund, which is later earned, is then put back into the fund and in the end can be paid out to the organisations that put money in the first place.

## 2.4 Policy framework England

Whether developers want to invest in climate adaptive infrastructure for rational or social reasons, the financial perspective remains important. In order to investigate the willingness to invest, it is important to examine the current legislative situation, because it needs to be possible to invest in climate adaptive infrastructure, as Carroll (2016) argues is legislation important. What are England's climate goals and what is the current situation regarding climate investments. First, current policy documents are examined to see where England stands now in relation to land value capture, negotiations and investment in climate adaptive infrastructure. Next, it looks at possible future legislation, around CIL and Section 106, and looks at possible funding models.

The National Planning Policy Framework is a document that provides a framework for spatial development. It also states that when applying for a building permit, the National Planning Policy Framework must be included in the preparation, because it contains planning decisions. It addresses planning, decision making, ensuring enough housing, quality of cities, sustainability, etc. On these aspects, the legislation precedes the general objectives. In terms of developer obligations, the following is said, that planning conditions take precedence over planning obligations. Planning conditions must be kept to a minimum and be necessary and relevant in relation to the permission. Planning obligations may only be required if they meet the three requirements which are stated in section 2.3.2, necessary, directly and fairly (Ministry of Housing Communities & Local Government, 2021).

To start with the climate policy in England in 2008 passed a Climate Change Act in response to climate change. The main goal was to emit 100% less greenhouse gases in 2050 than in the reference year 1990. Carbon budgets have been established so that a certain amount may be emitted every five years. Finally, the Climate Change Act makes it compulsory to draw up a Climate Change Risk Assessment and a national adaptation programme every five years (Government UK, 2007).

The last national adaptation programme has been drafted from 2018 to 2023. The national adaptation programme has listed six climate change risks for England and set goals for each to counter the risk (Department for Environment Food and Rural Affairs, 2018).

- Flooding and coastal change risks to communities, businesses, and infrastructure.
- Risks to health, well-being and productivity from high temperatures.
- Risks of shortages in the public water supply for agriculture, energy generation and industry.
- Risks to natural capital including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity.
- Risks to domestic and international food production and trade.
- New and emerging pests and diseases and invasive non-native species affecting people, plants and animals.

Local authorities in England have a say in which public goods are invested. The national adaptation programme also specifically identifies the role of local authorities. The six risks identified above have implications for local authorities, and local authorities must make decisions about what to invest in. The national adaptation programme indicates that funding for climate adaptive infrastructure is a bottleneck. There is little discussion on how to solve this bottleneck of financing for climate infrastructure. However, it has set up a Green Taskforce, in which stock exchange related companies can participate to make recommendations to support strategic objectives in the field of green finance.

In addition to the five-year plan and the Climate Change Act 2008 focusing on the year 2050, a 25-year plan has also been set up. The goals correspond to the five-year plan and the Climate Change Act. The principle of net environmental gain is striking; this is already applied in practice, namely the

biodiversity net gain, and is also the only climate topic mentioned in the report. However, more is said here about the financing of climate infrastructure. The Green Finance (taskforce) which is also mentioned in the national adaptation programme has produced a report. The government wants to make it more attractive for private parties to invest in climate infrastructure and encourage them to do so. The Green Finance Strategy in figure 4 clearly shows what the goals and strategies are. In terms of financing climate investments, there is no direct mention of land value capture and developer obligations. It does, however, mention building robust and consistent green financial markets and frameworks, but looking at the report on how to apply this, it mainly says to provide more certainty and transparency (Department for Business, Energy & Industrial Strategy et al., 2019).

The aim of the biodiversity net gain is to leave the natural environment in a measurably better condition than it was before (Department for Environment, Food and Rural Affairs, 2022). This is reflected in the above policy documents. The introduction of the net gain in biodiversity ensures that improvements for biodiversity can take place not only in the area itself, but compensation is also allowed outside the area to be developed, through contributions from different developers this can be combined and invested in a larger green infrastructure (Planning advisory service, n.d.). In order to obtain planning permission from the local authority, the developer must demonstrate that their proposals will deliver a net biodiversity gain, if it is not possible onsite, offsite may also be an option (Zu Ermgassen et al., 2021). Notable is that developers are required to fulfil the biodiversity net gain, but that this isn't included in the Planning Act, but in the Environmental act. What the research of Zu Ermgassen et al,. (2021) does not indicate is that what are the consequences of this policy, as developers are required to invest in biodiversity, less money is left for other infrastructure, including climate adaptive infrastructure.

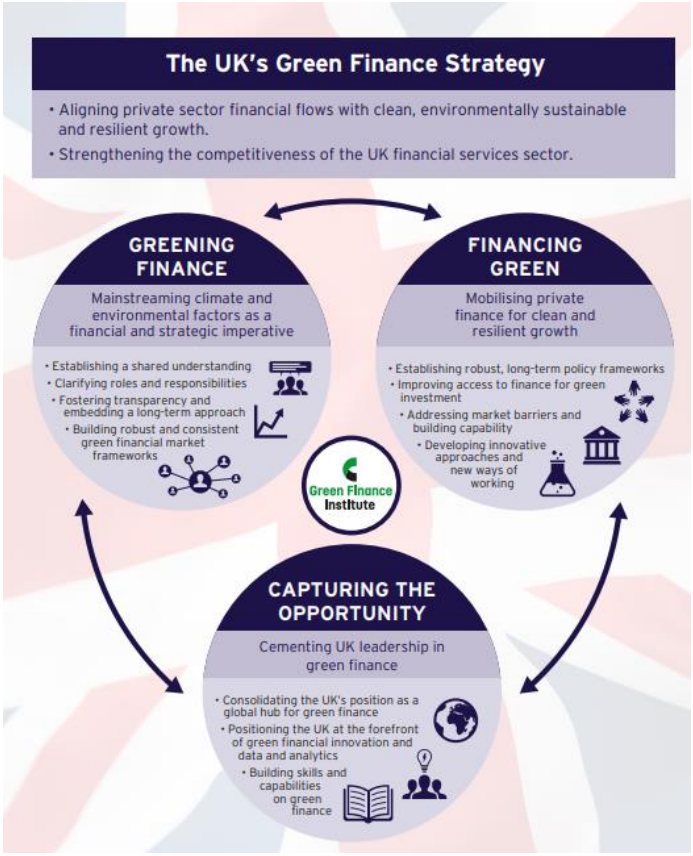


*Figure 4: Green Finance Strategy (Department for Business, Energy & Industrial Strategy et al., 2019).*

The current planning system is seen as complex. Planning decisions are taken freely rather than being rules-based, it takes too long for a local plan to be adopted and the negotiation process is too complex, lengthy and unclear, making outcomes uncertain and local authorities generate less revenue to invest in infrastructure. In response to this, the report 'Planning for the Future' (2019) was written, with the following five proposals:

- Make the planning process more democratic and effective.
- Modernise the planning process.
- Refocus on design and sustainability.
- Reform the contribution of developers, improve infrastructure in all parts of England.
- Make more land available for housing.

The Planning for the Future report makes proposals to revise the infrastructure levy. A new bill has been drafted for this purpose, namely the Levelling Up and Regeneration Bill. The Bill indicates that developer contribution will be replaced by simple mandatory and locally determined infrastructure levy. This should reduce the unequal distribution between local authorities and developers, and the local authority can choose whether to receive a share in-kind or financially. Section 106 will not disappear, but is being given a different interpretation, for example when do developers have to provide infrastructure or an agreement on what will be paid in-kind or financially. However, the value of infrastructure in-kind may not be less than what would otherwise be paid through the levy. To solve the economic geographical inequalities, key changes in the Levelling Up and Regeneration Bill include sharper mid-term targets, reorienting national policy, giving local authorities more say, getting a better idea of where the money is invested. The bill was introduced on 11 May 2022 and it is yet to be seen what the consequences of this bill will be. There are six areas in which spatial inequalities arise and these the government wants to tackle:

- Physical capital (infrastructure, machines and housing).
- Human capital (the skills, health and experience of the workforce).
- Intangible capital (innovation, ideas and patents).
- Financial capital (resources supporting the financing of companies).
- Social capital (the strength of communities, relationships and trust).
- Institutional capital (local leadership, capacity and capability).

As for Section 106 and CIL, in the current planning system some developers profit unfairly from the developments they do. In response, they propose the new infrastructure levy so that local authorities can more efficiently extract value from developments, thereby identifying public goods. The levy will be charged on the values of the property when it is sold by the developer, there is a minimum threshold, but it can go above this. Local authorities must already have a plan for how the money will be spent on infrastructure. Specifically, the focus on infrastructure delivery is prescribed CIL. *"A simple, non-negotiable, locally determined infrastructure charge will ensure that developers pay a fair share to provide the infrastructure that communities need"* (Government UK & Ministry of Housing, Communities and Local Government, 2022).

The question is, will this not make the planning system less flexible? What are the consequences for developers, won't housing become much more expensive? Will this shift give local authorities more power over the infrastructure they invest in? Are the local authorities prepared to make these decisions? And does it solve the economic geographical inequalities?

The way the national government is trying to make public infrastructure more geographically equitable is a way of generating more revenue, simply by making more stringent demands. But if developers themselves are willing to contribute, isn't a solution from section 2.3.3 possible, to keep England's planning system flexible?

## 2.5 Conceptual model

Figure 5 shows the conceptual framework, which is derived from the literature review and theoretical framework. The aim of the study is to investigate the willingness to pay for climate adaptive infrastructure. To measure this independent variable is divided into two dependent variables, the behaviour of developers to invest in climate adaptive infrastructure and the priorities of local authorities. Both dependent variables influence the willingness to pay, the negotiations between de developer and local authorities are important to investigate because this also influences the outcome on what is being paid for public infrastructure, like climate adaptive infrastructure. The next chapter methodology will discuss this in more detail.

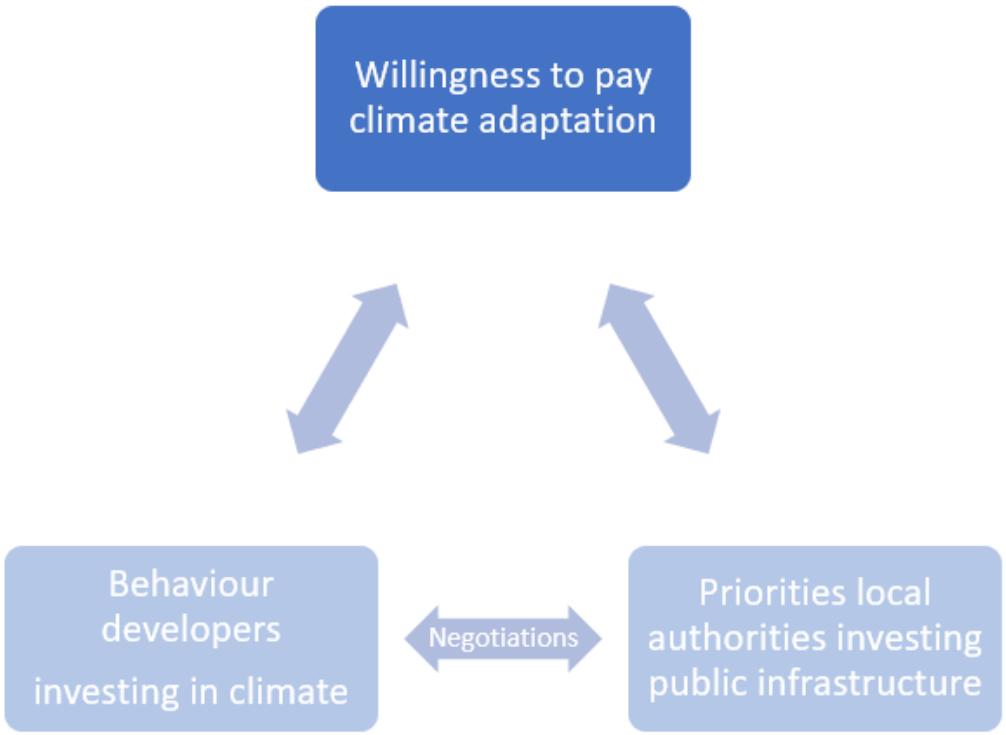


*Figure 5: Conceptual framework (own work).*

# 3. Methodology

The methodology answers the question of how the research question is answered. The research onion of Saunders et al. (2019) in figure 6 shows what steps are being taken. Starting with the research design, data collection and operationalisation, next the data analysis and finally the validity and reliability of the research. The choices that are made are explained in this chapter.

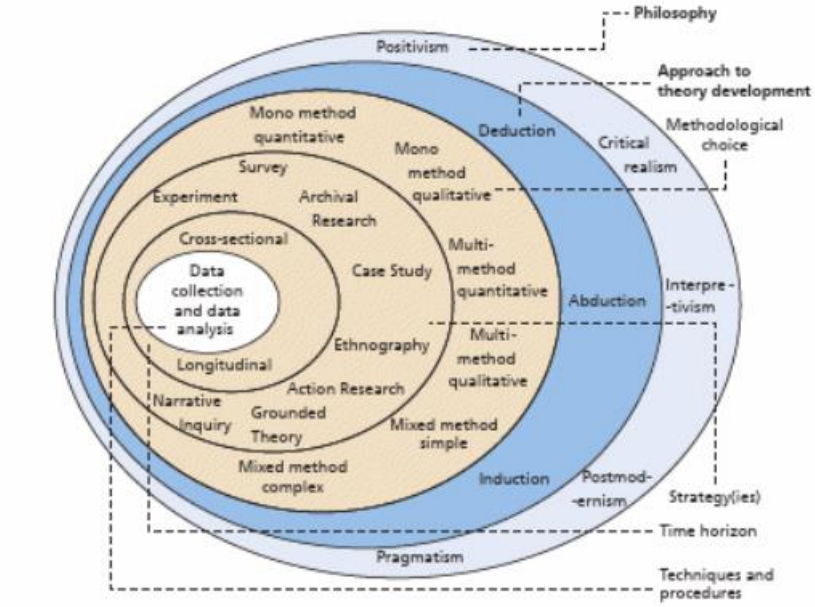


*Figure 6: Research Onion (Saunder et al. 2019).*

## 3.1 Research design

The research design is the overall plan of how to answer the research question. It explains which philosophy is chosen, how the theory is approached, how data will be collected and analysed, and it addresses the reliability and validity of the research.

Saunders et al. (2019) indicate that research philosophy refers to a system of beliefs and assumptions about the development of knowledge. It is about how the research questions are understood, what methods are used and how the findings are interpreted. This is an important part of the research because a different philosophy leads to different findings. Ontology refers to the assumptions about the nature of reality. It shapes the way you see and study your research objects. Epistemology refers to assumptions about knowledge, what is acceptable, valid and legitimate knowledge, and how we can transfer knowledge to others. Epistemology also determines the choice of methodology. The methodology is the overall research strategy that determines how research is conducted (Howell, 2013) (Saunders et al., 2019).

In objectivism, the interpretation and experiences of social actors do not affect the existence of the social world. Objectivism is interested in universal facts and laws. Subjectivism, on the other hand, holds that social reality is shaped by perceptions and the resulting actions of social actors. Subjectivism recognises that social interactions are a continuous process, in addition, they recognise that they themselves have their own values which influence the research (Saunders et al., 2019).

Looking from this perspective, research into the willingness to invest in climate adaptive infrastructure with behavioural economics inspired approach fits in subjectivism, because it is a process between different actors who come together to reach an agreement. These actors all have their own ideas about how to invest in climate adaptive infrastructure.

The research philosophy of interpretivism fits well with this. Interpretivism emphasizes that humans differ and create their own meanings. In addition, everyone has different backgrounds, experiences events in different circumstances, etc. The research focuses on the behaviour of developers and the priorities of local authorities, as interpretivism states, people cannot be governed in the same way when it comes to social research. The goal of interpretivism is to create new understandings and interpretations of the social world and contexts. And not like positivism to discover universal laws that apply to everyone. The aim of this research is to investigate the willingness to pay of developers and local authorities, with the geographic economic disparities and different types of developers needing to be taken into account from everyone's perspective.

The theory that is applied can be done in three ways, deductive, inductive and abductive. In deductive research you test existing theories to your research, in inductive research there is little literature available on the topic and in abductive research, a new theory is attempted to be generated or an existing theory is modified after the research. This research was designed deductively, from the theoretical framework, connections were made that formed the conceptual framework and tested from the operationalization scheme.

A distinction can be made between whether qualitative or quantitative data is collected. Quantitative fit more with objectivism and qualitative with subjectivism. Qualitative data collection is a logical step from interpretivism and fits well with research. In qualitative research, opinions are derived from words and not from numbers. For this research, it makes sense to examine qualitatively what the behaviour is, why developers and local authorities make certain choices, and what the negotiations are like. It is common in qualitative research to use unstructured or semi-structured methods in order to be flexible with the questions and concerns. However, for this study, it is chosen to conduct structured interviews so that there can be a systematic way to compare the different responses of developers and local authorities (Saunders et al., 2019). The next section discusses this in more detail.

The purpose of the research determines whether it is exploratory, descriptive, explanatory or a combination of these. Exploratory research often asks open-ended questions to gain insight into the topic. Descriptive research aims to create a clear picture of the subject. Finally, explanatory research examines the subject to explain the relationships between variables (Saunders et al., 2019). This research is exploratory, it will give insight and understanding of the topic of willingness to pay for climate adaptive infrastructure. It will gain insight into how negotiations going between developers and local authorities, where they base their priorities and how they make the priorities.

## 3.2 Data collection

As mentioned above, the qualitative method is used to answer the main question. Different methods are possible to investigate the subjective side, observations, interviews or case studies. For this research, observation would be a good option to investigate social interactions during negotiations. However, it is not possible to be present at a negotiation meeting. Case studies require a lot of information about the project and do not provide insight into the opinions and thoughts of developers and local authorities. In England, many cases are conducted behind closed doors, which is why interviews were chosen. Interviews can provide insight into the behaviour of developers, what priorities they have and where they base their decisions on. Local authorities are asked what they think of the developer contribution Section 106 and CIL, what priorities they have and what they think of the new bill. The question of how negotiations are going can be asked from both the developer side and the local authority side to see if this matches or differs.

For exploratory research, in-depth and open-ended questions are useful to understand the context of the situation and provide insight into the topic. To analyse the data, the interviews are structured but with open-ended questions in order to explore the opinion of the developer or local authority. In

addition, there are some case study questions for developers to explore what they would do in practice.

For a structured interview, the questions have to be defined beforehand, the questions come from the theoretical framework, conceptual framework and finally the operationalization scheme. In addition, the questionnaires are also checked by experts before the interviews take place. In order to ask the right questions, the operationalization scheme is drawn up from the theoretical framework, with variables that can be tested, see chapter 3.2.1.

In order to carry out the structured interviews, persons must be selected. There are two options, the first is a probability sample, the researcher looks for targeted persons. This is done because targeted answers are needed from a person. The other possibility is a non-probability sample, in which case no criteria are attached to the persons to be interviewed (van Thiel, 2014). For this research, the non-probability sample was used, whilst it is clear that developers, local authorities and experts will be interviewed, this is still a broad concept. In addition, the challenge was that it started with a network of two people, the snowball effect was used to interview several people. One of the last questions during the interview was whether the interviewee knew of another suitable person to interview. For the developer, the person needed to know what it is like during negotiations. In the case of local authorities, it has to be the person who is also present at the negotiations in order to be able to say something about how the negotiations go. The experts are selected based on theory, namely knowledge of behavioural economics and negotiations between local authorities and developers, in addition, the expert interviews were used to gain knowledge of the English planning system and after hand to verify responses from developers and local authorities. Table 2 is an overview of the respondent and the respondent number will be used in the data result to refer. The research takes place in England, but the region was made more specific by interviewing developers who also work in the Liverpool/Manchester area.

*Table 2: Overview of the respondents.*

| Interview number | Respondent number | Organisation | Function |
|---|---|---|---|
| 1 | Respondent 1 | Developer | Assistant Director Real Estate |
| 2 | Respondent 2 | Developer | Director development |
| 3 | Respondent 3 | Developer | Director urban regeneration |
| 4 | Respondent 4 | Developer | Director of Energy & Environment |
| 5 | Respondent 5 | Regional Combined Authority | Lead Officer Spatial Planning |
| 6 | Respondent 6 | Local authority | Service lead for Development Management and Building Control |
| 7 | Respondent 7 | Local authority | Senior Planner, Local Plans |
| 8 | Respondent 8 | Institute | Expert |
| 9 | Respondent 9 | Institute | Expert |

### 3.2.1 Operationalize

Operationalization is an important step in deductive research; it indicates what is being investigated and how it is being investigated. It indicates step by step what data will eventually be asked for in the interview. According to van Thiel (2014), operationalization is the step of translating theoretical

concepts, from the theoretical framework, into observations or measurements. Appendix A shows the operationalization scheme in detail.

The theoretical framework ends with the conceptual framework, the independent variable the willingness to pay is not measurable. The dependent measurable variables are the behaviour of developers and the priorities that local authorities have. The indicators were created from the theoretical framework, for the behaviour of developers, this comes down to what the willingness to pay is, so more the rational aspect. Then the economic responsibility, where the focus is on investing in climate adaptive infrastructure. Then the legislative responsibility, has been changed for developers to ask what developer contribution they would prefer, Section 106 or CIL. In addition, the question of future legislation was not asked directly of developers, but they did indicate during the interview what they would like the government to do. Ethical and philanthropic responsibility were merged into social awareness because it is difficult to make a hard separation between the two aspects. The questions on negotiation emerged from what negotiations are like, the difference between local authorities and also what they expect from the government. Finally, case study questions were created, from priorities, on-site or off-site investments and climate adaptation level, to test if this corresponds to the answers from the theory.

For local authorities, value capture is something that is not yet known how much it is, and how effective it is. This is covered by the indicator economic responsibility. Then they are also asked about their willingness to pay, so what is their prioritization for public values. Then the questions about the negotiations but especially questions about the new legislation, what they think about it, what are the consequences or are they prepared for this. They are also asked if they expect from developers to contribute to public goals. There is one case study question for local authorities regarding area development and whether this is used.

In addition, interviewees also provided examples, for example, what negotiations are like, this is added to chapter 4 results, to better understand what is meant and to validate the answers.

Logically, for the structured interview, the questions were prepared in advance. These questions flow from the operationalization scheme. The main questions for the interview are in the operationalization diagram and the follow-up questions are in the interview guide. Appendix B contains the interview guide for developers and Appendix C for local governments. Appendix D contains the questions asked to experts. The operationalization scheme also shows the codes for the analysis of the interviews to be determined in advance, this are the indicators.

## 3.3 Data analysis

The aim of the research is to understand the willingness of developers and local authorities to make contributions to the provision of public infrastructure in England. For this research, there are two sub-questions in order to give an answer to the main question; what is the willingness of local authorities and developers to pay for climate adaptive infrastructure?

The first sub-question is: *"Which factors influence the willingness to pay for climate adaptive infrastructure, as well for developers as local authorities?"*

The aim of this sub-question is to give insight into why they are willing to invest in climate adaptive infrastructure, or if they are not willing to invest. To investigate this in the theoretical framework a basis has been laid for examining why developers want to pay, is it for rational reasons or because they feel socially responsible. In addition, it also asks what priorities developers have to invest in public infrastructure. These questions also ask to local authorities.

The second sub-question is: *"How does the current England planning system align with investment in climate adaptive infrastructure?"*

Where the first sub-question examines whether developers and local authorities are willing to invest, the second sub-question examines whether it is possible to invest in climate adaptive infrastructure. So what do developers think of the developer contribution and what do they want to change. Local authorities are also asked about this and whether they are asked for climate adaptive infrastructure contributions.

To answer the questions, data is collected through interviews. All interviews were recorded with the consent of the interviewee and then the interview was transcribed. The interviewee was asked if they wanted to read through the interview after transcribing as well before it was analysed, a number of them took advantage of this. Since the research was designed deductively the codes are already known, the codes come from the operationalization scheme. Often qualitative research is done inductively and uses open coding and axial coding. Since the research is exploratory and open-ended questions are asked, important aspects that do not emerge from the operationalization scheme are used and added to the study. The interviews are analysed in the software Atlas.Ti. After the interviews are coded and grouped, they are further analysed by indicators from the operationalization scheme. The results of experts are added to developers or local authorities, where it is applicable.

## 3.4 Validity of research and reliability of findings

There are two different types of validity, namely internal and external. Internal validity has to do with the coherence of the research itself, i.e., do the connections that have been stated actually exist? External validity describes to what extent the research is generalisable, i.e., do the results also apply to other persons, companies, countries and time. The reliability of the research indicates the accuracy and consistency of the variables. If the research is reliable, this means that the research is systematic and forms a representative picture. To make the research consistent, the interview should be conducted more often with different experts (van Thiel, 2014).

To ensure the internal validity the research is based on variables that emerged from the conceptual framework. The questions for the interview are based on the operationalization scheme. This scheme derived the variables and questions were formulated for each variable. The operationalization scheme is based on the conceptual framework, which indicates the relationship between the willingness to pay and the behaviour of developers and the priorities of local authorities. The conceptual framework stems from the theoretical framework.

To ensure the external validity of the research is that all the interviews are recorded with the consent of the interviewee and subsequently transcribed. The interviewees were given the opportunity to check their own transcript. However, it should be noted that the focus is on the English planning system, so the interview question can be used for more interviews with English local authorities and developers. The developers and local authorities interviewed work mainly in the northwest of England, with developers also having projects elsewhere in England.

The reliability of the study was increased because structured interviews were prepared. This makes it possible to compare the data consistently. The answers that developers and local authorities give can differ greatly, but this makes it interesting what developers and local authorities think and want. As interpretivism indicates everyone has their own background and because of this the answers that developers and local authorities give can differ from each other, but this makes it interesting what developers and local authorities think and want. The transcripts are checked by the interviewee themselves, so they can check if they agree with the answers. It is not possible to ask the same questions again to the same people, due to lack of time and also the time it takes from the interviewee.

From interpretivism, the role of the researcher is also addressed, from the interpretivism philosophy it is expected that the researcher takes an empathetic stance (Saunders et al., 2019) however, this research it is attempted to take an objective stance and through expert interviewing substantiate results of interviewees.

# 4. Results

This chapter presents the results of the nine interviews. For each indicator from the operationalization scheme, the different opinions of the developers or local authorities are presented. First, the indicators from developers are presented, then from the local authorities. The interviews of the experts added to both developers and local authorities. In table 2 section 3.2 the functions and information of respondents are shown. Chapter 5 discuss the results of this chapter.

## 4.1 Willingness to pay developers

The willingness to pay is about how willing someone is to pay for something (Stobierski, 2020). Looking from a rational perspective, developers are expected to be willing to contribute to something if it makes money. The question is if they have their own priorities on what they want to pay for public infrastructures or are there investments they would rather invest in than other investments.

Respondent 1 states: "*when negotiating about the planning permission and Section 106, basically the idea is to pay zero Section 106, but this is not the approach from local authorities. So, you're more concerned about the overall number rather than what it's being spent on, because generally you don't have very much influence on that. If you had influence on it, probably would want to spend it on things that increase the value of your development, like public realm, greening the area, because that will make the development more attractive."*

This is a different approach than respondents 2 and 3 argue. Respondent 2 states that *"if the local authority ask for financial contribution, we need to explore the viability of these assets, to make sure that they are real and they actually support the place to come forward."*

As a developer they draw up a viable masterplan and then the local authorities come up with the contributions they want for certain infrastructure. If they ask for too much infrastructure the viability of the project is threatened and as a developer, they are not going to build it. So, it takes cooperation with the public sector to keep the project viable.

Respondent 3 states: *"investments in all infrastructure are important, so priorities are driven by the stage of delivery and particular needs/challenges facing projects at any particular stage, funding is also a key driver. No investor would not invest, if it isn't clear that it is related to/of benefit to the place and its environment, and if it isn't clear that it is viable/affordable, and beyond the order/duties of others to provide."*

Respondent 4 states that they have joint ventures with local authorities so that the focus is not only on the development partners but also on the public sector. The approach of respondent 4 is to see at every building if it is sustainable or not, and it is not just only the building itself, but also the area surrounding it. *"Each building has their own little plan, factors that influence that plan are the investor, public consultations and our own pledges and legislation, which is driven by the policies of local authorities, but our pledges and legislations are higher than the policies of the local authorities."*

## 4.2 Economic responsibility developers

Developers can act from a rational perspective, they also can behave because they feel socially responsible for societal problems (Carroll, 2016) (Ditlev-Simonsen & Midttun, 2011) (Thorne et al. 2011). Even when they feel responsible for societal problems they still need to make a profit. But there is no evidence of value capture from climate adaptive infrastructure. Therefore, the question is asked if the developers think there is an increase in value if they invest in climate adaptive infrastructure. Besides, climate adaptive infrastructure is most of the time long-term investment, so

the question is whether developers have this long-term vision for developments, to make it feasible to invest in climate adaptive infrastructure.

Respondent 1 argues that they do think there is a positive relationship between value increase and investing in climate adaptive infrastructure, but right now they cannot afford to invest, because the legislation in guidance policy is way behind. When land is valued and sold, it is not taking these investments into account. To make it feasible to invest in climate adaptive infrastructure they look at the environmental social governance goals. In order to get a fund from the environmental social governance, sustainability is a requirement and in return, they give more money or give money at a lower rate of return, which makes it financially attractive to invest in climate adaptive infrastructure.

Respondent 1 works for different types of developers, with different long-term visions. *"Some developers they got background in the industry, they are buying sites, developing them and then selling them on. They are not interested in the long-term hold off the site. Whereas other developers with pension fund or investment funds, they are thinking in long-term, and holding assets for long-term returns. They are much more interested in higher quality, something which is retain its value, so they are more willing to have higher costs in the beginning, because they can retain and spread it out on that investment."*

Respondent 2 also noticed that there are different types of developers, like respondent 1 there are short-term developers. *"Trader developments come in, they might buy a site, get planning permission, raise the money, build it out, once it is built, they leave. They are interested in one specific project and how much money they need to put in the risk and then the exit strategy."* Respondent 2 is a long-term developer. *"We have a long-term approach to deliver a place, a sustainable place. And why is that important? Because we have our responsibility, because we own a lot of land and do a lot of activity, but also it is good for jobs, place and people. Besides we have the equity to put in the projects."*

Respondent 2 deals with a big market failure project, because of the land values, and in order to make it feasible to develop, they needed a different approach to develop the area and invest in certain infrastructure. *"So as a result of market failure, you're not going to get your trader developers coming and helping you to fix it, that is just not going to happen. So we need to create the environment to allow other partners to come in, allow them to make there sort of a profit margin, whatever that is, and some developers will look for a certain level of profit on cost or internal rate of return. If they don't hit that, before the start of the project, they're not going to go ahead and do it. So the more you overlay Section 106 contributions onto the trader developer then for them that is just an external cost, which makes the viability even more difficult to deliver. So then it comes down to the fundamentals of regeneration, which is about kind of mixed use, create a sense of place."*

Respondent 3 states: *"because we are challenged on budgets, it makes you think clearer what you want to invest in. Our mantra is don't try everything in one go, just make quality counts in terms of placemaking and sustainability.* The viability is important, *"the project need to be viable, in order to fund the sustainable projects, at this moment the government funding/assistance until sales/rental values reach a point were projects can be commercially viable and include for the delivery of climate adaptive infrastructure."* The developer also thinks that there is a positive relationship between investments in climate adaptive infrastructure and land value. They believe that this relationship while increase because:

- *Of a more informed audience (tenants and buyers) who are looking to locate in sustainable places as a lifestyle choice, cost of living necessity and long-term residual growth multiplier.*

- *Investors looking to invest in climate (and as a direct residual value) resilient projects that will perform better as policies and costs of living push more towards better (energy) performing buildings and as the consequences of climate change become more acute.*

Respondent 4 states that they think about the costs and the climate impact of that building, and then they calculate the 60-year lifetime of that building. *"Twenty years ago, we have just been putting up concrete boxes, now not only development partners, but also public consultations are asking, what materials are you using? What is the green space? What is the longer-term plan? In order to make these shifts we need to have a strategy for the developments adapt and be flexible with these requirements.*

With joint-venture respondent 4 says that they want to have a shared vision with the local authorities, to make it work. Money is always a factor, during the negotiations they are trying to find a way to break down the costs.

Respondent 4 has a long-term view for their building, an example of that is that they argue that: *"one of the things we argue about building new buildings, if you don't build a good sustainable building now, 80% of the buildings are still here in 2050, so the last thing we want is to build a poor building that need retrofitting."*

Respondent 8 argues that it varies between developers if they act rational or act because they feel socially responsible. According to the expert, it is important to see who the business owns if the business is on the stock exchange, they need to keep the price up.

## 4.3 Legal responsibility developers

Legal responsibility is about the government prescribing the laws and regulations (Carroll, 2016). However, this study also looks at what developers think, hence it asked about Section 106 and CIL and what they think of them, whether there are in-kind contributions. During the interviews with developers, the new Levelling Up and Regeneration Bill was not yet known, however, the interviewees indicated what they would like to see from the government and adjustments to the current planning system.

Respondent 1 argues that they do not have a preference for Section 106 agreements or CIL. *"Section 106 obviously affects more directly your development, so it is related to your local impact, where is CIL obviously goes into a big part and there is a whole list of projects. But CIL gives us as developers more clarity."* Both developer obligations applies, if the local authority asks for money to spend on something, they need to spend it. If they don't, the developer can ask the money back. They also see some local authorities ask for in-kind contributions, often in the cities of northern England. *"They would look at it and say, right first of all we want you to deliver the best quality building you can deliver and that includes a strong sustainable and zero carbon strategy. Secondly, they want to see what the quality of the green infrastructure onsite is, the public realm. Because of the economic decline, they need regenerate the fabric of the city.*"

Respondent 1 argues that the current planning system is behind, to make it possible to invest in climate adaptive infrastructure the government should look at market subsidisation, there needs to be a carrot and stick legislation. *"The government has to introduce regulation to give everybody a clearer guidance, because right now as a developer, it is a lot of uncertainty and put a lot of risk on knowing what you have to do. They need to be clearer on their expectations regulation standards, measurements."*

Respondent 2 states the following about Section 106, CIL and the current planning system: *"If there was a cohesion vision, to what the money was going to invest in, and there was confidence that the delivery of that bit of infrastructure, whatever it may be, social infrastructure, physical infrastructure, then I think there will be a much more sort of warm reception to it. Currently, Section 106 requests are a bit of half baked and they are a bit kind of nice to have, and there isn't really a plan to deliver whatever the Section 106 goes into, and that is I guess a little bit frustrating. So you end up contributing some money which doesn't go anywhere, or it might go into some project which then fails in terms of infrastructure. So you are left with poor quality and then the local authority don't control the quality of that development, so therefore you're stuck with the worst of both worlds. So I think, if there is a sort of clarity about the infrastructure that is needed to sort of transform the place and that was robust, that is fine. And then there are contributions that can be made, if they are affordable, the developer will pay them."*

Respondent 3 indicates that transparency, viability and proportionality to the project is the most important thing and that both CIL and Section 106 can provide this. The challenge according to respondent 3 is that when contributions are placed in a holding fund it is unclear how, where and on what the contribution will be spent. Respondent 3 also argues as respondent 2 that *"the clarity of the vision in terms of this is where we want to get to, is always missing. And these are the specifics of what needs to be on how it is going to be realized, and then the leadership in terms of how we are going to get from A to B."*

Respondent 3 says that there are sometimes in-kind investments, like capital funding. But also other in-kind contributions like:

- *Staff time – volunteer days and attendance/contributions spending time working with local voluntary groups to support their work and initiatives*
- *Consultancy inputs – covering the costs of staff and consultants fees engaged in designing and delivering partnership projects*
- *'Know-how' and 'Knowledge Transfer' – transferring experience and know-how from other projects that are more progressed/have been underway for much longer, and sharing this with delivery partners.*

Respondent 3 needs from the government leadership, clarity of thinking, consistency and resourcing/funding. There needs to be more collaboration to deliver a good place, as respondents 2 and 3 suggest: "*there need to be a good vision, with specifics how it is going to be realized. Besides the local government need to break down the silos in the local government. And if they have the action plan, they also need to work out the action plan of delivering what can and work out in terms of roles and resources, and where the resources are going to come from. It could be Section 106, CIL, it could be government grant, it could be value capture, it could be a whole range of things."*

Respondent 4 prefers CIL, *"we would like to see more taxation, if you look at Londen, much more stringent planning requirements, there are some things that have driven such good change in London that we would like to see those brought into the regions. I think the levees were originally well-intentioned, but are they enough to driven the improvements we need? No, so certainly for me, I think that that needs to be strengthened."*

In order to improve the planning system respondent 4 argues for planning requirements, so it is not a race to the bottom but everybody trying to do the best thing. Also, there needs more a collaborative approach between the local authority, developers, customers and the general public. In addition, developers are willing to pay for something, *"but the question is how much are we willing to pay and*

*what do we want in return?"* Respondent 4 suggests two options to solve the problem of the legislation:

1. *"Make it prescriptive, or;*
2. *Create a voluntary market, the easiest way is to incentivize behaviour and that means getting a break on something."*

## 4.4 Social awareness developers

Social awareness is a combination between ethical responsibilities and philanthropic responsibilities because the line between these two responsibilities is close. Social awareness tries to explain why developers want to invest in climate adaptive infrastructure without being able to provide financial security, besides the question is asked if the developers want to invest in climate adaptive infrastructure, because they feel socially responsible.

Respondent 1 argues that the willingness to contribute to climate adaptive infrastructure increases. According to respondent 1, there are three strands why this increase. First of all, the market and investments, this is mainly due to the environmental social governance funds. Secondly, is about what the occupiers want, companies want to be responsible employer and choose a building with excellent credentials and wellness and health facilities, but also residential properties are making these choices and that is affecting what the developer delivers. And the last is that developers care about climate change.

Respondent 1 states that their company also behave in two ways. On the one hand, they are enabling its employees to make better choices and reduce carbon impact. On the other side, they recognise the importance of the issue and try to work together with clients to make an impact on the agenda, so monitor carbon emissions from a realistic perspective and initiate ways of reducing that impact.

Respondent 2 states the following: *"we want to be leaders in major scale transformational change, but doing this in a sustainable way. And why is that so important? We have our responsibility; we own a lot of land and we do a lot of activities. But it is also good for jobs, place and people. What we found out recently is that more institutional investors, we have money and equity we put in our projects, but also we bringing in funding partners, like pension funds, insurance companies, so in the last 3 to 4 years they only want to talk about sustainability. We think we have reached a bit of a tipping point when these institutions are only investing in sustainable projects and places."*

The tipping point is changing and there are different factors for this change according to respondent 2: *"Organizational approach towards ESG, organizations wants to be associated with a more sustainable place for their operation. Residents want to live in a more sustainable lifestyle. Pension funds want the money in good things, making good social income."*

Respondent 3 argues that previously sustainability was a kind of marketing to brands, but now sustainability is more about making the place attractive, it is more of a lifestyle. Sustainable is not more something between the developer and local authorities, but it is now open up and talking with prospective occupiers, existing communities and a wider range of collaborators.

There are some conditions for investing in climate adaptive infrastructure, respondent 3 states the following: "*the approach to public funds is most often to seek additional 'match' funding. This means that most public funds will set out the need to a 3rd party or a collective of 3rd parties to match the public funding being invested. Most often investment in infrastructure involves a 'cocktail' of funding from different sources. As such, the conditions to invest in infrastructure may include that other parties who may benefit from the public infrastructure also make a proportionate contribution and,*

*that certain benchmark, guarantees are made regarding future maintenance and management of the new infrastructure to high standards."*

Respondent 4 argues that their business has always been sustainable, the business was born out of taking old buildings and giving them a second life. These days the business is not only looking at the building itself but also investing in the places. The developer argues that they also invest in innovations like urban farming because their business wants to see thriving cities. Respondent 4 also noticed the influence of buyers and investors. *"Younger people starting to have more of an impact and more say on their thoughts around climate change and the impacts on the planet. Every public consultation people really want to know what your plans are around making sure that you're building something sustainably".*

But respondent 4 also wants to see something in return from the local authority: *"Looking at the different funding models, I think there are two options, make it prescriptive, which might be where we need to go with it, or secondarily if we want to try to create that voluntary market, the easiest way is to incentivize behaviour, and that means getting a break on something. But they were looking at some of these mechanisms which are predominantly, could we within the environment fund could we manage locally things like biodiversity net gain, offsetting and some elements of climate mitigation. And what they not have established, and I think this is where it is hard, if they take us for an example to say OK, we are willing to pay something, but we want something in return? But what is that, what would you be willing to pay and what do you want in return. The concept is fine, but where I think it is useful is investors now putting a value on climate risk, and consequently, people like us to start to put a value on clime risk. That helps to start thinking about what slice of that you might be willing to pay in order to help somewhere reduce those impacts on your own buildings.*

## 4.5 Negotiations developers

The negotiation between developers and local authorities is an important part because what follows from this is where the contributions will be invested in. The question that is asked is, how the negotiations are going, if they see differences between local authorities and if there is a change over time what they ask for.

Respondent 1 states: *"we've got an obey national sort of planning policy framework, but at the primary plans, the development plans, they have just simplify this, they don't really have to be consistent. There are these obvious topics which are common between all of them, so I would say that the kind of things that are negotiating are pretty similar, it just depends on local political priorities."*

Respondent 1 indicates that both the local authority and the developer indicates what they want. A developer, before they start with negotiation, they have an idea of what the costs and practice are going to be. *"The bigger the development the bigger the contribution Section 106 is, but there is a tipping point, when is the development viable and does it meet our own profit margin requirements. According to the respondent, the same aspects are often negotiated, but sometimes it depends on what the local politician wants."*

They see a change over time, climate change, like green space, health and wellbeing, design and carbon adaptation are moved up on the agenda. But the traditionally issues are still on the top. COVID influenced the aspects because everyone was stuck in their place, so now the developer sees more a combination of the traditional aspects and sustainability.

Respondent 2 creates a blueprint and a masterplan for the area that is going to be developed, what the infrastructure is that is required, and to deliver. Because sometimes they see that local authorities don't have that kind of expertise or capability to do. There is a viability point, and then

they are going to the local authorities for the planning application, and local authorities ask for financial contributions. *"But if they overlay too much, a developer can't go ahead and build these things because it becomes unviable."*
The developer argues that it is more a dialogue with local authorities, than that the local authority demands certain things. For sustainability contributions, the respondent prefers to use a model of working with the government, rather than making a Section 106 contribution.

Respondent 3 states that trader developers are working in a short-term, small size of the plot. And they are working like repeating the same model on a plot. But what respondent 3 does is look at the plot and look at the vision of the plot. Respondent 3 states*: "that it is not always appropriate to have a simple conversation about Section 106 and they saying you pay for this, because if we can't afford it, nobody built anything. That is why they are thinking of a new way, from plot all the way through the city scale and then collaboratively work with different governments, agencies and local community groups of people."*

Respondent 3 also states that there are differences between local authorities, because everyone has their own remit, and their remit and specific area shape their priorities and ways of working. They do see change over time, and climate change is becoming a higher priority.

Respondent 4 indicated more joint ventures with local authorities to work together and create a common vision, where goals of both parties are put on the table and then start working together. They see differences between local authorities because they are driven by their own pledges, commitments and policy. Respondent 4 see change over time, that councils now looking at the problems in a more holistic way, and not just looking at the capital expenditure and the project in isolation. In order to combat climate change, the government alone cannot solve it, but developers alone cannot solve it either. With stringent planning requirements then they expect that it isn't a race to the bottom, but everybody trying to do the best thing.

## 4.6 Willingness to pay local authorities

The willingness of local authorities to pay for public infrastructure and specifically for climate adaptive infrastructure was examined by asking which choices are made to invest in public infrastructure and whether they think there is a positive relationship between climate adaptive infrastructure and land value.

Respondent 5 has drafted a strategic development policy for addressing the key public values that needs to be invested in, to make a prioritisation. For this purpose, they asked residents what their priorities are, rather than setting priorities by themselves. Here the following emerged: *"37.7% of the respondents said climate change is number 1 issue and next 18% was health and wellbeing so that was the second issue."*

After this, they expanded this with five objectives and went back to the inhabitants to discuss the five objectives. With the information of the residents, they make the strategic development plan for the upcoming years. Once the strategic plan is in place, it will form part of the regional local government's local plans. Planning applications should consider the strategic development plan before they give planning permission. The five key themes are:

- Climate change and environment
- Health and wellbeing
- Inclusive economy
- Placemaking and communities
- Social value

Respondents 6 and 7 indicate that it is mainly the politicians who indicate the overall priorities and then it is up to the planning committee to elaborate this further in the local plan. Respondent 6 says that in the new local plan, climate has become an important theme, the local plan identifies priorities and a report is prepared for each project that specifically states how much money is requested and what it will be spent on. Respondent 6 states the following: *"The starting point is always to address the policy if there is any viability gap, we have to look and consider what is the most important, but equally if it is unviable, it may be that the scheme is unacceptable in that if the infrastructure is necessary, it can't be delivered, then the scheme may be unacceptable.*

The strategic objectives for the local authority are a sustainable borough, a special and healthy place to live, and a thriving place. But like respondent 6 states it depends on the project which choices are made in de policy. The local authority historically does not ask for climate adaptive infrastructure, because the local plan dates from the year 2000, but in the new local plan it is a requirement.

As respondent 7 points out, asking for Section 106 contributions is policy and plan-led driven. They only can ask for infrastructure which is necessary because viability is always an issue. The contributions are now mainly requested for affordable housing, education and open spaces. Affordable housing is an example of an in-kind contribution, which is policy driven. The requirements for this local authority are:

- 15 or more homes, 30% need to be affordable.
- 11 or more homes, educational contributions.
- 150 or more homes, open space contributions.

The local authority of respondent 7 asks for climate adaptive infrastructure, but only for sustainable drainage systems by large developments. Because of the Environment Act, there are some investments in climate, like the obligation biodiversity net gain and habitat regulation.

The answer to the question of whether they think there is a positive relationship between land value and climate adaptive infrastructure, respondent 6 says: "*no, but from the developer's perspective it can be interesting."* Respondent 7 doesn't know but thinks that developers are aware of flood risk and surface water.

## 4.7 Economic responsibility

To examine the economic responsibility of local governments, the focus is on value capture. Through land value capture, governments can generate revenue through land value capture to finance public goods (Muñoz Gielen & van der Krabben, 2019). In England, Section 106 and/or Community Infrastructure Levy is used. However, the question is how much value is captured, what investments are made with it, and how effective do local authorities find the mechanism?

As respondent 5 states: "*The income you get from the planning agreements must be related to the development, so the Section 106 contribution has to relate to the development. It is not a funder the council can spent on anything. But when you put a planning application is, you need to pay a fee, so that is also a way money comes in."*

Respondents 6 and 7 are now working for a local authority where no CIL is requested. Respondent 6 says the following about Section 106 agreements: *"They can be and I think should be very effective, but you to make them work you have to have an effective planning policy framework. Because 106 is only address the policy sort of shortfall. So for example the policy says you need contributions for off site open space. Then you can ask for Section 106. If it doesn't say that, if it doesn't specify it, you've got less grounds to ask for it. And so authorities can get substantial amounts of money in for*

*infrastructure that's proportionate to development, but only where it's got a good policy framework to do that."*

It is also possible to ask for an in-kind contribution, but it depends on what the contribution is, and it isn't always practical: "*If a number of different people or developers have to contribute to it, then it might be that the developer gives us the land or something else, and we as a local authority built it."*

Respondent 6 first works for a local authority which uses CIL. The respondent argued that CIL can be effective, but it is only possible to apply it in viable areas. From the developer perspective, the respondent argues that it is more certain when using CIL, but that it is less flexible and the council need to wait until there is enough money to pay for the infrastructure.

Respondent 7 says that the local authority first never asked for Section 106, but with the new local plan this changed and developers are now expected to pay for infrastructure as well. According to respondent 7, it depends on how effective Section 106 contributions are, because of the viability issue. The viability isn't high in their local authority so there isn't much leeway. If they ask for Section 106 agreements, it is very much a policy and plan-led approach. Because viability is an issue, they cannot ask for too many infrastructure contributions, because that is going to put off developers and then the developers are arguing that they cannot afford to develop, so they are going somewhere else.

Respondent 9 says that it is important to know who determines the prices in the different markets. So, does the developer determine prices, or just something sell that determines it, or just the demand or availability. The question is if developers invest in higher quality environmental ratings, how do they recoup the cost of that? *"Does changing the environmental credit of the quality of building influence the price. All academic analyses on environmental policies of residential building and office stock, is inconclusive. Because it can't deal with the availability of credit and the fluctuations in that in terms of when things are being produced, which means that there's no incentive for developers. To include that is environmental things with a higher, requirements of quality. If they're not going to recoup that value uplift because it's determined more by the mortgage market and it is by underlined amount."*

## 4.8 Legal responsibilities local authorities

Legislative responsibility is to ensure that residents' wishes are implemented in policy. Questions were asked about the new bill and what the implications are for local authorities. This last question was not asked to respondent 5.

Respondent 5 makes the new policy for a strategic development policy. In order to make this, they need to speak to the inhabitants, so they could make them aware of what they think is important. The regional authority makes the policy, but the local authorities within that regional authority need to obey the policy. Climate change became an important issue, not only because they ask the inhabitants but also because there was a protest outside the office building. The mayor of the regional authority initiates that one of them could speak to the board, but the mayor was also the one who said to the policymakers that they need to go out and speak to the people who are actually living in the regional authority.

In the local authority of respondent 6 the new local plan has just been released, which makes it possible to ask for Section 106 contributions. The choices that are made to invest in certain public values depend on individual circumstances. The new local plan is based on political priorities, but also walk-in exhibitions and focus groups to discuss various options for housing and employment land allocation.

Respondent 6 indicates that the new legislation will provide more certainty for developers. However, the respondent does indicate that it remains to be seen whether the economic geographic inequalities in England will be resolved, as it will be based on land values. So wealthy local authorities will also be able to ask for more CIL. In addition, the local authority also says they are not yet ready for the legislation change because there is more work involved in relation to viability and research needs to be done on the rates that need to be set.

Respondent 6 states the following about the biodiversity net gain: *"To be honest that's really difficult. Biodiversity net gain is done under the Environment Act, not the Planning Act. So it means that developers have to pay for the 10% biodiversity uplift and through credits they have to do that before you even get round to talking about providing school places or roads or open space or any other form of investment so the biodiversity trumps everything else it if they have to that's at the top of the pile in terms of the ask, so it comes off the profit first. The costs of it can be phenomenal, equally there is an issue there about because developers can buy credits and spends those credits elsewhere. Then what's the stop? Developers effectively paving over, you know beautiful sites and just spending it spending their credits somewhere else in the country. So, I think there's there are some significant weaknesses in the system. It's my personal view. It is a very specific calculation that you're absolutely right, it doesn't take account of some of the broader climate impacts or any other of the impacts on a site."*

Respondent 8 argues as an expert that the problem with biodiversity net gain is that it is one small topic, they prefer to see all ecosystems services delivered. Besides if the money is spent on biodiversity net gain, developers may not be able to spend any other money at all. *"It seems like a whole separate planning system that we've got to run now alongside the main planning system. The first thing we need for climate is to change the national planning policy framework. To bring it in line with the Climate Act 2008 and the Paris Agreement. And even the government recognises that The National Planning Policy Framework NPPF is out of date and they will be consulting on changes to it this year, the new levelling up Bill*." According to the expert the problem with the New Levelling Up Bill there is no explanation of how the new bill is going to work alongside the biodiversity net gain. The new Bill still includes Section 106 possibilities, but what the expert is thinking is what type of infrastructure is for climate adaptation and mitigation. What the expert suggest is considered a holistic approach for all developer contributions, and then local authorities can decide what they think is important. The problem biodiversity net gain creates is that local authorities are forbidden from deciding what is most important, with the New Levelling Up Bill, the space to choose is limited.

The local plan of respondent 7 is more a given, they are almost seen as something necessary. The local plan is a policy and plan-led approach to ask for Section 106 agreements. It is important for respondent 7 that there is a local plan, to allow contributions to be asked from developers. *"The priorities are set out in the local plan. The councillors approve the local plan, they are also the one who set the overall priorities for the local plan. The planning committee decide on most sort of major significant planning application."*

Respondent 7 has no idea yet what the consequences will be for the local authority and that it will be a challenge to make it work, but that they will do their best to make it work. However, project viability will be a priority again, but the local authority is waiting for the details of what will happen.

### 4.9 Social awareness local authorities

Social awareness for local authorities is harder to investigate because they have their legal responsibility. That is why the question is asked if they expect that the developer contributes to social problems, and specific if they expect that developers are willing to invest in climate change infrastructure.

Respondent 5 states that as a regional authority they think it is important that developers contribute to social values. *"Developers are doing social value anyway, like public open space, local companies for brick builders, they are a company to make money, that is what they there for and there is nothing wrong with that, and they make a profit for their shareholder and that is all they are interest in, well I don't think it should be all about profit, it should be they have got to make a profit but what about the communities they are building in, why should you give those people who surround the development have some kind of benefit as well."*

Respondent 6 argues that the new local plan requires developers to use the social value policy. But on the question, of the respondent thinks that developers are coming up by themselves to invest, they do not know because: *"every developer has its own approach."*

Respondent 7 states: *"developers would perhaps tend to look at what we're requiring, and then decide whether they want to go beyond that. But we don't get people saying, oh we'll build you a new school or doctor surgery out of the goodness of their hearts, for example. So I would say it is probably led by our policies."*

Respondent 8 suggests that it is important that designers have the freedom to work out the national rules, for every site, because there are different outcomes they need to achieve, and if you combine climate, nature and people, designers are able to bring different aspects together.

## 4.10 Negotiations local authorities

The negotiation between developers and local authorities is an important part because what follows from this is where the contributions will be invested in. The local authority asked what the negotiations are like, if they ask for in-kind contributions and if they ask for climate adaptive infrastructure.

Respondent 5 states that what is being discussed comes from the policy, in particular the local plan. All different aspects are able to negotiate but developers cannot afford to pay for all, so that is part of the discussion. It is a mixture of financial contributions and in-kind contributions, a local authority can manage for instance a collaboration with another party, so the developer will just give the money and the local authority is able to find the right people to manage it. *"What is important is if you ask for money for like a highway scheme, then that money need to be used for the highway scheme."* The politicians influence what the prioritisation is. "*Developers will offer up certain things and then they will say we have done an economic assessment and we can't afford to pay for all, but we can afford do pay for that one and that one, we will offer you that. It then just go into a discussion how far you go so, it is often depends on where you are and what the need is in that area."*

Respondent 6 also argues about the economic assessment from the developers: "*if they (developers) felt it was unviable, then we will properly check this, and there is a methodology on how to do that."* According to respondent 6, it depends on the contributions if they can ask for an in-kind contribution. The negotiations differ, and this is an issue for the council on how to deal with it. *"We have some sites where developers have cleared sites in advance of the legislation coming in. There is some sort of guidance about that it is very hard to enforce it. But also developer looking at it in the sense of well, OK, we do the calculation and tell you how much or many credits we need and from the developer point of view it is like problem solved, here is the money, now you go and find somewhere to spend it."*

Respondent 7 also have a methodology if developer says that they cannot afford to pay for certain infrastructure. They are doing a detailed viability assessment. *"Setting out all of the finances and the reasons to justify why they can't do it, and then we have a specialist consultant who looks at that and*

*sees whether he agrees."* This influences the negotiations, but because of the viability issues, the local authority doesn't ask for much. The issue respondent 7 rise is that the Environmental Act requires developers to invest in biodiversity net gain and the habitat regulations, so if developers provide that, they maybe cannot afford it to pay for affordable housing, but respondent 7 doesn't know how that would influence each other.

Respondent 9 noticed that legislation can change behaviour during the negotiation process: *"because during the negotiation they need to reach a consensus, which is normally you trying to get peoples views of the world to align, so you're trying to get the developers views to align with the plan. Besides negotiation is a difficult process, because both want the maximum, local authorities need to be careful about what they ask for, so they can ask for more, but if the local authority is clear about what they want, they will never achieve more then what they ask for. If the local authority is clear and they ask too much, they maybe will have zero developments, and if it is possible to negotiate you can come to consensus.*"

Respondent 8 also argues this, but he noticed that: *"for local authorities it is difficult in negotiations that the government says we have to have so many houses in each area. The developer can always say well if you want the houses, you have to agree to our terms, so one of the things that is really damaging, is what's called the housing target."* Respondents 6 and 7 also say this, not specifically for the housing target, but for the biodiversity net gain policy. It will influence developers on how much they can pay.

# 5. Discussion

This chapter discusses the results of chapter four. The chapter analyses whether the responses between developers and local authorities are similar or different, as well as whether it is consistent with what the literature indicates in chapter two. The chapter is divided into the themes that were also used in chapter four.

## 5.1 Willingness to pay

The willingness to pay for the developers' side is how much they are willing to pay for a certain product or service (Stobierski, 2020). Koppenjan & Enserink (2009) indicates profit, positive cashflow, risk-free and political certainty is important. Looking at the interviews of developers it is notable that developers are willing to invest in infrastructure if the development is viable. Koppenjan & Enserink (2009) indicate that a project itself cannot be profitable, but by combining several projects it can be attractive for the developer to invest anyway. Respondent 2 also states this in section 4.2. The developers themselves have no priorities in what to invest the money in, the local authorities make these priorities. Although they do prefer something that increases the value of the project area. What is notable is that developers 2, 3 and 4 are searching for collaboration with the local authority to make projects viable.

From the local authority perspective, the choices that are made for policy is important to know if the local authority is willing to pay for climate adaptive infrastructure, such as the local authorities respondents state that the priorities are based on the policy. Carroll's (1991) pyramid also indicates that in addition to economic responsibility, responsibility for legislation that meets the wishes of citizens. The authorities' priorities vary. Respondents 5 and 6 state that investments in climate adaptive infrastructure get a higher priority. Otherwise, respondent 7 states that the traditional contributions are still be more important. The priorities of the policy were decided primarily by politicians in respondents 6 and 7, while in respondent 5 residents were asked to prioritize what should be invested in. In section 2.4 the influence of biodiversity net gain is discussed, respondent 7 they are required to ask developers to invest in biodiversity. This may influence the negotiations, but the extent of this influence is not known.

## 5.2 Economic responsibility

Economic responsibility corresponds to the willingness to pay. As Caroll (1991) points out in section 2.2.1 but so does Koppenjan and Enserink (2009), firms are expected to make a profit. All developers notice that money is always an important aspect, this is similar to the theory.

For investments in climate adaptive infrastructure in relation to the value of land, there is no connection made. Respondents 1, 3 and 4 are arguing that there is a positive relationship, respondent 2 does not answer the question. What is striking is that the influence on investing in climate adaptive investments comes more from the outside, this is what respondents 3 and 4 argue. For respondent 1 the argue to invest in climate adaptive infrastructure is because in this way they can make use of the environmental social governance fund, which is striking because it makes it seem that investments in climate adaptive infrastructure do not have a financially positive relationship on land value. The investments that respondent 4 makes are spread out over the life of the building, often 80 years, making it more financially distributed. In chapter 2.3.3, various ways of enabling climate investments have been examined in the literature, the use of funds is also mentioned, but the other possibilities, such as residual value, allocation of surcharges/area development and land exploitation are not put forward by the developers themselves.

Local authorities have been using developer obligations to generate revenue. As section 2.3 points out there are several ways of generating revenue, England uses Section 106 and community infrastructure levy. As respondents 6 and 7 argued, CIL isn't always an option to gain revenue because the area needs to be viable. So, they are introducing more Section 106 contributions in order to make it possible to invest, but if they ask for too much Section 106, developers will not develop and so developers are going to develop somewhere else, this is also what the developers argue in section 4.5. But in order to ask for Section 106 contributions, the local authorities need a policy which makes it clear what they ask for. The planning fee, as respondent 5 argue, is another way to gain revenue, but this can be used for all kinds of finance, not specific for public infrastructure in relation to the development.

## 5.3 Legal responsibility

The legal responsibility applies especially to local governments, that they take into account the wishes of the citizens in their policies. Developers must operate within the established legal frameworks (Carroll, 1991).

Respondents 1 and 2 and 3 do not have an immediate preference for Section 106 or CIL. What they indicate is that CIL gives clarity to what the money is invested in, if the local authorities do not invest the money it may be asked back, and this also applies to Section 106. However, what respondents 1, 2 and 3 do indicate is that with Section 106 developers have more potential to say that the money should be spent locally. Respondent 4 wants to see more taxation. Overall, the developers want certainty and that risks are taken away, this is also what Koppenjan & Enserink (2009) state. Current legislation is behind and can be improved. Possibilities suggested by developers are the creation of a masterplan or clear requirements. The new legislation (see chapter 2.4) mainly focuses on introducing more CIL, which creates more certainty for developers.

The policy is important, local authorities are possible to ask for developer contributions. Respondent 5 bases its strategic development strategy on what the inhabitants want to see, respondent 6 also tries this, but there is still influence from politicians, the local plan of respondent 7 is based on what the politicians want. As respondents 6 and 7 state is that a good local policy framework can make it feasible and easier to ask for Section 106 contributions, however, viability is always an issue section 2.3.2.1. also indicates this. The influence of the Environmental Act, specifically the biodiversity net gain, is likely to affect what can be invested further in the area to be developed. The local authorities must ensure that developers comply with the biodiversity net gain policy, but it is not clear what impact this will have. The influence of the new legislation (Regeneration and Levelling Up Bill) is still little to say about. The policy framework in England is based on discretionary, see section 2.2, with the introduction of using more CIL this change.

## 5.4 Social awareness

Social awareness is based on ethical and philanthropic responsibilities. Companies are expected to contribute (ethical) but a company itself may have altruistic motivations (philanthropic) to invest in climate adaptive infrastructure.

All developers are concerned with sustainability, in the company itself and the projects they undertake. What is interesting is that investors who finance projects are also shifting towards investing in sustainable projects. The ethical responsibility is also increasing, as all developers indicate that new projects must meet sustainability aspects because the buyers, residents, occupiers and organizations, also expect and demand this. But these developers don't say what short-term developers would do. Respondent 8 states that the different types are influenced from the outside, which is similar to what the developers say. The influence from outside are customers, investors and

pension funds. What is notable is that they argue that the finance world is changing towards sustainability faster almost than the government world. Caroll's pyramid (1991) indicates that action is taken from within the company, what is striking about the interviews is that the influences come mainly from outside, i.e. from buyers and investors. Respondent 9 says that it is important to be aware of those developers who may suggest that they believe in what they are doing is positive, developers can't change the market, simply because they operate within the market. But the market is socially constructed, the society is always changing the very nature of that market. This gives the developer more responsibility to change the whole structure of the market or the economy through their action. This is kind of what happening in practice, developers are all saying that society wants them to change.

Little can be said about what local authorities think about the social responsibility of developers, what is striking is that policy plays a role, in the sense that according to local authorities, developers do look at what the local authority asks, and then possibly look further at what is possible. Respondent 5 state that developers invest in social value, as Caroll (1991) claims, developers are also expected to make a profit, respondent 5 also indicates this in section 4.9. Respondents 6 and 7 argue that every developer is different.

## 5.5 Negotiations

The negotiations are an important part because it indicates the outcome in which ultimately investments will be made (Lord et al. 2019).

The developers indicate that the local government often arrives with a list of what they would like the developer to contribute but that local authorities cannot demand everything. Money plays an important role when it comes to negotiations, this is also reflected in the section economic responsibilities. Just like viability, which is discussed in the literature in section 2.3.2.1, if local authorities demand too much from developers, then the project will not go ahead. In addition, developers also indicate that sometimes there is cooperation, such as a dialogue and/or joint venture with local authorities. It is notable that some developers would like to see a vision or a holistic way from the local government to address multiple problems in the area. This is striking because local authorities have a local plan which indicates the priorities.

All local authorities indicate that they have a policy that they want to ask the developer can contribute to, and then the discussion takes place on what the developer can and cannot afford. What is noticeable is that as well local authorities, experts and developers argue that it is like a game what they can and cannot ask for. Money and viability always play an important role, because if they ask too much a developer will not develop. If the local authority asks for less, then they cannot invest in all necessary infrastructure.

# 6. Conclusion

The question examined in this thesis is as follows: "*what is the willingness of local authorities and developers in England to pay for climate adaptive infrastructure?"* To answer this question, two sub-questions were formulated; to answer these questions a qualitative study was conducted. Interviews were conducted with developers, local authorities and experts to gather the data.

The first sub-question was about what factors influence the willingness to pay for climate adaptive infrastructure. First, the answer is provided from the perspective of developers. From the rational perspective, it can be said that developers are willing to pay for climate adaptive infrastructure if it increases land value. As Dunning & Lord (2020) point out, the link between investment in climate adaptive infrastructure and the increase in land values has not yet been established. Rationally, it cannot be indicated whether that is the reason for developers to invest, hence, from the behavioural economic perspective, socially responsible entrepreneurship has been examined. This may explain why developers are willing to invest in climate adaptive infrastructure beyond the rational aspect, Caroll's (1991) pyramid was used for this purpose. Economic responsibility is the basis for corporate social responsibility, from the literature it is also indicated that developers should and may make a profit (Carroll, 1991). In the research of Koppenjan & Enserink (2019) the rational perspective is used, but they also indicate that a positive cash flow is necessary. Developers in the interview indicated also that money always plays an important role in developments and during negotiations, the viability of a project is also important. Looking at the social awareness of developers, it was investigated whether from that perspective could be explained why developers want to contribute. The developers interviewed indicated a willingness to pay for climate adaptive infrastructure, however, the motivations vary. Developers are willing to invest so they receive the environmental social governance goals fund, sustainability is a criterion which must be fulfilled. Developers also see a shift from investors and (pension) funds, they only want to invest their money in sustainable projects. In addition, developers are aware of the need to realize sustainable developments, because this is what buyers expect from them. Some developers indicate that they feel the responsibility to invest in climate adaptive infrastructure.

Looking at the perspective of local authorities which factors influence them to invest in climate adaptive infrastructure. Policy plays an important role, which will also emerge in sub-question 2. The local authorities interviewed indicated that the viability of their municipality is low, which also allows them to ask for fewer developers' contributions. If local authorities ask for too many developer contributions, the risk is that developers will no longer invest in their borough. The topic of climate does get higher on the agenda, and the local plans that have just been drafted, or will be drafted in the next few years prioritize climate among other topics. What is striking is that the traditional topics are often still at the top, i.e. affordable housing, education and open spaces. The priorities that are set are determined by the politician of the municipality and the viability of the municipality.

In conclusion, money plays an important role in investment and during negotiations, from the outside, the pressure increases for developers to invest in climate adaptive infrastructure. The priorities that local authorities have set in policy, influence what is invested in.

Sub-question two is about whether the current English planning system allows for investment in climate adaptive infrastructure. For this purpose was looked at the developer contribution and what developers think of the current planning system. Developers now run into the fact that developer contributions are often uncertain and risky, what they would like to see is that it is clearer what is asked of them. Developers indicate that if local governments ask for more developer contributions for public infrastructure, they should also look at how this can be financed. The dividing line of

project viability is thin, local authorities can't ask for too much because then developers won't develop much, but if they don't ask for developer contributions, the infrastructure can't be delivered.

Local authorities were asked how the priorities for the policy are made, if climate is a priority and what they think of the "Levelling Up and Regeneration Bill". Legislation plays a significant role, as Koppenjan & Enserink (2017) argues that it depends on the government what the developer can invest in. If legislation doesn't include climate adaptive infrastructure, it becomes difficult for the developer to invest in this, if they want this. The local authorities also indicate that developers are looking at the legislation and negotiating what is included in the legislation, it is not that developers are coming up with additional investments themselves. The national government of England also indicates that the current English planning system is not working adequately, there are many economic geographical differences. Therefore, a new bill has been introduced that introduces more Community Infrastructure Levy. As local authorities point out, this provides more certainty for developers but fewer options for local authorities. In addition to the planning system, developers also have to contribute to the net biodiversity gain, this is mandatory, but this is left out of the negotiations, local governments and experts do suspect that this has an impact on the negotiations.

To answer in conclusion, the main question is that under conditions and adjustments both developers and municipalities, are willing to pay for climate adaptive infrastructure. Carroll's pyramid is used to provide answers. Economic responsibility for both developers and local authorities is the most important thing. For developers, the project must be viable, for the local authorities interviewed the viability of their area is an important factor in how much they can demand from developers. For legislative responsibility, the prioritisation of the local authorities is important, the aspects that the local authorities have included in the policy are negotiated by the developers. So if climate adaptive infrastructure is on the list, it is being negotiated too. Looking at the ethical and philanthropical responsibility, little can be said from the side of local authorities, from the developer side it is notable that the influence from outside (buyers and investors) ensures that investments are made in climate adaptive infrastructure.

## 6.1 Contribution to the theory

In section 1.3, the scientific relevance of the research is presented. This section briefly reviews it and then describes what this research contributes.

First, the knowledge gap between climate adaptive infrastructure and property value is addressed. This research does not quantify the relationship, but the question was asked in general terms to the interviewees and they do see that it is positive. This is in line with what Koppenjan and Enserink indicated in their 2009 study.

Because the relationship was not clearly known, research was conducted into companies' corporate social responsibility, with a focus on climate. This provides interesting insights, mainly that there is external influence. Buyers and investors influence the behaviour of developers to invest in climate adaptive infrastructure. The knowledge gap from section 1.3 why developers invest in climate adaptive infrastructure rationally or because they feel socially responsible, it can be said that rationally money and viability are important aspects, but this research does not statically indicate the connection. In addition, developers invest in climate adaptive infrastructure because it is indicated by policy/legislation. In addition, because buyers and investors want developers to build sustainably.

As indicated in section 1.3 there is no literature about the developers' side, what motivations and prioritisation they have. Through this exploratory study, a start has been made to investigate what developers want and what priorities they have.

In several studies, the knowledge gap is that there is little information on value capture and how negotiations take place. This research indicates that, as Carroll's pyramid also indicates, legislation plays an important role. This research shows that a clear policy framework ensures that demands can also be made of developers and that developers know where they stand. This can be both negotiable and non-negotiable.

This research has also shown different ways of funding models for climate adaptive infrastructure, England is in the process of passing new legislation and wants to set up more non-negotiable contributions, while more options can be applied.

## 6.2 Limitations study

There are also limitations to this research, which are discussed in this section.

First of all, only nine interviews were conducted, of which four were with developers, three with local authorities and two with experts. With this number no conclusion can be drawn for the whole of England, to make the research more representative more developers and local authorities should be interviewed. An attempt was made to arrange more interviews through a variety of communication channels. There was little to no response to this and, in addition, time was limited to find new contacts. Hence expert interviews have been done and prior interviews have taken place to gather information about the English planning system, after the interviews with developers and local authorities questions have been asked to experts to check if it matches. This thesis is exploratory research so it does indicate what developers and local authorities think about the topic of willingness to pay for climate adaptive infrastructure.

The interviews indicated that there are different types of developers, roughly speaking, short- and long-term developers. The interviews were conducted with long-term developers, they were open to being interviewed. However, during the interview the side of short-term developers was mentioned and how they behave. However, this is too little and not reliable to draw any conclusion from this.

This study did not distinguish between climate adaptation and climate mitigation, while there is certainly a difference. For this research climate adaptation was chosen because climate adaptation can be measured at the local government level. Climate adaptation means preventing the impacts of climate change or minimizing the devastation. Mitigation means taking action to counteract the effects of climate change by preventing or reducing it (European Environment Agency, 2020). Mitigation has global benefits, but can be invested locally or regionally, whereas adaptation is invested locally/regionally and the impacts are often felt locally/regionally. With investments in adaptation measures, often the effects can be seen right away, whereas with mitigation it can take several years (Klein et al., 2007). As the research by Klein et al., (2007) indicates, mitigation investments are often done by (inter)national governments, and climate adaptation measures can be done by local governments. However, the dividing line is also occasionally thin and used interchangeably. During interviews, it was not explained why adaptation was chosen instead of mitigation and what the difference is.

Another limitation of the research is that before the interview it is made clear that the focus of the research is on climate adaptive infrastructure. It is notable that because the focus is placed on climate beforehand, this topic recurs in many answers. Then, later in the interview, developers and local authorities are asked about what priorities they have when it comes to investing in public infrastructure and how these priorities are made. This broadens the thinking, i.e. affordable housing, parks, education, etc.

The introduction, scientific relevance, and willingness to pay often reflect the fact that a link between climate adaptive infrastructure investments and land value capture has not yet been made in the literature. This research does not provide an answer to this either but tries to provide insight into what developers and local authorities think. This was achieved by asking questions about how the prioritisation was drawn up and who makes the choices for the prioritisation.

From behavioural economics, it is indicated that everyone has their history and vision, not only the organization but also the employees themselves. This was not asked for during the interviews, due to time constraints. However, it may give insight to ask this though, in order to get a picture of whether someone is speaking the interview themselves, or answering from the perspective of the company. For this research, the theory behind behavioural economics was not fully explored, and further research was done from the behavioural economics perspective.

The English planning system faces many economic geographical differences. As stated in the conclusion, in some areas the land value has to go up so that more can be asked of developers. Or as stated in chapter 2.4 other ways of value capture should be applied, this research did not further explore what the opinion of developers and local authorities is to apply a different way of land value capture. As respondent 7 points out in section 4.6, at present Community Infrastructure Levy can only be applied in viable local authorities. The new legislation seeks to introduce more Community Infrastructure Levy, the question that cannot be answered is whether this is possible, and how this will work out in the future.

For this research, local authorities were interviewed in northwest England, where investment in climate adaptive infrastructure is becoming higher on the agenda, but it is not a given. Due to economic geographical differences, it may be the case that the southeast/London region does get asked about climate adaptive infrastructure by default.

## 6.3 Recommendation practise

The limitations described in the paragraph above also provide opportunities for follow-up research. First, recommendations are given based on the findings of the research, then recommendations are given for follow-up research based on the research methodology.

Developers do not directly indicate that they look at the policies that local authorities have, while local authorities indicate that this is the basis for negotiations. The subject of investment in climate has recently been high on the list of local authorities or has yet to appear on it, while developers indicate that they already invest in this, it may be that developers invest in other regions, which may explain why the answers are different. For follow-up research, it would be interesting to investigate this difference further and to ask developers where exactly they invest in order to find out whether it corresponds to the answers of local authorities.

As section 6.2 indicates, there is no direct evidence to support the literature on whether there is a positive relationship between climate adaptive infrastructure and land value and how much value is retained. Follow-up research could focus more on this to create this understanding. However, as respondent 1 indicated during the interview, developers would like to see statistics on the relationship between climate adaptive infrastructure and property value so that they can pass this on as well. It is therefore important to consider quantitative research alongside qualitative research.

The focus of this research is on the English planning system, where negotiations decide what to invest in. The Environment Act has made it mandatory to comply with the biodiversity net gain, there are also costs associated with this. It is not known what impact this legislation will have on negotiations, it is conceivable that developers will be less willing to invest, or even not have the

opportunity to invest in other public infrastructure, because they have to comply with the biodiversity net gain legislation. In follow-up research, this question can be asked of developers so that it becomes clear what the consequences are for them and how they deal with this.

Many developers own land and have to contribute to investments in public infrastructure, the new legislation wants to introduce more CIL. Developers had been interviewed before the new bill was presented, so they were not asked directly what they thought about this. Of the three local authorities interviewed, only one had an opinion on it and was critical of the bill, the other did not know what it would mean for them. Currently, local authorities are allowed to decide for themselves whether or not to apply CIL, and the three local authorities interviewed do not apply it because their region is not considered viable. So it remains to be seen what the impact of the new bill will be, should it be introduced. It is interesting to have the follow-up study when it is clear what the consequences will be for local authorities or when the new legislation is in force, in order to have a clear understanding of the consequences.

Carroll's pyramid was applied as a basis for corporate social responsibility. The interviews indicated that in the area of ethical and philanthropic responsibility, more external influence plays a role. For follow-up research, it would be interesting to include this perspective in the literature, so that questions can be asked more specifically about external influences.

For follow-up research, it is important to interview more developers and local authorities throughout England to explore the perspectives of different developers and local authorities. So also interview short-term developers and local authorities from other regions in England like Southeast England. Besides, from the behavioural economics perspective, it may be interesting to further investigate why developers and local authorities make certain choices and if the choices are based on the perspective of the organisation or an individual person.

Another recommendation for follow-up research is that it might be interesting not to put the focus on climate right away, even before the interview takes place, in order to make it more equal for other public investments. During the interviews, it is a possibility to make clear the distinction between climate adaptation and mitigation.

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# Appendix A: Operationalization scheme

| Concept | Variable | Indicator | Sub-indicator | Questions |
|---|---|---|---|---|
| **WTP climate adaptive infrastructure** | Behaviour developers investing in climate | Willingness to pay | Prioritisation | Do you have your own priorities on what you want to pay for in public infrastructure? |
| | | | | Are there investements that you would rather invest in than other investments? |
| | | Economic responsibility | | Do you think there is a positive relationship between investments in climate adaptive infrastructure and land value? |
| | | | | How long is your long-term vision to earn back investments? |
| | | Legal responsibility | | Are there many in-kind, rather than money contributions? |
| | | | | You have two types of developer contributions, which one do you prefer? |
| | | | New legislation | What do you think of the new Levelling UP and Regeneration Bill? |
| | | Social awareness | Ethical responsibility | How willing are you to contribute to climate adaptive infrastructure? |
| | | | Philanthropic responsibility | As a company, do you feel socially responsible for social problems? |
| | | Negotiations | | How are the negotiations going? |
| | | | | Do you see a change over time during negotiations? |
| | | | | Do you see many differences between the local authorities during the negotiations? |
| | | | | What do you expect from the government/local authorities to combat climate change? |
| | | | | What is the impact of the implementation of the biodiversity net-gain on negotiations? |
| | | | | |
| **Case study question developers** | | Prioritisation | | Suppose the government wants to invest in a climate adaptive solution, they have two options, one is a technical, not beautiful solution, but cheaper and this has little extra value for the area. The other is to integrate the solution into the area, which would increase the value of the area, but you would have to pay for this. Which one do you prefer? |
| | | Off-site infrastructure | | Would you be willing to pay for flood-proofing infrastructure that does not take place in your immediate development area? In other words, would you pay for off-site infrastructure? |
| | | On-site infrastructure | | Would you be willing to pay for infrastructure that prevents flooding, but which takes place in the area to be developed? So pay for on-site infrastructure? |
| | | Climate adaptation level | | Suppose the national government imposes a climate adaptation level, so houses have to meet certain requirements, and/or as many green spaces in the neighbourhood, and/or invest in climate adaptive infrastructure, what would you think of that? |
| | | | | |
| | Priorities local authorities investing public infrastructure | Economic responsibility | Value capture | How much of the value is captured? |
| | | | | How large is the part of the increase in land value capture? |
| | | | | How effective is land value capture? |
| | | | | What is currently being done with the value capture? |
| | | Willingness to pay | | Do you think there is a positive relationship between investments in climate adaptive infrastructure and land value? |
| | | | Prioritisation | How are choices made to invest in certain public values? |
| | | | | Do you have a prioritisation for public goals? |
| | | Negotiations | | How are the negotiations going? |
| | | | | Are there many in-kind, rather than money contributions? |
| | | | | Why do you ask for the things you ask for, in Community Infrastructure Levy and for Section 106? |
| | | | | Do you also ask for climate adaptive infrastructure? |
| | | | | Do you see many differences between developers during the negotiations? |
| | | | | What is the impact of the implementation of the biodiversity net-gain on negotiations? |
| | | Legal responsibility | | To what extent do local politicians influence the priorities during negotiations? |
| | | | New legislation | What do you think of the new Levelling UP and Regeneration Bill? |
| | | | | What do you think will be the consequences of this new legislation if it is passed? |
| | | | | Do you think the public sector is well prepared for the change? |
| | | | | What do you think will be the consequences of this new legislation if it is passed? |
| | | Social awareness | | Do you expect the developer to contribute to social goals, specifically climate adaptation? |
| | | | | |
| **Case study question local authorities** | | | | Do you sometimes claim climate investment on area development? So instead of something technical and less beautiful, make a plan that it will be incorporated into the development? |

# Appendix B: Interview guide developers

**Interview developers.**
Firstly, I would like to thank you for allowing me to interview you. The purpose of my research is to investigate the willingness of developers to contribute to public infrastructure, with a focus on climate adaptive infrastructure. I am conducting the research as part of my Master's programme in Spatial Planning at Radboud University in Nijmegen, in the Netherlands. I am conducting the research at the University of Liverpool. I would like to ask you if you would give me permission to record the interview? The interview will take a maximum of one hour.

**General question**

1. Would you like to introduce yourself, what is your job, what kind of projects are you involved in?
    a. What do you think about climate change as a company?
    b. What do you think about investments in climate adaptive infrastructure?

**Willingness to pay**

2. As a company, do you have your own priorities on what you want to pay for? (Priorities for public infrastructure)

3. Are there any investments that you would rather invest in than in other developments?
    a. If yes, which are they?
    b. Why these investments? And what are the investments you would rather not invest in?
    c. If not, why not?
    d. Does this affect the negotiations?

**Economic responsibility**

4. Do you think there is a positive relationship between investments in climate adaptive infrastructure and land value?
    a. If so, would you be willing to invest in climate adaptive infrastructure sooner?
    b. If not, suppose it is proven to be so, perhaps even with quite precise amounts, would you invest sooner?

5. How long is your long-term vision to earn back investments?
    a. Climate adaptive infrastructure generally requires a long-term vision, are you willing to extend the long-term vision?
        i. If so, what should be the counterbalance?
        ii. If not, why not?
    b. Funds are sometimes started to invest for public facilities, would that increase the willing to pay for climate adaptive infrastructure?
        i. If yes, why?
        ii. If not, why not?

**Legal responsibility**

6. You have two types of developer contributions, the Community Infrastructure Levy and Section 106, which one do you prefer?
    a. Why?
    b. I think CIL is more transparent, what do you think?
        i. Does it helps that it is more transparent?

7. Are there many contributions in-kind, rather than money contributions?
    a. If so, what does this look like?
    b. What contributions are these mainly?
    c. If not, do you have a preference for this in-kind contributions?

**Social awareness**

8. How willing are you to contribute to climate adaptive infrastructure?
    a. Under what conditions would you be willing to pay for climate adaptive infrastructure?

9. As a company, do you feel socially responsible for social problems, such as climate change, housing shortage, etc.?
        i. If so, how did this come about and what does it mean in concrete terms?
        ii. If not, why not?

**Negotiations**

10. How does it work during the negotiations?
    a. Do the authorities indicate what they want?
    b. Or do you come up with ideas?
    c. Is there much difference between projects?

11. Do you see many differences between the governments/local authorities during the negotiations?
    a. If so, what are these differences?
    b. What causes these differences?
    c. What influence do these differences have?
    d. If not, how come they are all the same?

12. Do you see a change over time during negotiations?
    a. Has there been a qualitative change in what local governments ask for? (i.e. what governments are asking for)
        i. Has climate change become a higher political priority?
        ii. Or is there more demand for affordable housing?
    b. Has there been a quantitative change in what local authorities are asking for? (So are they now asking for more affordable housing, etc.?
    c. Do you see a difference in what you pay for over the years, does the perspective change?
        i. If so, how do you think this is changed.

13. What do you expect from the government/local authorities to combat climate change?

**Case questions / investing in climate adaptive infrastructure**

Flooding is one of the major climate problems for England.

14. Would you be willing to pay for flood-proofing infrastructure that does not take place in your immediate development area? In other words, would you pay for off-site infrastructure?
    a. Why would you be willing to pay for this?

b. What do you expect to get in return?
c. Why do you not want to pay for it?
d. Do you ever face such negotiation questions?

15. Would you be willing to pay for infrastructure that prevents flooding, but which takes place in the area to be developed? So pay for on-site infrastructure?
    a. Why are you willing to pay for it?
    b. What do you expect from the government?
        i. That they also help pay? That they arrange things?
    c. Why don't you want to contribute to this?
        i. What would have to change in order for you to pay?

16. Suppose the government wants to invest in a climate adaptive solution, they have two options, one is a technical, not beautiful solution, but cheaper and this has little extra value for the area. The other is to integrate the solution into the area, which would increase the value of the area, but you would have to pay for this.
    a. What do you prefer?
    b. Why would you pay or not pay?

17. Suppose the national government imposes a climate adaptation level, so houses have to meet certain requirements, and/or as many green spaces in the neighbourhood, and/or invest in climate adaptive infrastructure, what would you think of that?
    a. What would be the consequences for you?
    b. What would be the consequences for the negotiations?

**Cooling off question**

18. Are there any variables or other aspects which we have not discussed but which you think are important to include in the interview?

**Closure**

I have one more question. Do you have any contacts with developers that I might approach for interviews?

I would like to thank you for your time, if I have any other questions can I email you to ask them? When I have transcribed the interview, I would like to send it to you so that you can see what I have written down, is that okay with you?

Thank you very much.

# Appendix C: Interview guide local authorities

**Interview local authorities**

Firstly, I would like to thank you for allowing me to interview you. The purpose of my research is to investigate the willingness of developers to contribute to public infrastructure, with a focus on climate adaptive infrastructure. I am conducting the research as part of my Master's programme in Spatial Planning at Radboud University in Nijmegen, in the Netherlands. I am conducting the research at the University of Liverpool. I would like to ask you if you would give me permission to record the interview? The interview will take a maximum of one hour.

**General questions**

1. Would you like to introduce yourself, what is your job, what kind of projects are you involved in?

**Value capture**

2. How much of the value is captured?

3. How large is the part of the increase in land value capture?

4. How effective is land value capture?

5. What is currently being don with the value capture?

**Willingness to pay**

6. Do you think there is a positive relationship between investments in climate adaptive infrastructure and land value?

7. Do you have a prioritisation for public goals?
    a. How do you balance the goals?
    b. Is it the same prioritisation in every project?
    c. Do you know what the prioritisation looks like?
    d. If not, what influences the choice?

8. How are choices made to invest in certain public values?

**Negotiations**

9. How does it work during the negotiations?
    a. Do you indicate what you want?
    b. Or do the developers come up with ideas?
    c. Do you see much difference between projects?
    d. Do you see a difference in what you ask for during the years, so do the perspective change?
        i. If so, how do you think this is changed?

10. Do you also ask for contributions in-kind?
    a. If so, what kind of contributions?
    b. Why do you ask for contributions in-kind? (Is it more profitable?)

11. Why do you ask for the things you ask for, in Community Infrastructure Levy and for Section 106?
    a. What is it based on?

b. What kind of information determines what kind of things you ask for during the negotiation?

12. Do you also ask for climate adaptive infrastructure?
    a. If so, do you ask for this in a structured way, i.e. in every project?
    b. What kind of climate adaptive infrastructure should I think of?
    c. Do you ask mainly for on-site or off-site infrastructure?
        i. Why do you ask for these mainly?
    d. If not, is there a possibility to pay more attention to climate?

13. Do you see difference between developers during the negotiations?
    a. If so, what are these differences?
    b. What causes these differences?
    c. What influence do these differences have?
    d. If not, how come they are all the same?

14. What is the impact of the implementation of the biodiversity net-gain on negotiations?

**Legal responsibility**

15. To what extent do local politicians influence the priorities during negotiations?

16. What do you think of the new Levelling Up and Regeneration Bill?

17. What do you think will be the consequences of this new legislation if it is passed?

**Social awareness**

18. Do you expect the developer to contribute to social goals, specifically climate adaptation?
    a. If so, how do you intend to achieve this?
    b. If not, how will the targets be achieved?

**Case study question**

19. Do you sometimes claim climate investment on area development? So instead of something technical and less beautiful, make a plan that it will be incorporated into the development?

**Cooling off question**

20. Are there any variables or other aspects which we have not discussed but which you think are important to include in the survey?

**Closure**

I have one more question. Do you have any contacts with developers that I might approach for interviews?

I would like to thank you for your time, if I have any other questions can I email you to ask them? When I have transcribed the interview, I would like to send it to you so that you can see what I have written down, is that okay with you?

Thank you very much.

# Appendix D: Interview guide experts

**Interview respondent 8**

Firstly, I would like to thank you for allowing me to interview you. The purpose of my research is to investigate the willingness of developers to contribute to public infrastructure, with a focus on climate adaptive infrastructure. I am conducting the research as part of my Master's programme in Spatial Planning at Radboud University in Nijmegen, in the Netherlands. I am conducting the research at the University of Liverpool. I would like to ask you if you would give me permission to record the interview? The interview will take half hour

1. Biodiversity net gain has been established by law, is it also possible to do something like this for climate adaptive infrastructure?
    a. If so, what would have to happen
    b. Does the new Levelling Up and Regenartion Bill affect this?
    c. If not, why not?
2. How did it come to pass that hard requirement are set for biodiversity?
    a. What about the financial side of the story, does it give developers any return?

3. How are the negotiations going, so does the local government come up with contributions they want to receive or do developers?
    a. How are the choices made to invest in something?

4. Do you think developers act mainly rationally during negotiations?
    a. Or are they also concerned with corporate social responsibility?
    b. How is this expressed?

5. My research also deals with land value capture, and in England that is via developer obligations and CIL. I am curious to know how large the contribution is that is actually determined, after the negotiations, do you have an idea?

6. How effective do you think Section 106 and CIL are?

7. What do you think of the new Levelling Up and Regeneration Bill?

8. Are there many differences between local authorities / developers?
    a. How does this affect negotiations?

**Closure**

I have one more question. Do you have any contacts with developers or local authorities that I might approach for interviews?

I would like to thank you for your time, if I have any other questions can I email you to ask them? When I have transcribed the interview, I would like to send it to you so that you can see what I have written down, is that okay with you?

Thank you very much.

**Interview respondent 9**

Firstly, I would like to thank you for allowing me to interview you. The purpose of my research is to investigate the willingness of developers to contribute to public infrastructure, with a focus on climate adaptive infrastructure. I am conducting the research as part of my Master's programme in Spatial Planning at Radboud University in Nijmegen, in the Netherlands. I am conducting the research at the University of Liverpool. I would like to ask you if you would give me permission to record the interview?

The study is about the willingness of developers to pay for climate adaptive infrastructure. The research is about the willingness of developers to contribute to climate adaptive infrastructure. It is about land value capture instruments, but also the behaviour of developers.

There are two aspects I can imagine that make developers willing to pay, the first being that it brings in money, and the second being that they feel socially responsible.

1. I have made my own assumptions from the perspective of the developers, which will influence the WTP, but first I would like to know what your assumptions are.

2. I have four assumptions from the developers can what influences the WTP, and I actually want to know is it correct or is something missing.
    a. Awareness, how important is climate change, for the business
    b. Information, there is a lot of interest about the importance of climate, but not about investments in climate adaptation and property value.
    c. What are competitors/market doing,
    d. Influence from outside, investors, new residents.

3. However, local authorities are also important to take into account as they indicate during negotiations what they want a developer to contribute to. What do you expect / know from the negotiations between developers and local authorities?

4. How do you think prioritisation occurs during negotiations?

5. Do you expect much difference between long- and short-term investors? When it comes to willingness to pay for climate adaptive infrastructure?

6. What do you think of CIL and section 106?
    a. Does it have much influence?
    b. Should the system/policy be changed/adapted?

7. The question is also whether corporate social responsibility plays an important role in influencing WTP of companies to invest in climate adaptive infrastructure, what do you think? What is your experience in this?

8. I see most of the time literature on behavioural economics and buying a home. Can I approach it in the same way? Or do you have good papers / literature on behavioural economics in relation to space, environment and/or real estate?

9. Are there aspects I should pay attention to when it comes to behavioural economics?

10. Are there aspects I should not forget when researching the willingness to pay for climate adaptive infrastructure, in relation to behavioural economics?

**Closure**

I have one more question. Do you have any contacts with developers or local authorities that I might approach for interviews?

I would like to thank you for your time, if I have any other questions can I email you to ask them? When I have transcribed the interview, I would like to send it to you so that you can see what I have written down, is that okay with you?

Thank you very much.