

# Urban living labs during COVID-19

Exploring the relationship between  
social cohesion and urban living labs

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## Executive summary

Climate change is and will have a severe impact on urban areas. Dutch cities are actively searching ways for successful climate adaptation. One way to do this is by experimenting with sustainable innovations in urban living labs (ULLs). This is a place where different urban actors, such as governments, businesses, knowledge institutes and citizens, collectively experiment with innovative ways to solve urban problems in a sustainable matter. This collective experimenting is also known as co-creation. From the beginning of the COVID-19 measures in 2020, ULLs are facing difficulties regarding co-creation as a result of the measures that are taken for social distancing. Furthermore, these social distancing measures affect the social cohesion in communities, and therefore most likely also in ULLs. The relationship between social cohesion and ULLs has not yet been studied extensively, and the COVID-19 measures give an opportunity to understand ULLs in a new way. Therefore, this thesis aims to answer the following research question: *What is the relationship between social cohesion and urban living labs in times of COVID-19?* The research methodology consists of expert interviews and a single case study research in ULL Reyerood+ in the neighbourhood Reyerood in Rotterdam. The expert interviews are conducted with five experts that are active in five different ULLs in the Netherlands. The case study research consists of document analysis to understand the aim and activities of ULL Reyerood+, as well as interviews with citizens of Reyerood. The research data is analysed using a social cohesion framework that subdivides social cohesion into the quality of social relations, identification with the social entity, and orientation towards the common good. Overall, the experts believe that regular physical contact, a long-term relationship, having an equal mindset, involving citizens in decision-making and experimenting, and taking a qualitative approach are perceived as being the most important for a successful ULL. From the citizen interviews became clear that problems of violence, waste and parking are experienced as priority problems in the neighbourhood and that they are, together with the experienced deterioration of the social situation, seen as ‘pauperisation’ or ‘degradation’. It appears that most citizens have other priorities than climate adaptation, for example in terms of income. This could impact the social cohesion, as it can affect people’s willingness to take part in civic engagement and social networking. The communication between actors in Reyerood+ were impacted by the COVID-19 measures, as meetings were organised online. Furthermore, the COVID-19 measures have impacted citizens’ involvement in the neighbourhood, mainly by increasing the awareness of people’s surroundings. This has most likely affected the community attachment of citizens. It is possible that this increased awareness will have a positive impact in the future. Furthermore, social cohesion and ULL Reyerood+ are connected through the development of a new way of communicating that deviates from the current top-down approach, and through the development of a sense of ownership among citizens. ULL experiments are therefore not only sustainability experiments, but also an opportunity for actors to learn how to approach citizen engagement and to develop a new way of communicating with citizens that could ultimately be beneficial for climate adaptation in urban areas. The results are debated on the basis of several discussion questions. The main limitations for this research lie with the research methods, which are not as ethnographic as was anticipated due to the COVID-19 restrictions, and the social cohesion framework, which is susceptible for subjectivity. The scientific contribution is the social science approach in the field of ULLs, which builds on existing literature. Implications and recommendations are given for the municipality and the citizens as actor groups. Finally, it is suggested that further research on citizens’ role in co-creation processes would be valuable for future research.

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# 1. Introduction

Many governments all over the world set 2020 as a tentative milestone for implementing climate plans as agreed on in the 2015 Paris Agreement. This aim is to keep the global temperature increase below two degrees Celsius as compared to the pre-industrial era. According to the UNFCCC (2020), the year 2020 was therefore going to be a pivotal year for climate action. Unfortunately, the COVID-19 pandemic (also well-known as the coronavirus disease, that was first identified in December 2019 and currently still grips the world) has diverted the attention as people's health now takes precedence. The UN Climate Change Conference that was scheduled to take place in Glasgow in November 2020, and that launched the 'Year of Climate Action', has been postponed to 2021 (COP26, 2020). Daily lives are dominated by the measures, that are mainly based on social distancing, taken to suppress COVID-19 and to slow down its spreading.

Despite this, Ursula von der Leyen, president of the European Commission, has made an appeal to not "fall back in old, polluting habits" when restarting the economy (NOS, 2020). Here, Von der Leyen addresses the fact that, even though COVID-19 currently has priority everywhere across the world, climate change is still the biggest threat to the planet in the long run. Especially vulnerable to climate change are cities. They are increasingly facing challenges as a result of climate change; rising sea levels and the increasing frequency of both heavy rainfall and periods of drought are forcing cities to adapt and prepare for a climate-resilient future (Hammett, 2020). Additionally, cities are perceived as central in the global economy, as they are home to more than half of the population worldwide, and therefore play a significant role in the transition towards a circular economy (Ellen MacArthur Foundation, 2017). As the Ellen MacArthur Foundation states: "With their high concentration of resources, capital, data, and talent spread over a relatively small geographical area, cities are uniquely positioned to drive a global transition towards a circular economy". Thereby, the UNDP explains the importance of climate adaptation and an active role towards a circular economy through the Sustainable Development Goals (SDGs), and especially through SDG 11: *Sustainable cities and communities*, and SDG 12: *Responsible consumption and production*. As they clarify: "Sustainable development cannot be achieved without significantly transforming the way we build and manage our urban spaces" (UNDP, 2020). It is thus inevitable for cities to take part in a sustainability transition.

## 1.1 Research problem

In the Netherlands, cities are increasingly prioritising climate action. One way in which Dutch cities respond to unsustainability is by experimenting with social innovations, which is explained by Naumann et al., (2018, p. 198) as: "any initiative [...] that challenges and – ultimately – fundamentally alters the defining routines, resource and authority flows, or beliefs of the broader social system in which it was introduced". An example of such an initiative are so-called urban living labs (ULL) in which different urban actors, such as governments, businesses, knowledge institutes and citizens are engaged. ULLs are defined by Chronéer et al. (2019, p. 60) as "a local place for innovative solutions that aims to solve urban challenges and contributes to long-term sustainability by actively and openly co-constructing solutions with citizens and other stakeholders". Municipalities are increasingly drawn to the implementation of this kind of experimenting, as they see a potential to use the outcomes in other (urban) contexts and to scale up the experiments to ultimately reach a broader system change (Kronsell



& Mukhtar-Landgren, 2018; Naumann et al., 2018). Among others, as Naumann et al. (2018) state, approaches such as ULLs can facilitate social cohesion and ecological sustainability. Social innovation is both the goal of an ULL as well as the means; the idea is not only to change the urban space with innovation experiments, but also to change people's behaviour and thereby to ultimately enable a system change.

However, ULLs currently face the challenge where they have difficulties operating in this time of COVID-19, as their work is based on co-creation that in most cases was not able to continue as usual due to the restrictions that aim to ensure social distancing. Kristalina Georgieva, International Monetary Fund (IMF) managing director, has stated that this social distancing can have negative effects for social cohesion in societies (Economic Times, 2020). Here, social cohesion broadly refers to the "extent of connectedness and solidarity" in a community or society (Manca, 2014). On the other hand, Corvo and De Caro (2020) argue that, while social distancing initially results in negative effects for social cohesion, people tend to find ways to increase social cohesion. An example they give is Italian people singing together from their windows, which allows for "a moment of strong union" (p. 248). In any case, it is likely that the COVID-19 measures impact the social cohesion in ULLs as well. It is therefore interesting to understand ULLs and their inhabitants through the ways in which they adapt to the circumstances and through their degree of resilience and ingenuity.

## 1.2 Research aim and research questions

The aim of this research is twofold. The first aim is to explore the relationship between social cohesion and ULLs. The second aim is to study the resilience and ingenuity of the ULLs in times of COVID-19, by researching the ways in which citizens and other actors communicate and have found ways to continue the ULL experiments.

The fact that social science research is underrepresented when looking at ULLs, and the fact that the impact of COVID-19 measures on social cohesion in ULLs has not yet been studied, has resulted in the formulation of the following overarching research question:

*What is the relationship between social cohesion and urban living labs in times of COVID-19?*

To answer this question, the following four sub questions are formulated:

1. *How do ULL experts perceive social cohesion in ULLs and the impact of the COVID-19 measures on the ULLs?*
2. *How did citizens of Reyroord experience the social cohesion in their neighbourhood, prior to the COVID-19 measures?*
3. *How do the COVID-19 measures impact the ULL Reyroord+?*
4. *What is the effect of the social cohesion in Reyroord on ULL Reyroord+ and vice versa?*

## 1.3 Relevance to the field of industrial ecology

The system approach within the field of industrial ecology can contribute to scrutinising this research topic by evaluating ULLs from different perspectives. Industrial ecology integrates a technical, environmental and social perspective in order to understand and evaluate issues regarding sustainable development and to design solutions to occurring problems. These three perspectives are also integrated to successfully upscale innovations. A well-known struggle

within industrial ecology is the implementation and upscaling of innovations, as they require a strong social acceptance and an extensive knowledge about how people interact with the innovation and with each other. Here it would be beneficial to pay more attention to a social perspective, preferably by conducting social science research. As Boons and Howard-Grenville (2009) explain: “While from its inception industrial ecology has displayed a technological bias, its development, diffusion and application has implications that can fruitfully be studied from social science perspectives”. This is important in the longer run, because energy and material flows are affected through human interaction; changes that occur in individuals’ and organisations’ socially embedded activities interrelate with changes that occur in energy and material flows, which can ultimately lead to a sustainability transition. Adding to this, taking this opportunity to use a social science approach could potentially benefit the whole field of industrial ecology, as the field knows a technological bias, which has resulted in the underrepresentation of social science research in the field. This thesis therefore has an added relevance by showing the significance of researching topics that are essentially seen as predominantly technological.

#### 1.4 Scope and boundaries

This thesis research revolves around Dutch ULLs, which means that the scope of the research is limited to the Netherlands. More specifically, the research takes a social science approach, which is typically qualitative, as well as a single case study approach. The methodology consists of expert interviews, document analysis and citizen interviews. The expert interviews will concern ULLs throughout the Netherlands, whether or not under construction or already running for some time, while the document analysis and the citizen interviews are solely focused on Reyerood+, an active ULL located in the neighbourhood Reyerood in Rotterdam. The choice for Reyerood+ will be elaborated in a later chapter. For clarity, the research (including the research questions) refers to the neighbourhood Reyerood in Rotterdam when using the name ‘Reyerood’, while the name ‘Reyerood+’ is used when referring to the ULL Reyerood+ as part of the neighbourhood Reyerood.

The focus of this research is mainly on citizens of ULLs. However, it should be noted that a city (or a city neighbourhood) as a boundary for an ULL means that different kinds of stakeholders are involved in the experiments. The most important actors involved can be grouped as public actors (regulatory role, e.g. municipality), private actors (practical knowledge and resources), knowledge institutes (expertise and scientific substantiation, e.g. university (of applied sciences)), and users (target group and behavioural definers, e.g. citizens) (Steen & Van Bueren, 2017a). Despite the primary focus on the latter group, and specifically citizens, others of the abovementioned groups will be concerned in this research to a certain extent, as there is a continuous and close cooperation between the actors.

In order to remove ambiguities, it is important to define the concept of ULLs as used in this research. It is important to mention that many similar concepts like ULLs refer to much the same kinds of experimentation in the context of social innovation. Well-known concepts are, for example, transition labs and sustainable consumption labs. However, there is no one clear definition of each, and also a scientific agreement on what constitutes an ULL seems not to exist. Where Juujärvi and Pessa (2013) mainly look at different types of living labs to define an ULL, Veeckman and Van der Graaf (2015) discuss the benefits of ULLs to form a definition, and Steen and Van Bueren (2017) and Voytenko et al. (2015) explicitly study the key characteristics to define the concept (Chronéer et al., 2019). For the sake of clarity, this thesis will solely use the concept of ULLs to also study relatable concepts, such as transition labs and

sustainable consumption labs. This is done to be inclusive and to show that the research is demarcated by the boundaries of cities. I believe that the concept of ULLs conveys this the best. Henceforth, this thesis uses the earlier stated definition of an ULL as defined by Chronéer et al. (2019). As the authors state, a clear formulation of the meaning of an ULL is essential in understanding and researching how an ULL operates and what the impact is on a sustainability transition. The Rathenau Instituut is closely involved with topics regarding ULLs and made an overview of Dutch ULLs (Rathenau Instituut, 2020). This knowledge institute aims to link science and innovation to societal issues. In the report in which the overview of Dutch ULLs is given, the authors discuss what a (successful) living lab entails and how they can develop knowledge (Maas et al., 2017). They also make a distinction between initiatives that call themselves living labs, which are open scientific research facilities, field labs of the manufacturing industry, commercial urban test facilities, and actual urban living labs. This knowledge is summarised in a map of the Netherlands with 90 initiatives that meet the criteria and conditions set by the institute (Rathenau Instituut, 2017). One important criterion is that the ULLs have to be co-creative between two or more actors such as governments, knowledge institutes, companies and citizens. Another essential criterion is that the ULLs must be focused on developing innovative solutions to societal challenges. The latter implies a diversity in themes; some ULLs are focussed on sustainability (including renewable energy, circular economy and mobility and transport), but others are focussed on age-friendly housing for elderly people, Dutch industry, poverty reduction or urban safety. A combination is also possible.

Regarding the definition of an ULL, an interesting comment that should be explicitly mentioned is about the fact that this research shows a certain 'hollowness' of the concept with regard to its use. As already shows from the fact that there is no one definition of an ULL, and as will also become apparent from the interviews, the current use of the concept of ULLs is very broad. In some cases, it seems like the concept is used as a buzzword to get the attention of different actor groups for the experimentation with socio-technical innovations in an urban setting, while there is in fact no actual case of co-creation. This topic will be debated further in relation to the outcomes of this research in chapter 5: Discussion.

## 1.5 Thesis outline

Chapter 2 presents a literature review which identifies a research gap, discusses the concept of social cohesion as main concept of the research, and explains the framework that is used to analyse the research data. Chapter 3 contains the research methodology. Subsequently, chapter 4 presents the results of the expert interviews and the citizen interviews, as well as the document analysis regarding Reyerwaard+. The discussion of the research, implications and recommendations and ideas for future research are discussed in chapter 5. Finally, chapter 6 concludes this thesis by answering the research questions.

## 2. Literature review

This chapter is divided in two parts. The first part is a literature review that aims to identify the role of social sciences (in terms of approach, methodology and research topics) and the concept of social cohesion in literature about urban living labs. The second part explains the concept of social cohesion and will present a social cohesion framework that will be used to analyse research data.

### 2.1 Social sciences in literature about urban living labs

A brief summary of the articles that were selected for this literature review, including the research perspective used by the authors and the link to a potential social science approach can be found in table 1. An elaboration on the selection of the academic sources is explained in chapter 3: Methodology.

*Table 1: The selected articles with their research perspective and their link to social sciences.*

	<b>Author(s)</b>	<b>Research perspective</b>	<b>Link to social sciences</b>
1	Ansell & Miura (2020)	Discuss the way in which platforms like ULLs can be used to help achieve government objectives.	None.
2	Anttiroiko (2016)	Discusses citizen engagement in the case of urban participatory innovation platforms.	Acknowledges that institutional conditions (can) form social behaviour in platforms and that societal conditions can form the shape and functioning of local institutions.
3	Cellina et al. (2020)	Study how a behavioural change app regarding car use reduction influenced the mobility behaviour of individual citizens in a living lab in Switzerland.	None.
4	Criollo Alvarez (2016)	Researches co-creation as a part of ULLs.	Acknowledges that social practices and social networks contribute to the elaboration of ULLs.
5	Delina (2020)	Aims to research Southern-oriented living labs and studies citizen engagement in a living lab in Thailand.	Uses qualitative research methods to research citizen engagement. States that social infrastructures of living labs can cause exclusion and that group relations can dominate experiments; this requires further research.
6	Frantzeskaki et al. (2018)	Approach ULLs with the concepts of sense of place, place attachment and community attachment to understand how ULLs can facilitate an urban sustainability transition.	Discuss concepts that are well known in social science theory and research, and use, among others, qualitative research methods to study the experiences of citizens in relation to place and community attachment.
7	Franz (2015)	Aims to show the significance of understanding ULLs in a more socially centred way.	Argues that future research should study a representative group of residents and that citizens should be

			referred to as individual human beings.
8	Lestar & Böhm (2020)	Use ecospirituality to show that urban communities are underrepresented in research.	State that an enormous research gap concerning social dynamics in urban communities regarding sustainability transitions exists.
9	Levenda (2017)	Links entrepreneurialism to responsabilisation to understand how ULLs engage citizens and what the implications of this are.	Argues that in ULLs citizens should not be approached as individuals, but rather as a social group.
10	Luederitz et al. (2017)	Propose a scheme to evaluate sustainability transition experiments.	State the importance of including changes in social structures and a shared sense of citizen ownership when evaluating transition experiments.
11	Nesti (2018)	Discusses how co-production is a part of ULLs.	Uses research methods that can be linked to social sciences, but does not use them to study citizens. Also states that characteristics of co-production require future research.
12	Scozzi et al. (2017)	Apply Urban Lab Methodology that supports ULL management to a case in Italy.	None.
13	Sharp & Salter (2017)	Focus on the impacts that ULLs have from the perspective of participants.	Use research methods that can be linked to social sciences. Also state that ULLs give opportunities for social learning.
14	Soares da Silva & Horlings (2019)	Discuss co-production in the case of citizen-led initiatives and how this can contribute to sustainable place shaping.	Conducted two in-depth interviews with initiators of a local energy initiative in Nijmegen, the Netherlands.
15	Soltani Ramezanzadeh (2019)	Designs a tool that U_CODE project operators can use to handle cultural differences when facilitating co-creation environments.	States that the influence of cultural aspects and values of citizens have a great influence on the success and effectiveness of urban co-creation.
16	Voytenko et al. (2016)	Aim to identify the key characteristics of ULLs from an urban governance perspective.	Acknowledge the importance of social and cultural processes in the impact of ULLs by stating that ULLs are capable of creating a shift in culture and people's behaviour and lifestyles.

An example of a paper specifically about the governance of ULL actors is the one by Scozzi et al. (2017). Scozzi et al. present an Urban Lab Methodology that supports ULL management, as they state that ULLs often have to deal with the management of several very different actors. The methodology is applied to an urban lab in Taranto, Italy. The authors mention that the motivations of citizens to participate in ULLs vary between financial incentives and an increase in their involvement in decision making processes. Despite their attention to the question of how citizens can be engaged in ULL management, they view the role of citizens to be rather static. This article therefore shows well what management around ULLs entails, but there is no further depth relating social processes among citizens. Ansell and Miura (2020) respond to this view on citizen engagement by stating that platforms such as ULLs are important, because



“co-production platforms may enable public authorities to engage citizens in improving delivery of government services” (p. 262). Their focus is thus on the way in which platforms like ULLs can be used to help achieve government objectives. Here, citizens are viewed as a tool to help stimulate governance, and the authors do not focus on group relations or social structures among citizens. The authors do mention challenges regarding the implementation of these platforms. For instance, this method can be used by governments to implement modes of social control. This could mean that it is difficult for citizens to carry out their wishes and to develop their behaviour in a way other than governments would prefer to see. No research has been done to confirm or contradict this. However, it is interesting to see that Anttiroiko (2016) also writes about platforms. He discusses citizen engagement when talking about the city as a participatory innovation platform. However, unlike Ansell and Miura (2020), he argues that engagement should be viewed in the context of institutional and societal conditions that can support this. Institutional conditions (a collective pattern of behaviour, norms and values) have the ability to form human behaviour, while societal conditions have the ability to affect the way in which local institutions are shaped and are functioning. What this entails exactly does not become clear from the paper, but this theory is well known in both sociology and anthropology. In contrast to Scozzi et al. (2017) and Ansell and Miura (2020), who are more focussed on the governance of ULLs, Cellina et al. (2020) are more concerned with the relationship between citizens and the government that is linked to the co-creation processes in an ULL. The authors discuss how a low receptiveness by citizens towards co-creation processes can delay the effectiveness of living lab experiments. They study an ULL in Switzerland where a behaviour change app is implemented to reduce car use. This app resulted in a collective learning process among the citizens, and Cellina et al. found that the physical boundaries of the lab resulted in more trust between the citizens and the government. Questionnaires were used to get an insight in the personal transportation use of the citizens. Despite the attention for human behaviour in their research, the aim of the authors is to map the efficiency of the behaviour change app among individual citizens, which is more of a psychological approach than a social science approach, and they therefore do not focus on social behaviour in living labs.

Except for Anttiroiko (2016), the papers described above seem to view citizens as another stakeholder group that requires to be engaged, rather than a group consisting of individual people. Other authors describe citizens as key actors in a successful experimentation, which can be seen as a step towards a social science approach. For example, Voytenko et al. (2015) state that it is important to think further than to only include new technological innovations and infrastructure in order to research sustainability in cities. They explain that a shift is also required in culture, as ULLs are focused on topics regarding (consumption) behaviour and lifestyles. They define ULLs using five characteristics, being: “geographical embeddedness, experimentation and learning, participation and user involvement, leadership and ownership, and evaluation and refinement” (p. 50). The authors mention that co-production of knowledge and ideas is an essential part of experimentation in order to change behaviour and lifestyles. They also argue that the participation of residents is highly important for the functionality of the ULLs. Even though Voytenko et al. show their awareness of the role of social behaviour of citizens in ULLs, their focus is rather on defining the characteristics of ULLs in general and on the role of policy interventions. They do not go into more detail regarding creating a shift in culture, behaviour and lifestyles and what this entails. Using a literature review and by evaluating several European ULLs, the authors perform qualitative research to answer their

research questions. This paper can therefore be a stepping stone to actual social science research.

Sharp and Salter (2017) study ULLs from another viewpoint than the previous authors. They study the perspective that participants (in this case citizens) have of the impacts that ULLs have. Citizens thus have a central and dynamic role in their research. The authors do this in a 'low-carbon living' focused ULL in Melbourne, Australia. Their research methods consist of action research, well known in the field of cultural anthropology, asset-based community development, participatory co-design and most significant change (MSC) research. These methods are all used to research the perspectives of individual participants. The authors' conclusion is that the experiments done in ULLs have the ability to create opportunities for social learning, being a transition in thinking and understanding by a community, rather than by an individual. Sharp and Salter state that "social learning, experimentation and a level of empowerment occurred, leading to real changes in participants' lives that reduced their carbon emissions to varying degrees" (p. 13). Sharp and Salter thus acknowledge the significance of understanding group behaviour and understanding how ULLs can alter participants' daily lives.

In contrast to Sharp and Salter (2017), Nesti (2018) does not study participants' perspectives, but she does put citizens at the centre of attention in her research. In her article she discusses how ULLs are connected to the concept of co-production, which she defines as: "the involvement of individual citizens and/or groups of citizens in public service delivery" (p. 310). She explains that co-production is valuable for citizens, as it creates situations that fit their needs in a cost-efficient way and situations that boost democracy and social capital. ULLs are based on co-production, but Nesti states that the connection between the two has not yet been studied thoroughly. Nesti's research is based on qualitative research methods, conducted in three ULLs in Amsterdam, Boston and Turin. Interviews were held with 'key informants', which are mostly officials from municipalities. Paradoxically, no interviews were conducted with citizens. The challenges that come from co-production in ULLs mostly stem from the viewpoint of policy-makers. Nesti acknowledges in her conclusion that a knowledge gap remains; further research is required to understand the characteristics of co-production as a part of ULLs. Soares da Silva and Horlings (2020) also discuss the concept of co-production, but they do this in the case of citizen-led initiatives. As the literature generally studies ULLs as government-led and citizen-based, this is a slightly different approach. For their research, the authors did conduct in-depth interviews among citizens and initiators of a Dutch local energy initiative in Nijmegen, the Netherlands. Other data was collected through the analysis of policy documents. The authors focus on the way in which co-production between governments and citizens of this local energy initiative can contribute to sustainable place shaping. Just like ULLs, local energy initiatives are place based and according to the authors, among others, "place shaping manifests itself [...] immaterially (via new relations between actors involved)" (p. 374). It is not explained how this takes shape exactly. Soares da Silva and Horlings do state that sustainable place shaping can be reached by "self-efficacy, local values and deviance from unsustainable practices" (p. 365).

The theory of Sharp and Salter (2017), Nesti (2018) and Soares da Silva and Horlings (2020) is taken a step further by Levenda (2019), by arguing that urban experimentation has the ability to contribute to a sustainability transition, but that a focus on systemic change is missing because the attention mostly goes to governing individual consumption. His focus is on ULL

communities and citizens specifically, where he asks himself how experiments engage citizens when they “often become experimental subjects or research participants” (p. 573). He states that ULLs do have the potential to create social support for sustainable innovation experiments, but that a critical way of engaging citizens is required; when approaching citizens as individuals, their incentive to participate is most likely going to be lower than when you approach them as a community with their own social developments. A paper that does this is written by Frantzeskaki et al. (2018). They approach ULLs with the concept of sense of place, a concept that is well known in sociological and anthropological research, as they state that the impact of ULLs can only be understood in a socio-spatial context. The authors conducted a qualitative case study research in which they found that ULLs have the ability to join a sense of change, a transformation, and a sense of place “by co-creating new narratives of place, by co-producing knowledge on new practices and new relations between people and place and by allowing the co-design of (re)establishment of places with symbolic meaning” (p. 1059). In this way, ULLs have the ability to facilitate a sustainability transition in cities, because they advance meaning of and attachment to a place. More specifically, Frantzeskaki et al. state that sense of place is established, among others, by social relations within a group of citizens, and that the experimental setting of an ULL causes changes in social relations and at the same time allows new social relations to form. Here, both the concepts of place attachment and community attachment are dealt with. The research that was conducted revolved around a longitudinal case study approach, in which research methods consisted of in-depth interviews with citizens, civil servants, policy makers and urban experts, as well as participant observation and focus groups, which are typical social science (and more specifically anthropological) research methods. The authors state that a research gap regarding sense of place remains, as this concept has not yet been studied thoroughly in relation to experimentation in ULLs. Overlap can be seen here with Soares da Silva and Horlings (2020), as both papers claim that the meaning of place is constructed by changes in existing social networks and the establishment of new social networks.

Lestar and Böhm (2020) argue that social dynamics within urban sustainability transitions have to be taken much more seriously and that research on this topic is underrepresented. The authors state that sustainability transitions are usually approached through technical innovations only, while social factors have gained too little attention among scholars. They state that it is important to see system change through understanding human (individual and social) behaviours and social practices in communities and social movements. As they mention: “the full spectrum of social analyses is still missing in the sustainability transitions framework” (p. 63). Literature on the evaluation of sustainability transition experiments is, however, emerging. Luederitz et al. (2017) propose a scheme to evaluate these transition experiments. They acknowledge the fact that in addition to, among others, knowledge, physical structures and scalability, it is important for understanding transition experiments to include changes in social structures and a shared sense of citizen ownership when evaluating them. Lestar and Böhm have used the concept of ecospirituality, which among others entails vegetarianism, to show that urban communities often need simplicity and frugality to engage in pro-environmental behaviour, which ultimately leads to a more efficient sustainability transition. They conclude with the challenge, aimed at scholars, that we need to understand and scrutinise social dynamics within urban communities in order to implement changes to business-as-usual. Franz (2015) applies this to ULLs specifically. In her article she focuses on the significance of understanding living labs in a more socially centred way. Her argument, just like Lestar and Böhm, is that ULLs have mostly been studied from a technological and

economic viewpoint, while social sciences have the ability to study ULLs as a stimulation tool for co-creation and collaboration among citizens. As she states: “Socially centred living labs take into account the local context by developing a space of encounter for the participants in the urban living lab and by implementing a set of living methods that suit both the research design and the local requirements” (p. 53). Franz uses a literature review to examine the role of social science research in the field of ULLs. While ULLs are great at including many different stakeholders, she argues that future research must ensure a representative group of residents, rather than only focusing on the most involved ones. Furthermore, she argues that citizens should be referred to in more technologically, economically and governmentally centred studies. Thus, while Franz does not use any specifically social science research methods herself, she recognises the importance of a better understanding of social processes among a total population of citizens, which can be understood in future research using a social science research perspective.

The claim of Franz (2015) that a representative group of citizens must be included in future research on ULLs suits well with the industrial ecology master thesis research of Criollo Alvarez (2016). Criollo Alvarez argues that, with co-creation in ULLs, a challenge remains in engaging passive citizens, and that it takes time to build an “arena of trust” (p. 127) in order to include a larger group of citizens in a positive way. Furthermore, she argues that ULLs are very context specific, and that for an ULL to be further developed it is required to understand citizens’ social practices and social networks. As her research created an early investigation of the topics of ULLs and co-creation, she did not research the latter in-depth. Franz’s claim also matches with Delina’s (2020) viewpoint. His aim is to focus on ‘Southern’-oriented cases of living labs, rather than ‘Northern’-oriented cases. His focus is more on rural areas and he studies a living lab case in Thailand using a mixed method ethnographic field study, with focus group discussions and interviews. Delina states that as a result of meet ups of citizens, the living lab itself is formed around both technologies and social norms of the citizens. He also claims that the social infrastructures can become “avenues for exclusion, disempowerment, and oppression due to persistent, uneven power relations and strategic behaviour of its actors” (p. 89). For example, in the researched case, exclusion was present because not all citizens were able to participate due to economic reasons. Delina warns that group relations can therefore simply dominate the experiments in living labs, disrupting a sustainability transition. According to him, further research on how social structures and group processes influence the engagement of citizens in living labs is required. Soltani Ramezanzadeh (2019) agrees on this. In her design for innovation master thesis she studies how different cultures and values of citizens influence co-creation in urban co-creation platforms. Her research is performed for the U\_CODE (Urban Collective Design Environment) project that creates places for citizens to engage in urban co-creation, in which the assignment was to assess how developed tools would perform in different cultural situations among European countries. Soltani Ramezanzadeh mentions that “the success and effectiveness of co-design sessions depends quite on the cultural values of participants”, because “the necessary information on how facilitators can engage with participants in a co-creation session [...] brings the best out of the participants” (p. 14).

## 2.2 Research gap

Literature regarding ULLs is diverse. Where some authors acknowledge (social) behavioural aspects within a community, most authors focus on the governance of the different actors that are linked to the labs or on the impacts the labs have in terms of policy-making and long term

system change. It is striking that almost all of the selected sources are about the concept of engagement and how citizens of ULLs can best be engaged to facilitate the experiments. In some cases, authors referred to the role of group relations and social structures, and a few authors used typical social science research methods, like participant observation and qualitative interviews, to gain knowledge regarding these concepts. However, it is apparent that many authors described ULLs from a management perspective, highlighting the engagement of the different stakeholder groups. Some authors mention aspects of social cohesion, of which examples are social capital among citizens and trust between actors, but social cohesion is not explicitly mentioned and is also not centred in any research regarding ULLs.

### 2.3 Defining social cohesion

In order to contribute to the identified research gap and to research ULLs and social cohesion together, it is important to define the concept of social cohesion. The framework that results from this will later be used to analyse the research data.

The concept of social cohesion originates from the field of sociology and is also one of the main theories of sociology. More specifically, Émile Durkheim, one of the founders of sociology as an academic discipline, was the first to describe theories regarding social cohesion in the 19<sup>th</sup> century. He was intrigued by how social groups were held together while the world was becoming increasingly individualistic. The context of this was a changing society as a result of 19<sup>th</sup> century industrialisation and emerging capitalism (de Jager et al., 2014).

Durkheim did not use the term social cohesion specifically, but instead referred to it as ‘social solidarity’, which can be defined as a social group’s sense of unity (Appelrouth & Edles, 2012). This concept is divided by Durkheim in mechanical solidarity and organic solidarity. Typically, mechanical solidarity describes a smaller or ‘pre-modern’ society, while organic solidarity describes a modern society. As Appelrouth and Edles (2012, p. 92) state: “Mechanical solidarity is typified by feelings of *likeness*. Mechanical solidarity is rooted in everyone doing/feeling the same thing”. This means that people living in these societies are bound together by commonalities, which Durkheim calls ‘collective conscience’ and which he describes as the “totality of beliefs and sentiments common to average members of a society” that “forms a determinate system with a life of its own” (Durkheim, 1984, pp. 38-39).

On the other hand, the concept of organic solidarity refers to larger and therefore more complex societies in which there are less feelings of likeness among people, but where society is held together by interdependence. This means that people rely on each other, despite their differences, for example as teachers, bus drivers, policemen, or even child labourers. Appelrouth and Edles (2012, p. 94) formulate it as follows: “In such situations, solidarity (or a feeling of ‘oneness’) comes not from each person believing/doing the same thing, but from cultivating individual differences and knowing that each is doing her part for the good of the whole”. The difference between the two types of solidarity is therefore not that one has a lesser or higher degree of social cohesion, but only that there is a different type of social cohesion.

Over the years, researchers have used the theory of Durkheim to investigate social cohesion further and to place the concept in a contemporary setting. However, there is no universal agreement of what social cohesion entails exactly. The current three most used definitions of the concept are by the Council of Europe (2008), the OECD (2011) and Jeannotte (2003) (table 2), however, according to Fonseca et al. (2019) these definitions do not fit the shifting



conceptions of contemporary societies. This links, among others, to different backgrounds of individuals, tolerance towards others that are “fundamentally different from them” (p. 245), and the diversity of values between individual people. Fonseca et al. therefore come up with a new definition of social cohesion that does include a multicultural element of resilient societies: “The ongoing process of developing well-being, sense of belonging, and voluntary social participation of the members of society, while developing communities that tolerate and promote a multiplicity of values and cultures, and granting at the same time equal rights and opportunities in society” (p. 246).

*Table 2: Definitions of social cohesion, expended on the basis of Fonseca et al. (2019).*

Council of Europe (2008)	“[...] the capacity of a society to ensure the well-being of all its members, minimizing disparities and avoiding marginalization”
Canadian Government (Jeannotte, 2003)	“[...] the ongoing process of developing a community of shared values, shared challenges and equal opportunity within Canada, based on a sense of trust, hope and reciprocity among all Canadians”
Fonseca et al. (2019)	“The ongoing process of developing well-being, sense of belonging, and voluntary social participation of the members of society, while developing communities that tolerate and promote a multiplicity of values and cultures, and granting at the same time equal rights and opportunities in society”
OECD (2011)	“A cohesive society works towards the well-being of all its members, fights exclusion and marginalization, creates a sense of belonging, promotes trust, and offers its members the opportunity of upward social mobility”
Schiefer and Van der Noll (2017)	“a descriptive, multifaceted and gradual phenomenon attributed to a collective, indicating the quality of collective togetherness. The essential features of social cohesion are (1) the quality of social relations (including social networks, trust, acceptance of diversity, and participation), (2) identification with the social entity, and (3) orientation towards the common good (sense of responsibility, compliance to social order)”

The criticism that Fonseca et al. (2019) have regarding the lack of a universal definition of social cohesion is often mentioned by multiple researchers. However, it is argued by Schiefer and Van der Noll (2017) that there is not much of a difference between the definitions in literature as is assumed by some researchers, and that there is in fact more overlap. Schiefer and Van der Noll study various academic literature in order to understand the several approaches regarding the definition of social cohesion, and based on this come up with their own, all-encompassing, definition (table 2). An interesting note they make is that elements such as shared values are determinants or consequences of social cohesion, and they themselves are not part of the concept. Another interesting comment is that social cohesion is not only applicable to the national level (macro; for instance, societal institutions), but especially also on the individual level (micro; for instance, personal convictions) and on the community level (meso; for instance, a group of people as part of a country). This makes the definition of social cohesion as formulated by Schiefer and Van der Noll a useful framework for analysing the research data in this thesis. They ultimately find that social cohesion entails three features.

### *The quality of social relations*

The first is social relations and the quality of them. The quality is determined by social capital (“*social networks*, i.e., the quality and quantity of social interactions with family members, friends, and acquaintances” (p. 584)), trust (between people and towards institutions, such as governments), mutual tolerance (between different groups) and participation (another word for civic engagement).

One of the most commonly used definitions of the concept of social capital nowadays is the one by Putnam (2000). He describes social capital as “connections among individuals – social networks and the norms of reciprocity and trustworthiness that arise from them” (p. 16). Here, Putnam describes two types of social capital, being ‘bonding’ social capital and ‘bridging’ social capital. Bonding social capital refers to social networks in homogeneous groups of people, while bridging social capital refers to social networks between groups of people. Because of the single case focus, bonding social capital will be of greatest importance in this research.

Trust is an important part of social relations and is often seen as a part of social capital. In the case of social cohesion, trust does not only refer to the degree of trust between people, but also to the degree of trust towards institutions (e.g. governments). This has to do with the fact that trust can be seen as an expectation that other people’s behaviour can be predicted and that this behaviour is shaped by positive intentions (Morrone et al., 2009). Schiefer and Van der Noll (2017, p. 584) explain that trust is “considered to be crucial for social development [...] and an essential element of social capital [...], since it enhances economic exchange, improves the efficiency of public institutions and provides the ground for collective action”.

The quality of social relations also contains the mutual tolerance between subgroups within a society or community. These groups can among others be based on characteristics like ethnicity, religion, lifestyle and age. Schiefer and Van der Noll (2017) state that it is important to focus, not only to the social relations within such a subgroup, but rather on the networks across these different groups within a society or community.

Finally, regarding the quality of social relations, is the component of participation. This component is also referred to as civic engagement, which entails “sense of belonging, solidarity and the readiness for mutual cooperation in the pursuit of common goals [...]”. Furthermore, social interactions in associations, political parties, unions, or non-governmental organizations strengthen shared values, sense of belonging, and trust” (p. 586)). Different kinds of participation can have different impacts on social cohesion, but participation is also easier to observe than, for example, trust and mutual tolerance.

### *Identification with the social entity*

The second feature is identification with the social entity (Schiefer & Van der Noll, 2017). In other words, attachment to and identification with a social entity (this can be any group, for instance a certain community or a country) is important in order to reach social cohesion. This also includes the attachment to a geographic location.

This is described in the concept of community attachment. Community attachment is closely linked to the concept of social cohesion, as it describes the connection between people and the group (the community) they live in. As Trentelman (2009, p. 201) explains: “It is typically used as a measure of sentiment regarding the community one lives in and an indicator of one’s rootedness to one’s community”. However, Chan et al. (2006) argue that the geographical space in which the group communicates is important to take into consideration

when discussing community attachment, as it “makes these concepts reflections of social cohesion” (p. 586). The degree of emotional attachment to a geographical space and the identification with a social entity can affect the willingness for people to take part in civil participation and social networking, which in turn can affect social cohesion.

### *Orientation towards the common good*

Finally, the third feature is the orientation towards the common good (Schiefer & Van der Noll, 2017). This can be linked to Durkheim's (1984) theories regarding interdependence and solidarity. There is an emphasis in the existent literature on the commitment that people need to have to the group and the willingness they have to let the social welfare of the group precede personal needs. Schiefer and Van der Noll (2017) explain that solidarity here means that one cares for the other, even if one does not know this person. Not only does this take place at the individual level, it also shows on the institutional level. This can be in the form of social welfare systems and subsidies. The willingness to let the social welfare of the group precede personal needs comes with a sense of responsibility towards the group, as well as compliance to the social order, rules and norms. A lack of responsibility and compliance could eventually result in higher crime rates. Schiefer and Van der Noll (2017) state, however, that it is important to formulate these elements carefully, as “assuming social order as a necessity for social cohesion overlooks the fact that modern, pluralistic societies see conflicting values, as well as the questioning of social order as legitimate constituents of political and public life” (p. 588).

## 2.4 Framework for social cohesion

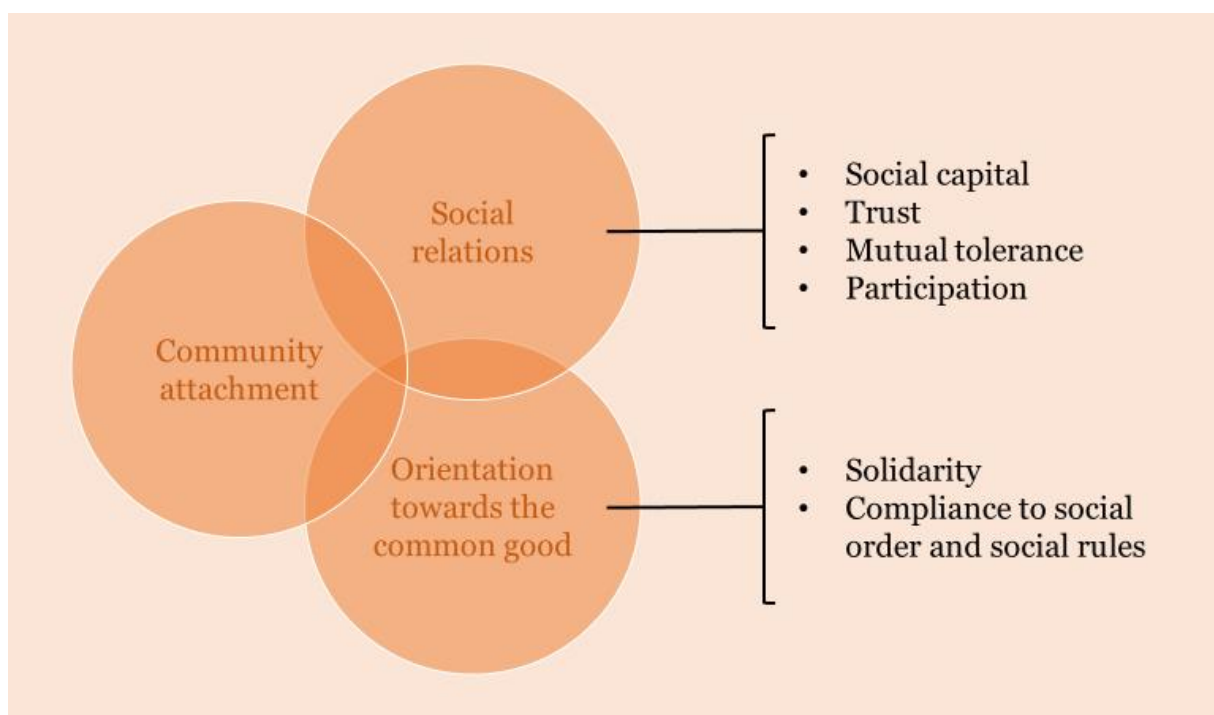


Figure 1: Framework for social cohesion (inspired by Schiefer and Van der Noll (2017, p. 591)).

The characteristics of social cohesion as argued by Schiefer and Van der Noll (2017) are summarised in the following definition:

[...] a descriptive, multifaceted and gradual phenomenon attributed to a collective, indicating the quality of collective togetherness. The essential features of social cohesion are (1) the quality of social relations (including social networks, trust, acceptance of diversity, and participation), (2) identification with the social entity, and (3) orientation towards the common good (sense of responsibility, compliance to social order) (Schiefer & Van der Noll, 2017).

The three features of social cohesion and their respective components function as a framework that will be used to analyse the research data. Using a framework gives structure to the analysis and presentation of the data, while it also gives a guideline that ensures that the analysis and presentation of the data proceed in a consistent manner. The results will be discussed using this framework in chapter 4: Results. Figure 1 shows a summary of the characteristics.

### 3. Methodology

This chapter presents the research methodology of the thesis. This entails the research approach and the methods that are used to study the topic of the thesis. The methodology is divided in three parts: a literature review part, an expert part and a case study part. The expert part, being interviews with several experts in the field of ULLs, partly functions as a basis for the case study part. In short, the case study research is done using document analysis and interviews with citizens of the neighbourhood Reyerood in Rotterdam.

#### 3.1 Research approach

In this thesis, a social science approach is applied. This approach is based on my background in cultural anthropology and development sociology. An anthropological research approach typically revolves around ethnography. Ethnography is characterised by its qualitative perspective, which means that results are expressed in words rather than numbers, and often includes in-depth interviews, focus groups, participant observation, photo-elicitation and document analysis (Hammersley & Atkinson, 2007). What methods are used exactly depends on the aim of the research and the opportunities that are available to the researcher. Furthermore, cultural anthropology and development sociology generally focuses on social behaviour and cultural aspects of population groups. Therefore, an anthropological research approach is here defined as follows: an approach in which social behaviour and cultural aspects within one or more population groups are examined, evaluated and analysed using ethnographic research methods, which are usually carried out within a specific case study in order to be able to investigate a social/cultural phenomenon in-depth and to reproduce a detailed analysis (Barnard & Spencer, 2010; Bryman, 2012; Hammersley & Atkinson, 2007).

Another approach taken in this thesis is known as a case study approach. Bryman (2012) argues that a case study approach is a prominent research design, which intensively analyses one or multiple cases. In the case of this research this is valuable, as literature that implements a social science approach to ULLs is scarce. A case study approach can help to obtain an in-depth understanding of one or more aspects of the real-life situation in an ULL. However, it is quite possible that the situation in one ULL differs from the situation in another one. Expert interviews will therefore be conducted in advance of the case selection, in order to obtain general information about cases. This information will be less in-depth than the citizen interviews, in the sense that it does not focus on citizens' experiences yet, but will function as an antecedent assessment to the actual case selection and case study research.

It is chosen to do a single case study, rather than a multiple case study, which is an intensive and in-depth analysis of one case (Bryman, 2012). This choice was only made after the expert interviews were conducted. The reason for doing a single case study are as follows. First, a single case study is less time consuming, as it takes less effort to gain access and requires less communication (Gustafsson, 2017). Second, it allows the researcher to do a more in-depth and careful study, which is an important characteristic of qualitative anthropological (or social science) research. Finally, a single case study is preferred when researching a group of people qualitatively, as it is most likely to gain an in-depth understanding of social behaviour and perceptions by these people. On the other hand, a multiple case study gives more certainty in terms of dependency and unexpected events. However, with the threat of new waves of COVID-19 infections, a single case study is now preferred because there is a high chance that



citizen interviews will have to be conducted through video calls, and this will probably take up more time and energy. Also, this is preferred in order to lower the chances of face-to-face contact.

Finally, case study research can be divided in three kinds, being explanatory case studies, descriptive case studies and exploratory case studies (Yin, 2018). This research will apply exploratory case study research, as it explores and describes an issue in a non-conventional way (Bryman, 2012). The research approach can be identified as inductive, as conclusions and theories are drawn from the results of the research.

### 3.2 Part 1: literature review

The literature review in chapter 2 aims to identify the research gap related to the general topic of ULLs and to formulate a framework for social cohesion that can be used to analyse the research data. It therefore functions as a theoretical basis for the expert interviews and the case study research. The methodology for these parts is therefore partly based on the literature review.

For the first part of the literature review, the identification of the research gap, academic journal articles were used. Because of the social science approach in this thesis, the literature review aimed to give a comprehensive overview of the role of a social science approach in research on ULLs. This means that literature with a descriptive nature regarding the meaning and characteristics of ULLs (Chronéer et al., 2019; Juujärvi & Pessa, 2013; Steen & van Bueren, 2017a; Veeckman & van der Graaf, 2015) are taken a step further. This review therefore does not present all existing academic literature in the area of ULLs, but rather covers social sciences applied to ULLs following the definition given in chapter 3.1 (Van Wee & Banister, 2016).

In total, 16 sources were reviewed. The sources were found in Scopus, an extensive online database of peer-reviewed articles, and the TU Delft repository, a database with student master theses. The following keywords or a combination of those were used: ‘urban living lab’, ‘transition experiment’, participation, urban, and co-creation. Multiple combination were tested, of which the most useful ones can be found in table 3. With the use of these keywords, in total 352 hits were found, of which some of the same sources appeared multiple times. Double hits were filtered out, and in order to select only the most appropriate sources, several selection criteria were applied. One criterion was whether or not the focus of the authors is technical (for example, papers aimed at describing or researching the efficiency of a technological innovation were not selected). Another criterion was whether or not the focus is on environmental sustainability (papers focused on other social issues, such as poverty, were not selected). Additionally, sources were selected by comparing similar hits and choosing the sources that are closest related to the problem statement and research aim. Thereby, it was chosen to select only one source per author(s) as in most cases the same concepts were discussed; the selected sources are mostly the most recent ones, because they usually refer back to the older ones. An overview of the keywords used and the amount of hits that appeared is given in table 3.

*Table 3: Keywords used and the total amount of peer-reviewed hits for the literature review.*

<b>Database</b>	<b>Keywords used</b>	<b>Total # of hits</b>	<b>Of which selected</b>
Scopus	<ul style="list-style-type: none"> <li>• ALL (“urban living lab”) AND (participation)</li> <li>• (ALL (“transition experiment”)) AND (participation)</li> </ul>	338	14
TUD repository	<ul style="list-style-type: none"> <li>• “urban living lab”</li> <li>• urban co-creation</li> </ul>	14	2

For the second part of the literature review, books and academic journal articles were used to define the concept of social cohesion and to choose the framework for the analysis of the results. The books that were used were purchased and read during my studies in cultural anthropology and development sociology; Appelrouth and Edles (2012), Durkheim (1984) and De Jager et al. (2014) provided a basis to explore the concept of social cohesion. Furthermore, the Scopus database was used to find relevant journal articles as a starting point. From there, the backward snowballing method was used to eventually use the framework by Schiefer and Van der Noll (2017) (Van Wee & Banister, 2016). Subsequently, computer tool Mendeley was used to maintain structure throughout the literature review.

### 3.3 Part 2: expert interviews

The second part of the research consists only of expert interviews. Here, several experts are interviewed with the main aim to find an ULL that can be researched in the second part of the research, being the case study part. The latter aims to research the topic of the thesis in a specific ULL. Another aim of the expert interviews is to gain general knowledge about the field of ULLs and to gain insights on the experiences of different experts that are working with ULLs regarding citizen participation, co-creation, social cohesion, resilience (in times of COVID-19), and other relevant themes.

As the aim was to find a case for case study research, there was no minimum amount of interviews set for this part of the research in advance. Ultimately, a case was selected after the third expert interview of a total of five expert interviews. This case is Reyerood+, an ULL in the neighbourhood Reyerood in Rotterdam, which will be discussed in detail in chapter 4: Results. The choice for this case only after the third interview was based on several aspects. First and most important, it was based on earlier contact that I had with a spokesperson of the municipality of Rotterdam a few months prior to the expert interviews, and the affirmative information that I received from the third expert interview. Second, even though the first and second interview were considered useful, the ULLs that were discussed with the experts were not suitable for case study research in the case of this thesis. This will also be elaborated in chapter 4: Results. Finally, the fourth and fifth interview could not be conducted before the summer holidays, and because of the availability of the experts, these were conducted after selecting Reyerood+ as a case. Therefore, these two interviews solely function as a means to gain more insights about the field of ULLs and the experiences of experts.

The experts were found by consulting the overview of Dutch ULLs made by the Rathenau Instituut as introduced in chapter 1.4 (Rathenau Instituut, 2020). The initial selection of possible expert respondents was based on the map by the Rathenau Instituut. For this selection, no restrictions were made based on place, as interviews could be conducted through video communication in case travel time would be an issue. It later became clear that, because of the COVID-19 measures, video communication would be the safest option for the

respondents as well as the interviewer. Important was that the selected experts are related to ULLs that are focused on sustainability, and that citizens play an active role in experiments. The experts in the initial selection were contacted through e-mail, which resulted in the responses of three experts in July and two experts in September of 2020. Table 4 shows details regarding these experts and ULLs.

*Table 4: Overview of the expert respondents.*

	<b>Expert</b>	<b>ULL</b>	<b>Location</b>	<b>Date of interview</b>
E1	Jacob Spaander	Ecohof Noorderveer	Zaanstad	06/07/2020
E2	Marc Holvoet	Urban Living Lab Breda	Breda	14/07/2020
E3	Daan Vermeer	Reyeroord+	Rotterdam	15/07/2020
E4	Els Leclercq	Strandeiland IJburg	Amsterdam	11/09/2020
E5	Leendert Verhoef	Marineterrein Amsterdam	Amsterdam	14/09/2020

The expert interviews are qualitative and semi-structured. First, qualitative here means that the interviews are less structured than quantitative interviews, which usually emphasises the own perspectives of interviewees (Bryman, 2012). It also means that the interviewer may depart from predefined interview questions in order to get rich and detailed answers. Second, semi-structured, as part of qualitative interviews, refers to the fact that the interviewer uses an interview guide to guide the course of the interview. An interview guide may contain a list of questions or a list of topics; in the case of this research, a list of questions was used which can be found in Appendix A1 (Dutch) and Appendix A2 (English). The questions were divided into three topics: practical questions about the specific case(s) in which the expert is involved, questions regarding social cohesion and group dynamics, and questions regarding the impact of the COVID-19 measures. The interviewer can choose to depart from the interview guide by leaving some questions out and adding new ones depending on the interviewees replies. However, approximately the same questions are asked to every respondent, because the interviewer usually sticks to the topic(s). In advance of the interviews, the respondents gave their consent to the use of their data via an informed consent form (Appendix C1).

The interviews were audio-recorded using the iPhone voice recorder app and the interviews were conducted using the video calling application Skype, by inviting the experts for an online meeting via a link. Skype was chosen because it is free and because everyone can easily access it in the desktop app or in an internet browser. The initial goal was to interview the experts face-to-face, but because of the COVID-19 restrictions it was safer for both the interviewees as the interviewer to do the interviews through video calling. It was anticipated that the interviews would not take longer than one hour, but in practice the duration of the interviews varied between roughly thirty minutes and one hour and forty minutes.

The interviews have been transcribed in order to analyse and code the data. Here, intelligent verbatim transcription has been used. This means that no changes were made in the phrasing of the respondents, but some filler words, throat clearing and laughter were omitted when they were deemed not to have added value to the research and would make the final transcript easier to read. The transcriptions were done using both Microsoft Word and oTranscribe. After transcribing, the interviews were coded using the three typical coding steps for qualitative interviews: open coding, axial coding and selective coding. This was done in Atlas.ti, a computer programme designed for analysing qualitative interviews.

For the analysis of the data in chapter 4, the expert respondents are referred to by their complete names. Because of the interviews being conducted in Dutch, the quotes in chapter 4

are translated as accurately as possible. It should be noted that in case of any doubt about the translation, the Dutch wording is leading.

### 3.4 Part 3: case study research

The final part of the research consists of document analysis and interviews with citizens of Reyerwaard. Unfortunately, neither physical nor online participant observation were possible during the research. This was due to the fact that the municipality had not planned new meetings between the municipality and citizens as a result of the COVID-19 measures. However, the neighbourhood was visited to get an idea of what the living environment of the respondents looks like. This has contributed to a better understanding and interpretation of the interviews. The aim of this part of the research is to gain insights of the experiences of citizens with ULL Reyerwaard+, their mutual communication and communication with the municipality and other actors, and finally whether or not the COVID-19 measures have impacted any of this.

First of all, document analysis is a method in which secondary documents are collected and analysed. This method is used to understand the context and activities of the ULL Reyerwaard+. The documents that were collected and analysed are newsletters from the municipality directed towards the citizens of Reyerwaard, other messages regarding Reyerwaard and/or ULL Reyerwaard+ from the neighbourhood networker of the municipality, and YouTube videos regarding Reyerwaard+. Among these videos, one is a recording of an online meeting about phasing out natural gas, which took place in December 2020. The textual documents, such as the newsletters, were obtained through one of the citizen respondents, who frequently forwarded these documents per e-mail. The YouTube videos were found by searching for 'Reyerwaard+' on YouTube. Only the recording of the online meeting was provided by another citizen respondent, as this video is not publicly available. Because the aim of the document analysis is to understand the context of Reyerwaard+, chapter 4.2 presents a summary of the aim and experiments of Reyerwaard+ as was found in the documents. This chapter ends with a short summary of the report by Joosse and Van Buuren (2020), in which the researchers studied whether the working method of Reyerwaard+ is in line with the wishes of the citizens of the neighbourhood, and whether it is enough to initiate an organisational change. This report was commissioned by the municipality of Rotterdam and was found by searching 'Reyerwaard+' in Google. Because of the possible relevance for this research topic, it was chosen to incorporate it in chapter 4.2 too.

Secondly, in total fifteen citizens were interviewed. The respondents were approached via the municipality's neighbourhood network, provided by Ilona van der Laan who works as neighbourhood networker for the municipality of Rotterdam. The neighbourhood network is a network of citizens who either regularly attend meetings regarding Reyerwaard+, participate in Reyerwaard+ in other ways, or have been in contact with the municipality for other reasons, for example for complaints about the outdoor space. The respondents were contacted through e-mail. Once an appointment was made, the interviewer provided the respondent with a link to a Skype call and an informed consent form (Appendix C2). In case a respondent was not able to participate in a Skype call, the interview was conducted by telephone. The latter was the case for two interviews. Table 5 shows details regarding the citizens.

Table 5: Overview of the citizen respondents.

	<b>Description</b>	<b>Date of interview</b>
C1	Female, has been living in Reyerwaard for 40 years, terraced-house homeowner, attended meetings of Reyerwaard+	12/01/2021
C2	Female, has been living in Reyerwaard for 4 years, apartment owner, not familiar with Reyerwaard+ but attended sustainability projects in neighbourhood, member of homeowner association (HOA)	13/01/2021
C3	Male, has been living in Reyerwaard for 43 years, terraced-house homeowner, attended meetings of Reyerwaard+	13/01/2021
C4	Male, has been living in Reyerwaard for 3 years, terraced-house homeowner, attended meetings of Reyerwaard+	13/01/2021
C5	Female, has been living in Reyerwaard for 2 years, apartment tenant, actively involved in projects and experiments of Reyerwaard+	13/01/2021
C6	Male, has been living in Reyerwaard for 48 years, terraced-house homeowner, attended meetings of Reyerwaard+ and member of the Rotterdam citizens' panel	14/01/2021
C7	Female, has been living in Reyerwaard for 49 years, terraced-house homeowner, not familiar with Reyerwaard+	14/01/2021
C8	Male, has been living in Reyerwaard for 48 years, apartment owner, attended meetings of Reyerwaard+ from role within HOA	15/01/2021
C9	Female, has been living in Reyerwaard for 40 years, terraced-house homeowner, attended meetings of Reyerwaard+	18/01/2021
C10	Male, has been living in Reyerwaard for 20 years, apartment owner, attended meetings of Reyerwaard+ from role within HOA	18/01/2021
C11	Female, has been living in Reyerwaard for 2 years, terraced-house homeowner, attended meetings of Reyerwaard+ and is open to participate in experiments	19/01/2021
C12	Male, has been living in Reyerwaard for 2 years, terraced-house homeowner, involved in neighbourhood regarding safety	20/01/2021
C13	Male, has been living in Reyerwaard for 7 years, apartment owner, member workgroup regarding renewable energy for apartment block	21/01/2021
C14	Male, has been living in Reyerwaard for 12 years, apartment owner, involved in district heating project from role within HOA	29/01/2021
C15	Female, has been living in Reyerwaard for 21 years, terraced-house homeowner, attended meetings of Reyerwaard+ and is interested to participate in experiments	01/02/2021

Just like the expert interviews, the citizen interviews are qualitative and semi-structured. Again, an interview guide was used to guide the course of the interview. For the citizen interviews, a list of questions was used which can be found in Appendix B1 (Dutch) and Appendix B2 (English). The questions were divided into four topics: questions about the experience of living in Reyerwaard, questions regarding the citizen's participation in the neighbourhood and Reyerwaard+ specifically, questions regarding the communication between the municipality and other actors, and finally questions regarding the communication among citizens. All categories contain question regarding the potential impact of the COVID-19 measures. The duration of the interviews varied between roughly 30 minutes and one hour.

In advance of the interviews, the respondents gave their consent to the use of their data via an informed consent form (Appendix C2). Three respondents indicated that their name should not be used in the report, and two respondents indicated that no audio recording should be made, of which some are overlapping. In case of the latter, written notes were taken during the interview. These were typed out directly after the interview. If an audio recording was



made, this was again done using the iPhone voice recorder app. For transcription, again intelligent transcription has been used. The transcriptions were done using both Microsoft Word and oTranscribe. After transcribing, the interviews were coded using the three typical coding steps for qualitative interviews that were also used for the expert interviews. This was also done in Atlas.ti.

For the analysis of the data in chapter 4, the citizen respondents are referred to by the letter and number combination in front of their names in table 5. Because of the interviews being conducted in Dutch, the quotes in chapter 4 are translated as accurately as possible. It should be noted that in case of any doubt about the translation, the Dutch wording is leading.

### 3.5 Data management plan

In order to secure careful handling of research data, a data management plan was set up. This entails all details about data storage during and after the research and the sharing of data. The research done in this thesis is considered to have a low risk to the data subjects. This means among others that no sensitive personal data was gathered and processed. The personal data that was however processed are signed consent forms, audio recordings and the transcripts of interviews. This data is solely shared with the supervisors of the thesis.

Furthermore, several types of data saving have been used to store the personal data. The thesis report and other text-based files were initially saved in OneDrive, allowing the saved files to be up-to-date at all times. These files were regularly saved locally and in Google Drive. More importantly, transcribed and coded interviews and other personal data were saved on a USB flash drive with SanDisk SecureAccess™ software. This software creates a private vault that can only be accessed by a personal password, in which files are automatically encrypted. 7-zip is used to save this personal data locally, by compressing the data and setting a password to view and edit the files. Specifically, the coded interviews are protected with a password in Atlas.ti, and a backup of the complete Atlas.ti library and project bundles are saved in the private vault on the USB flash drive. To make sure that the data is saved for a minimum of ten years after the end of the research, the data will be saved in the same way, being locally as encrypted 7-zip files and in the personal vault on the USB flash drive. It is important to mention that the audio recordings have been deleted as fast as possible after the transcriptions were made and were coded.

## 4. Results

### 4.1 Expert interviews

Five expert interviews were conducted in total, which in the first place aimed to find a potential case, and in the second place to gain foundational insights on the research topic. After an introduction to the respondents and the ULLs in which they are active, the data from the interviews is analysed using the framework of Schiefer and Van der Noll (2017) as described in chapter 2.

#### *Practicalities of respondents and ULLs*

Table 6: Overview of the ULLs the experts are involved in.

Expert	ULL	Summary
Jacob Spaander	Ecohof Noorderveer	<ul style="list-style-type: none"><li>• Type of ULL: ecovillage, bottom-up</li><li>• Phase: yet to be implemented, regular consultation with future citizens, municipality etc.</li><li>• Main theme: sustainability</li></ul>
Marc Holvoet	Urban Living Lab Breda	<ul style="list-style-type: none"><li>• Type of ULL: city level, bottom-up</li><li>• Phase: start-up</li><li>• Main themes: healthy living environment, quality of life, energy transition, circularity</li></ul>
Daan Vermeer	Reyeroord+	<ul style="list-style-type: none"><li>• Type of ULL: neighbourhood level, top-down</li><li>• Phase: active conduct of experiments and encouraging of citizen participation</li><li>• Main themes: energy transition, circularity, health, living environment</li></ul>
Els Leclercq	Strandeiland IJburg	<ul style="list-style-type: none"><li>• Type of ULL: future district level, top-down</li><li>• Phase: start-up</li><li>• Main themes: sustainability, accessibility, temporality, architecture</li></ul>
Leendert Verhoef	Marineterrein Amsterdam	<ul style="list-style-type: none"><li>• Type of ULL: city quarter (commercial, no housing yet), top-down</li><li>• Phase: start-up, several experiments running</li><li>• Main themes: urban problems, like energy transition, mobility, health</li></ul>

Table 6 shows a short overview of the ULLs that the expert respondents are involved in. This is divided in what type the ULL is, the phase in which it is currently working, and the main themes the ULL is concerned with.

The first expert interview was conducted with Jacob Spaander, president and future citizen of Ecohof Noorderveer. Ecohof Noorderveer is a yet to be implemented ecovillage in the municipality of Zaanstad. The ecovillage can be labelled as an ULL, as its aim is to perform sustainable innovation experiments in order to create a living environment that is as sustainable as possible, while at the same time to function as an example for other projects. The ULL is not yet implemented, but future citizens have been coming together for years. Thereby, the site, an old school area, is already agreed on. The project is currently in contact

with different actors, among which are the municipality, the province and the water board. Because the ULL will have both owner-occupied and rental properties, Jacob hopes that people with different economic possibilities will be able to join. Ecohof Noorderveer is mainly concerned with sustainability. Because the idea of the ecovillage comes from the future citizens, this ULL has a bottom-up approach.

Urban Living Lab Breda takes a completely different approach. This ULL includes the whole city of Breda. The second expert interview was conducted with Marc Holvoet. He is landscape architect and supervisor in higher education. Urban Living Lab Breda is the first ULL in which he is actively involved. He is a member of the core team. Marc Holvoet explained that the ULL is quite new and that there have not yet been opportunities to bond with citizens extensively. However, for now the aim of the ULL is to form a consortium in which all parties resemble each other. At the moment, most of those involved are the municipality of Breda, schools, such as the Avans university of applied sciences, (commercial) companies, and social organisations, such as the Transitiehuis, in which active citizens concern themselves regarding transition issues. The main themes covered in the ULL are healthy living environment, quality of life and energy transition. The ULL is currently doing projects concerning sustainability and circular flows, communication between stakeholders and implementing technology for mobility in the city and to close waste processes. Because Urban Living Lab Breda has been drawn up independently of the wishes of governments and functions as a mediator between several actor groups, among which are governments and citizens, the approach taken can be seen as a bottom-up approach.

Daan Vermeer is the third and only respondent that works for a municipality, being the municipality of Rotterdam. He is actively involved in Reyeroord+, an ULL in the neighbourhood Reyeroord in Rotterdam. The municipality initially had the ambition to phase out natural gas in the neighbourhood and to replace the sewage system, but both the municipality and the citizens saw this as an opportunity to experiment with sustainable innovations in order to create a sustainable living area. Daan Vermeer is in close contact with citizens and also explained that Reyeroord+ is a very active ULL. The bigger projects in the neighbourhood are phasing out natural gas, replacing the sewage system and creating a big water storage in the neighbourhood's central green belt. These projects are combined with experiments in which citizens are involved, of which an example is smart rain barrels that are connected to internet and relieve the sewage system by gradually discharging water. Furthermore, Daan Vermeer states that themes that are indicated as important by the citizens are mostly concerned with the spatial environment, for example community playgrounds and biodiversity. The vision of the municipality is to upscale the lessons learnt in Reyeroord to the whole city of Rotterdam. Because Reyeroord+ is initiated by the municipality of Rotterdam, the ULL takes a top-down approach.

The fourth interview was held with Els Leclercq. In her job as urban designer and researcher, she participates in projects related to the circular economy at TU Delft and AMS Institute. She is closely associated with the development of ULL Strandeiland IJburg in Amsterdam, which will be the largest future city district of Amsterdam when building is finished in 2040. Els Leclercq maintains close contact with citizens and the municipality of Amsterdam. The municipality aims to involve citizens, entrepreneurs, governments and other experts to execute the district as an ULL. A special participation process is designed to do this. The main themes covered in the ULL are sustainability, accessibility, temporality and architecture. As the principles for Strandeiland IJburg were established by the municipality, this ULL takes a top-down approach.

The final expert respondent, Leendert Verhoef, is a living lab developer at AMS Institute for the city quarter and test area Marineterrein in Amsterdam. Here, open innovation, special living arrangements, sports, recreation and a green environment are emphasised. This ULL is active but still developing, as there has not yet been found a way to actively involve citizens in experiments. However, citizens, mostly Amsterdam youth, currently enjoy the place as swimming paradise in summer. The aim of the Marineterrein is to eventually find a way to involve the citizens in ULL experiments, and to increase the role of citizens' interests in decision-making and experimenting along with other actors. Bureau Marineterrein Amsterdam is responsible for the management of the development of the Marineterrein. Because they work on behalf of the national government and the municipality of Amsterdam on the aim and vision of the Marineterrein, the approach taken can be seen as a top-down approach.

### *Social cohesion according to the experts*

A number of points emerged from the interviews of which the respondents stated it to be important for a properly functioning ULL. It is important to note that Jacob Spaander is the only respondent out of the five who talked about his experience in working with different actor groups as both an expert in the field and a citizen himself. This may have affected his answers. In total, eleven code groups have been created in Atlas.ti, which can be seen as a summary of the topics that were discussed in the interviews. The three code groups 'Practicalities of ULLs', 'Important aspects of ULLs' and 'Role of respondents in ULL(s)' are more general, while the other eight refer to specific themes. The code groups, their descriptions and the amount of codes in the group can be found in table 7. It should be noted that some codes appear in multiple code groups, because they comprehend multiple themes.

These aspects of a properly functioning ULL largely correspond to the characteristics within the framework of social cohesion by Schiefer and Van der Noll (2017). These characteristics are the quality of social relations, identification with the social entity and orientation towards the common good.

*Table 7: Code groups of expert interviews.*

	<b>Code group</b>	<b>Description</b>	<b># of codes</b>
1	Aligning expectations	The respondents' vision on (the importance of) aligning the expectations of all different actors.	75
2	Collaboration with actors	The respondents' vision on the collaboration with actors.	122
3	Effects of COVID-19 measures	The respondents' vision on how COVID-19 measures affected the collaboration between actors and the experiments in ULLs.	33
4	Important aspects of ULLs	The respondents' vision on what makes a good ULL.	26
5	Practicalities of ULLs	Practical information about the ULLs.	38

6	Relationship with citizens as a group	The respondents' vision on how the relationship with citizens as a group is or should be maintained by other stakeholders.	12
7	Relationship with municipality	The respondents' vision on how the relationship with municipalities is or should be maintained by other stakeholders.	60
8	Respondent experience of online meetings	The respondents' experience of online meetings due to COVID-19 measures.	33
9	Role of respondents in ULL(s)	The respondents' function in ULLs.	21
10	Social dynamics	The respondents' vision on the group dynamics in ULLs, either between actors or among citizens.	48
11	Vision and goals of actors	The respondents' vision on the, whether or not equal, visions and goals of actors in ULLs.	25

### *The quality of social relations*

The quality of social relations is by far the most important aspect for the experts and it can be found in the code groups 'Aligning expectations', 'Collaborations with actors', 'Important aspects of ULLs', 'Relationship with citizens as a group', 'Relationship with municipality' and 'Social dynamics'. Schiefer and Van der Noll (2017) divide the quality of social relations in the elements of social capital, trust, mutual tolerance and participation.

Regarding social capital, the respondents stated the importance of a close relationship among all different actors. Jacob Spaander also emphasised the importance of positive group dynamics among citizens. As both Jacob Spaander, Marc Holvoet and Daan Vermeer said, regular physical contact with and among citizens is crucial to secure strong social dynamics between actors and among citizens. Marc Holvoet stated: "[...] we just have to build a long-term relationship with the city, at neighbourhood level or at any level. We will simply investigate what is going on, asset-based, and we need to know what people need and what kind of questions people ask. And then we will try to unite that." In general, all five respondents stated that building a long-term relationship, having an equal mindset, involving citizens in decision-making and experimenting, and taking a qualitative approach are the most important aspects that make a good ULL. More specifically, Jacob Spaander stated that the future citizens of Ecohof Noorderveer have built a close bond with each other and a close affiliation with the project over time, which has resulted in a high degree of trust in the group. He explained: "Eventually, the group that we currently have is a very close group that feels very connected to each other and to the project. And well, that is a good basis to collectively move further." Daan Vermeer also mentioned the good contact between citizens in Reyerwaard. He stated that citizens regularly meet at Oeverloos, a community garden that presents itself as communal growth- and learning lab. Citizens come here to meet each other, but also to talk with spokespeople from the municipality.

Regarding the element of mutual tolerance, Schiefer and Van der Noll (2017) state that it is important to focus not only on the social relations within a subgroup, but rather on the networks across different groups within a community. Els Leclercq stressed this by explicitly mentioning the importance of a proportional power distribution between a municipality and citizens, because, as she stated, collaboration, being the basis of an ULL, is not possible when there is a vertical power relation instead of a horizontal power relation. Leendert Verhoef responded to this by stating: “It requires energy to ensure that a professional party talks to a citizen as an equal party. As a municipality, it is very easy to talk to a citizen as, let’s say, a customer of the municipal services.”

Both the elements of social capital and mutual tolerance seem to be important for the overall trust between actor groups, which in turn can be beneficial for the benevolence of citizens to participate in experiments of the ULLs. Regarding trust within the community, Jacob Spaander stated that the basis of a shared goal, the aligning of expectations, and the fact that citizens are willing to make sacrifices for the group, results in a trusting group of people. The latter can be linked to the third characteristic of social cohesion regarding orientation towards the common good.

### *Identification with the social entity*

The identification with the social entity is difficult to define in the case of the expert interviews. This topic is less relevant for the experts who do not live in the community that they are working with. However, aspects of this element can be found in the code group ‘Social dynamics’ in the form of community attachment, a concept that Schiefer and Van der Noll (2017) identify as part of identification with the social entity.

Jacob Spaander does have a high identification with the social entity and a high feeling of community attachment, because he communicates with future citizens of Ecohof Noorderveer as a future citizen himself. This explains why 35 of 48 codes about social dynamics come from the interview with Jacob Spaander. He explicitly mentions topics such as group energy, group stability and group solidarity multiple times when referring to the relationship among citizens. Because Jacob Spaander is part of this community as a citizen himself and because he’s also actively involved, he experiences a strong community attachment.

The four other experts do not have the roles of both expert and citizen. Even though this should not be a necessity for a good functioning ULL, it could potentially be a disruptive factor in the communication between actor groups. The emotional attachment to a geographical space being less than that of citizens, as is also described by Schiefer and Van der Noll, could result in different interests and different expectations of one another. This could in turn affect the quality of social relations. Els Leclercq indicated this by means of her example about ULL Strandeiland IJburg, about which she explained: “[...] in all the projects that we have seen, you can also see the missing social cohesion, if you want to put it that way, between the municipality and citizens who want to get something done. There is just a very big gap there and a lot of frustration.” This results in less trust in each other’s capabilities. An overlap can be found in the orientation towards the common good.

### *Orientation towards the common good*

The orientation towards the common good is mostly described in the code group ‘Vision and goals of actors’. Schiefer and van der Noll (2017) divided this final characteristic of social cohesion in the elements of solidarity and compliance to social order and social rules. The latter



is not applicable in case of the expert interviews, however, solidarity emerges as important theme from the vision and goals of the actors.

A good example of this feature is given by Marc Holvoet. He stated that the aim of Urban Living Lab Breda is to support the needs of the citizens in the city of Breda by using an asset-based approach. This means that the ULL builds their projects on the ideas and needs of the citizens, instead of implementing projects without consulting the citizens. Daan Vermeer agrees on this approach. He explained that the aim of the municipality is to facilitate the ideas of the citizens of Reyerwaard. Regarding phasing out natural gas he stated: "That will happen anyway. For the time being, [the citizens] can still choose not to connect their homes to it, the heat network, but eventually it will have to happen. So there are things that are going to happen anyway, no matter what the citizens think about it. But we will always make sure that the citizens can talk about it with us and express their ideas." Daan Vermeer emphasised that citizens ultimately see this as beneficial for the common good of the neighbourhood as well. Els Leclercq took a different position on this subject. As stated in the previous social cohesion characteristic of identification with the social entity, she explained that in ULL Strandeiland IJburg there is a gap between the interests of the municipality and the interests of the citizens, which results in frustration between the actor groups. She thinks that the municipality wants to implement their own ideas for the development of Strandeiland, without using the existing networks in the neighbourhood or looking at the needs of the citizens. However, she stated that at the same time citizens in general should have a more active role in the sustainability transition, instead of relying too much on governments. In these cases the common good does not seem to precede the personal needs, however, all actors involved could have the feeling that their approach is beneficial for the common good in some way, even though the approaches do not match. Finally, Leendert Verhoef added to this by stating that it is essential for the solidarity within ULLs to actively engage citizens: "I think [engaging citizens] is essential for living labs. Otherwise they are not really that 'living'. Then I would rather think that it's some kind of field lab, or some kind of experiment or trial by the municipality."

### *The impact of the COVID-19 measures according to the experts*

The three characteristics of social cohesion as described by Schiefer and Van der Noll (2017) can also be used to describe the impact of the COVID-19 measures on the social cohesion in the ULLs.

### *The impact on the quality of social relations*

According to the experts, the COVID-19 measures affected the quality of social relations the most. Jacob Spaander and Daan Vermeer stated that the quality of social relations was good before the COVID-19 measures. However, during the measures both the communities in Ecohof Noorderveer and Reyerwaard+ had to arrange their meetings online. As Jacob Spaander explained: "[...] you notice that when you meet up through a screen, you revert to the bond you already created with each other a lot, but you do have to try to find that connection." He explained that this causes a distance that would otherwise not have been there. However, he thinks that this ultimately contributes to the cohesion of the group, because the group is sharing an experience. Therefore, he believes it is best for the group to accept the situation. As stated earlier, Jacob Spaander explained that the basis of a shared goal, the fact that citizens are willing to make sacrifices for the group and the aligning of expectations results in a trusting group of people. This did not change as a result of the COVID-19 measures.

In the case of Reyeroord, Daan Vermeer thinks that citizens are most likely to meet and talk to each other even more often, as many people are working from home and meet each other during their daily walks. Thereby, he has seen an increase in people's awareness of the situation and environment in their own street. Since the COVID-19 measures, there have been more applications for subsidies to 'brighten up' the neighbourhood. This may indicate an increase in civic engagement and this overlaps with both the identification of the social entity and the orientation towards the common good.

Despite this, Daan Vermeer sees a different trend when looking at the quality of social relations among all actor groups. His overall view is that the contact between the municipality and actors apart from the citizens has watered down as a result of the COVID-19 measures. Nevertheless, according to Daan Vermeer the communication between the municipality and the citizens has changed its form, but has not necessarily decreased. He explains that, especially in the first few weeks of the COVID-19 measures in 2020, the municipality spoke less with citizens due to uncertainty of the situation. He explained: "A lot had really come to a standstill. I'm thinking of what projects exactly, but everything kind of went into a pause, because nobody knew how long it would last." However, after this initial uncertainty, he noticed that he himself took more time for citizens in online conversations than he did when he was in the neighbourhood prior to the measures. Despite this, he would choose physical contact with the citizens over online contact. For meetings with his colleagues at the municipality, he would like to have a combination of online and physical meetings, because this would allow him to easily dial in from any place, for example the neighbourhood.

The other experts agree with this positive side of online meetings when it comes to actor groups apart from the citizens. Marc Holvoet states that online meetings are ideal for short appointments, because it saves travel time. Els Leclercq was also not hindered by the online meetings. Her meetings with AMS continued online, as well as the communication with the municipality. Leendert Verhoef mentions that, where the time availability of different actors previously could not be matched (e.g. civil servants work during the day, while citizens are mostly only available in the evenings), this is now easier because most people are working from home. As he stated: "It's not so easy to bring all those parties together in one evening, or to entice the citizens to come during the day. Maybe working from home makes that a little easier, because we're all at home."

Finally, regarding participation, Els Leclercq mentioned that the online participation of citizens was a success. An online participation process was organised to question citizens about their ideas for a new beach, to which many replies from citizens were received and roughly 700 votes were cast. On the other hand, Leendert Verhoef mentioned that multiple projects were not able to continue. This was a result of the disappearing role of citizens in the experiments because of the social distancing measures. This in turn put a (temporary) stop to citizen participation. It therefore depends on the case if civic engagement was increasing or decreasing.

### *The impact on identification with the social entity*

The identification with the social entity is again difficult to define in the case of the expert interviews. However, Jacob Spaander stated that the group energy, stability and solidarity were already strong in Ecohof Noorderveer before the start of the COVID-19 measures. He thinks that this is the main reason that the degree of community attachment did not change for him or others in the community.

With the case of Reyerwaard, Daan Vermeer demonstrated that people's awareness of the situation and environment in their own street increased as a result of the COVID-19 measures, and that this led to an increase in the amount of applications for subsidies to enhance the neighbourhood. In Reyerwaard, the COVID-19 measures stimulated civic engagement because of a new emphasis on citizens' living environment. It is likely that the community attachment of these people grew as a result of a stronger attachment to the geographic location (Schiefer & van der Noll, 2017).

#### *Orientation towards the common good*

According to the experts, the situations that they described regarding the solidarity that the different actor groups did or did not have prior to the COVID-19 measures did not change as a result of the measures. However, the example of Reyerwaard by Daan Vermeer can again be used to demonstrate that the COVID-19 measures could have impacted the orientation towards the common good positively. The increase in the amount of applications for subsidies to enhance the neighbourhood shows that citizens are not only concerned with their own gardens, but also care for their whole street or even the neighbourhood. The fact that there are subsidies available to do this proves that this solidarity does not only take place on the individual level, but on the institutional level as well (Schiefer & Van der Noll, 2017).

#### **4.2 Case introduction: Reyerwaard+**

The expert interviews that were conducted in the previous part of the research aimed to find ULLs that could potentially function as cases for the second part of the research. Based on the expert interviews, Reyerwaard+ in Rotterdam was chosen as case. This choice was based on the facts that Ecohof Noorderveer (Jacob Spaander) and Strandeiland IJburg (Els Leclercq) are under construction, Marineterrein (Leendert Verhoef) has not yet found a way to actively involve citizens in experiments, and Urban Living Lab Breda (Marc Holvoet) is covering the whole city of Breda, which is too broad for this research. Furthermore, Daan Vermeer was able to provide information regarding multiple actor groups, including the citizens of Reyerwaard. This creates the opportunity to obtain a thorough overview of the case when it is supplemented with the experiences of citizens.

#### *The aim of Reyerwaard+*

Reyerwaard+ has been active as an ULL since 2018 and is initiated by the municipality of Rotterdam. It is located in the neighbourhood Reyerwaard, in the city of Rotterdam (figures 2 and 3). The name Reyerwaard+ refers to the fact that the ultimate goal of the municipality is to experiment with sustainable innovations in Reyerwaard and to eventually implement the knowledge across the borders of the neighbourhood, in order to reach a future proof city.

As the neighbourhood has to phase out natural gas, and as the sewage system requires replacement, the municipality and citizens of Reyerwaard see an opportunity to work on issues relating the energy transition and the circular economy (Gemeente Rotterdam, 2020). Actors such as entrepreneurs, citizens and active parties in the neighbourhood (such as supermarkets, healthcare institutions, churches and schools) work together with the municipality of Rotterdam on several experiments.



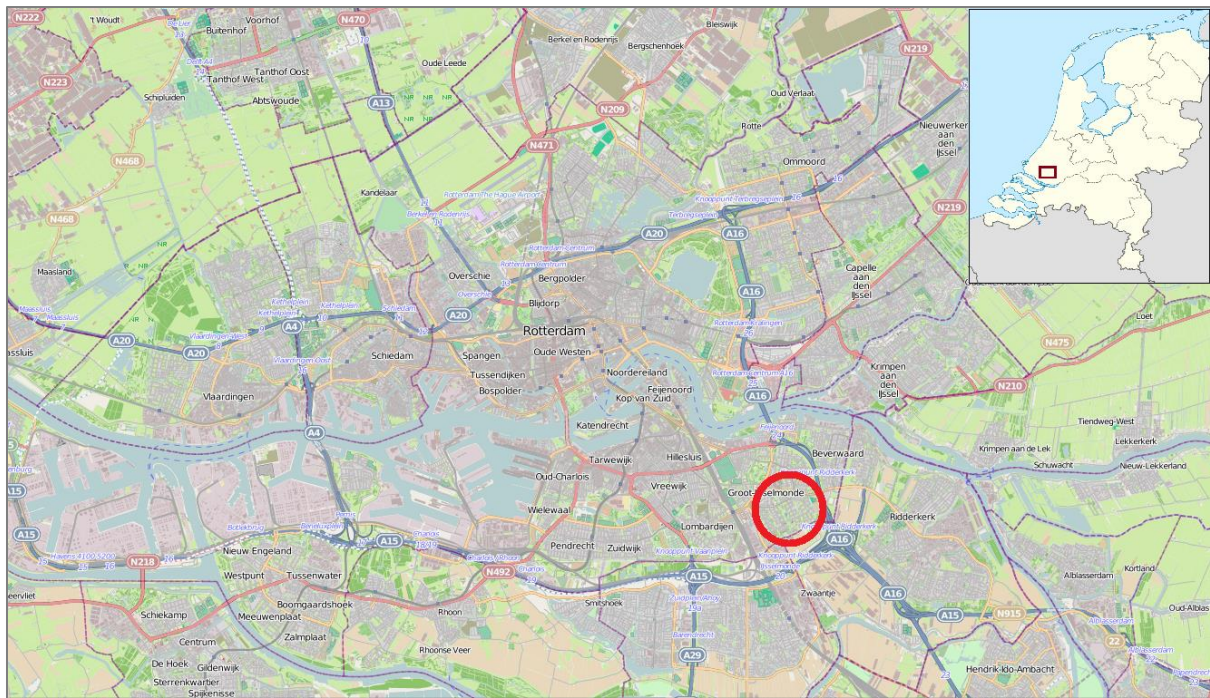


Figure 2: The location of Reyerwaard in Rotterdam (Wikipedia, 2018).

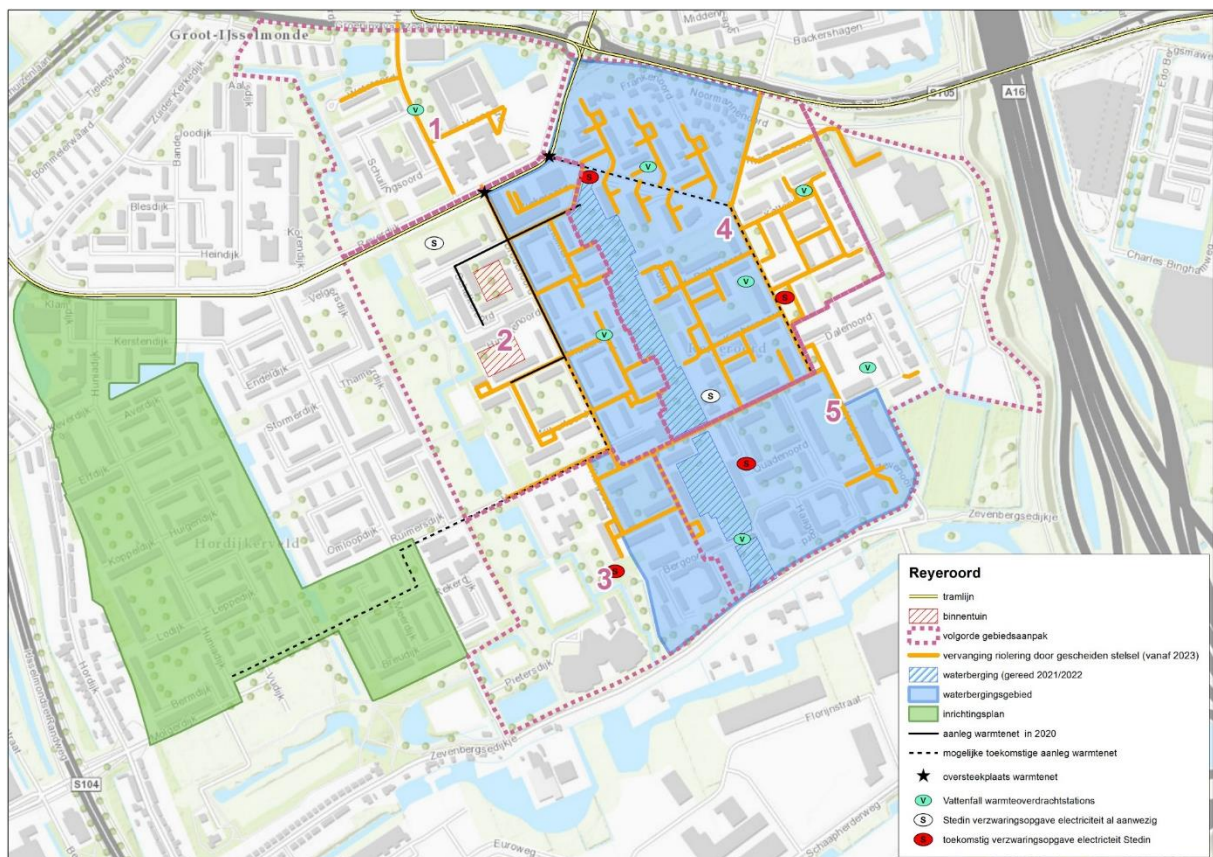


Figure 3: Map of Reyerwaard and its area approach and development plan for district heating.

## *Experiments*

The experiments of Reyerwaard+ can be divided into four sub categories, being phasing out natural gas, the green belt and water storage, renewable energy, and circular use of materials.

### *Phasing out natural gas*

Houses in Reyerwaard are currently heated using natural gas. Because of the ambition of the Dutch government, and therefore the municipality of Rotterdam, to phase out natural gas completely by 2050, a transition to district heating will be made in the next couple of years. Heat from the Port of Rotterdam will be used for this. Reyerwaard, together with four other neighbourhoods, serves as a pilot neighbourhood for the municipality because it can be combined with the replacement of the sewage system (TV ZUID, 2021).

Most houses in Reyerwaard are built between the 1960s and the 1980s, which means that they are not fit to be heated with a lower temperature, as is the case with a heat pump or geothermal heat (Stadsontwikkeling Rotterdam, 2021). District heating thereby supplies the same temperature heat as is the case with a central heating system, which means no additional adjustments need to be made. For the adjustments that eventually have to be made, the municipality asks a one-time payment from the citizens. Citizens who can't afford to pay this, but do want to join in the energy transition, are supported by the municipality in the form of financing arrangements.

Information about what district heating means for the citizens of Reyerwaard was given during an online information meeting in December 2020 (Stadsontwikkeling Rotterdam, 2021). Citizens were able to send their questions beforehand, but there was also time for questions during the meeting. A majority of these questions were about possible changes that will have to be made inside the houses and about the costs.

### *The green belt and water storage*

The experiments in the green belt and the water storage can be seen as a combination project, because they mostly take place in the same area of the neighbourhood, being the central green belt. The main aim for this area is to implement a large scale water storage for flood prevention, which will ultimately affect roughly 1600 households. For the design of the water storage, the municipality organised two online meetings to inform citizens and ask for their input. The municipality gave the citizens two options each, after which the citizens could indicate their preference. The design options they could choose from included a straight or a sloping watercourse, a lawn or a flower meadow, a culvert or a bridge, a semi-paved footpath or a paved footpath, and trees in groups or in lines.

The preferences of the citizens and other input was summarised by the municipality and sent to the citizens a couple of weeks after the meeting. The wishes of the citizens that participated in the meetings are divided in four themes: pleasant living environment, water, growth and flowering, and playing. The wishes for a pleasant living environment are mainly about safety, among others for playing children, regarding scooters and cyclists, and regarding the prevention of creating dark places. Regarding water, the citizens wish to see a natural looking water storage. For growth and flowering, the greenery in the neighbourhood is much appreciated by citizens. This will therefore be retained or even expanded. Citizens want better green space management, because they feel this has deteriorated in recent years. The wishes for playing are mainly centred around more play areas for children and less dog dirt.



The municipality is aware that citizens want action. The citizens would prefer not to have another meeting, but would rather see ideas being worked out. The municipality is therefore currently working towards a final design.

Apart from the water storage, several experiments have taken place in the green belt. These experiments have been done with the involvement of several actors, among which are the municipality, citizens, contractors and foundation Tussentuin that organises the activities at Oeverloos, see figure 4 (Stichting Tussentuin, 2021). The role of Tussentuin is to develop a vision for the green belt, with co-creation with citizens as foundation. The aim of Oeverloos is not only to change the green belt into a meeting place for citizens, but also to create awareness among citizens regarding the energy transition and the water storage.



Figure 4: Oeverloos in Reyeroord (Stichting Tussentuin, 2021).

Furthermore, a dog play area has been built in the green belt, which originated from an initiative from citizens. The aims for this dog play area are to create a meeting place for citizens and to create a place for dogs to play without leaving dog dirt in play areas for children. This project was subsidised by the IJsselmonde area committee. The gardener at Oeverloos takes care of the greenery, but is also concerned with the social aspect. This is mainly the engagement of local citizens. According to the involved parties, the project creates a “kind of ownership in the public place” (TV ZUID, 2020a).

Another experiment in the green belt is the Magical Playground (‘de Magische Speeltuin’). This is a piece of green space between two primary schools. Both pupils and teachers wanted to be able to go outside to play and teach. The pupils themselves designed the area and the municipality used this design to arrange the surroundings. This was mainly done



with reused materials, such as wood and trees, but a leftover sewer pipe was used for the playground as well. In addition, there is a bench that is meant to charge your phone by means of solar energy generated by the solar panels in the bench (figure 5). The municipality stresses that children are the future of Reyerood and that it is important to get them involved in the experiments of Reyerood+ (Rotterdam Circulair, 2021). With this involvement, the municipality hopes to ultimately create a sense of involvement in the public space among children. They state that this contributes to the total ownership and involvement in the neighbourhood. The main challenge regarding this experiment and the engagement of citizens in general, as the municipality states, is the constant attention that a project requires in order to keep citizens interested. An experiment like this can therefore also be seen as an experiment for the municipality regarding citizen engagement.



*Figure 5: Solar powered bench in the Magical Playground (Rotterdam Circulair, 2021).*

### *Renewable energy*

The solar powered bench in the Magical Playground is an example of renewable energy related experiments in Reyerood+ (figure 5). Another experiment regarding renewable energy is the Park of Tomorrow ('het Park van Morgen'). This part of the green belt is decorated with a walkway surrounded by many small lights that get their electricity from the bacteria around plants. This innovation responds to the idea of plants making nutrients on which bacteria grow. The bacteria in turn emit a small amount of electricity on which the lights work. This technology is created by Plant-e, a company from Wageningen, the Netherlands. The citizens were involved in the experiment by asking for their input regarding benches and further development of the area.

Regarding this experiment, the municipality has indicated that they are aware of the fact that not all citizens are familiar with the concepts of energy transition and circularity (Rotterdam Circulair, 2021). It was stated that the municipality should try to use these concepts not too often in average conversations, but to make the concepts concrete and tangible. This will be done by stressing the role citizens can take, for example in the topic of food waste. The municipality started the 'golden campaign', a campaign with, among others, golden logos and golden garbage trucks, to show that waste is valuable. According to the municipality, research shows that many Rotterdam citizens know about this campaign.

Another experiment regarding renewable energy is the CENT-R (Rotterdam Circulair, 2021). The CENT-R is a special pole that was devised by one of the lighting tower managers of

the municipality. He noticed how there was an increase in the amount of objects placed in the outdoor area, such as charging stations, sensors and cameras. To avoid crowding of these objects, the lighting tower manager designed a unit which combines multiple of these objects. This means that if one component breaks it can be replaced more easily and it requires less materials. The unit was developed in collaboration with Lightwell and currently three units have been installed as an experiment.

The CENT-R is connected to The Walker, an energy-generating floor by the company Energy Floors. The company uses the pavement as an energy-generating surface (TV ZUID, 2020b). The Energy Floors consist of solar panels and an energy-generating dance floor; they are interactive panels with sensors and LED lighting. The added value of The Walker is that it can be used to encourage exercising through playing and dancing, but energy is still generated via the solar panels when the product is not in use. According to Michel Smit, the CEO of Energy Floors, Reyroord offers a climate where these kinds of innovations can be experimented with. The energy generated by The Walker is stored in one of the CENT-R units.

### *Circular use of materials*

As is stated on the website of the municipality of Rotterdam, all objects and materials (including water) in public areas are used as circular as possible (Gemeente Rotterdam, 2020). One experiment concerning the circular use of materials is called 'In de Rey van Morgen'. Here, the municipality is testing how they can use their own materials in a circular manner. Among other things, it has been tested how pavement tiles can be reused by replacing them, either by using them upside down or by using them in the building of planters. The aim of this experiment is to understand how well the municipality is able to reuse the materials, but also to learn the opinions of citizens about it. The municipality plans to upscale this idea to the rest of the city. According to the municipality, this requires a strong network among colleagues at the municipality and other actors, as well as transparency of the knowledge that is gained during the experiment.

The municipality stresses that each neighbourhood needs an approach that suits the area and local citizens. This is a learning process, in terms of citizen engagement, material use, financial costs and environmental costs (Rotterdam Circulair, 2021).

### *Citizen engagement in the experiments*

The experiments described above all try to engage the citizens of Reyroord as much as possible. Citizens are brought together to discuss their ideas for the neighbourhood and to work together in experiments and other projects. This can be initiated by the municipality, but this can also come from both the municipality and the citizens of Reyroord.

Citizens are kept informed via newsletters. These are delivered to the citizens both online and physically. The neighbourhood networker of Reyroord shares information regarding activities in and updates about the neighbourhood and the ULL via e-mail. However, this reach is limited and not all citizens are (equally well) informed about the experiments and projects in the neighbourhood. A sustainability shop is located in the shopping centre Keizerswaard. Citizens are able to visit this shop for questions regarding sustainability.

Even though the municipality seems to be eager to engage citizens in the experiments, in several newsletters and the information meeting regarding phasing out natural gas there is a notable emphasis on the voluntary aspect of citizen participation. It is not clear why this

emphasis is made, but this information could be valuable in the analysis of the citizen interviews.

### *Neighbourhood statistics*

Finally, it is important to mention that not many statistics on Reyerwaard are available, as most information is about the district of IJsselmonde, of which Reyerwaard is one of the neighbourhoods, or about Rotterdam as a whole. It is assumed that IJsselmonde has a fairly homogeneous distribution among the neighbourhoods in terms of average annual income, however, it should be noted that it can differ per neighbourhood whether the income is above or below the average of IJsselmonde as a whole.

Valuable information about IJsselmonde is that most houses were built in the years between 1950 and 1970 (figure 6). The average income per citizen per year of IJsselmonde is €21,100. This is the fourth lowest average income in Rotterdam (figure 7). Thereby, it can be valuable to know what the ownership relations are when looking at housing. For example, a housing corporation has a social task to increasingly support sustainable development; this is not only to the benefit of the citizens. However, convincing private property owners to invest in sustainable development might be more difficult, because of different interests and different economic possibilities. In both Rotterdam and the district of IJsselmonde, about 65% of the houses are owned by housing corporations, and 35% are private property (AlleCijfers, 2020a, 2020b). It is therefore assumed that this is also the case for Reyerwaard. Unfortunately, the municipality of Rotterdam and the housing corporation Vestia do not agree on the plans of the municipality in IJsselmonde to phase out natural gas for the rental properties (Liukku, 2020). Vestia predicts that the energy costs for the specific properties in IJsselmonde will be higher than is expected by the municipality. Vestia is planning to connect their rental properties to central district heating in 2027. In the meantime, the municipality will focus on private properties in IJsselmonde.

### *Independent research on the working method of Reyerwaard+*

Joosse and Van Buuren (2020) (Erasmus School of Social and Behavioural Sciences, Public Administration) were commissioned by the municipality of Rotterdam to investigate the working method of Reyerwaard+, whether it is in line with the activities and energy in the neighbourhood and whether it is enough to initiate an organisational change. The authors present Reyerwaard+ as a movement from the municipality, rather than an ULL, because the municipality not only strives for a sustainable change, but also for an organisational change within the municipality regarding this subject. However, they note that this requires understanding of the neighbourhood. Their critique is that a balance has not yet been found between the caring government and a self-organising community. One of their questions is therefore about what happens with the neighbourhood once the municipality moves on to another neighbourhood. It is interesting for this research to take the outcomes of this report in mind when interviewing the citizens of Reyerwaard+ and discussing the results in general.

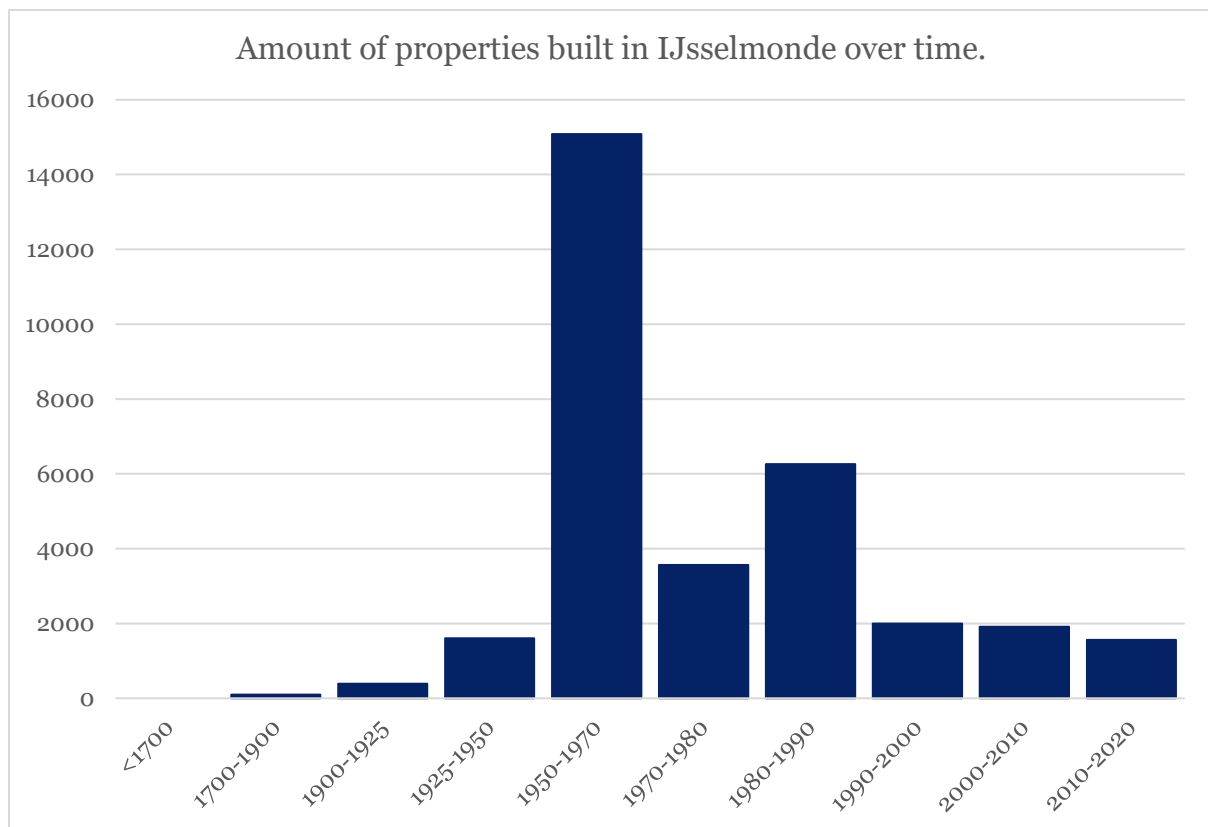


Figure 6: Amount of properties built in IJsselmonde over time (AlleCijfers, 2020b).

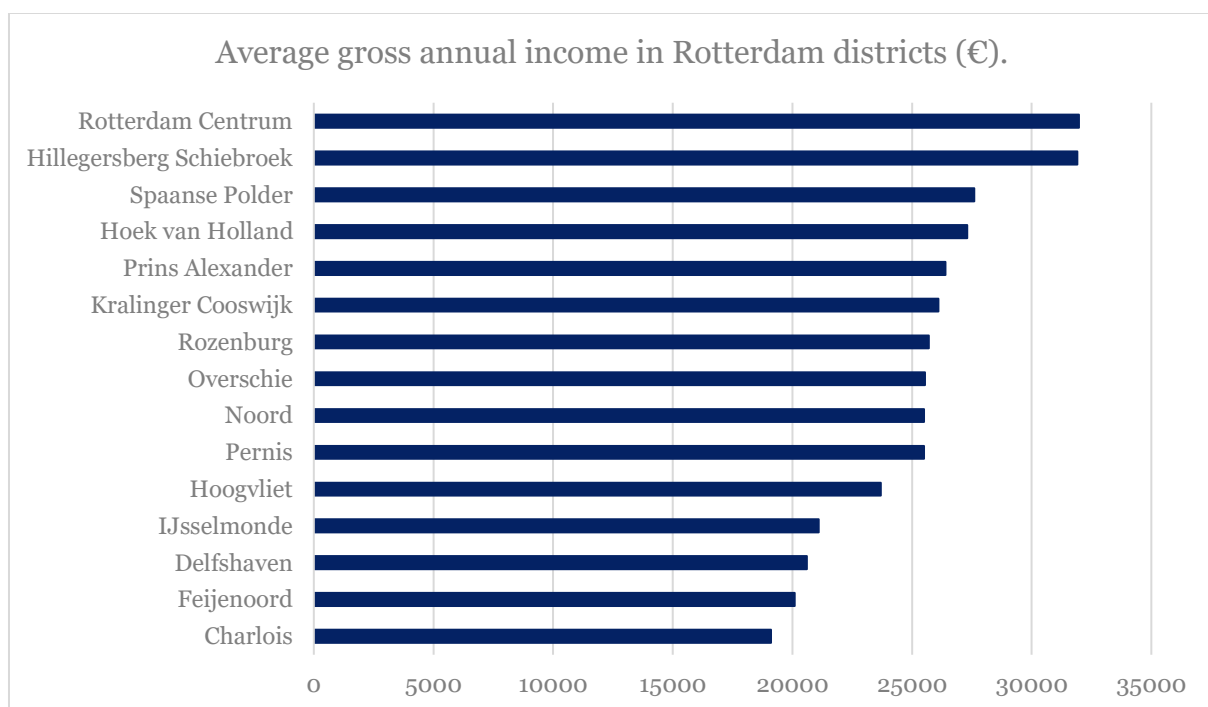


Figure 7: Average gross annual income in Rotterdam districts (€) (AlleCijfers, 2020b).

### 4.3 Citizen interviews

Fifteen citizens of Reyerwaard were interviewed as part of the case study research. To clarify the context of the interviews, it is important to note that they were conducted approximately one month after the last online meeting regarding Reyerwaard+, which was organised by the municipality in December 2020. In total two online meetings were organised prior to the interviews since the beginning of the COVID-19 measures in March 2020, of which a recording of the last meeting was viewed for this research (chapter 4.2). Before the COVID-19 measures, the municipality had hosted a couple of physical meetings regarding Reyerwaard+. When the interviews were conducted, the respondents were still awaiting a summary of points that were discussed during the last online meeting. At that time, no new meetings had been scheduled. However, before and after the interviews took place, the citizens of Reyerwaard were kept informed of the progress and activities in the neighbourhood by e-mail. Newsletters have been and still are being spread by e-mail and people's mailboxes.

During the analysis of the interviews, seven code groups have been created in Atlas.ti, which can be seen as a summary of the topics that are discussed in the interviews. The code groups 'Citizens' perception of neighbourhood' and 'Important themes according to citizens' give an idea of the overall perception the respondents have of the neighbourhood and what they think are important themes for the neighbourhood. The other code groups refer more to Reyerwaard+ specifically and the relationship citizens have with their neighbours and the municipality. The code groups, their descriptions and the amount of codes in each group can be found in table 8. Just as for the expert interviews, it should be noted that some codes appear in multiple code groups, because they comprehend multiple themes. Just like the expert interviews, the data from the citizen interviews will be analysed using the framework of Schiefer and Van der Noll (2017) as described in chapter 2.

Table 8: Code groups of citizen interviews.

	<b>Code group</b>	<b>Description</b>	<b># of codes</b>
1	Citizens' perception of neighbourhood	The respondents' vision on the neighbourhood in general	110
2	Effects of COVID-19 measures	The respondents' vision on how COVID-19 measures affected the neighbourhood, their relationship with other citizens and the municipality and Reyerwaard+	44
3	Important themes according to citizens	The respondents' vision on the themes that do or do not play a role in the neighbourhood	73
4	Relationship with municipality	The respondents' vision on how the relationship with the municipality of Rotterdam is and/or should be	73
5	Relationship with other actors	The respondents' vision on how the relationship with other actors is	8
6	Relationship with other citizens	The respondents' vision on how the relationship with other citizens in	100

		the neighbourhood is and/or should be	
7	Reyeroord+	The respondents' vision on Reyeroord+ in general and the ULL experiments specifically	247

### *Social cohesion according to the citizens of Reyeroord*

#### *The quality of social relations*

Social capital, trust, mutual tolerance and participation, the key elements of the quality of social relations, are all applicable to Reyeroord. They can be found back in de code groups 'Relationship with municipality' and 'Relationship with other citizens'. However, since the neighbourhood is divided in several smaller parts and different housing types (e.g. apartment buildings, terraced houses), the perceptions of the citizens can differ. For example, while some citizens indicate to have a good relationship with their neighbours in the street, others explain that they barely see their neighbours, let alone speak to them. Generally, though, what citizens explain to be a good relationship mainly consists of greeting and/or having a brief chat when seeing each other in the street. Citizens seem to have almost no contact with neighbours who do not live in the same street. A number of dog owners indicate that they have more opportunity for a chat with neighbours while walking the dog. Respondent C2 summarised this as follows: "We also have a dog, so when we walk outside [...] we stay in touch with everyone a little bit. In such a way that you make small talk."

A number of citizens that have lived in the neighbourhood for some time stated that this contact has changed negatively over the past decades and that most people do not greet each other anymore when they walk past each other in the street. The citizens that stated this have mentioned the development of a mix of cultures and the increasing number of 'pawnbrokers' as the main causes of this. First of all, according to some citizens, the increasing diversity in cultures and languages spoken in the neighbourhood leads to a certain social distance between the citizens. This can be applied to mutual tolerance in the framework of Schiefer and Van der Noll (2017). Secondly, the number of pawnbrokers that rent out cheap flats has increased in the past decade. The cheap flats attract people who only want to live in the neighbourhood for a short time. Respondent C7 explained: "Back in the days, people used to live here for years. But suddenly a lot of people left. And the people who come back in their place just want to rent an apartment until they can buy a house somewhere else. So, yes, a lot of people live here for one or two years and then they are gone. So in that respect I actually know very few people in the street." Because these people are only short-term residents, it is more difficult to build a relationship among citizens, but it is also more difficult for the municipality to involve these citizens in experiments and other projects concerning Reyeroord+. In addition, people mentioned that homeowners are generally more involved with their living environment than tenants, while there are more people renting than owning in the neighbourhood, but this cannot be said with certainty. Overall, citizens believe that people in the neighbourhood are more individualistic and keep to themselves nowadays.

A topic that I will elaborate further in *Identification with the social entity* is the nuisance experienced by citizens in the neighbourhood. This is mainly about safety, waste and the shortage of parking spaces. Regarding participation, or civic engagement as Schiefer and Van der Noll (2017) also call it in their framework, citizens wish that the municipality would take



more responsibility and initiative in tackling these problems. However, a number of citizens also said that in some cases this should come from the citizens themselves. For example, some respondents that are involved in their homeowner association indicated that the attendance at meetings was very low, despite people indicating that they would like to see change in the neighbourhood or their houses specifically. According to respondent C14, “people sometimes complain or hope that something will happen, but then they don’t show up at the meeting. Then it’s your own fault [...]. But people aren’t really involved at all, well, until someone breaks into the flat somewhere [...]”. Some people also felt that they themselves were responsible for the nuisance caused by waste in the neighbourhood. The municipality could facilitate this by providing more dustbins, for example. One respondent stated that if people wanted to see improvements in the neighbourhood, they would have to tackle the problems collectively. In the case of security, this is more complicated. Security is a social problem that citizens need help with from the municipality.

### *Identification with the social entity*

With regard to the attachment to and identification with the social entity, in this case the neighbourhood Reyerwaard, it is important to understand citizens’ perspectives of the neighbourhood (Schiefer & Van der Noll, 2017). This can be found in the code groups ‘Citizens’ perception of neighbourhood’ and ‘Important themes according to citizens’.

Citizens generally find the neighbourhood a quiet and green place; many people have moved there to find the peace and quiet, but still live close to the city. The disadvantage of this is that there are only few facilities. There is a small shopping centre, Keizerswaard, but it does not offer many options. The options available are much of the same (e.g. many opticians) and there are no modern cafés or the like. Respondent C11 explained: “Yes, [the shopping centre] is very basic, but also [...] not a lot of diversity. For example, the number of opticians is really high. And I know that there are a lot of elderly people living here, but still, it could really be made nicer.” Respondent C9 added to this topic by stating: “There are four supermarkets, four opticians, or five even, four drugstores and so on. We do have a choice, but there’s no nice café or anything. That would bring people more in touch with each other, you could meet and talk to each other there.”

Despite the quiet and green surroundings, citizens are concerned about rubbish lying around on the streets. The parking problem in the neighbourhood is also mentioned very often. This means that there are too many cars and not enough parking space, which regularly causes inconvenience. The citizens feel that the enforcement of this is inadequate. In addition to these problems, violence plays a major role in the neighbourhood. Recently, there have been many reports of violence, including shootings and stabbings. There have also been robberies and burglaries. Citizens with children indicate that the neighbourhood is a nice surrounding for their children, because they have plenty of room to play and go to school. However, the criminality is a reason for some citizens to doubt whether this is the right neighbourhood for their children to grow up in. Like respondent C9 said: “When we bought the house it was the intention to stay here for a longer period of time. But suppose it gets really unsafe, or it will become increasingly unsafe in the future, or not safe for my son to grow up here [...] then I think I would consider living elsewhere.”

The combination of these causes of nuisance that is currently experienced in the neighbourhood, together with the change in the social situation mentioned earlier, are referred to by multiple citizens as ‘pauperisation’ or ‘degradation’. In addition, the neighbourhood was built just after the war, and has meanwhile undergone considerable wear and tear, both

indoors and outdoors. Respondent C8 elaborated: “Everyone here is saying ‘it’s degrading’. Well, they don’t mean that in terms of sustainability. They just mean social safety and neglect of the objects. That’s what they mean. I think the municipality should make that link to their municipal goals regarding sustainability, water storage and stuff. Make a combination, but don’t approach it from a whole different side. It’s still a bit too much one-way traffic. [...] Reyerroord+ was intended for dialogue with all citizens, the complete neighbourhood, in terms of participation. So the goal was great, but finding a connection is not working. And you also have to ask yourself if this is what the neighbourhood needs.”

The perceptions of the neighbourhood refer mostly to the geographical space in which the group communicates. This could have a great impact on the social cohesion in the neighbourhood and Reyerroord+, mainly because it can affect the willingness for people to take part in civil participation and social networking (Schiefer & Van der Noll, 2017). This is described by respondent C5 as follows: “If citizens themselves start investing time for maintenance of the outdoor space, then they will get a bit of a connection to the public space. Then the public space is considered to be something communal. [...] You have to feel connected to something to be able to do something and take responsibility.” There is a chance that a well thought-out approach to the problems can increase citizen’s willingness to engage in civil participation and social networking.

### *Orientation towards the common good*

The element of orientation towards the common good is divided by Schiefer and Van der Noll (2017) into two parts, being solidarity (i.e. the willingness to let the social welfare of the group precede personal needs) and compliance to the social order, rules and norms. First of all, solidarity in Reyerroord takes two sides. On the one hand, citizens think that the neighbourhood needs improvement, because it ultimately is in the interest of the whole community. However, most citizens indicate their need for help from the municipality in the form of social welfare systems and/or subsidies, because they do not have the money and means to do it without the municipality. Right now, it seems like the personal needs of many citizens precede the social welfare of the group, because people are first and foremost worried about their cost of living.

Secondly, the high crime rate in the neighbourhood can be linked to the framework’s element of compliance to the social order, rules and norms. However, this will not be elaborated in this research, because this complicated societal issue cannot be explained using the research methods of and data obtained during this research.

Citizens’ perception of Reyerroord+ can be placed under this element of orientation towards the common good as well. After all, Reyerroord+ originates from the idea of solidarity. Reyerroord+ is not a familiar concept to every citizen in Reyerroord. A number of citizens indicate that they do not or hardly read the newsletters, which means that it is not clear what kind of experiments are being done in the neighbourhood.

Respondent C1: “I sometimes have my doubts about the information provided by the municipality. They say that everyone is kept informed, but well, I know that a lot of people throw away the letters from the municipality that they receive in their mailbox right away. They think it’s a hassle. We do participate in meetings with the municipality, but well, if eighteen citizens participate, from all those people living around the green belt... I think it’s very little.”

Respondent C3: “When you look at the demographics of IJsselmonde, you see there are mainly elderly people. So I wonder, will it all work out with these people? What about the digital literacy of the elderly? Are people being sufficiently informed? [...] You can’t expect older people in their 60s, 70s or 80s to all sit down at their computer and absorb all this information about what’s going on in the neighbourhood. [...] For policy to be successful, there must be support. And to gain support everyone has to participate. So the degree of participation, apart from the willingness, is still debatable.”

Respondent C12: “Yes, I’ve heard of [Reyeroord+]. I get the e-mails, but I don’t read all of them. I have quite a few other things I do and I find myself involved in a different way, which is safety. I don’t think Reyeroord+ is directly concerned with safety.”

Apparently, many of the citizens have other priorities than keeping informed of or participating in the ULL experiments. However, overall the meetings are experienced as positive by those who have attended them. Citizens stated that the municipality explained the plans clearly and that there was plenty of time to ask questions. A few citizens noticed that some of these questions were not limited to the experiments within Reyeroord+ or the general sustainability of the neighbourhood. Many questions are about the costs or about the nuisance in the neighbourhood in terms of safety, waste on the street and the parking problem.

Another remark made by some citizens is that the follow-up after the meetings is too slow to keep the attention of the citizens. Although the municipality usually shares a report with the most important points discussed after a meeting, some citizens feel that a faster follow-up could generate more interest. Respondent C8 stated: “There was an event here at the playground. People could come by and write down their dreams for the neighbourhood, that kind of stuff. But then it got quiet [...] and you will never see or hear about it again. And that is an eternal pitfall of the municipality. And when there’s another event later during the year [...] the connection between the events are no longer made by people.” Respondent C6 explained: “Regarding Reyeroord+, I think the projects are very much lingering in the stage of inventory and citizen participation. I’ve been attending meetings for two years already and I’ve pasted so many memos. They’ve done so many activities that I’m now at the point of wanting to see some concrete proposals so we can talk about that instead of ideas from scratch.” In addition, some feel that citizens’ wishes are not taken into account, which reduces the interest in participating in a future meeting.

Respondent C14 indicated that his enthusiasm for participating was also not stimulated by the attitude of some of his fellow citizens. He sometimes felt that his efforts would not make any difference, because other citizens would still cause a nuisance or leave litter behind. About his interest in participating in experiments of Reyeroord+, respondent C14 commented: “Well, that’s decreasing a bit [...] in the sense that I think the others don’t care at all either.” In general, most citizens feel that sustainability is not seen as an important issue in the neighbourhood. People have too many other priorities on a personal level. However, an opening was created by allowing the citizens to think about the design of the neighbourhood, which in the future may contribute to their interest in the theme of sustainability. For this, it is important that there is a quicker follow-up from the municipality and that concrete results can be seen in the short term.

### *The impact of the COVID-19 measures according to the citizens*

The three characteristics of social cohesion as described by Schiefer and Van der Noll (2017) can also be used to describe the impact of the COVID-19 measures on the social cohesion in the ULLs. The impact of the COVID-19 measures has been summarised in the code group 'Effects of COVID-19 measures'.

#### *The quality of social relations*

Again, in this case of the impact of the COVID-19 measures, citizens' perceptions on the quality of social relations differ in some ways. Regarding this characteristic of social cohesion, the elements of social capital and participation stood out the most.

Regarding social capital, the perceptions differ from generally seeing neighbours more often to seeing neighbours less as a result of the COVID-19 measures. In the cases of respondents that stated the contact with their neighbours to be better, the respondents indicated that the cause of this is that they are at home more often. They generally see their neighbours when working in the garden, or when taking a walk during the day. On the other hand, some respondents stated that they see their neighbours less, because many people staying inside as a result of social distancing. One respondent explained that this was also the case with social contacts outside of the neighbourhood, as a result of social distancing and the bad and cold weather in winter. However, a couple of respondents mentioned to have experienced no change at all regarding social capital. In general, it seems that the relationship between citizens, when it comes to citizens who regard the contact with their neighbours as good, does not deteriorate significantly.

Some respondents state that elderly people in the neighbourhood have been staying at home more frequently. Some respondents helped their elderly neighbours by either doing grocery shopping for them, or by starting a WhatsApp chat group in case a neighbour needed help:

Respondent C1: "There were some initiatives during the outbreak of the corona crisis, for example, where there were people in the street who were sick. They came back sick from Spain with corona. [...] with a few neighbours, we took the initiative to create a WhatsApp group, so that if someone suddenly gets sick and needs help, or groceries or something, we can message each other to help."

Respondent C9: "I have a very good relationship with the neighbours on the corner. They are very old, 85 and 90. They also take care of my cat when we are not at home, and when they are gone I water their plants, and it goes very well. Of course, we currently don't see each other inside of the house a lot, but normally we visit each other on our birthdays and stuff. [...] But I do have better contact with them now, because I did groceries for them, and yes, that's nice."

The COVID-19 measures have also impacted the communication between parties within Reyerwaard+, which relates to the framework's element of participation. Before social distancing started in 2020, physical meetings were organised, for example in the form of community walks. However, the COVID-19 measures forced the municipality to organise meetings online. According to some respondents, the municipality needed some time to figure

out how best to organise such an online meeting. This has led to a number of online meetings being initially moved to a later date.

Despite this, respondents generally believed that the online meetings went well, and that it was beneficial for the communication between the municipality and citizens that attended the meetings. For example, respondent C10 stated to be very positive about the communication with the municipality in the past months: “I actually think that the communication with the municipality has been better in the last few months. [...] The last time when there was such a large project [like the current replacement of the sewage system] was thirteen years ago. A big meeting was organised somewhere in a big hall of the local council office in the neighbourhood and a lot of people came, like 50 or so. But then the conversation degenerated into all kinds of different topics, [...] because the fact that the municipality was only discussing the sewage system during that meeting didn’t interest those 50 people at all. [...] During the latest meeting, the municipality was already aware of the parking problem, for example.” In addition, the provision of information by the municipality during the meetings was also sufficient, and the municipality promised to share the reports of the meetings afterwards. Citizens stated the online meetings to be easily accessible, however, most respondents would prefer the meetings to be physically again. They experienced the online meetings as more distant than physical meetings. One respondent claimed that more elderly people were present at the online meetings, because of the low threshold to join. However, another respondent was worried about whether or not elderly people were able to understand the technology in order to join the online meetings and therefore to remain up to date with the projects and experiments in the neighbourhood.

### *Identification with the social entity*

Regarding the identification with the social entity, and thus the citizens’ perspectives of the neighbourhood, several respondents stated the COVID-19 measures to have had an impact on their and others’ involvement in the neighbourhood. This differs from being more aware of what is happening in one’s own garden, to being more aware of what is going on in one’s own street, to being more involved with the neighbourhood in general. For example, respondent C15 stated that she feels more involved with the neighbourhood because she is at home more and sees more as a result of the COVID-19 measures. She indicated that she has discovered what parts of the neighbourhood, according to her, need improvement. As a result, she also became more involved in the water storage project, because she started to think more about its design. Respondent C5 stated: “People became more and more aware of their own garden and what happened in there. They were saying, [...] ‘I suddenly hear birds, are they all of a sudden singing more or something?’”

For others, the COVID-19 measures seemed to have a negative impact by worsening the parking problem and waste on the street. About this, respondent C8 said: “[...] a negative effect is that the neighbourhood is more full, so you can no longer park your car and the litter is increasing. That’s the negative side of it.” Respondent C9 stated that she saw a trend of neighbours moving out of the neighbourhood since the COVID-19 measures, most likely as a result of being more aware of the surroundings: “Apparently it plays a role, because I hear from neighbours that people in the area are all moving to the Hoeksche Waard. I think it’s because you’re very much thrown back to yourself in this time, and you start to wonder: what do I want for my future, you know?”

These consequences for citizens’ perspectives of the neighbourhood have most likely affected the community attachment of citizens. In this case, the effect was mostly on the

perception of the geographical place, rather than on the perception of the connection between people in the neighbourhood (Chan et al., 2006; Schiefer & Van der Noll, 2017). However, there is no immediately visible impact. It is possible that the increased awareness will have a positive impact in the future.

#### *Orientation towards the common good*

Regarding the COVID-19 measures, solidarity as characteristic of the orientation towards the common good is a relevant theme. It is unsure whether the COVID-19 measures will have a long-term impact, but some consequences of the measures can be seen as enhancing the solidarity in the neighbourhood.

First of all, the online meetings were organised from the idea of solidarity; a way of eventually improving the neighbourhood and thus letting the social welfare of the group precede personal needs, especially during COVID-19 times. The fact that some respondents stated to be more aware of their surroundings due to being at home more often shows an increased sense of responsibility towards the neighbourhood. In addition, several citizens have supported their neighbours by, for example, helping with grocery shopping or starting a WhatsApp chat group.

Again, it is not certain whether these consequences of the social distancing measures will have a long-term impact. Many citizens are still facing financial issues and could therefore ultimately let their personal needs precede the common good. However, this event showed that this is not equally obvious for every citizen.

### **4.4 Main findings**

This section presents the main findings of the research in terms of overarching themes that could possibly contribute to the degree of social cohesion. The two topics that are discussed here are a traditional relationship between the municipality and citizens, and feelings of ownership and responsibility.

#### *Traditional relationship between municipality and citizens*

In the expert interviews, two respondents mentioned the importance of a proportional power distribution between a municipality and citizens for optimal co-creation, the basis of an ULL. It was stated that the municipality has a high tendency of approaching citizens as customers of the municipal services, instead of as like-minded people with innovative ideas. This topic, the relationship between citizens and the municipality, also arises from the data that is discussed above. In the case of Reyerood+, the relationship between the municipality and the citizens seems to be a traditional relationship, which means that the municipality takes the role of initiator, and citizens take the role as participants. Simply put, the municipality expects from the citizens to participate in their ideas, while the citizens see the municipality as expert and expect them to actively come up with ideas that the citizens can participate in. As Joosse and Van Buuren (2020) explained about Reyerood+ (chapter 4.2), a balance has not yet been found between the caring government and a self-organising community.

The municipality and the citizens ultimately seem to both want to work on the common good. However, it seems that they do not yet agree on the way in which this should happen. The municipality is more focused on the implementation of sustainability, while the citizens



are more concerned about financial issues, safety issues and spatial issues such as parking and waste on the streets.

It is important to take this reciprocal relationship between the municipality and citizens into account when discussing the social cohesion in Reyerood, as it can influence different elements of the concept. For example, it can influence the trust citizens have towards the municipality, the way in which citizens would prefer to shape their civic engagement, and the solidarity they feel towards the community they are in. It should be noted that these elements are interrelated and constantly interact with each other.

### *Ownership and responsibility*

Sense of ownership comes with a sense of responsibility. A public space is often seen as owned by the municipality, and it can therefore be difficult for citizens to feel responsible, because they feel like they have no ownership. This will gradually need to be shifted, whereby the aim will be that public spaces are seen as a joint property of the municipality as well as the citizens and other actors. ULL experiments are an excellent opportunity to discover and develop a new way of communication and this new sense of ownership. In the case of this research, the context of the COVID-19 measures has provided a glimpse into how this communication may be developed in the future. In the case of Reyerood+, the increased awareness of citizens' surroundings as a result of the COVID-19 measures could eventually have a positive effect on the sense of ownership and responsibility, as this awareness increases the community attachment and the attachment to the geographical place, being the neighbourhood.

## 5. Discussion

This chapter revolves around the discussion of the research results and the methodology. Furthermore, it elaborates on the scientific contribution of the research, implications and recommendations for the involved actors, and potential future research.

### 5.1 Results

#### *How do social cohesion and ULLs relate to social innovation?*

In chapter 1.1, a brief introduction was given to ULLs as social innovations. It was stated by Naumann et al. (2018) that social innovations like ULLs can, among others, facilitate social cohesion. An example the authors give is ULL Helle Oase in Germany, where a community garden and testing ground is used to create social cohesion in what they call a “socially deprived area” (p. 208). Important to note in this case, though, is that this ULL is community-led, rather than organised by a government. The authors state that, in order for an ULL to develop social cohesion, there must be a strong support base among citizens. This will be referred back to in chapter 5.4 when discussing the implications and recommendations for the different actors.

When looking into this topic further at this stage of the research, it is interesting to see that Naumann et al. (2018) mention one of the things social innovations could entail in the urban governance sphere to be new governance modes. Despite Reyerwaard+ being called an ULL, there is currently a traditional relationship between the municipality of Rotterdam and the citizens of Reyerwaard. Therefore, the question is whether a new government mode will arise within Reyerwaard+ in the short term, or even in the long term. Naumann et al. explain that the ULLs they have researched do not challenge the present governance structures. However, ULL experiments may result in obtaining new urban knowledge, which in turn may result in a systemic change in governance.

#### *Can anything actually be said about the relationship between ULLs and social cohesion?*

The research question that was formulated to study this thesis’ research topic is: *What is the relationship between social cohesion and urban living labs in times of COVID-19?* This question is deliberately broad because of the exploratory nature of the research. However, when looking at the results, one question that comes up is if anything can actually be said about the relationship between ULLs and social cohesion. In the case of Reyerwaard+, many of the citizen respondents talked about their perception of life in the neighbourhood, and not specifically about the ULL Reyerwaard+. This therefore remains a somewhat open question, because this research anticipated to hear more about the citizens’ experiences with the ULL, rather than about their complaints about the neighbourhood and the municipality. However, in this case, it seems that the ULL and life in the neighbourhood cannot be separated from each other. For citizens, Reyerwaard+ is an example for and emphasises the communication with the municipality, and their perception of life in the neighbourhood partly influences their willingness to participate in ULL experiments. Therefore, the social context of the neighbourhood influences the willingness of civic engagement and thereby the success of ULL experiments. As discussed in chapter 4.3, the appeal and sense of ownership of the public space can provide a boost to social cohesion. This can be seen as a self-reinforcing effect; several goals can be achieved with(in) an ULL, of which social cohesion is one. However, it can also

work the other way around. For example, if an ULL is not organised properly, it can be at the expense of social cohesion, or an ULL may not function without social cohesion, for instance in a surrounding neighbourhood like Reyeroord.

### *Can Reyeroord+ be called an ULL?*

Another question that arises is whether or not Reyeroord+ can really be regarded as an ULL. The definition of an ULL that has been used in this thesis is as follows: “An urban living lab is a local place for innovative solutions that aims to solve urban challenges and contributes to long-term sustainability by actively and openly co-constructing solutions with citizens and other stakeholders” (Chronéer et al., 2019, p. 60). Reyeroord+ has an explicit focus on experimenting with innovative solutions aimed for sustainable development in the urban environment (chapter 4.2). However, this definition implies the importance of co-creation between different actors. This is not necessarily the case in Reyeroord+, as the municipality actively tries to involve citizens by insisting their voluntary role by using the words ‘participation’ and ‘engagement’. Furthermore, citizens do not seem to have their priorities with the ULL, or simply are not aware of their opportunities; their expectations mainly lie with the municipality organising projects and experiments. These conflicting expectations show that there is actually no question of co-creation. Rather, Reyeroord+, in the form it has now, seems to be a conventional project of citizen participation from a top-down perspective. A follow-up question that arises here is: to what extent are urban living labs able to put co-creation into practice? This question cannot be answered using the data from this research, but could function as a starting question for future research.

Regarding the definition of an ULL, it was introduced in chapter 1.5 that this research shows a certain ‘hollowness’ of the concept with regard to its use. As was stated, the concept is used very broadly. In some cases, it seems like the concept is used as a buzzword to get the attention of different actor groups for the experimentation with socio-technical innovations in an urban setting, while there is in fact no actual case of co-creation. This hollowness can be seen in the heterogeneity of the ULLs discussed in the expert interviews. For example, the difference between an eco village as ULL set up by future citizens and an ULL organised by a municipality in an existing neighbourhood is very large; these are two completely different situations. It is important to be aware of the fact that this hollowness most likely has an impact on the data analysis and the reliability of the conclusions of the research, because this broad use of the concept makes comparing the different ULLs to be a challenge. In addition, there are different types of ULLs, as was demonstrated, among others, by the overview of Dutch ULLs by the Rathenau Instituut as mentioned in chapter 1.4 (Rathenau Instituut, 2020). The fact that I have researched one specific type of ULL makes it difficult to draw conclusions about others. Nevertheless, Reyeroord+ and the outcomes of this research may be useful for ULLs that are experiencing a similar situation.

### *Can an ULL be organised from a top-down perspective?*

A question that connects to the previous one is: is it possible to organise an ULL from a top-down perspective? This is an important one, as the concept of ULLs has acquired the connotation of a bottom-up approach over time. However, ultimately that is not necessarily the case. In the case of Reyeroord+, it looks like it is becoming or has become a municipal instrument. This question refers back to the topics of ownership and responsibility. It can be difficult to create a sense of ownership, and thereby a sense of responsibility, when an ULL is

organised from a top-down perspective. This top-down perspective will most likely maintain the vertical power relationship between the municipality and the citizens. Furthermore, a top-down perspective does not invite citizens to think about the interpretation of the public space, as they still assume that this space does not belong to them and that they therefore have no control over it. Precisely in the case of Reyeroord+, it is important to challenge the citizens to think about this, because their priorities are already elsewhere. For example financially, or in case of a citizen being a short-term resident. The municipality does often state that the participation of citizens is on a voluntary basis, which may imply that the municipality wants citizens to participate or come up with ideas on their own initiative. However, in practice this is not yet the case, probably due to the top-down approach. This can eventually become a vicious cycle. The will from the municipality to shape the situation differently is there, but it is not yet feasible. The view of the citizens, in terms of priorities and interests, will most likely not change in the short-term. A top-down perspective could therefore be needed to engage citizens anyway. Then, it would probably be more clear and more transparent towards the citizens to not call the experiments an ULL, but to explain the project as one regarding citizen participation. This might lead to the experiments being more easily accessible for citizens to participate. The idea of giving citizens the freedom to get involved in experiments and projects initiated by the municipality is an innovative approach, but in a case like Reyeroord, where sustainability is not on citizens' priority list, it will most likely take much time and effort to convey the enthusiasm of the municipality.

*How does the case of Reyeroord+ compare to other ULL cases?*

Compared to some ULL examples discussed in the literature review and the expert interviews, Reyeroord+ seems to have a less technological and experimental emphasis (e.g. in comparison to Marineterrein in Amsterdam). The aim is to expand this, but the emphasis is currently mostly on the development of the neighbourhood in terms of phasing out natural gas, replacing the sewage system and creating a water storage in the central green belt, in dialogue with the citizens of Reyeroord. However, on the other hand, Reyeroord+ is dealing with a complicated social context in which citizen engagement is the biggest challenge for the municipality. This shows that the potential of Reyeroord+ can be optimised when the residents take a more active role, so when co-creation is actually the case. It is currently the task of the municipality to find an answer to the question of how they can best facilitate this. This will also return in chapter 5.4 concerning implications and recommendations for the different actors.

## 5.2 Methodology

The discussion of the methodology can be divided in the data approach and collection and the social cohesion framework that was used to analyse both the expert and citizen interviews.

### *Data approach and data collection*

There are several points regarding the data collection in this research that require attention. In total, there are four, of which the first one is a general point of interest of qualitative research, whereas the other points are more specific to this research.

First of all, this research is solely using qualitative research methods. Overall, this brings critique that will now be elaborated on briefly. This critique is mainly regarding subjectivity of the research, the research being difficult to replicate, problems of generalisation, and lack of

transparency (Bryman, 2012). The first point of critique refers to the fact that a qualitative researcher often uses an unsystematic way of deciding what is significant to highlight. This is a bias that could possibly influence the way in which the research data is interpreted, despite the researcher's aim to do this as objectively as possible. The second point of critique picks up on this by stating that this unsystematic way of working causes difficulties when wanting to replicate the qualitative research. This can refer to the interpretation of data, but also to the way in which interview questions are asked, and the way in which the researcher reacts to responses of the respondents. It could, however, be argued whether or not it is possible to replicate qualitative research in the first place. The third point of critique is about the question of "how can the findings be generalised to other cases?" It is argued that in case of participant observation or qualitative interviews with a small number of respondents, it is not possible to generalise the findings to other cases. For this thesis, fifteen citizen respondents have been interviewed and they have been reached through a mailing list of the neighbourhood networker in Reyerwaard. In a way, these citizens are therefore already involved in the neighbourhood. Consequently, these people are most likely more involved than the average citizen of Reyerwaard, despite the fact that some respondents indicated that they were not very familiar with Reyerwaard+. Perhaps more diversity could have been created by obtaining respondents by addressing them on the street, but this was not possible at the time due to the COVID-19 measures. Finally, the fourth point of critique is about the possible lack of transparency as a result of the unclarity of how the researcher came to the study's conclusions. This thesis aimed to counter this issue by using the social cohesion framework by Schiefer and Van der Noll (2017) for the analysis of the data. Despite these points of critique, the qualitative research methods used in this thesis have shown to be the best choice for collecting data and consequently answering the research questions of this specific research topic.

A second point of interest of this research approach is the inability to put more emphasis on an ethnographic research approach. The research approach that is chosen in this research is a social science approach based on my background in cultural anthropology and development sociology. An ethnographic approach typically uses research methods like in-depth interviews, focus groups, participant observation, photo-elicitation and document analysis. The initial aim at the start of the research was to combine in-depth interviews with participant observation and document analysis. Participant observation would have been of added value for this research, because it would have given the chance to obtain an extensive understanding of the behaviour of people and the way in which actors communicate and cooperate in the citizens' living environment. Because participant observation is such a characteristic element of ethnographic research, the research approach used here is presented as a social science approach, rather than an ethnographic or anthropological approach.

Consequently, a third point of interest is based on the fact that both the expert interviews and the citizen interviews were conducted online, mostly through video calls and in some cases through phone calls. This was done to secure the safety of both the researcher and the respondents during the COVID-19 pandemic. The exact limitations compared to face-to-face interviews are not certain, but the most important issue to take in mind is the lack of body language that can be observed during video and phone calls, as people's bodies are not (entirely) visible (Bryman, 2012). As Bryman states: "Body language may be important because of the interviewer's ability to discern such things as discomfort, puzzlement, or confusion" (Bryman, 2012, p. 488).

Finally, the fourth point of interest is concerned with the general research approach. The research approach in the industrial ecology study programme mentions the following criterion as characteristic for an industrial ecology thesis: "The thesis is interdisciplinary; it synthesizes

methods, theories or concepts relevant to the field of IE” (TU Delft, 2021, p. 1). However, instead of using methods, theories or concepts from different fields (e.g. technical and social), the focus in this research is solely on methods, theories and concepts from the social sciences cultural anthropology and sociology. Nevertheless, this social science approach is still neglected in research about ULLs and in the field of industrial ecology in general, making this research an addition to existing viewpoints that will hopefully only strengthen the field.

### *The social cohesion framework*

The social cohesion framework by Schiefer and Van der Noll (2017) that was used to analyse the research data aimed to make the concept of social cohesion researchable. Social cohesion is a concept that can be interpreted broadly; there is not one fixed definition and the concept can also be applied on multiple scales, such as on a national level or a specific neighbourhood. In order to analyse the research data, this social cohesion framework was chosen as it is based on an extensive literature review about what social cohesion entails. However, the framework is subject to the researcher’s interpretation, because the framework has been described to be applicable to different situations. This entails a certain bias in the interpretation of the results. Therefore, although the framework has helped to clarify the concept, the interpretation of the results is always subject to the subjectivity of the researcher.

## **5.3 Scientific contribution**

In chapter 2.2 the research gap for this thesis was defined. Most authors in the field of ULLs focus on the governance of the different actors that are involved in the experiments, or on the impacts the ULLs have in terms of policy-making. A majority of the reviewed sources are about the concept of engagement from a government or management perspective. The concept of social cohesion is not explicitly mentioned in the literature regarding ULLs. Furthermore, since the COVID-19 pandemic has (had) extraordinary consequences for society, research about ULLs in times of COVID-19 has not yet been performed. The scientific contribution of this research is therefore that it fills the research gap of social cohesion being neglected in ULL literature, by building on the existing literature and providing new insights regarding social cohesion in ULLs.

## **5.4 Implications and recommendations: relevance for different actors**

Implications and recommendations can be given to municipalities and citizens as being the most important actors discussed in this thesis. It should be noted that the implications and recommendations are based on the case of ULL Reyerood+ specifically, and there is a chance that implications and recommendations would be different for other ULLs.

### *The municipality*

This research gives municipalities or other ULL initiators the insight that citizens play a crucial role in successful long-term ULL experiments. Transparency and clarity are required to bring the aim of ULLs across to citizens. In case of Reyerood+ specifically, it is important for the municipality to understand that the ULL is ultimately mainly about enabling participation and gaining support and acceptance among the citizens of Reyerood for the goals of the municipalities and the changes (both physical and social) that come with these goals. This was

mentioned as well by Naumann et al. (2018) with regard to social innovations enabling the development of social cohesion. Although the municipality appears to be aware of this, as evidenced by the fact that the participation of citizens is stressed to be voluntary and the active effort to involve citizens in projects and experiments under the name of ULL, there is still much to be gained from the quality with which the municipality does this. In addition, the municipality can learn from the outcomes of this research that an ULL is not solely a platform for the implementation of sustainable innovations, but that it also serves as a means to improve the social situation in the neighbourhood, which can ultimately help with the success of the ULL experiments.

Furthermore, it is important for municipalities or other ULL initiators to see if an ULL should really be called an ULL, or if its goal is mainly to be a citizen participation project. This distinction can avoid confusion among citizens and other actors, as the name of the project can (rightly or wrongly) suggest the role distribution or the kind of collaboration that is expected in a project.

Municipalities or other ULL initiators can use the insights from this research, because they are ultimately looking for a way to involve citizens in the sustainability transition. In case of Reyerwaard+, the municipality indicated that this is a major challenge, for which these insights could potentially help to provide a solution, for example by improving the quality of social relations with citizens. Ultimately, this could have an impact on the trust that both parties feel towards each other. Thereby, the municipality could ask themselves whether they would like to approach citizens from the traditional top-down approach or not, on which they can finally base their choice for an ULL approach or a more traditional citizen participation approach.

An important lesson from this research is that actors require to be on the same page regarding expectations and priorities. Even though the aim of municipalities to work on climate adaptation and experiment with innovative solutions is good, it is not sustainable when it is not accepted by the public. By tackling what citizens experience as problems, or by organising an approach that combines sustainable innovations and problems and obstacles as perceived by citizens, interest in the ULL experiments among citizens may increase. ULL experiments cannot be organised unilaterally, but the interest and effort must come from both sides. For this, a new way of working has to be developed; ULLs could provide a good environment to investigate this further.

Despite the COVID-19 measures causing some ULL experiments to be postponed or cancelled, the situation gave the opportunity for a new way of organising meetings, being online through video calls. Municipalities and other ULL initiators could use the insights of this research to prepare for unexpected events that could possibly affect (elements of) social cohesion. The insights could therefore ultimately contribute to the resilience and ingenuity of ULLs.

### *The citizens*

In case of the citizens of Reyerwaard, implications and recommendations are slightly more difficult to give in comparison to the municipality. This is because the majority of the citizens seems not to be intrinsically motivated to participate in ULL experiments, for example due to having other priorities. Adding to that, the citizens generally think other issues in the neighbourhood, such as waste and safety, should currently require more attention than, for example, an energy transition. However, the citizens of Reyerwaard can learn from the insights of this research that their active involvement in the ULL is required for successful co-creation,



which in turn will most likely lead to a combination of tackling their problems, as well as the development of sustainable innovations, as is the wish of the municipality. If the municipality has a better understanding of what the priorities of citizens are, it will most likely be easier for citizens to understand the overarching aim of the ULL as a result of transparency and clear communication. The feeling of being acknowledged in their problems could make it more interesting and accessible for them to participate and/or initiate new ideas or innovations. Furthermore, the awareness of the fact that the public space is a space in which the citizens have a say as well can lead to more interest in participation in the ULL. While the municipality finds its way to an improved way of working, the citizens of Reyeroord are recommended to continue expressing their thoughts and worries.

Finally, the insights regarding the impact of the COVID-19 measures on ULLs can make citizens realise that participation in ULL experiments can be more accessible than it was before. It takes less effort to attend meetings and thus keep abreast of progress in the neighbourhood. In the long term, this could give a boost to the degree of civic engagement.

## 5.5 Future research

An extension of this research could be done in several ways. A division can be made between further research in terms of methodology and in terms of content of the results. This research could be conducted as a longitudinal study to see what the long-term consequences of the COVID-19 measures for ULL Reyeroord+ or ULLs in general are. Furthermore, the research could be conducted in the case of other similar ULLs, to investigate whether they experience the same hurdles as in Reyeroord+. However, researching other types of ULLs could be valuable if a comparison between different kinds of ULLs is desired. To be able to make statements about the traditional relationship between the municipality and citizens, and about the issues of ownership and responsibility, a multiple case study among ULLs that are organised in different ways than Reyeroord+ (e.g. bottom-up) could be performed to make more in-depth assertions regarding these topics. Participant observation, either physical or online, could be used to obtain an extensive understanding of the behaviour of people and the way in which actors communicate and cooperate in the citizens' living environment. Overall, citizens' role in co-creation processes is important and after this research still underexposed, even though their role is often seen as an obstacle for successful experiments. Attention for citizens as users of ULLs and the concept of social cohesion in ULLs therefore deserve extensive follow-up research.

## 6. Conclusion

This chapter answers the main research question of this thesis: *What is the relationship between social cohesion and urban living labs in times of COVID-19?* The four sub questions that were formulated in chapter 1 will lead to an answer to this question.

### *1. How do ULL experts perceive social cohesion in ULLs and the impact of the COVID-19 measures on the ULLs?*

Regarding social cohesion, the quality of social relations stood out most in the interviews with the expert respondents. The experts stated the importance of a close relationship among all different actors. This includes regular physical contact, a long-term relationship, having an equal mindset, involving citizens in decision-making and experimenting, and taking a qualitative approach. Two of the five respondents acknowledged the importance of a proportional power distribution between a municipality and citizens, as this co-creation is the basis of an ULL. As the experts emphasised the importance of the quality of social relations, according to them, this element of social cohesion is also mostly affected by the COVID-19 measures. Most of the meetings that were initially organised physically had to be postponed or had to be arranged in an online setting. Overall, the experts experienced the online meetings to be positive when looking at meetings with actors other than citizens. In these cases, the meetings are especially ideal for short appointments, because it saves travel time. However, overall the respondents prefer physical meetings over online meetings with citizens. A physical meeting feels less distant, and it is easier to maintain a higher quality of social relations. On a more practical level, the COVID-19 measures seemed to have affected the ULL experiments in different ways. This mainly depends on the nature of the experiments. For example, experiments where input from citizens was needed were able to continue much easier than the ones that required citizens to physically be at the location. In the latter case, multiple experiments were not able to continue as a result of the disappearing role of citizens in the experiments because of the social distancing measures. It therefore depends on the case if civic engagement was increasing or decreasing.

### *2. How did citizens of Reyerwaard experience the social cohesion in their neighbourhood, prior to the COVID-19 measures?*

The citizen respondents in this research were, and still are, experiencing some negative factors that influence the social cohesion in the neighbourhood. First of all, a number of citizens that have lived in the neighbourhood for some time stated that the social contact has changed negatively over the past decades. These citizens mentioned that the increasing diversity in cultures and languages spoken in the neighbourhood leads to a certain social distance between the citizens. Thereby, the number of pawnbrokers that rent out cheap flats has increased in the past decades. This has attracted short-term residents, which makes it more difficult to build a social relationship. Overall, the citizens believe that people in the neighbourhood are more individualistic and keep to themselves nowadays. Furthermore, citizens experience nuisance regarding violence, waste, and the shortage of parking spaces in the neighbourhood. The combination of these causes of nuisance that is currently experienced in the neighbourhood, together with the change in the social situation, are referred to by multiple citizens as ‘pauperisation’ or ‘degradation’. These perceptions of the neighbourhood refer mostly to the geographical space in which the group communicates. This could have a great impact on the

social cohesion in the neighbourhood, mainly because it can affect the willingness for people to take part in civil participation and social networking. Finally, it seems like the personal needs of many citizens precede the social welfare of the group, because people are first and foremost worried about their cost of living. These points indicate that there was no improvement in the degree of social cohesion prior to the COVID-19 measures.

### *3. How do the COVID-19 measures impact the ULL Reyerwaard+?*

The COVID-19 measures have impacted the communication between actors in Reyerwaard+. Before social distancing started in 2020, physical meetings were organised, for example in the form of community walks. However, the COVID-19 measures forced the municipality to organise meetings online. According to some respondents, the municipality needed some time to figure out how best to organise such an online meeting. This has led to a number of online meetings being initially moved to a later date. These arrangements seem to be made by the municipality; this was not organised on the initiative of the citizens. Despite this, the citizen respondents generally believed that the online meetings went well, and that it was beneficial for the communication between the municipality and the citizens that attended the meetings. Citizens stated the online meetings to be easily accessible. However, most respondents would prefer the meetings to be physically again. They experienced the online meetings as more distant than physical meetings. Several respondents stated the COVID-19 measures to have had an impact on their and others' involvement in the neighbourhood. This differs from being more aware of what is happening in one's own garden, to being more aware of what is going on in one's own street, to being more involved with the neighbourhood in general. These consequences for citizens' perspectives of the neighbourhood have most likely affected the community attachment of citizens. In this case, the effect was mostly on the perception of the geographical place, rather than on the perception of the connection between people in the neighbourhood. It is possible that the increased awareness will have a positive impact in the future. Finally, it is unsure whether the COVID-19 measure will have a long-term impact, but some consequences of the measures can be seen as enhancing the solidarity in the neighbourhood. For example, the fact that some respondents stated to be more aware of their surroundings due to being at home more often shows an increased sense of responsibility towards the neighbourhood. It is not certain whether these consequences of the social distancing measures will have a long-term impact.

### *4. What is the effect of the social cohesion in Reyerwaard on ULL Reyerwaard+ and vice versa?*

The main effect of social cohesion in Reyerwaard on ULL Reyerwaard+ is in terms of the communication between the municipality and citizens, and the experiments within the ULL. The concerns in the neighbourhood in terms of violence, waste and parking have led to a number of citizens being already involved in the neighbourhood before the COVID-19 measures. This has resulted in a neighbourhood network which is also used by the municipality to contact citizens regarding the ULL experiments of Reyerwaard+. The degree of social cohesion in Reyerwaard has therefore impacted the way in which the municipality and the citizens are currently communicating. However, the fact that citizens in the neighbourhood seem to be individualistic and have other priorities than sustainable development and climate adaptation has led to the majority of citizens not being familiar with the experiments of Reyerwaard+. The citizens that are familiar with the experiments and participate in them do not view the experiments as a means of social interaction with other citizens. The reason to

participate that stands out the most is to counter the impoverishment in the outdoor surroundings of the neighbourhood. The other way around, the main effect of the ULL Reyerroord+ on social cohesion in Reyerroord is in terms of the development of the relationship between the municipality and the citizens, and the sense of ownership citizens have towards the public space in the neighbourhood. First of all, the current relationship between the municipality and the citizens of Reyerroord seems to be a traditional relationship. The relationship takes a top-down approach where the municipality takes the role of engager of the citizens, while the citizens expect that the municipality takes their responsibilities to enhance the neighbourhood to a certain extent. It is important to take this reciprocal relationship between the municipality and citizens into account when discussing the social cohesion in Reyerroord, as it can influence different elements of the concept. For example, it can influence the trust citizens have towards the municipality, the way in which citizens would prefer to shape their civic engagement, and the solidarity they feel towards the community they are in. Secondly, ownership is an important concept here. Sense of ownership comes with a sense of responsibility. A public space is often seen as owned by the municipality, and it can therefore be difficult for citizens to feel responsible, because they feel like they have no ownership. This will gradually need to be shifted, whereby the aim will be that public spaces are seen as a joint property, of the municipality as well as the citizens and other actors. ULL experiments are an excellent opportunity to discover and develop a new way of communication and this new sense of ownership.

When looking at the perceptions of experts and citizens regarding the ULL practices, there are some significant points to be made. In general, it looks like the experts are aware of what a good functioning ULL requires. This mainly revolves around the quality of social relations and the importance of close and trustful relationships between actors. Despite the fact that the citizens generally agree on these values, their concerns are mostly about nuisance in the neighbourhood in which they want to be heard by the municipality. More attention to these subjects would increase the trust of citizens in the municipality. There is therefore room for improvement in terms of trust between the actor groups. Furthermore, it is interesting to see that the perception of expert Daan Vermeer about Reyerroord+ seems to be based on a more active and engaged group of citizens. For example, he described Reyerroord+ as very active in terms of projects and experiments and he stated that themes that are indicated to be important by the citizens are concerning the spatial environment (for example regarding community playgrounds and biodiversity). He also said that there is good contact between the citizens and that they regularly meet up at the community garden Oeverloos. In contrast, it became clear from the citizen interviews that not every citizen in the neighbourhood knows about Reyerroord+ or is aware of everything that is happening with regard to the ULL. Moreover, despite the citizens being concerned about the spatial environment, they indicated that this has more to do with the nuisance in terms of violence, waste on the street and the parking problem. Research among both active and less active residents could perhaps provide a more diverse picture of the situation regarding the ULL. A positive note is that both the expert and the citizens indicate that regular contact is crucial to secure strong social dynamics. Thus, a faster and clearer follow-up to previous meetings by the municipality could potentially get more out of the ULL.

In conclusion, it is important to bear in mind that ULL experiments could not only be seen as sustainability experiments. In fact, the experiments are also an opportunity for actors to learn how to approach citizen engagement and to develop a new way of communicating with citizens

that could ultimately be beneficial for climate adaptation in urban areas. The COVID-19 measures have shown that online meetings could be used in this new way of communication, as it can help to maintain the social cohesion in an ULL in times of social distancing.

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## 8. Appendices

### Appendix A1: Interview guide for the expert interviews (Dutch)

#### Introductie:

- Hoe werken u en uw organisatie aan of met ULLs?
- Wat is uw rol hierin?
- Wat is volgens u de kracht van ULLs?

#### Praktische vragen over de specifieke casus(sen) waarbij de expert betrokken is:

- Bij welke ULLs bent u betrokken en hoe bent u daarbij betrokken geraakt?
- Welke activiteiten vinden er nu plaats binnen deze ULLs en hoe worden deze georganiseerd?
- Hoe zijn deze ULLs tot stand gekomen en welke actoren hadden hier een rol in?
- Hoe zijn al deze actoren bij elkaar gebracht en hoe hebben zij vertrouwen in elkaar kunnen opbouwen in het begin?
- Wat wordt er verwacht van de actoren bij de experimenten binnen de ULLs?
- Wat zijn de belangrijkste onderwerpen of thema's waaraan de ULLs werken?
- Wat is de visie en hoe werkt deze visie door in de activiteiten binnen de ULLs?
- Wat zijn de resultaten van de ULLs en wat is er geleerd (als geheel en door betrokkenen)?
- Wat heeft u of hebben betrokkenen geleerd in één ULL dat later toegepast kon worden in een andere?
- Wat is volgens u wat deze ULLs sterk maakt en wat zou er volgens u beter kunnen?

#### Vragen met betrekking tot sociale cohesie/groepssamenstelling:

- Hoe is de relatie en samenwerking tussen de verschillende betrokkenen?
- Vertrouwen de verschillende betrokkenen elkaar op hun expertise en verantwoordelijkheden en hoe uit dit zich in vergaderingen en experimenten?
- Hoe vindt normaliter de interactie en communicatie tussen de verschillende actoren plaats?
- Voor zover u bekend bent met de bewoners van de ULLs, hoeveel bewoners zijn betrokken in de ULLs en zijn deze ook allemaal betrokken bij de experimenten?
- Hoe zou u de bewoners als groep omschrijven?
- Zijn de visies van bewoners en andere actoren gelijk? Zo ja, denkt u dat dit bijdraagt aan een voorspoedige samenwerking? Zo nee, waarin verschillen die visies en levert dit problemen op in de samenwerking?

#### Vragen over de impact van de coronamaatregelen:

- Wat gebeurde er met de projecten en experimenten binnen de ULLs toen de coronamaatregelen van kracht gingen?
- Wat was de eerste reactie van de verschillende betrokkenen hierop?
- Wat was het effect van de maatregelen op de interactie en communicatie tussen de bewoners en andere actoren?
- Was er een manier waarop de projecten door konden gaan midden in de coronacrisis en zo ja, hoe en wie kwam met dit idee?

- De regels omtrent *social distancing* en andere maatregelen zijn weer een beetje aan het versoepelen, hoe gaan de verschillende actoren nu om met de situatie?
- Is dit een duurzame oplossing, of zou u zeggen dat deze manier van communiceren binnen de ULLs tijdelijk is?
- Wat denkt u dat de maatregelen en de oplossingen binnen de ULLs voor effect heeft (gehad) op de groepsdynamiek onder de bewoners en het vertrouwen tussen actoren?
- Wat zijn andere succesvolle ULLs die u kent en hoe werd er daar (met succes) gereageerd op de coronamaatregelen? Waar denkt u dat dit aan heeft gelegen?
- Wat zijn nu uw verwachtingen voor de ULLs?

Tot slot:

- Wilt u nog een opmerking maken over of heeft u nog iets toe te voegen aan de dingen die we hebben besproken?
- Kunt u mij andere relevante personen aanbevelen met wie ik eventueel zou kunnen praten?
- Heeft u nog vragen aan mij?

## Appendix A2: Interview guide for the expert interviews (English)

### Introduction:

- How do you and your organisation work on or with ULLs?
- What is your role in this?
- What do you think is the strength of ULLs?

### Practical questions about the specific case(s) in which the expert is involved:

- Which ULLs are you involved in and how did you get involved?
- What activities are currently taking place within these ULLs and how are they organised?
- How did these ULLs come about and which actors played a role in them?
- How were all these actors brought together and how were they able to build trust in each other in the beginning?
- What is expected of the actors in the experiments within the ULLs?
- What are the main topics or themes that the ULLs work on?
- What is the vision and how does this vision affect the activities within the ULLs?
- What are the results of the ULLs and what has been learnt (as a whole and by those involved)?
- What did you or those involved learn in one ULL that could later be applied in another?
- What do you think makes these ULLs strong and what do you think could be improved?

### Questions related to social cohesion/group composition:

- What is the relationship and cooperation between the various parties involved?
- Do the various parties involved trust each other in their expertise and responsibilities and how does this manifest itself in meetings and experiments?
- How does the interaction and communication between the different actors normally take place?
- As far as you are aware of the citizens of the ULLs, how many citizens are involved in the ULLs and are they all involved in the experiments?
- How would you describe the citizens as a group?
- Are the views of citizens and other actors the same? If so, do you think this contributes to a successful cooperation? If not, how do those views differ and does this cause problems in the collaboration?

### Questions about the impact of the COVID-19 measures:

- What happened to the projects and experiments within the ULLs when the COVID-19 measures came into effect?
- What was the first reaction of the various actors to this?
- What was the effect of the measures on the interaction and communication between residents and other actors?
- Was there a way for projects to continue in the midst of the COVID-19 crisis and if so, how and who came up with this idea?
- The rules regarding social distancing and other measures are relaxing a bit, how are the various actors now dealing with the situation?

- Is this a sustainable solution, or would you say that this way of communicating within the ULLs is temporary?
- What effect do you think the measures and solutions within the ULLs have had on the group dynamics among the citizens and the trust between actors?
- What are other successful ULLs that you know and how did they (successfully) respond to the COVID-19 measures? What do you think this was due to?
- What are your expectations for the ULLs now?

Finally:

- Would you like to comment or add anything to the things we have discussed?
- Can you recommend other relevant people I could possibly talk to?
- Do you have any questions for me?

## Appendix B1: Interview guide for the citizen interviews (Dutch)

### Introductie:

- Hoe lang woont u al in Reyeroord?
- Hoe vindt u het om in Reyeroord te wonen?
- Zou u ooit uit deze wijk willen verhuizen?

### Vragen met betrekking tot Reyeroord+:

- Is Reyeroord+ voor u een bekend begrip?

#### Zo ja:

- Hoe bent u bekend geworden met Reyeroord+?
- Wat vindt u van dit initiatief?
- Doet u mee of heeft u meegedaan aan experimenten van Reyeroord+?
- Wat voor experimenten zijn dit?
- Is het voor u duidelijk wat voor bijeenkomsten en experimenten er allemaal gedaan worden?
- Ziet u de momenten van de bijeenkomsten en experimenten waarbij u betrokken bent als sociale gelegenheden?
- Hoe denkt u dat uw participatie bijdraagt aan het verbeteren of toekomstbestendig maken van de wijk?
- Zijn er nog andere activiteiten in de wijk waaraan u mee doet?

#### Zo nee:

- Wordt u op de hoogte gehouden van de projecten die worden gedaan in de wijk?
  - Zou u mee willen doen met de activiteiten die georganiseerd worden vanuit Reyeroord+?
  - Waarom wel/niet?
  - Hoe speelt het contact met medebewoners uit de wijk een rol in deze beslissing?
  - Zijn er andere activiteiten in de wijk waaraan u mee doet?
  - Hoe zou het voor u interessanter kunnen worden om mee te doen aan de experimenten van Reyeroord+?
- 
- Reyeroord+ is opgericht om de wijk te verbeteren en toekomstbestendig te maken. Wat zijn voor u belangrijke punten voor de wijk die aandacht vereisen?
  - Wie denkt u dat er verantwoordelijk is/zijn hiervoor?
  - Wordt hier (genoeg) aandacht aan besteed door deze mensen of partijen?
  - Reyeroord+ houdt zich voor een groot deel bezig met duurzaamheid, zowel in de omgeving als bij de bewoners thuis. Wat voor rol speelt dit thema in uw dagelijks leven?
  - Hoe denkt u dat kleine experimenten rondom de grote projecten van Reyeroord+ een impact kunnen hebben op de wijk?
  - Op welke manier voelt u zich sinds de coronamaatregelen betrokken tot de wijk?
  - Op wat voor manier bent u nu betrokken bij de activiteiten en/of experimenten die plaatsvinden in de wijk?



- Welke effecten denkt u dat de coronamaatregelen hebben op de projecten en experimenten in de wijk die worden georganiseerd vanuit Reyeroord+?

Vragen met betrekking tot relatie met gemeente en andere organisaties:

- Hoe zou u de rol van de gemeente in de wijk omschrijven?
- Wat vindt u daarvan?
- Zijn er andere organisaties die binnen de wijk een belangrijke rol spelen?
- Zo ja, wat is die rol?
- Wat vindt u van de rol die zij innemen in de wijk?
- Wat zijn voor u de opties om uw mening te laten blijken over het verbeteren van de wijk?
- Wat voor impact hebben de coronamaatregelen gehad op het contact met de gemeente in het algemeen?

Vragen met betrekking tot relatie met medebewoners:

- Hoe zag het contact met uw burens en andere buurtgenoten eruit voor de coronamaatregelen?
- Hoe vaak en hoe lang duurde dit contact?
- Hoe is dit contact ontstaan?
- Hoe werd dit contact onderhouden?
- Hoe zou u de relatie tussen u en uw buurtgenoten omschrijven?
- Vond u deze relatie prettig of had u het liever anders gezien?
- Zou u vaker meedoen aan activiteiten in de wijk als uw relatie met medebewoners beter was geweest?
- Is uw contact met buurtgenoten veranderd in de afgelopen maanden met de coronamaatregelen? Zo ja, hoe? Zo nee, waarom denkt u dat er niks is veranderd?
- Hebben de coronamaatregelen iets veranderd aan uw beleving van wonen in Reyeroord?
- Welke effecten denkt u dat de coronamaatregelen hebben op wonen in de wijk?

Vragen ter afronding:

- Hoopt u dat er nog iets gaat veranderen in de wijk? Zo ja, wat?
- Wat denkt u dat er in de wijk zal gebeuren rondom het thema duurzaamheid als de gemeente klaar is met de projecten rondom van het gas af gaan en rioolvervanging?
- Is er nog iets waar u het over wilt hebben wat we nog niet besproken hebben?

## Appendix B2: Interview guide for the citizen interviews (English)

### Introduction:

- How long have you been living in Reyerood?
- How do you experience living in Reyerood?
- Would you ever want to move out of this neighbourhood?

### Questions regarding Reyerood+:

- Is Reyerood+ a familiar concept to you?

#### If so:

- How did you become acquainted with Reyerood+?
- What do you think of this initiative?
- Do you participate or have you participate in experiments of Reyerood+?
- What kind of experiments are these?
- Is it clear to you what kind of meetings and experiments are being done?
- Do you see the moments of the meetings and experiments in which you are involved as social occasions?
- How do you think your participation contributes to improving the neighbourhood or making the neighbourhood future-proof?
- Are there any other activities in the neighbourhood that you participate in?

#### If not:

- Are you kept informed about the projects that are being done in the neighbourhood?
  - Would you like to participate in the activities organised by Reyerood+?
  - Why/why not?
  - How does contact with fellow citizens in the neighbourhood play a role in this decision?
  - Are there other activities in the neighbourhood that you participate in?
  - How could it be more interesting for you to participate in the Reyerood+ experiments?
- 
- Reyerood+ was established to improve the neighbourhood and make it future-proof. What do you think are important themes for the neighbourhood that require attention?
  - Who do you think is/are responsible for this?
  - Is (enough) attention being paid to this by these people or parties?
  - Reyerood+ is largely concerned with sustainability, both in the surroundings and in citizens' homes. What role does this theme play in your daily life?
  - How do you think that small experiments around the large projects in Reyerood+ can have an impact on the neighbourhood?
  - In what way do you feel involved in the neighbourhood since the COVID-19 measures?
  - In what way are you currently involved in the activities and/or experiments taking place in the neighbourhood?

- What effects do you think the COVID-19 measures have on the projects and experiments in the neighbourhood that are organised in Reyeroord+?

Questions regarding relationship with the municipality and other organisations:

- How would you describe the role of the municipality in the neighbourhood?
- What do you think of that?
- Are there other organisations that play an important role within the neighbourhood?
- If so, what is that role?
- What do you think of the role they play in the neighbourhood?
- What are the options for you to express your opinion about improving the neighbourhood?
- What impact have the COVID-19 measures had on contact with the municipality in general?

Questions regarding relationship with fellow citizens:

- What was the contact with your neighbours and other citizens in the neighbourhood like before the COVID-19 measures?
- How often and how long did this contact last?
- How did this contact come about?
- How was this contact maintained?
- How would you describe the relationship between you and your neighbours?
- Did you enjoy this relationship or would you prefer it to be different?
- Would you participate more often in neighbourhood activities if your relationship with fellow citizens had been better?
- Has your contact with neighbours changed in recent months with the COVID-19 measures? If so, how? If not, why do you think nothing has changed?
- Have the COVID-19 measures changed your experience of living in Reyeroord?
- What effects do you think the COVID-19 measures will have on living in the neighbourhood?

Finally:

- Are you hoping that something will change in the neighbourhood? If so, what?
- What do you think will happen in the neighbourhood with regard to the theme of sustainability when the municipality has completed the projects relating to phasing out natural gas and the replacement of the sewage system?
- Is there anything else you want to talk about that we have not discussed already?

## Appendix C1: Informed consent form for the expert interviews

In advance of the interviews, the respondents gave their consent to the use of their data via an informed consent form, which described the research in the following manner:

*The aim of this interview is to obtain information from an expert about social cohesion among citizens in urban living labs and its effect on experiments and how this is influenced by the measures concerning COVID-19. This information will only be used for research purposes.*

*All confidential information will be handled and respected with care. Please indicate in your answers on the next page if any confidential information is provided.*

*During the interview you will be asked questions about group processes among residents of urban living labs in general, and specifically in relation to the measures concerning COVID-19. The audio of the survey will be recorded. The recording will be used to transcribe the interview. The survey will take up to one hour maximum and you are free to skip questions that you would prefer not to answer. In addition, you can end your participation at any time during the interview process.*

The respondents were asked to state their preference/understanding for the following points:

- *I voluntarily agree to participate in this study and I understand that I can refuse to answer questions and that I can withdraw from the study at any time without providing a reason.*
- *I understand that participation in the study involves an audio-recorded interview and that the researcher may also take written notes. The audio recordings will be transcribed as text and will be stored securely. Only the researcher has access to the original data.*
- *I understand that the information provided by me will be used for the researcher's master's thesis report.*
- *I agree that my name, job description, company and information that I share may be quoted in the results of the research.*
- *I understand that any other personal information collected about me that can identify me will not be shared outside of the research team.*

## Toestemmingsformulier – Semi-gestructureerde interviews

Titel onderzoek:

Voor- en achternaam onderzoeker:

Voor- en achternaam respondent:

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Het doel van dit interview is het via een expert verkrijgen van informatie omtrent sociale cohesie onder bewoners in urban living labs en het effect hiervan op experimenten en hoe dit beïnvloed wordt door de maatregelen omtrent COVID-19. Deze informatie zal **alleen** gebruikt worden voor **onderzoeksdoeleinden**.

Alle **vertrouwelijke informatie** zal voorzichtig worden behandeld en gerespecteerd. **Gelieve in uw antwoorden op de volgende pagina aan te geven of er vertrouwelijke informatie wordt verstrekt.**

Tijdens het interview zullen u vragen worden gesteld omtrent groepsprocessen onder bewoners van urban living labs in het algemeen en specifiek in relatie tot de maatregelen omtrent COVID-19. De audio van het onderzoek zal opgenomen worden. De opname zal worden gebruikt om het interview te transcriberen. Het onderzoek zal maximaal 1 uur duren en u bent vrij om vragen die u liever niet wilt beantwoorden over te slaan. Daarnaast kunt u uw deelname op elk moment binnen het interviewproces beëindigen.

Voor meer informatie of vragen kunt u contact opnemen met de onderzoeker:

Telefoon:

E-mail:

***Gelieve de vakjes aan te kruisen die voor u van toepassing zijn***

**Ja      Nee**

**Deelname aan het onderzoek**

Ik stem er vrijwillig mee in om deel te nemen aan dit onderzoek en ik begrijp dat ik kan weigeren om vragen te beantwoorden en dat ik me op elk moment kan terugtrekken uit het onderzoek, zonder dat ik daarvoor een reden hoeft te geven.

☐☐

Ik begrijp dat deelname aan het onderzoek gepaard gaat met een audio-opgenomen interview en dat de onderzoeker ook schriftelijke aantekeningen kan maken. De audio-opnames worden als tekst getranscribeerd en veilig opgeslagen. Alleen de onderzoeker heeft toegang tot de originele gegevens.

☐☐

**Gebruik van de informatie in het onderzoek**

Ik begrijp dat de door mij verstrekte informatie zal worden gebruikt voor het masterscriptie-verslag van de onderzoeker.

☐☐

Ik ga ermee akkoord dat mijn naam, functieomschrijving, bedrijf en informatie die ik deel kan worden geciteerd in de onderzoeksresultaten.

☐☐

Ik begrijp dat alle andere persoonlijke informatie die over mij wordt verzameld en die mij kan identificeren niet buiten het onderzoeksteam zal worden gedeeld.

☐☐

**Handtekeningen**

Klik of tik om tekst in te voeren.

**Naam respondent**

**Handtekening respondent**

Klik of tik om een datum in te voeren.

**Datum**

Klik of tik om tekst in te voeren.

**Naam onderzoeker**

**Handtekening onderzoeker**

Klik of tik om een datum in te voeren.

**Datum**



## Appendix C2: Informed consent form for the citizen interviews

In advance of the interviews, the respondents gave their consent to the use of their data via an informed consent form, which described the research in the following manner:

*The aim of this interview is to obtain information through the experiences of citizens of Reyroord (Rotterdam) about social cohesion among citizens in urban living labs and the impact of the COVID-19 measures on social cohesion and the experiments and projects that are being done in Reyroord. This information will only be used for research purposes.*

*All confidential information will be handled and respected with care. Please indicate in your answers on the next page whether you consent to some participation and use of information in the research.*

*During the interview you will be asked questions about your experience of living in Reyroord, your activity in the neighbourhood and with Reyroord+, your contact with neighbours and the municipality, and finally the impact that the COVID-19 measures have (had) on this. The interview will last approximately 30 minutes and you are free to skip any question you prefer not to answer. In addition, you can end your participation at any time during the interview process.*

The respondents were asked to state their preference/understanding for the following points:

- *I voluntarily agree to participate in this study and I understand that I can refuse to answer questions and that I can withdraw from the study at any time without providing a reason.*
- *In addition to taking written notes, the researcher may also make an audio recording of the interview.*
  - *The recording will be used to transcribe (type out) the interview with the aim of facilitating the analysis. The audio recordings are only accessible to the researcher and are deleted immediately after transcribing. The text is stored securely and shared only with the researcher's two supervisors.*
- *I give permission that the information I provide will be used for the researcher's master's thesis report.*
- *I understand that personal information, such as my e-mail address and home address, will not be shared.*
- *My name may be mentioned in the results of the research.*
- *The experiences I share may be quoted in the research results.*

## Toestemmingsformulier – Bewonersinterview Reyeroord

Titel onderzoek: Building and maintaining social cohesion in urban living labs in times of COVID-19

Voor- en achternaam onderzoeker:

Voor- en achternaam respondent:

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Het doel van dit interview is om via de ervaringen van bewoners van Reyeroord (Rotterdam) informatie te verkrijgen omtrent sociale cohesie onder bewoners in urban living labs<sup>1</sup> en de impact van de coronamaatregelen op de sociale cohesie en de experimenten en projecten die gedaan worden in Reyeroord. Deze informatie zal alleen gebruikt worden voor onderzoeksdoeleinden.

Alle **vertrouwelijke informatie** zal voorzichtig worden behandeld en gerespecteerd. **Gelieve in uw antwoorden op de volgende pagina aan te geven of u toestemming geeft op enkele deelname aan en gebruik van informatie in het onderzoek.**

Tijdens het interview zullen u vragen worden gesteld over uw ervaring met wonen in Reyeroord, uw activiteit in de wijk en met Reyeroord+, uw contact met buurtgenoten en de gemeente, en tot slot de impact die de coronamaatregelen hierop hebben (gehad). Het interview zal ongeveer 30 minuten duren en u bent vrij om vragen die u liever niet wilt beantwoorden over te slaan. Daarnaast kunt u uw deelname op elk moment binnen het interviewproces beëindigen.

Voor meer informatie of vragen kunt u contact opnemen met onderzoeker Maaïke van Dijk:

Telefoon:

E-mail:

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<sup>1</sup> Een urban living lab, of stadslab, is een term die gebruikt wordt om een plek te beschrijven waarin wordt geëxperimenteerd met innovaties die als doel hebben om stedelijke uitdagingen (bijv. omtrent klimaatverandering of armoede) op te lossen. Bij deze experimenten worden verschillende partijen betrokken, waaronder bewoners, de gemeente, scholen en universiteiten en bedrijven. Reyeroord+ wordt gezien als urban living lab.

*Gelieve de vakjes aan te kruisen die voor u van toepassing zijn*

Ja      Nee

### Deelname aan het onderzoek

Ik stem er vrijwillig mee in om deel te nemen aan dit onderzoek en ik begrijp dat ik kan weigeren om vragen te beantwoorden en dat ik me op elk moment kan terugtrekken uit het onderzoek, zonder dat ik daarvoor een reden hoeft op te geven.

☐      ☐

De onderzoeker mag naast het maken van schriftelijke aantekeningen een audio-opname maken van het interview.

☐      ☐

De opname zal worden gebruikt om het interview te transcriberen (uit te typen), met als doel om de analyse te vergemakkelijken. De audio-opnames zijn alleen toegankelijk voor de onderzoeker en worden direct na het transcriberen verwijderd. De tekst wordt veilig opgeslagen en alleen gedeeld met de twee begeleiders van de onderzoeker.

### Gebruik van de informatie in het onderzoek

Ik geef toestemming dat de door mij verstrekte informatie zal worden gebruikt voor het masterscriptie-verslag van de onderzoeker.

☐      ☐

Ik begrijp dat persoonlijke informatie, zoals mijn e-mailadres en woonadres, niet zal worden gedeeld.

☐      ☐

Mijn naam mag worden genoemd in de onderzoeksresultaten.

☐      ☐

De ervaringen die ik deel mogen worden geciteerd in de onderzoeksresultaten.

☐      ☐

### Handtekeningen

Klik of tik om tekst in te voeren.

**Naam respondent**

**Handtekening respondent**

Klik of tik om een datum in te voeren.

**Datum**

Klik of tik om tekst in te voeren.

**Naam onderzoeker**

**Handtekening onderzoeker**

Klik of tik om een datum in te voeren.

**Datum**