

**Looking over the garden wall: Citizen  
Participation in Smart City Urban Living Labs**  
*a mixed-methods approach investigating the factors and  
experiences that influence citizen participation*  
MA Thesis

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## ABSTRACT

The rise of big data, high-tech infrastructures, sensors, and communication networks has transformed cities into hybrids of the physical and digital, addressing complex problems like climate change. To integrate citizens into smart city development, policymakers increasingly make use of Urban Living Labs (ULLs). Despite their growing popularity, our understanding of ULLs, their impact, and citizens' roles and experiences remains limited. Existing literature highlights the importance of citizens and local contexts in ULLs but lacks insights into citizens' perspectives. This research aims to bridge this gap by investigating factors and experiences that influence citizens' willingness to participate in ULLs.

The central research question addressed is: What factors and experiences influence citizens' willingness to participate in Urban Living Labs? To answer this, the study adopts concepts and measures from literature on citizen participation and social movements. Empirically, the research focuses on the Marineterrein Urban Living Lab (MALL) in Amsterdam, The Netherlands, employing a mixed-methods design consisting of two phases: a survey and semi-structured interviews.

The first phase involved a survey to assess the extent to which civic engagement and pro-environmental behaviour influence citizens' willingness to participate in ULLs. Findings indicated that while high civic engagement showed only a marginally significant effect on willingness to participate, pro-environmental behaviour showed to be a positive predictor of future participation. In the second phase, semi-structured interviews were conducted with six local residents who had participated in one or more ULL activities. Participants expressed a strong perceived efficacy of ULLs but pointed out a lack of transparency regarding practitioners and projects. They also reported a lack of ownership over the ULL initiatives and highlighted the concept of co-organizing as a mode of participation that could enhance ownership and increase awareness among less-engaged citizens. These findings contribute to closing the existing research gap in ULL literature by emphasising citizens' experiences and providing insights into who is more likely to participate. Furthermore, the study introduces the notion of co-organizing as a new mode of participation, enriching the existing framework on citizen participation in ULLs. This research underscores the importance of transparency and ownership in fostering citizen participation and offers practical implications for policymakers and practitioners aiming to enhance civic engagement in smart city initiatives.

**KEYWORDS:** *Citizen participation, Urban Living Labs, Sustainability, Mixed Methods, Smart Cities*

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## 1. Introduction

### 1.1 Democratic smart city development?

With the rise of big data, hi-tech infrastructures, sensors and communication networks, smart cities have become a hybrid of the physical and the digital. These urban media technologies pose an answer for policymakers dealing with complex problems such as climate change (De Lange & De Waal, 2015, p. 48 ). Projects for developing smart cities typically consist of a collaboration between government, knowledge institutions and private businesses. Such consortia often ignore the role of citizens as equally important agents (De Lange & De Waal, 2015, p. 49). In order to involve citizens within smart city development, policymakers increasingly make use of *urban living labs (ULLs)* for dealing with complex global issues, such as climate change (Bulkeley et al., 2019, p. 318 ; Puerari et al., 2018, p. 1). As locally embedded, co-creative projects for piloting urban solutions, ULLs offer a way for policymakers to collaborate with citizens and local organisations in urban neighbourhoods (Bulkeley et al., 2019, p. 319; Puerari et al., 2018, p. 2). With the goal of learning and ongoing improvement, these labs run a wide variety of experiments, workshops and activities to improve city life (Bulkeley et al., 2019, p. 319; Puerari et al, 2018, p. 2). This new form of collaboration in urban planning, allows citizens to envision their future city together with policymakers (Rahmawan-Huizenga & Ivanova, 2022, p. 8).

Citizen participation takes many forms, from reactive polls to grassroot movements (Pallet et al., 2018, p. 591; Marres, 2012, p. 8). ULLs provide a range of modes for participation to citizens. Ranging from no participation to information, consultation and the most intensive, co-creation (Menny et al., 2018, p. 70). However not all citizens are equally willing or able to participate in shaping the future city. Some factors are expected to influence participation in ULLs. It is important to view less explicit forms of engagement to influence participation in ULLs. Citizens engage with themes of ULLs, such as sustainability, not always explicitly in a public context. With the rise of previously mentioned urban media technologies, citizens are able to engage with public topics such as sustainability from within the confines of their home (Marres, 2012, p. 83). Citizens show pro-environmental behaviour through domestic consumption and use of information, products and services at home. For example the usage of recycling and smart energy metres (Marres, 2012, p 83) and engaging in social trends like ethical consumerism (Kim-Marriott, 2021, p. 183) are expected to positively influence participation in ULL. Additionally, investment in efforts to improve local social cohesion such as civic engagement is likely to increase participation of citizens in ULLs (Park & Fujii, 2023, p. 103; Remr, 2023, p. 3252). Citizens differ in their efforts to improve conditions within the life of a local community. For example by being helpful to neighbours or maintaining official volunteer positions in local organisations (Adler & Goggin, 2005, p. 241).

Furthermore, literature shows how the dynamic between perceived cost of participation and motivations influence willingness to participate (Klandermans & Oegema, 1987, p. 530). Tied to these motivations are the concepts of sense of ownership and perceived efficacy. These are important constructs to the involvement of citizens in the processes of ULLs and to understand the perspectives of citizens. Perceived efficacy explains how people perceive the impact of their own participation and the effect of participation by itself. It plays an important role in moderating motivations (Klanderman & Oegema, 1987, p. 530)

## **1.2 Research focus and relevance**

While the popularity of Urban Living Labs as a tool for developing smart cities is increasing, our understanding of ULLs, their impact and the role and experiences of citizens are still limited (Bulkeley et al., 2019, p. 318 ; Puerari et al., 2018, p. 1). Academic literature discusses how citizens and local context are key dimensions within ULLs but provide limited insight on the perspectives of citizens (Bulkeley et al., 2019, p. 333; Puerari et al., 2018, p. 2). However, research on participation in ULLs primarily focuses on the role of other stakeholders and initiators (Puerari et al., 2018, p. 12; Rahmawan-Huizenga & Ivanova, 2022, p. 13). Existing literature is mainly concerned with the production of frameworks to participation, but lacks the empirical support of citizens' own voices and experiences. In order to build a complete understanding of participation in ULLs it is important to uncover how citizens differ in their likelihood to participate and what their experiences, motivations and perspectives on ULLs are (Puerari et al., 2018, p. 2). This research thus aims to answer the question: *What factors and experiences influence citizens' willingness to participate in Urban Living Labs?*

This research aims to fill the research gap of the under-developed view of the role of citizens in the co-creative processes of ULLs (Puerari et al., 2018, p. 14; Rahmawan-Huizenga & Ivanaova, 2022, p. 555). Since known factors influencing citizen participation in ULLs are lacking, this research adopts concepts and measures from literature on citizen participation and participation in social movements. Using a mixed-methods research design, the first phase of the research consists of a survey to answer the following question: *To what extent do civic engagement and pro-environmental behaviour influence the willingness of citizens to participate in ULLs?* Aiming to understand which citizens are more likely to participate and what motivations and barriers influence their willingness to participate. Subsequently, semi-structured interviews have been conducted with participants of urban living lab activities in order to understand how participants see the effectiveness of the ULL and the role their own contribution plays in achieving a positive outcome. Additionally the interviews allow for contextualising findings from the survey, thus answering the

*question: How does citizens' experience with ULLs relate to their sense of ownership and perceived efficacy of ULLs?*

This knowledge will allow policymakers and urban living lab initiators to organise and plan their work reflecting citizen interests (De Lange & De Waal, 2017, p.93). ULLs are becoming increasingly more popular among policymakers to develop our future smart cities. However, their success and the reasons behind their success are being contested (Bulkeley et al., 2018, p. 333). Therefore, it is important to carefully capture the full range of their effect before replicating them at scale while being potentially irrelevant for those living in the cities that are most directly affected by the outcomes of ULLs, the citizens. Understanding the factors and experiences shaping citizen participation in ULLs could have wider implications for discussion on how we develop our future cities together using ULLs. Firstly, it concerns the importance of including users in early stages of ULLs for effective co-creation and impact. Since participation is more often than not volunteer based, maintaining stable participation in co-production activities in ULLs is critical to achieve significant and effective results in experimentation (Nesti, 2018, p. 321). Understanding what drives people to participate in ULL activities and how they perceive their own role, will help form co-creation processes that align with the goals and preferences of citizens. Secondly, this knowledge will help involve a representative selection of the diverse population of cities. It is important to understand the motives underlying citizen participation in order to engage a wide variety of citizens. If only homogeneous groups of people participate that do not reflect the broader population, the majority of inhabitants are left without a voice. Understanding the motivations of those citizens that join, and the barriers of those unable or unwilling to, will help shape ways to involve a representative of the diverse population of cities. A third and final implication is the relevance and impact of ULLs. What factors for effectively scaling local solutions from the testbed of ULLs into widespread implementation in society are still contested (Bulkeley et al., 2018, p. 333). Getting a better view on how citizens perceive ULLs and their projects might help in developing a better strategy for implementing on a bigger scale where citizens simultaneously act as local residents and consumers of these novel solutions.

### **1.3 Outline of the thesis**

This thesis is structured as follows. Following this introduction, in Chapter 2, I review the existing literature on citizen participation and participation in urban living labs. Chapter 3 presents my methodology methods of data collection and analysis and I contextualise my research setting. Chapter 4 shows the results from the survey and interviews. Finally, I provide a discussion and conclusion in Chapter 5.

Empirically, I focus on the Marineterrein Urban Living Lab (MALL) which is situated in Amsterdam, The Netherlands. The research consists of a mixed methods research design consisting of two phases, a survey and semi-structured interviews. First, a survey was distributed among local residents and visitors of the terrain. The survey was primarily focused on capturing respondents' willingness to participate in an urban living lab activity and their corresponding motivations and barriers. Data on respondents' civic engagement and pro-environmental behaviour were captured. Counter expectations, high civic engagement only showed a marginally significant effect on willingness to participate. Pro-environmental behaviour was shown to be a positive predictor for future participation. Then in the second phase, semi-structured interviews were conducted with six local residents who participated in one or more activities organised by the urban living lab. The interviewees discussed a strong perceived efficacy of the ULL in general but missing transparency about the ULL's practitioners and its projects. Citizens expressed a lack of ownership and discussed the notion of co-organising as a mode of participation with high ownership and a way to increase awareness for those citizens that are less likely to involve themselves in ULL activities. These findings lay the groundwork for closing the existing research gap in ULL literature lacking the views and experiences. It highlights citizens' experiences by sharing their views in their own words and providing an overview of who is more likely to participate. Additionally, I make a novel contribution to existing frameworks of citizen participation by adding the notion of co-organising as a new mode of participation adding to the known framework on citizen participation in ULLs (Menny et al., 2018, p. 71).



## **2. Theoretical Framework**

What follows is a review of the literature surrounding the topic of citizen participation in urban living labs. Firstly, covering citizen participation in the public sphere. Secondly, citizen participation within urban living labs. Then, as the research on citizen perspectives in ULL literature is scarce, theories from participation in social and political movements are borrowed to provide relevant factors. Leading to civic engagement as the first factor expected to be influencing participation in ULLs and pro-environmental behaviour as the second factor. Concluding, control variables such as motivations, barriers and socio-demographics are discussed.

### **2.1 Citizen Participation**

Despite the wide variety of definitions, participation can be defined as taking part, or being involved, in an event of public interest (Pallet et al., 2018, p. 591). Citizen participation has often been reduced to fulfilling two roles – citizens are either formally invited to provide feedback in late stages of development through opinion polls and committees (Pallet et al, 2019, p.591) or by self-initiating informal community action such as protests (De Lange & De Waal, 2017, p. 51; De Waal, 2014; Pallet et al, 2019, p.591). However, this binary divide across the literature is problematic as in reality the boundaries between the private and the public sphere are blurred (Marres, 2012, p. 8; Pallet et al, 2019, p. 591). Less explicit forms of participation are often overlooked. Engaging in complex topics such as climate change is also done in daily activities such as separating waste or choosing which mode of transport to take for commuting (Marres, 2012, p 76.; Pallet et al, 2019, p. 591). These latent forms of participation are what Marres (2012) describes as everyday practices of engagement (p. 3). Everyday practices of engagement are mediated by (technological) objects (Niederer & Priester, 2016, p. 137). For example, the use of urban media technologies such as Google maps or social media allows citizens to share local experiences without needing to be in the same physical space (De Waal, 2014, p. 18) or homes equipped with smart garbage separation and smart energy metres allow citizens to engage with climate change (Marres, 2009, p. 121). These everyday practices of engagement allow people to make decisions regarding complex themes such as climate change in a way that directly impacts their daily life, but in aggregate cause wider societal changes (Marres, 2009, p. 129).

### **2.2 Participation in urban living labs**

As locally embedded, co-creative projects for piloting urban solutions, ULLs offer a way for policymakers to collaborate with citizens and local organisations in urban neighbourhoods (Bulkeley et al., 2019, p. 319; Puerari et al., 2018, p. 2). With the goal of learning and ongoing improvement, these labs run a wide variety of experiments, workshops and activities to improve city life (Bulkeley

et al., 2019, p. 319; Puerari et al, 2018, p. 2). One way of participating in public events are these activities organised by urban living labs, considered to be a form of public experimentation (Marres, 2012, p. 83; Menny et al., 2018, p. 70). Temporarily located in a specific neighbourhood, urban living labs involve a wide variety of actors throughout the process of experimentation: government bodies, businesses, knowledge institutes, NGOs, special interest groups and local residents (Bulkeley et al., 2019, p. 2). Through a series of connected activities, knowledge sharing sessions and workshops these stakeholders decide on future directions of the projects and collaborate on designing and testing new solutions for problems in cities such as waste management, clean mobility and energy infrastructure. These activities range from information campaigns to workshops and testing products. Activities that require more intense engagement employ ethnographic tools such as focus groups and scenario building. In these types of activities participants are encouraged to come up with ideas and discuss these through various methods such as brainstorming, visualisations and other ethnographic approaches (Nesti, 2018, p. 314).

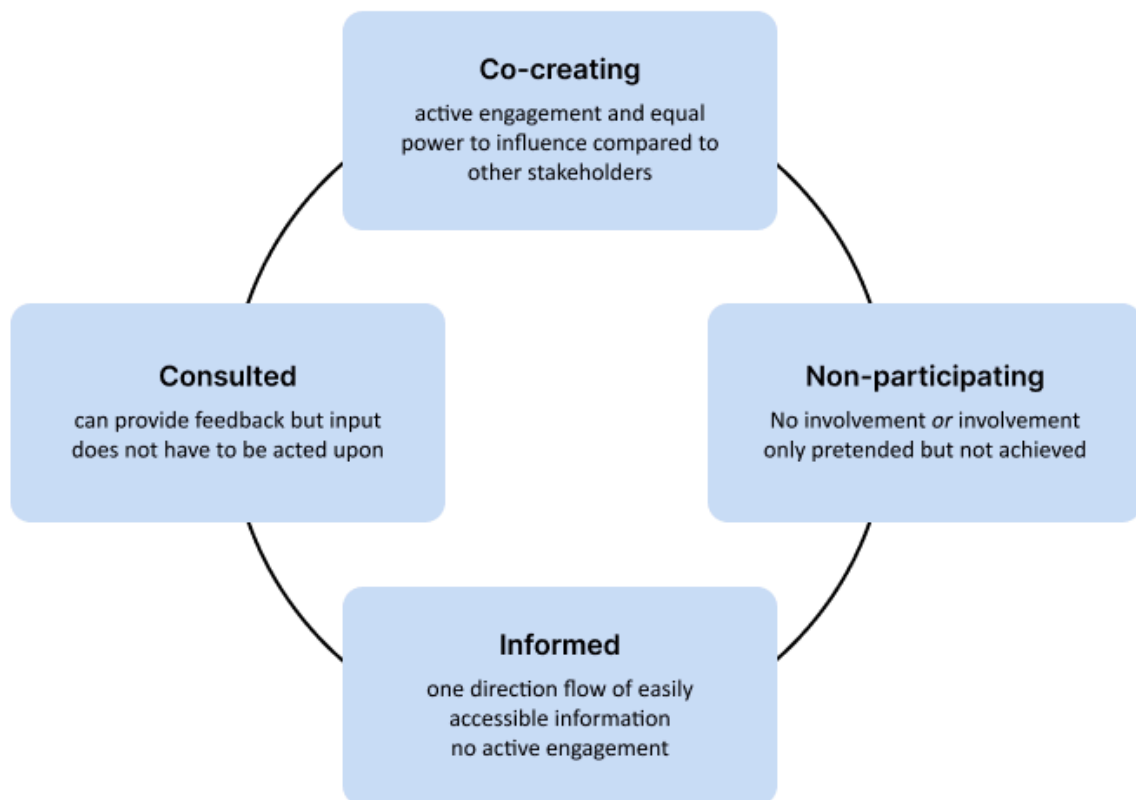
Participation in these activities is often stressed as one of the main benefits of ULLs (Bulkeley et al., 2019, p. 319; Puerari et al, 2018, p. 2). The dynamics of participation change depending on the phase of the project (Menny et al., 2018, p. 71; Nesti, 2018, p. 319), the actors involved (Puerari et al, 2018, p. 10; Rahmawan-Huizenga & Ivanova, 2022) and the mode or level of involvement (Menny et al., 2018, p. 71; Nesti, 2018, p. 319). Generally split between design, implementation and evaluation, citizens can contribute at moments throughout different phases of the process (Menny et al., 2018, p. 71; Nesti, 2018, p. 312). The design phase primarily concerns itself with framing the problem, setting goals and processes and generating potential solutions. Citizen involvement in this early phase is important as it allows citizens to decide on the means and methods through which they will be involved throughout the process, however it is the phase with the least amount of citizen participation (Menny et al., 2018, p. 69). The implementation phase is where detailed solutions are created and explored. This seems to be the phase where currently most citizen participation is happening (Menny et al, 2018, p. 75). The evaluation phase is where the final result is tested, learnings are shared and goals adjusted. These phases do not provide true clear cut boundaries, phases often happen in a cyclical nature with the evaluation phase constantly informing the next steps.

Throughout these phases different modes of participation can exist, each with a different level of involvement. Based on frameworks from citizen participation Figure 1 shows Menny et al. 's (2018) outline of four levels of participation, stakeholders can achieve within ULLs. Ranging from no participation to the highest degree of decision making power, co-creating. Non-participating is simply the lack of involvement (either perceived or actual) from the citizens. The second level, informed concerns itself with the communication process on updates about projects and outcomes

without any interaction. The third level, consultation, covers the interactions that happen when citizens are asked for their opinion or feedback, for example testing potential solutions or responding to an outcome. The highest level of participation is co-creation, co-creation has two goals: learning together and making together (Puerari et al., 2018, p.5). Co-creation is considered the highest level of participation (Menny et al, 2018, p. 71) and allows for citizens to decide together on goals, collaborate on designing or creating solutions and even help shape the process of participation.

**Figure 1.**

*Levels of participation in ULLs, adapted from Menny et al., 2018, p. 71*



Despite having some insights on the participation of various stakeholders, ranging from entrepreneurs to citizens and organisers, literature reveals limited insights on citizens' perspectives within ULLs (Menny et al., 2018, Puerari et al., 2018; Rahmawan-Huizenga & Ivanova, 2022). What follows is a first attempt to provide such a discussion on the factors and experiences influencing citizen participation in ULLs. For this, I borrow theories from literature on civic engagement and participation in social movements. They are deemed suited as first, these theories cover voluntary

forms of participation and intrinsic motivation, which is the case for most citizens participating in ULLs (Nesti, 2018, p. 312; Puereari, 2018, p.5). The second reason these theories are deemed appropriate, is the shared geographical context with ULLs. The majority of civic engagement theories are oriented towards participation in local areas such as neighbourhoods and communities (Adler & Goggin, 2005, p. 241), similarly to how urban living labs focus on experimenting in local neighbourhoods to improve city life. Social movements do not solely focus on local areas, but local areas play an important role in mobilising participants (Klandermans & Oegema, 1987, p. 521). The third reason is that participation in social movements such as protests and environmental movements concerns matters of public concern (Kim-Marriott, 2021, p. 183; Klandermans & Oegema, 1987, p. 519). Paralleling the public experimentation of urban living labs concerned with complex global topics such as climate change (Bulkeley et al., 2019, p. 318 ; Puerari et al., 2018, p. 1). Lastly, the theories of civic engagement and social movements provide a depth of work studying the factors influencing participation, such as socio-demographics, barriers and motivation (Adler & Goggin, 2005, p.1; Klandermans & Oegema, 1987, p.1). These elements are lacking in the literature about stakeholder participation in ULL. The next sections describe important factors to participation in the literature on social movements. These factors are deemed most likely to be relevant for participation in ULLs.

### **2.3 Civic engagement**

The first factor deemed important to citizen participation in ULLs, is civic engagement. Civic engagement does not have an agreed upon definition (Adler & Goggin, 2005, p. 238). The literature does agree on the goal of civic engagement being active participation in the betterment of the local community life or that of wider society (p. 241). Definitions of what activities and scale are considered to be civic engagement varies. Ranging from voluntary service in associations or political action or just general social commitment to see local friends and acquaintances; electoral voting is sometimes included in the definition (Adler & Goggin, 2005, p. 238). This research uses the definition posed by Adler & Goggin (2005): *“Civic engagement describes how an active citizen participates in the life of a community in order to improve conditions for others or to help shape the community’s future”* (p. 241). Some evidence exists that civic engagement is positively linked to participation in ULLs (Park & Fujii, 2023, p. 103; Remr, 2023, p. 3252). A sense of social belonging, feeling attached to the local area, is also often stressed as an important dimension of civic engagement as it encourages participation in local life (Irani, et al., 2023, p. 11; Remr, 2023, p. 3252). A sense of contribution to public good leads to increased participation levels in ULLs (Park & Fujii, 2023, p. 94). Other local attachments, such as feeling like you belong in the neighbourhood,

are related to participation in smart city projects (Remr, 2023, p. 3255). This shows civically engaged people might be more likely to participate in ULLs.

**Hypotheses 1:** *Higher levels of civic engagement leads to a stronger willingness to participate in ULLs.*

## **2.4 Pro-environmental behaviour**

The second factor deemed to be important to citizen participation in ULLs, is pro-environmental behaviour. Most ULLs focus on experimenting with new solutions to climate change (Bulkeley et al., 2019, p. 2). Likely to draw in mostly those citizens that are already aware and engaging with sustainability, which is not representative of the average citizen. Research shows citizens at the forefront to participate are often driven due to their interest in novel developments such as experimental solutions to climate change (De Waal, 2014, p. 12; Marres, 2012, p. 72). For example, people with high self-reported pro-environmental behaviours were shown to be volunteering more frequently in community events with a pro-environmental topic (Irani et al., 2023, p. 7). Citizens do not only participate through formally organised activities in the public sphere (Marres, 2012, p. 3; Pallet et al., 2019, p. 591). Engagement with complex topics, such as climate change, happens on a daily basis within the confines of a home (Marres, 2012, p. 8). Irani et al. (2023) describe two main dimensions of this pro-environmental behaviour: information seeking and household behaviour (p. 6). Information seeking describes a person's active pursuit of and discussion of knowledge surrounding climate change and investigation towards solutions to climate change. Household behaviour describes habits and activities such as recycling and lowering energy usage. It seems natural that those who have an interest in a topic would seek out more opportunities to engage with it. This leads to the second hypothesis:

**Hypotheses 2:** *Citizens with higher levels of pro-environmental behaviour show a stronger willingness to participate in ULLs.*

## **2.5 Motivations and barriers to participation**

Literature shows that willingness to participate is shaped by the interaction between motivations and barriers, positioning it as an important factor to understand. Although research on citizen motivations to participate in Urban Living Labs is limited (Puerari et al., 2018, p. 14; Rahmawan-Huizenga & Ivanova, 2022, p. 13), studies on political activation of social movements show the more motivated people are, the higher the barriers they are willing to overcome in order to participate in movements (Klandermans & Oegema, 1987, p. 520). Motivation is therefore likely important for understanding people's willingness to participate in ULL's. Known factors shaping

motivations to participate in ULLs are: awareness, incentives, social network, perceived efficacy and sense of ownership. Awareness of the problem and the opportunity for participating in a solution is important (Puerari et al., 2018, p. 3; Kim-Marriott, 2021, p. 190). First, citizens need to consider the problems targeted by ULLs to be worth solving. Subsequently, citizens need to be aware of the opportunity to participate in finding solutions to this problem. Incentives, as ULLs do not provide monetary benefits, a sense of fulfilment is often stated as intrinsic motivation, but what that means is different for everyone (Puerari et al., 2018, p. 12). Studies on smart cities show how the most active or first participants often are motivated by indulging their interest in novel or experimental technologies (De Waal, 2014, p. 14; Marres, 2012, p. 32). Other known motivations are: Enjoyment from participating, improving the quality of local services, learning or improving skills, and meeting people with similar interests (Nesti, 2018, p. 312). Another factor shaping motivation to participate is the shared social networks of organisers and citizens. People who are already involved in a network of similar causes are more prone to be recruited for collective action (Klandermans & Oegema, 1987, p. 520 ; Kim-Marriott, 2021, p. 190). This is similar to how qualitative studies in ULL show new participants often emerge from the networks of initiators or through open calls and events (Puerari et al., 2018, p. 11). Another factor shaping motivation is perceived efficacy. Perceiving the act of participating as useful is a key motivator for joining protest actions (Klandermans & Oegema, 1987, p. 529). Research on participation in community grassroots organisations shows having participated in the past has positive effects on participation (Perkins et al., 1996, p. 97). The same relationship can be assumed for participation in ULLs. The last factor shaping motivation is sense of ownership, qualitative studies in literature on ULLs show an important relationship between effectiveness of co-creation in ULLs and a high sense of ownership among participants (Puerari et al., 2018, p. 11). Sense of ownership describes how much influence participants believe they have on the overall co-creation process. Believing that contributing is valuable is deemed an important factor in participation in social movements (Klandermans & Oegema, 1987, p. 527).

As mentioned previously, willingness to participate is shaped by the interaction between motivations and barriers. It is therefore important to view motivations in combination with possible (perceived) barriers. Literature on civic engagement and social movements indicate three main barriers to participation: biographical availability, geographical availability and perceived costs and risks. Biographical availability entails the lack of personal restraints such as commitment due to employment, parenthood or limitations due to health issues (Kim-Marriott, 2021, p. 185). Qualitative studies in pro-environmental social movements show having to care for young kids was a clear reason why participants could not join social movements (Kim-Marriott, 2021, p. 189). Geographical availability, such as distance and ease of transport have been shown to negatively

influence participation (Kim-Marriott, 2021, p. 186; Park & Fujii, 2023, p. 102). Financial costs are a critical barrier to collective action (Kim-Marriott, 2021, p. 186). As most ULLs are free to participate it is considered to be less relevant, however perception of a potential high financial cost must be considered. The last barrier consists of perceived legal and health risks (Klandermans & Oegema, 1987, p. 25; Kim-Marriott, 2021, p. 186), these barriers are assumed to be less relevant for ULLs as there are no physical or legal dangers associated with participation but citizens might still perceive it as such.

## **2.6 The moderating role of socio-demographics**

Literature on participation in ULL's states the importance of getting more insight into which types of citizens participate in ULLs (Puerari et al., 2018, p. 14; Rahmawan-Huizenga & Ivanova, 2022, p. 13) and the importance of homogeneity of stakeholders involved (Menny et al., 2018, p. 76). There are a few known socio-demographic factors influencing participation, civic engagement and pro-environmental behaviour.

Age seems to show mixed results. Generally young people are deemed the most likely to participate in social movements, however some studies show the contrary (Klandermans & Oegema, 1987, p. 528; Kim-Marriott, 2018, p.188). More senior citizens might have reduced biographical barriers due to not having to take care of family tasks anymore (Kim-Marriott, 2018, 189). The extent to which age influences participation in volunteering shows mixed results (Adler & Goggin, 2005, p. 243; Remr, 2023, p. 3259). Older people tend to be less engaged in the community, compared to younger people, but older people are more prone to participate in electoral opportunities (Adler & Goggin, 2005, p.243). Young people seem to be more prone to be part of environmental organisations and have increasingly become more active in civic involvement (Adler & Goggin, 2005, p.245). In regards to pro-environmental behaviour, age seems to have a mixed effect. Some evidence exists where older people tend to engage more in pro-environmental behaviour (Scannell & Gifford, 2010, p.294) but in case of household emissions age tends to be normally distributed, peaking in the middle years of 35 to 60 years (UK Report, 2013, p. 27). One explanation given is the difference in income and access to resources with age, as well as associated household size and composition. Considering the likely increase in income and available time with age the following hypothesis is stated:

**Hypothesis 3a:** *Older people show a stronger willingness to participate in ULLs compared to younger age groups.*

Education seems to show mixed effects on participation. The effect of education on pro-environmental behaviour does not seem to be significant (Scannell & Gifford, 2010, p. 294). Additionally, the participation in pro-environmental social movements show contesting results (Kim-Marriott, 2021, p. 191; Marres, 2012). However, the most evidence for participation in social movements seem to show high education levels (Klandermans & Oegema, 1987, p. 528). Therefore the following hypothesis is proposed:

**Hypothesis 3b:** *Highly educated people show a stronger willingness to participate in ULLs compared to lower educated people.*

Despite some contesting results, income seems to positively influence participation. Those likely to participate in social movements tend to be of higher income (Klandermans & Oegema, 1987, p. 528). Higher income has shown to be a positive indicator of joining pro-environmental social movements (Kim-Marriott, 2021, p. 191) However, income seems to decrease pro-environmental behaviour (Hargreaves et al., 2013, p. 17). Explanations given are likely due to household emissions increasing with gaining more income, by purchasing more emission heavy products such as cars. In light of this evidence, the following hypothesis is proposed:

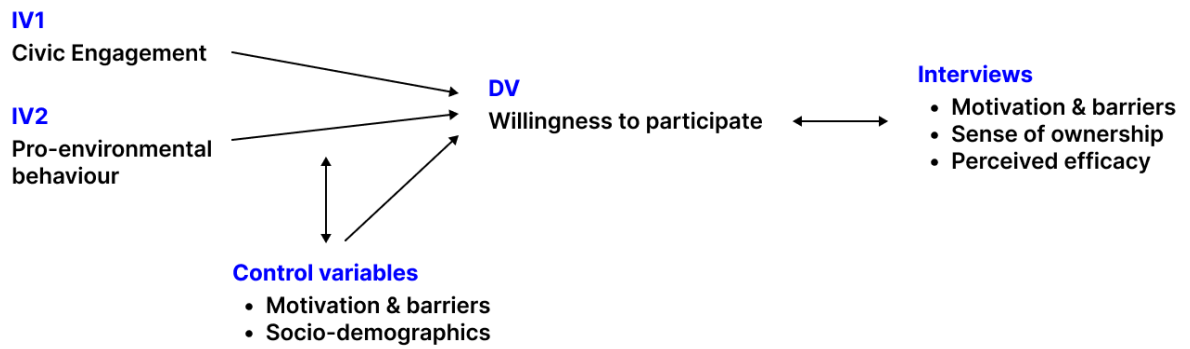
**Hypothesis 3c:** *People with high income show a stronger willingness to participate in ULLs compared to low income groups.*

Other related factors are household size having been positively linked to participation levels in ULLs (Park & Fujii, 2023) and household size having negative effects on pro-environmental behaviour as more resources are consumed (Hargreaves et al., 2013, p.40). Another factor is length of residence, which seems to have mixed effects on pro-environmental behaviour (Scannell & Gifford, 2010, p. 295). Figure 2 below shows how these socio-demographic variables relate to the other variables in a conceptual model. Socio-demographic variables influence all variables. They have independent effects on the willingness to participate, but also on civic engagement and pro-environmental behaviour. Additionally, socio-demographic variables also have a relationship with barriers and motivations. For example citizens might be motivated by people from their own social network, generally consisting of people with similar backgrounds or age could explain differences in barriers to participation (Klandermans & Oegema, 1987, p. 520 ; Kim-Marriott, 2021, p. 190). As explained in previous sections, the independent variables of civic engagement and pro-environmental behaviour seem to also have some influence over each other. Willingness to participate and the perceived efficacy and sense of ownership seem to have a relationship as well (Klandermans & Oegema, 1987, p. 530; Puerari et al., 2018, p. 13). A high sense of ownership and a



high perceived efficacy are expected to positively influence the willingness to participate. However low willingness to participate could also cause a lower perceived efficacy and sense of ownership as citizens will not have had any first-hand experiences.

Figure 2.  
*Conceptual model*



### 3. Research design

This chapter starts with a section outlining the justification of the methods used in this research. In the next section a description of the research context will be given, as ULL contexts are rather dynamic and varied. The third section outlines the operationalisation, starting with a brief description of the survey instrument and the measures used. After that the sensitising concepts for the interview are discussed. The fourth section describes the data collection methods and the sampling strategy used. This chapter concludes with a section describing the steps taken in the analysis process.

#### 3.1 Choice of methods

Research on urban living labs has for the most part relied on qualitative interviews and case studies (Bulkeley et al., 2019, p.1; Puerari et al., 2018, p.1; Rahmawan-Huizenga & Ivanaova, 2022, p.1). This research uses a mixed-methods design with two phases: an initial quantitative phase where a survey aims to identify factors influencing willingness to participate in ULLs. The subsequent qualitative phase consists of semi-structured interviews conducted with participants in a ULL activity. Only participants that scored high on the measure willingness to participate (four and five out of five) were invited to an interview. The interviews in the second phase also provided context to survey results, such as answering why potential mean deviations exist and how motivations relate to each other and to encountered barriers. Interviews are also well suited to explain hard to measure concepts such as *sense of ownership* (Puerari et al., 2018, p. 5). The main benefit of this approach is the contextualisation of quantitative data (Seale, 2012, p. 489). Where surveys allow for broad generalisable patterns and correlations, interviews provide contextual information often lacking in survey data (Seale, 2012, p. 489). For example Puerari et al (2018, p. 12) shows that a 'sense of fulfilment' is often stated as motivation to participate in ULLs but participants differ in their understanding of what the term means for them. Thick qualitative descriptions show nuances in these interpretations (Seale, 2012). One of the risks accompanying using mixed-methods is an increased workload. This was dealt with by having a smaller sample size for both methods, decreasing the waiting time during data collection in the first phase. Leaving ample room for reporting and making the amount of qualitative data manageable enough for cross analysis with the findings from the survey. All things considered, despite some risks, using a mixed methods approach strengthens the credibility of this research. It provides a unique way to find generalisable patterns as well as explore the context and circumstances shaping participant motivation in greater detail.

### 3.2 Research context of Marineterrein Urban Living Lab

This research consists of a mixed methods research design consisting of two phases, a survey and semi-structured interviews. Both the survey and interviews were conducted at the Marineterrein Urban Living Lab (MALL). MALL is situated in the Oostelijke Eilanden neighbourhood in Amsterdam, the Netherlands on the terrain of an old navy academy base. The space is hosted in a semi-public park accessible to the public. Since 2018 AMS Institute has been a partner of MALL, adding to their portfolio of ULL locations throughout Amsterdam. In the case of MALL, the official partners are AMS Institute, Bureau Marineterrein Amsterdam (BMA), Amsterdam Smart City and NEMO Science Museum. Despite official agreements, collaborations between partners are often fluid and non-official partners often joint efforts on a specific initiative. In practice, ULL experimentation is facilitated by AMS Institute and BMA where each experiment contains its own stakeholder field. AMS focuses on six urban challenges, with a focus on sustainability themes but which also cover smart technology and governance. The six urban challenges are: Smart Urban Mobility, Urban Energy, Climate Resilient Cities, Metropolitan Food Systems, Responsible Urban Digitalization and Circularity in Urban Regions. Bureau Marineterrein focuses more on social inclusion projects and facilitating the coordination between organisations and implementation of projects at MALL. The various experimental projects range from eco-show homes to electric bike charging stations and smart plastic collection points. (AMS-Institute 2023). Depending on the goal and stage of the projects, citizens are included or excluded.

Since activities vary across ULLs and the findings are based on this one specific case, details of the events available to citizens in the duration of the research are described to provide better context and improve the interpretation of the interview data. Some ULL projects were displayed publicly on the terrain but did not provide any way to interact outside of reading the informational sign. Other ways for citizens to participate in ULLs was through the following four events.

A first activity was the *Green Market by Bureau Marineterrein and AMS Institute*. This activity was used for the measure of the dependent variable 'willingness to participate'. Also every interview participant joined the green market event. Organised twice a year at Marineterrein on a Sunday. During this event local residents, together with organisations from the Marineterrein, showcase their green urban projects. The market aims to inspire residents with activities, workshops, and the chance to learn about sustainability projects happening in the area (AMS-Institute 2024). Visitors could purchase bio-based lamps from startups that were part of the ULL. Do workshops about dying with natural materials or learn more about ecology from a local museum. There were also sustainable food stalls and live music.

The second activity available to citizens was the *Pop-up Repair & Clotheswap cafe pilot* by *Bureau Marineterrein*. This activity was mentioned as a good example by participants in the interviews. Organised by one of the informal partners Design Agency AndThePeople and BMA. During a trial period of three days people could come to Marineterrein and bring their electronics, bikes and clothes to be repaired by two local residents and two fashion students from a local vocational school.

The third activity available was: *Guided tour of the eco-showhome 'Innovation Pavilion'* by *Gemeente Amsterdam*. Every Thursdays from 16:00-17:30 people could sign up to view the eco showhome situated on the terrain. It is completely built using circular material such as seaweed and compost. Anyone can view the building and a few informational signage, but the interior is only accessible during the guided tour. This activity was open to anyone, but was not explicitly mentioned by participants during the interview.

The last ULL activity available to citizens was *'Nieuw economisch denken. Nieuw economisch doen'* by Amsterdam Economic Board. This event was mentioned by two participants. Presentations of economists and policymakers on a presentation showcase of a few entrepreneurs who are working with a new business model. Followed by a short workshop where attendees envisioned how MALL could employ these principles and practices. The event took place at the Marineterrein on Tuesday April 16th from 16:00-19:00.

### **3.3 Operationalisation**

Before starting the survey, participants were informed about the nature of the survey. This information included that the research was about their level of involvement in neighbourhood activities and local technological developments, the duration it will take and that participation is voluntary. In addition, participants were informed that all data will be collected anonymously and used for academic purposes only, if they agree to these terms and want to continue. In case they disagreed with the terms mentioned, they were sent immediately to the end of the survey. Participants that agreed first filled in the questions about their socio-demographics of age, sex, education, income and residency. This was followed by questions concerning their civic engagement and their pro-environmental behaviour. The final part of the survey addressed their awareness of ULL at Marineterrein, their past participation and their willingness to participate in the green market activity organised by MALL. Depending on the willingness score participants were asked a different follow up question. The respondents were shown a list of perceived barriers if they scored 1,2 or 3 on willingness to participate or a list of motivations if they scored a 4 or 5. The survey concluded with a request for a follow up interview and contact details. In total the survey took approximately 6 minutes

### 3.3.1 DV: Willingness to participate in Urban Living Lab

Borrowed protest potential measure from Kwak (2021, p. 446). It covers two dimensions: *past participation* and *participation potential*. *Past participation* indicates if respondents have participated in demonstrations in the past 5 years. Answering with *have done* and *never*. Past participation was constructed as an ordinal scale (0, 1 time, 2-3, more than 3 times). *Participation potential* indicates respondents' willingness to engage in future living lab activities. The measure was operationalised as willingness to participate in an upcoming ULL activity (the green market) using a Likert scale with five response categories: definitely will not, probably would, maybe, probably will, and definitely will.

Past participation did not show enough variation with the vast majority of the sample and was thus dropped from the scale. Therefore the final scale used for the dependent variable was the participation potential operationalised as a 5-item Likert scale. In terms of cleaning, the dependent variable 'Willingness to Participate' was recoded from an ordinal scale into a numeric variable. The four ordered variables: definitely would not, probably would not, maybe, probably would, and definitely would, were recoded respectively into a continuous variable ranging from 1 = definitely would not to 5 = definitely would.

### 3.3.2 IV1: Civic Engagement

Adopting the Civic Engagement Scale (CES) validated for application to smart cities by Remr (2023, p. 3259). Respondents are requested to answer on a five point Likert scale (1 = Strongly disagree, 5 = Strongly agree), based on 14 statements. It is divided into two dimensions: attitude (8) and behaviour (6). Example statements are 'I believe that all citizens have a responsibility to their community.' and 'I am involved in structured volunteer position(s) in the community' respectively. The scale covers multiple aspects mentioned in the civic engagement literature: sense of belonging, responsibility to contribute to social good (Irani, et al., 2023, p. 11), active volunteering and helping neighbours. Despite electoral voting sometimes being included in the definition of civic engagement (Adler & Goggin, 2005, p. 238). The scale excludes electoral voting as it was deemed to be not focused enough on local community life.

The variable civic engagement consisted of two dimensions 'civic engagement attitude' with nine scale items and 'civic engagement behaviour' with seven scale items. The mean values for each of the dimensions was calculated. The final value for the variable was calculated as the sum of the dimensions (civic engagement = mean civic engagement attitude + mean civic engagement behaviour) resulting in a continuous variable ranging from 1 to 10.

### 3.3.3 IV2: Pro-environmental behaviour

Measures of Irani et al (2023, p. 6) were adopted. The scale measures respondents' answers on a five point Likert scale (1 = Strongly disagree, 5 = Strongly agree), based on 10 statements. Divided into three dimensions: household behaviour (5), information seeking (3) and transportation (2). Example statements are 'Talk with others about doing something about environmental problems.' and 'Turn off the lights at home when they are not needed' respectively. Two additional questions were added, one based on Marres (2009): 'Bought environmentally friendly and/or energy efficient products and 'Read, listen or watch content with an environmental topic' And one "Travel by foot, bike or public transport instead of car". The wording of the questions were slightly altered to improve clarity (see appendix A). Additionally one question on sustainable food consumption was added to reflect a dimension of Markle (2016, p. 909). "Excluded or replaced beef, pork, poultry or fish in your meals with vegetarian or vegan options" and one to content consumption. The variable Pro-environmental behaviour consisted of two dimensions 'pro-environmental behaviour social' with four scale items and 'pro-environmental behaviour lifestyle' with seven scale items. The mean values for each of the dimensions was calculated. The final value for the variable was calculated as the sum of the dimensions (Pro-environmental behaviour = mean pro-environmental behaviour social + mean pro-environmental behaviour lifestyle) resulting in a continuous variable ranging from 1 to 10.

### 3.3.4 Control variables

Measures for socio-demographics were adopted from the European Social Survey (2022, p. 1). The following variables are included: Age, measured in years. Gender, measured as nominal category (Male, female, non-binary/third gender, prefer not to say). Education level as highest achieved education on an ordinal scale (1: No formal education – 7: Doctorate (Phd)). Situation of employment as a nominal category with 10 options adopted from European Social Survey (2022, p. 1). Income was operationalised as a monthly net income on an ordinal scale (1: Less than 1000 – 8: More than 15.000) and a 'prefer not to answer' option. The variables education and income were also recoded from ordinal scales into numeric variables. Prior to recoding one level per variable were dropped as the answer is not relevant to the regression model 'Other' in education and 'Prefer not to Answer' in income. Additionally the levels 'No formal education' and the levels '€10.000 – €15.000' and 'More than €15.000' were dropped from education and income respectively as there were no corresponding observations for these levels. This cleaning resulted in education being recoded into a continuous variable ranging from (1 = primary education to 7 = Doctoral degree) and income recoded into a continuous variable ranging from (1 = Less than €1.000 to 7 = €5.000 – €10.000).

Ethnic background was defined as the country in which the respondent was born with 10 most common options for people in The Netherlands adopted from the European Standard Classification of Cultural and Ethnic Groups specified for The Netherlands (European Social Survey, 2022, p. 1). The same question was asked for the respondents mother and father. A container option 'other' was added that led to a follow up question asking for the region of birth with 6 items (North America, Central/South America, Europe, Middle East, Africa, Asia/Pacific). Answers were later grouped into Dutch (consisting of the subgroups 'native' and '2nd generation immigrant') and non-dutch (consisting of 6 regions).

Other control variables measured were concerned with residency. This included household size, measured in the number of people. Location of residency, by first asking if the respondent lives in Amsterdam or elsewhere (including specification) and for those living in Amsterdam asking if they live in one of the surrounding neighbourhoods (8 options) plus another option for specification. Length of residence, in number of months as ordinal scale (1: Less than 1 year - 5: More than 9 years). Lastly residence type was measured as nominal category (private rent, social rent, own property or other). For a complete overview of measures used see Table 3.1.

**Table 3.1.**

*Survey variables and associated measures*

<i>Variable</i>	<i>Measurement</i>
<b>Dependent variable</b>	
Future willingness to participate	Likert scale (1: Definitely no – 5: Definitely yes)
Past participation	Ordinal scale (0, 1 time, 2-3, more than 3 times)
Awareness of ULL	Nominal category (Yes, No, Maybe)
<b>Independent variable 1</b>	
	Sum two dimensions
Civic Engagement attitude	9 question Likert scale (1: Definitely no – 5: Definitely yes)
Civic engagement behaviour	7 question Likert scale (1: Definitely no – 5: Definitely yes)
<b>Independent variable 2</b>	
	Sum of two dimensions
Pro-environmental behaviour social	4 question Likert scale (1: Definitely no – 5: Definitely yes)
Pro-environmental behaviour lifestyle	7 question Likert scale (1: Definitely no – 5: Definitely yes)
<b>Control variables</b>	
Age	Numerical (age in years)
Gender	Nominal category (Male, female, non-binary/third gender, prefer not to say)
Education level (Highest achieved)	Ordinal scale (1: No formal education – 7: Doctorate (Phd))
Situation of employment	Nominal category (10 options)
Income (monthly net)	Ordinal scale (1: Less than 1000 – 8: More than 15.000)
Ethnic background	Nominal category (11 options) and 6 'other' categories
Household size	Numerical
Length of residence	Ordinal scale (1: Less than 1 year - 5: More than 9 years)
Location of residency	Nominal category (9 options)
Residency type	Nominal category (private rent, social rent, own property, other).



### 3.3.5 Reliability analysis (factor analysis PCA)

For the civic engagement scale, the 16 items which were Likert-scale based were entered into an exploratory factor analysis using Principal Components extraction with Direct Oblimin rotation based on two fixed factors,  $KMO = .87$ ,  $\chi^2 (N = 143, 120) = 729.42$ ,  $p < .001$ . The resultant model explained 63.89% of the variance in willingness to participate. Factor loadings of individual items onto the two factors found are presented in Table 3.2. The factors found were:

*Helping neighbours.* The first factor included nine items about views and behaviour about helping each other in the local neighbourhood.

*Volunteering.* The second factor included seven items about views and behaviour about volunteering in official positions. It contains a weak alpha. Removing any items did not result in a stronger alpha. Therefore it was included to maintain validity and theoretical relevance.

The factors found here do not reflect the two dimensions from attitude and behaviour of the civic engagement scale (CES) adopted from Remr (2023, p. 3259). Attitude and behaviour seems to be spread out surrounding two topics which is inline with the theoretical definition of civic engagement used (Adler & Goggin, 2005, p. 241). In order to maintain consistency with previous research the original split in dimensions of attitude and behaviour was kept.

For the pro-environmental behaviour scale 11 items which were Likert-scale based were entered into an exploratory factor analysis using Principal Components extraction with Direct Oblimin rotation based on two fixed factors,  $KMO = .80$ ,  $\chi^2 (N = 143, 55) = 542.97$ ,  $p < .001$ . The resultant model explained 51.67% of the variance in willingness to participate. Factor loadings of individual items onto the two factors found are presented in Table 3.3. The factors found were:

*Personal.* The first factor included seven items about views and behaviour about actions one can take themselves.

*Household.* The second factor included four items about views and behaviour about actions that are tied to a household.

The factors here marginally reflected the two dimensions of the Pro-environmental behaviour scale by Irani et al (2018). In order to maintain consistency with previous research and the civic engagement scale the original split in dimensions of attitude and behaviour was kept.

**Table 3.2.**

*Factor loadings, explained variance and reliability of the two factors found for the scale 'civic engagement'.*

Item	<i>Helping neighbours</i>	<i>Volunteering</i>
I feel responsible for my community.	.814	
I am committed to serve in my community.	.800	
I believe I should make a difference in my community.	.722	
I believe that it is important to be informed of community issues.	.711	
I stay informed about events in my community	.680	
I help a neighbor or other members of my community	.655	
I believe that all residents have a responsibility to their community.	.602	
When working with others, I make positive changes in the community.	.511	
I join conversations about doing the right thing for society/my neighborhood	.490	
I believe that it is important to volunteer.		.719
I am involved in official volunteer position(s) in a community		.542
I help out at a church, synagogue, or other place of worship		.537
I believe that it is important to financially support charitable organisations.		.502
I believe that I have a responsibility to help the poor and the hungry.		.492
I contribute to charitable organisations within the community		.427
I help out at a local school		.245
<i>R</i> <sup>2</sup>	.35	.09
Cronbach's $\alpha$	.86	.60

**Table 3.3.**

*Factor loadings, explained variance and reliability of the two factors found for the scale pro-environmental behaviour'*

Item	<i>Personal</i>	<i>Household</i>
Talk to others about environmental issues	.807	
Worked with others to address an environmental problem or issue	.797	
Read, listen or watch content with an environmental topic	.759	
Participated as an active member in a local environmental group	.743	
Bought environmentally friendly and/or energy efficient products	.540	
Travel by foot, bike or public transport instead of car	.359	
Excluded or replaced beef, pork, poultry or fish in your meals with vegetarian or vegan options	.310	
Reduced energy usage in my home (e.g. turn off appliances/lights when not in use).		-.843
Reduced heating and/or gas usage in my home		-.831
Reduced water usage in my home (e.g. short showers or washing cycles)		-.726
Recycled waste at home		-.695
<i>R</i> <sup>2</sup>	.37	.15
Cronbach's $\alpha$	.78	.77

### 3.3.5 Sensitising concepts for semi-structured interviews

Three sensitising concepts were used for collection and analysis of interview data (see Appendix B - Interview topic guide). The only known mentions of motivations to participate in ULLs from citizens are a 'sense of fulfilment' (Puerari et al., 2018, p. 12). Hence it was important to provide empirical evidence of concrete motivations. *Motivations and barriers* to participation. Motivations are always paired with the perceived cost of participation but in different configurations based on the context (Klandermans & Oegema, 1987, p. 530). Since these are so context dependent it was important to review them in a more exploratory way through interviews. The aim is to understand if the participants of the survey and interviews share the same barriers and if so, how they contextualise and justify overcoming them. Interviews helped share context on the drivers behind these motivations and how it relates to their experience with participation.

The second concept that literature showed to be an important factor is *Perceived efficacy* (Klandermans & Oegema, 1987, p. 527). Perceived efficacy concerns itself with how effective people believe the action in question will be. Either the perceived effect of their own participation or that of the movement as a whole. Literature explains how perceived efficacy and a person's attitude towards the goals are linked, but their individual importance depends on the context (Klandermans & Oegema, 1987, p. 530). Perceived efficacy helps to understand how people perceive the effectiveness of living labs: Did they get a sense of fulfilment out of it? Do they think it achieved the desired outcome? How does their experience change their perception of the topic?

Lastly, the notion of *shared ownership* (Puerari et al., 2018, p. 4) helps to understand how people reflect on their own participation. Do they feel their contribution matters and have real decision power? And, do they have a feeling of shared responsibility? This concept was chosen as literature shows that a high sense of ownership seems to be linked to successful co-creation practices (Puerari et al., 2018, p. 13), one of the key benefits of an Urban Living Lab (Bulkely, et al 2018, p 319). Additionally a sense of ownership seems to be strongly linked with the motivation to participate, most likely as participating provides intrinsic rewards (Nesti, 2018, 312).

Furthermore, these concepts seemed tied to one another. Perceived efficacy explains how people perceive the impact of their own participation and the effect of participation by itself. It plays an important role in moderating motivations and the belief of people's own contribution in the process (Klanderman & Oegema, 198, p. 529). The combination of having interwoven relationships and not much literature to base the interview guide on. These concepts are well suited to be explored in a semi-structured interview setting, where there is room for participants to discuss elements that are not yet apparent in literature.

### **3.4 Data collection & sampling strategy**

As part of the sequential design sampling was conducted in two stages. The goal of the survey sampling was to reach a wide selection of 250 responses from residents in the neighbourhoods surrounding MALL. Where the survey was designed to be widely focused on understanding which types of residents were likely to participate. The interview sampling was designed to narrowly focus solely on those that participated in a ULL activity. The first reason was relevance. Since limited theory exists on which citizens participate it is first important to understand who the citizens are that are willing to participate, then if that group is not deemed valuable or representative enough further research can focus on non-willing citizens. The second reason was practical concerns considering the time range, as it is hard to interview those not participating due to their lack of availability.

The survey was formatted as a flyer with an introduction and a QR code to fill the survey online on Qualtrics (see Appendix A). It was double-sided including both the Dutch and English translation. The Dutch translation was done by me as native speaker. The original sampling strategy of the survey entailed cluster sampling by postal code. Respondents were included in the sampling frame if they share the same first four postcode digits as the ULL, 1018. The flyers were planned to be distributed in phases. In the first phase two hundred fifty flyers were distributed by hand, selecting every sixth mailbox. The low initial response rate of the flyer in the mailboxes, four days after the distribution, caused a change in sampling strategy. In order to reach more citizens, I resorted to convenience sampling at the Marineterrein. I distributed the survey flyer by hand to people at the Marineterrein and let them complete the survey on their phone. Additionally, to reach citizens who I might not be able to meet at Marineterrein, a selection of local community organisations were approached. They were requested to disseminate the survey within their community (see Table 3.2). Additionally, a community leader was approached through a contact of Bureau Marineterrein, one of the organisations part of MALL, who provided contact details of seven other community leaders and organisations. These were all approached with the request for disseminating the survey within their network, four of these community leaders responded and agreed to help. With some of these leaders I first had an introductory meet and greet over tea in order to build rapport. All people previously mentioned were provided physical copies of the flyer and a pre-written introduction text as well as an accompanying image for digital distribution (see appendix A). Unfortunately the survey tool Qualtrics does not allow for the creation of unique online links. Therefore it is not possible to match responses with exact newsletters or know if more responses were captured through the flyers in the mailbox (see appendix A).

In regards to the sampling for the interviews, most respondents were recruited through the survey. A total of thirty six people indicated an interest to be interviewed and left their email or phone number in the survey. Seven people replied to the sequence of emails of which four fit the criteria of having participated in an activity organised by MALL. Additionally on the event of the activity in question 'The Green Market', the emails of eighteen potential respondents were captured. Of these respondents only two replied to the sequence of emails and were interviewed. Furthermore, sixteen people in the local community centre De Witte Boei were approached across three different days; however, none of the people discussed fit the criteria of having participated in an activity organised by MALL. The final list of participants consisted of four recruited through the survey and two participants recruited through the collected list at the 'Green Market' event. The ULL activity 'Green Market' took place on Sunday 21st of April from 14:00 -17:00 at Marineterrein. The participants for the ULL activity were recruited by MALL through an open call in the neighbourhood through posters and local WhatsApp groups as well as the local extended networks of the initiators. The survey also contained the announcement of the event.

The location of the interviews were set by the participants who could choose a date, time and place through Calendly. All but two interviews were conducted at Studio De Kat, a location owned by Bureau Marineterrein located at the entrance of the terrain. One interview was conducted by phone as the participant wasn't able to meet at last minute notice. The remaining interview was done through Google Meet per request of the participant. All interviews lasted between forty-five minutes and one hour and fifteen minutes. Most interviews were conducted within the first two weeks following the ULL event, with the last interview taking place one month after the event on 21st of April. Interviews were conducted in Dutch and were recorded with consent. The recordings were manually transcribed in GoogleDocs.

### **3.5 Data analysis**

#### **3.5.1 Survey data preparation**

The survey data was collected in Qualtrics and exported as a csv file. Which then was imported into Rstudio for cleaning and further analysis, irrelevant Qualtrics metadata such as timestamps were removed to maintain a clean dataset that was easy to work with. Cleaning and analysis of the survey results was done using Rstudio with base R and packages 'tidyverse', 'dplyr'. The sample consisted of 178 responses, however 35 responses were incomplete. After removing these, the remaining sample consisted of 143 responses. The 'psych' package was used for general statistics and 'ggplot2' for visualisations. A hierarchical linear regression analysis – to measure the effects of the moderator variables – was done for H1, H2 and H3 – using base R and additional packages of 'ordinal' and 'tidymodels'.

### **3.5.3 Multiple linear regression analysis**

As part of the hierarchical regression model an ANOVA test was run with the models to compute R<sup>2</sup> values and regression values (to obtain coefficients). Then, sums of squares between models from ANOVA results were compared. Firstly, to compute a difference in sum of squares (SS) at each step. Second, to find corresponding F-statistics and p-values for the differences were found the results are visible in Table 4.3. Hypothesis 1 was tested using a linear regression model. The same was done for hypothesis 2. For Hypothesis 3 a,b and c the appreciate variables were added as control variables in a multiple linear regression model.

### **3.5.4 Interview analysis**

The analysis of the interviews followed the thematic analysis method by Braun and Clarke (2006). The steps are as follows: First, the data was read and re-read to become familiar with the content, with initial ideas noted down. Initial codes were generated by highlighting relevant entries in Google Docs and annotating them with comments. These initial codes were then transferred to a codebook in Google Sheets (see appendix E - Codebook) , where they were organised and colour-coded to identify patterns. Similar and related codes were merged into larger categories, forming initial themes. These themes were reviewed to ensure they accurately represented the data, with attention to nuances and contradictions. Each theme was clearly defined and named to describe its content. The final step was producing the report, including themes and supporting quotes translated into English where necessary. Throughout the process, reflexivity was maintained to ensure reliability and prevent overlooking important data. A primarily inductive approach was used to generate themes from the data, with some deductive elements based on concepts from the interview guide. This combination ensured the analysis was data-driven and informed by existing frameworks. This approach provided a thorough exploration of citizen participation in Urban Living Labs (ULLs), offering valuable insights.

## 4. Results

### 4.1 Survey sample description

The total sample consisted of 143 responses. In the final sample the percentage of women was 55.9% and the male share was 39.1%, 0.2% identified as binary or third gender, and 0.1% preferred not to disclose their gender. The remaining two responses contained a missing value. Participants' average age is 45 ( $SD = 15.91$ ) ranging from 21 to 77. The majority of respondents were Dutch (69.9%). Most of the non-Dutch respondents were from the European region (51.1%). The vast majority of the respondents (81.9%) were residents of Amsterdam of which most of the respondents (55.3%) lived in the neighbourhoods directly surrounding the ULL. The sample is slightly skewed towards higher educated people. The most named highest education level was Bachelor's degree (38.0%), followed by a Master's degree (36.6%) and Doctoral degree (9.15%). In regards to income the sample skewed towards low ranges of income. The lowest income was Less than €1000 with 9.8% and the highest income range was between €5000 and €10000 net per month with 5.6%. The most named income range among the respondents (31.5%) was between €3000 and €4500 net per month. The second most named income (27.3%) was between €2000 and €3000 net per month. 8.4% of the respondents preferred not to answer. These values can be found in Table 4.1.

**Table 4.1**

*Mode of occurrences of control variables in the sample in percentages*

Measure	Mode	Mode in %
Gender	Women	55.9
Nationality	Dutch	69.9
Education	Bachelor's degree	38.0
Income	3000-4500	31.5
Residency in Amsterdam	Amsterdam	81.9



As for awareness of urban living labs (see Figure 4.1), most people in the sample were not aware of urban living labs (55.2%), some (11.8%) were not sure if they heard the term before, the 12 preferred not to answer. The remainder (32.8%) did know about urban living labs, a lack of information and awareness seems to be the main barrier for participation among the sample (see Figure 4.5). The scores for all main variables are displayed in Table 4.2. The dependent variable, willingness to participate in a ULL activity (see Figure 4.2). The most often stated response was ‘Probably yes’ (35.0%), followed by ‘Unsure’ (28.7%) with ‘Definitely not’ being the least common (10.5%). The main motivations for participation seem to be curiosity, gaining knowledge, looking for inspiration and contributing to a good cause (see Figure 4.4). As for civic engagement, the sample was fairly civically engaged with a mean of 6.1 ( $SD = 1.0$ ), ranging from 3.5 to 10 (see Table 4.1). Split between the two dimensions attitude and behaviour the sample scored fairly high on civic engagement attitude ( $M = 3.8, SD = 0.5$ ) and less on civic engagement behaviour ( $M = 2.3, SD = 0.67$ ). Meaning that the sample considered contributing to improving life in the local community important, but were less inclined or able to contribute to it. As for pro-environmental behaviour, the sample was fairly environmentally friendly with a mean of 7.1 ( $SD = 1.2$ ), ranging from 3.4 to 10. Split between the two dimensions social and lifestyle the sample scored fairly high on pro-environmental behaviour social ( $M = 2.9, SD = 0.8$ ) and less on pro-environmental behaviour lifestyle ( $M = 4.16, SD = 0.54$ ). This shows that the sample was prone to discuss it with others, but were less inclined or able to create a lifestyle that was focused on reducing resources such as energy and waste.

**Table 4.2**

*Measures of dispersion and central tendency of main variables of the sample*

<b>Measure</b>	<b>Mean</b>	<b>Median</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
Willingness to participate	3.30	3.00	1.18	1.00	5.00
Civic engagement	6.06	6.03	1.07	3.54	10.00
Pro-environmental behaviour	7.07	7.2	.19	3.43	10.00

Figure 4.1

*Awareness of ULLs among sample*

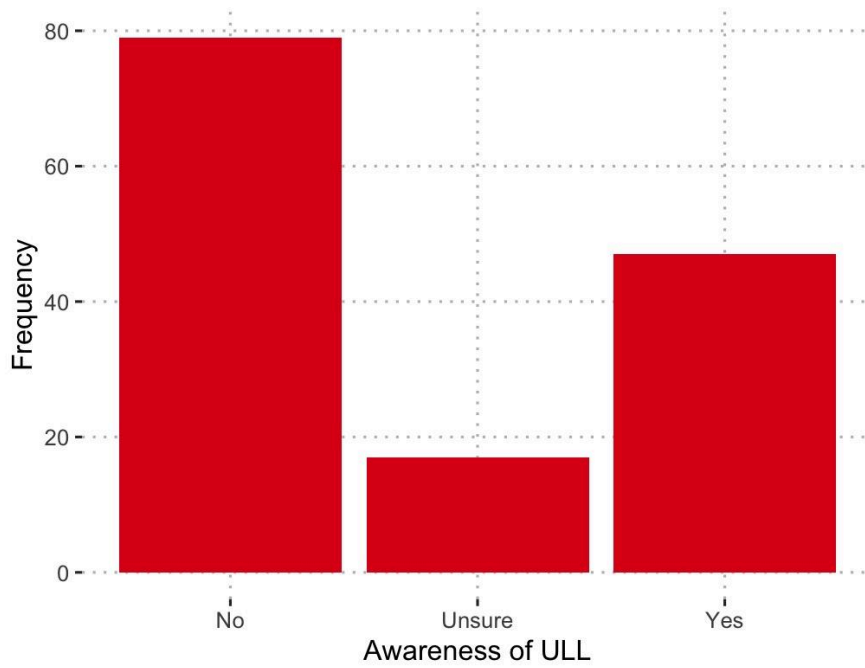


Figure 4.2

*Dependent variable of Willingness to participate*

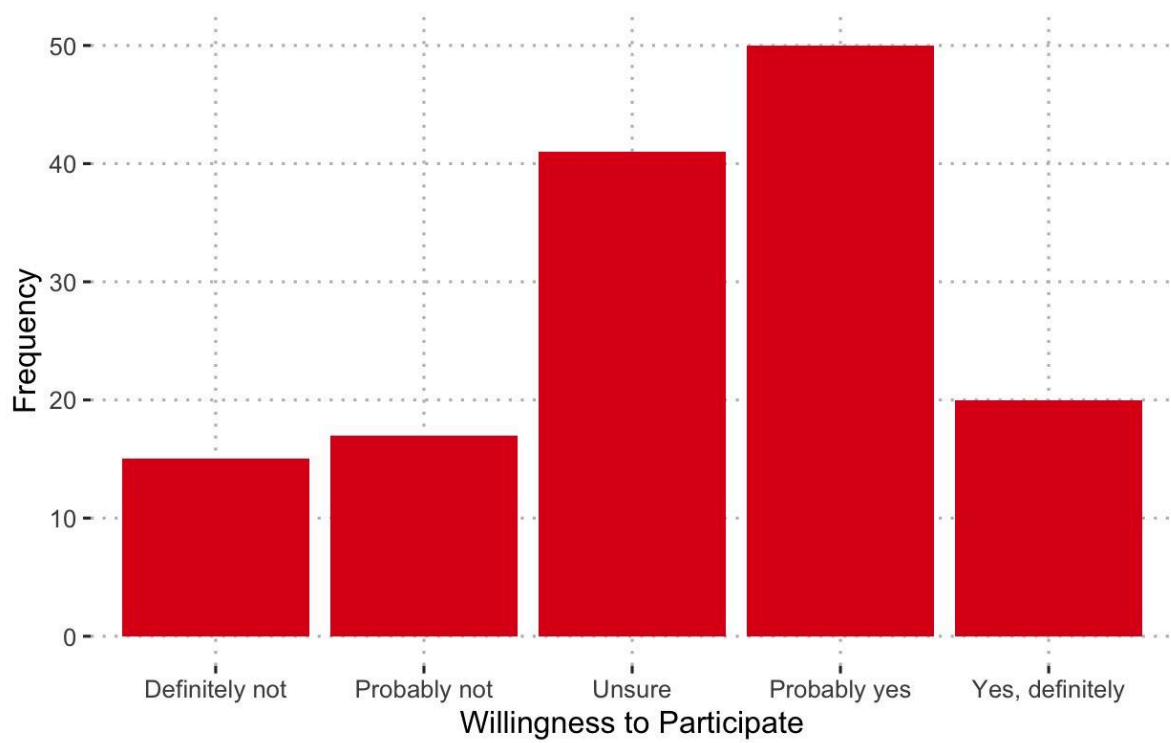


Figure 4.4

*Motivations for participating among sample*

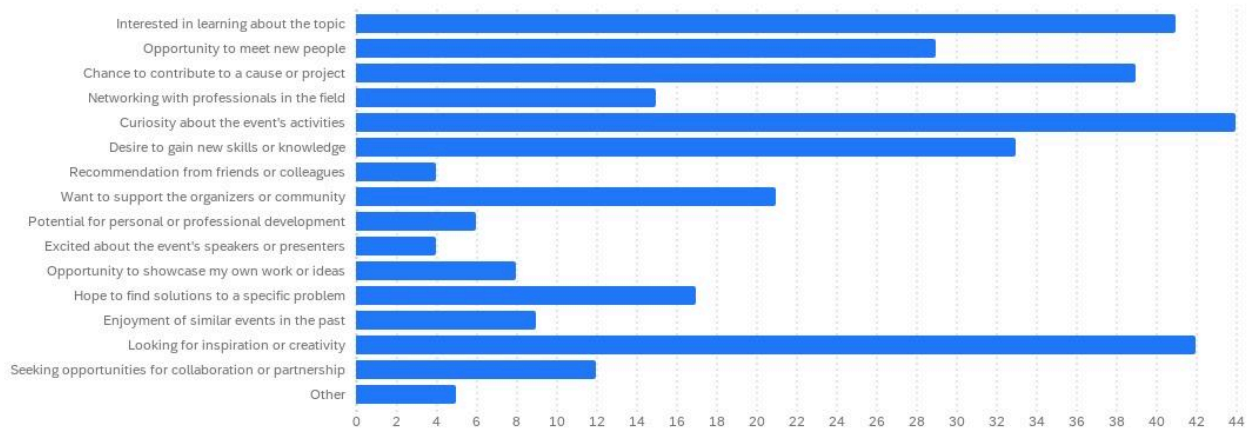
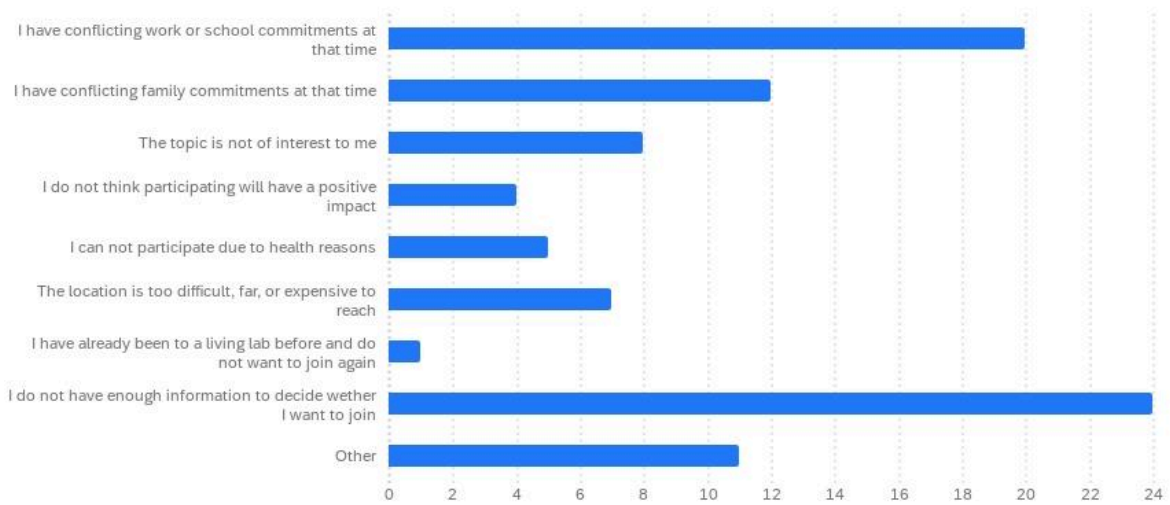


Figure 4.5

*Barriers for participating among sample*



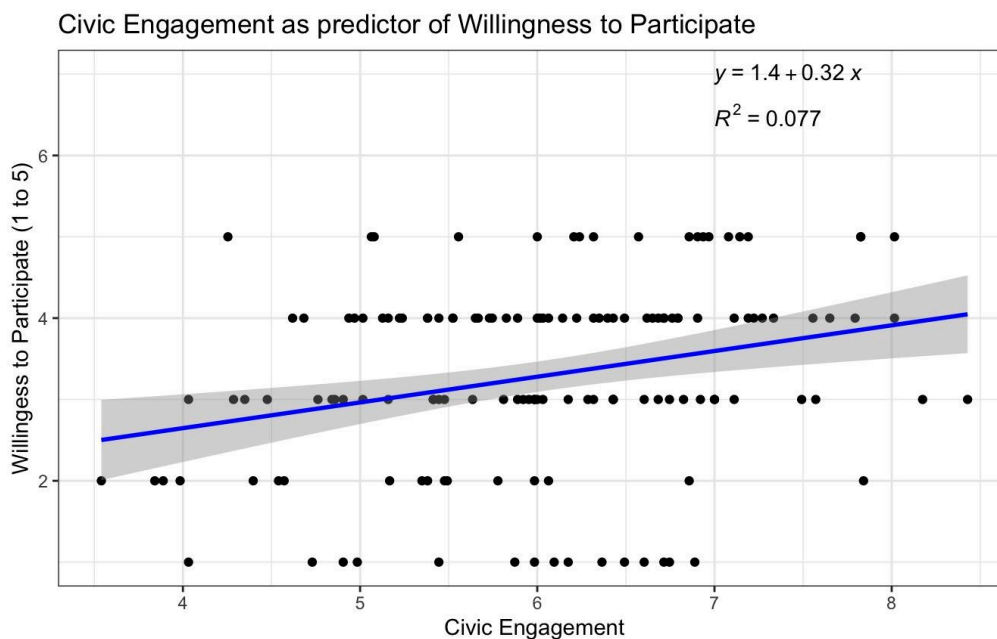
## 4.2 Multiple Regression Analysis

### 4.2.1 Hypothesis 1: Civic Engagement

Literature showed civic engagement would be a likely factor to influence citizens participation in ULLs (see chapter 2.3). To test the first hypothesis of whether Higher levels of civic engagement leads to a stronger willingness to participate in ULLs was true, the two variables were added into a linear regression model. The corresponding graph and values can be found in Figure 4.4 and Table 4.3 respectively. The regression model of the willingness to participate in a ULL activity as the dependent variable and civic engagement as an independent variable is marginally significant,  $F(1, 59) = 3.99, p = .050$ . The regression model is thus marginally useful for predicting the willingness to participate in a ULL activity, but the predictive power is minimal: 8 percent of the differences in willingness to participate can be predicted based on the score of civic engagement ( $R^2 = 0.08$ ). The civic engagement score,  $b^* = 0.32, t = 1.14, p = .050, 95\% CI [-0.47, 0.01]$ , has a marginally significant, weak positive correlation with willingness to participate. For each point of civic engagement the estimated willingness to participate increases by 0.32. Thus hypothesis 1 can be confirmed. Higher levels of civic engagement leads to marginally stronger willingness to participate in ULLs.

Figure 4.4

*Linear regression analysis with civic engagement as predictor of willingness to participate*



**Table 4.3.**

*Linear regression analysis with civic engagement as predictor of willingness to participate*

Predictor	$\beta$	$t$	$p$
Civic Engagement	.32	1.14	.050*
		$R^2 = .08$	$\Delta R^2 = .17$

*Note.* \* indicates  $p < .05$ , \*\* indicates  $p < .01$ , \*\*\* indicates  $p < .001$

#### **4.2.2 Hypothesis 2: Pro-environmental behaviour**

Literature showed pro-environmental behaviour would be a likely factor to influence citizens participation in ULLs (see chapter 2.4). To test the second hypothesis of whether higher levels of pro-environmental behaviour lead to a stronger willingness to participate in ULLs was true, the two variables were added into a linear regression model. The corresponding graph and values can be found in Figure 4.5 and Table 4.4 respectively. The regression model of the willingness to participate in a ULL activity as the dependent variable and pro-environmental behaviour as an independent variable is marginally significant,  $F(1, 59) = 3.99, p = .050$ . The regression model is thus marginally useful for predicting the willingness to participate in a ULL activity, but the predictive power is minimal: 15 percent of the differences in willingness to participate can be predicted based on the score of pro-environmental behaviour ( $R^2 = 0.15$ ). The pro-environmental behaviour score,  $b^* = 0.39, t = 1.14, p = .050, 95\% CI [-0.47, 0.01]$ , has a marginally significant, weak positive correlation with willingness to participate. For each point of pro-environmental behaviour the willingness to participate increases by 0.39.

Figure 4.5

Linear regression model of pro-environmental behaviour as predictor of willingness to participate

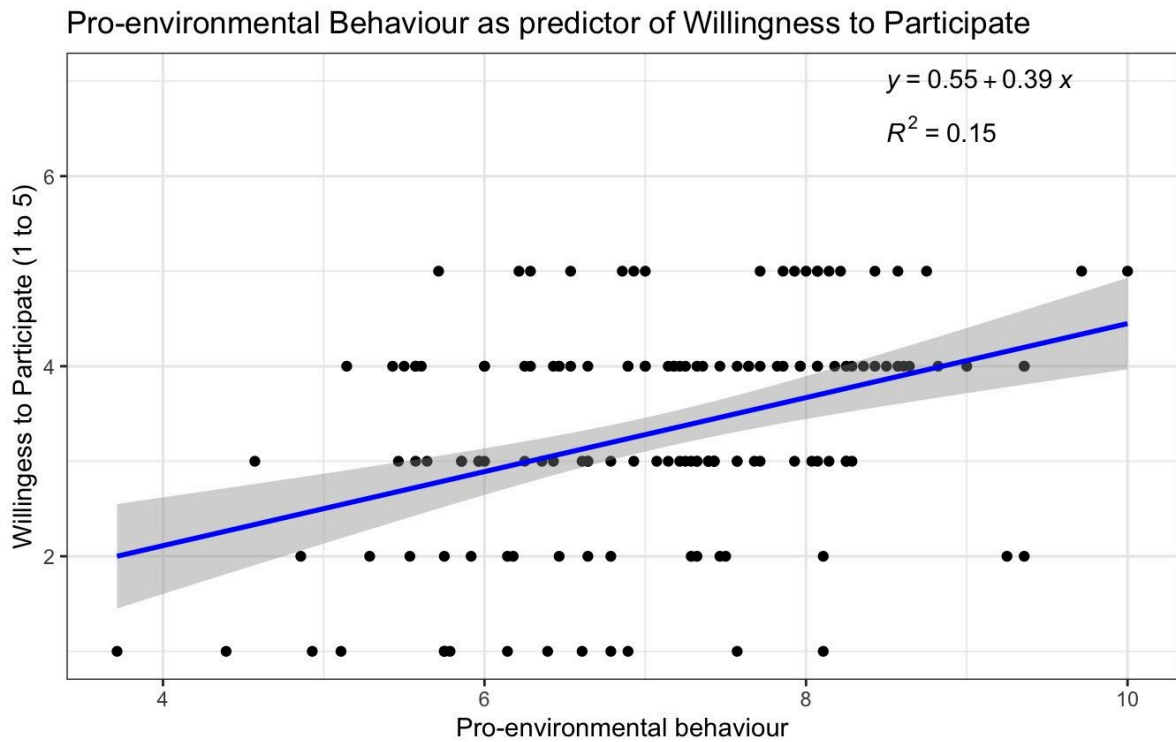


Table 4.4

Linear regression analysis with pro-environmental behaviour as predictor of willingness to participate

Predictor	$\beta$	$t$	$p$
Pro-environmental behaviour	.39	1.14	.050*
		$R^2 = .15$	$\Delta R^2 = .17$

Note. \* indicates  $p < .05$ , \*\* indicates  $p < .01$ , \*\*\* indicates  $p < .001$

### 4.2.3 Control variables

Literature showed age, education and income would be a likely factor to influence citizens participation in ULLs (see chapter 2.6). These variables were added into a hierarchical linear regression model with the other variables. Testing the following hypothesis, hypothesis 3a of whether older people show a stronger willingness to participate in ULLs compared to younger age groups. Hypothesis 3b: Highly educated people show a stronger willingness to participate in ULLs compared to lower educated people. Hypothesis 3c: People with high income show a stronger willingness to participate in ULLs compared to low income groups.

A hierarchical regression was conducted with willingness to participate as a dependent variable. Civic engagement level was entered in the first block, while pro-environmental behaviour was added in the second block, the third block contained moderator variables of age, education and income. Table 4.5 presents the findings of the analysis. When civic engagement was used as a single predictor the model was significant. When Pro-environmental behaviour was entered into the model in the second block, the resulting model did significantly increase the explained variance in willingness to participate. When age, education and income were entered into the third block, the resulting model did not significantly increase the explained variance in willingness to participate. Hypothesis 3a is rejected. Age is not a useful predictor for the willingness to participate in a ULL activity. Hypothesis 3b is also rejected. Education is not a useful predictor for the willingness to participate in a ULL activity. Hypothesis 3c is also rejected. Income is not a useful predictor for the willingness to participate in a ULL activity. Pro-environmental behaviour is a significant predictor of willingness to participate. By adding pro-environmental behaviour, the model sum of squares increased by 12.81, a statistically significant change according to the corresponding F-statistic and p-value. The  $R^2$  increased by .07 in Model 2. By adding the moderator variables: age, education and income, the model accounts for additional SS 2.58, however it was not statistically significant. Model 1 is significant  $p = <0.001$ . It seems model 2 is the most suited ( $p = <0.001$ ) as model 3 one does not provide additional significant results ( $p = .525$ ).

One additional control variable was analysed. Since the participants for the survey were solely female, it caused the question if gender is not also an important factor in predicting the willingness to participate. A two sample t-test was conducted between Men and Women. There was no significant effect for gender,  $t(130) = -0.9$ ,  $p = .339$ , despite women ( $M = 3.35$ ,  $SD = 8$ ) being slightly more willing to participate ( $M = 3.16$ ,  $SD = 7.8$ ). We accept the null hypothesis. The mean willingness to participate between males and females is equal.

**Table 4.6**

*Hierarchical regression analysis to predict willingness to participate with both IVs and moderators*

<i>Predictor</i>	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
Civic engagement	.36***	.19	.26*
Pro-environmental behaviour		.31**	.28**
Age			-.01
Education			-.04
Income			-.05
<i>R</i> <sup>2</sup>	.11	.18	.20
$\Delta R^2$		.07	.02

*Note.* indicates  $p < .1$ , \* indicates  $p < .05$ , \*\* indicates  $p < .01$ , \*\*\* indicates  $p < .001$

### **4.3 Interviews: Understanding participation Motivations and Experiences in Depth**

The survey showed how citizens that are more civically engaged and pro-environmental are more willing to participate in ULL activities. The interview sample showed congruent findings, each of the participants was actively volunteering in one or more local community organisations and proclaimed to have a pro-environmental lifestyle (see Table 4.7). Contrary to the results of the survey, all the interview participants were highly educated women above the age of 37. Where the survey analysis showed no significant effect of age and education on willingness to participate. Gender was originally not considered a variable, however the interview participants were all female, therefore gender was also included in the survey analysis. The analysis showed no significant effect on willingness to participate (see 4.2.3).

Motivations of participants seem to be consistent across the survey and the interviews. The main motivations were concerning, gaining knowledge and inspiration, curiosity and wanting to contribute to a good cause. The interviews additionally showed how social interaction with acquaintances and new people as well as the enjoyment of music, good weather as a day activity are important motivations. The survey further provided improved understanding of how motivations barriers and sense of ownership and perceived efficacy are related.



**Table 4.7.**

*Sample description of interview participants*

<b>Participant</b>	<b>P1</b>	<b>P2</b>	<b>P3</b>	<b>P4</b>	<b>P5</b>	<b>P6</b>
<b>Date and time</b>	24/04 Wed 18:30	25/04 Thu 13:15	29/4 Mon 14:00	30/04 Tue 15:30	16/05 Thu 13:30	22/05 Wed 11:30
<b>Pseudonym</b>	Suzanne	Emma	Helena	Claudia	Monique	Lilly
<b>Gender</b>	Female	Female	Female	Female	Female	Female
<b>Age</b>	60	38	62	58	67	77
<b>Nationality</b>	German (moved to NL long ago)	Dutch	Dutch (NL born but lived in Africa and USA, for all her adult life, since 2 years in NL),	Surinamese-Dutch (Surinam born, Dutch raised)	Dutch	Dutch-Indonesian (Dutch born, Indonesian mother) Lived in US for 10 years
<b>Education level</b>	Tertiary (higher) education	Tertiary (higher) education	Tertiary (higher) education	Tertiary (higher) education	Tertiary (higher) education	Tertiary (higher) education
<b>Employment situation</b>	Employed Part-time (teacher)	Employed part-time	Self-employed no staff (UN consultant)	Retired (artist)	Retired (recently, ex-municipality worker)	Retired
<b>Residency</b>	Local resident	Local resident	Amsterdam resident	Local resident	Local resident	Local resident
<b>Participation in ULL</b>	Participated in green market multiple times	Participated in green market multiple times	Participated in green market and Amsterdam Economic board meetup once	Participated in green market multiple times	Participated in green market multiple times	Participated in green market multiple times
<b>Civic engagement</b>	Volunteer in local community garden	Volunteer in neighbourhood committee	Volunteer in multiple organisations	Volunteer in multiple organisations	Volunteer in multiple organisations	Volunteer in multiple organisations
<b>Pro-environment</b>	Self proclaimed	Self proclaimed	Self proclaimed	Self proclaimed	Self proclaimed	Self proclaimed

#### 4.5.1 Visibility through stories

The participants generally perceived the ULL as being good for society but lacking transparency about its organisations, people and projects. It seems this low visibility attracts mainly the most active citizens (through word-of-mouth and proactive curiosity). The primary motivations to join the ULL activities of the participants whose primary motivations are hope, inspiration and social connection which are in line with the survey results (see 4.1). Furthermore, participants expressed the need to understand ‘the stories’ behind the ULL as a way to understand and connect with the projects, its vision and the motivations of its members as most participants were looking to contribute to a meaningful cause.

##### *Lack of transparency*

All participants shared the view that the goal and projects of the ULL are beneficial for society. This was more based on a few serendipitous encounters and a general feeling as all participants shared most of the work is hidden behind the offices and they lack a clear way to see what goes on ‘behind the walls’. They were aware valuable and innovative things were being developed but were unsure what exactly that entailed. This is congruent with the results from the survey which show the majority (67%) of people are unaware or unsure of what a ULL entails (see 4.1). Most experiences shared discussed accidental encounters of ‘stumbling upon innovation’ where they approach or get approached by ULL employees that happen to be working on a project in the public space during that time. As one of the participants, Helena, shared: “You see them [ULL employees] working sometimes, I approach them but not everyone does. People need to have a lot of natural curiosity to find out what is happening”. Participants mainly expressed the need for more informational signage, communication about the visions and visibility of the ULL members. Looking to put a face to the organisations and understand the motivations of the members to work on the ULL projects.

Most participants seemed to have an awareness of the ULL through their social network from their volunteering work. Two participants had a prior connection to the ULL through an acquaintance. All other participants were aware of the ULL through visiting the terrain, joining a partner event or the announcement of a ULL activity on local social media groups or posters. The reasons stated about joining the ULL activities were reflective of the survey results.

*Connection through stories*

The main elements participants were looking for to get a better understanding of the ULL was a shared vision of the ULL and the motivations of ULL members. Most of the participants shared a need for understanding 'the story behind the ULL'. A story describing the shared vision among the ULL projects and organisations at the Marineterrein Living Lab. Participants expressed the lack of having a clear overview of what connects all the organisations together, what ideal they work towards and how each individual project contributes to that ideal.

This desire to relate to a story seems to not only be related to the shared vision among the projects of the ULL but also the motivations of its project members. Aside from wanting to know more factual information about the goals and progress of the projects, the attraction to stories seems to be partly driven by a need for social contact with the people behind the projects. Participants shared they enjoyed chatting with the people behind the organisations, either by chance on the terrain or as planned at the ULL events, as a way to gather inspiration but also to try to figure out if there is more to the story than just the end product that they see. One of the participants shared her experience about talking with an entrepreneur that created compostable cups:

Well for example I really liked those cups. Those people who said the regulations have been changed because they do not fit within the regulations about what plastic is. I have enough cups, so I don't need any cups, so it doesn't make sense to buy any. But the realisation that these kinds of companies exist and develop these cups, deliver them and also collect them I simply find it really nice to hear. (Helena)

These personal stories help put a face behind the project citizens can connect with for feedback and questions but also someone to build a long term relationship with. Another participant shared her story of talking with an entrepreneur and being so fascinated by his ambition that she connected him to an old-colleague of hers. Emma, a more critical participant, expressed it as her need for a human face behind the organisation. "But add an informational sign there or something. Who can you call if you have questions about it? Make it personal, because now you also have... who do you call about it? I think it's very big and vague, Marineterrein, they own it but who can you call about it?".

#### 4.5.2 Experiential participation and the joy of experimenting

Aside from discussing visibility of the ULL projects and connecting to its people, participants talked about the joy of trying out new things and missing a more intensive hands-on approach to participating. Participating is a way to discover new materials and techniques for use in daily life but also to find hope and connect with others. Citizens sometimes felt more like consumers than participants, and were looking for more intensive ways to contribute to, or experience projects.

##### *Engaging the senses*

Most of the motivations shared to join ULL activities were inspiration, hope, trying new things, contributing to a good cause and socialising with others. All motivations were congruent with the results from the survey. The motivations were primarily related to looking for inspiration and hope, reflecting the survey findings (see 4.1). One of the participants, Monique, expressed her joy about walking in the neighbourhood and seeing experiments happening instead of reading about them. "That you see experiments happening and can almost see how people think, that speaks to the imagination. Otherwise it's too theoretical." Another motivation was looking for inspiration for things to implement in their daily life but most participants missed concrete examples of how these big projects could be brought into their neighbourhood or household. Multiple participants mentioned one specific ULL project of an autonomous boat that collects plastic waste. Seeing things work in action allows people to imagine the impact of an abstract technology in daily life. Emma continues to describe her experience:

But quite often you get an invitation.....'Oh, think along, about the future of the city.' And then you think, yes, super nice, but also super vague. Make it concrete. In my daily life, I don't often think about solutions for the future of the city. That's not what your daily life is. Your daily life is running errands or you're dealing with your waste or you're.... And that is what maybe makes that waste robot more concrete because that's what you can imagine sailing in your own neighbourhood. Demonstrations and practical workshops increase the fun factor, but also enjoy the interaction and discussions with other people either from the neighbourhood or other areas. It also has a connection to the theme of co-organising, one of the participants shared how bringing in expertise from locals strengthens the value. "Like those repair cafes, that is fun. That people started doing it and bringing in their own expertise." (Claudia) another: "I personally thought that was a very fun way to one one hand try new things and on the other hand use the experiences [of people], as everyone experienced things." (Suzanne). In order to bring these abstract innovations into their household,

This is where the stories help to convey dense information in a way that speaks to the imagination and connects to daily life (see 4.5.1). As participant Lilly expresses, “If you want to attract more people you need to have a product you can explain to the audience. Explained in steps: step 1, step 3 and then only after show the result.”

*Meaningful contribution / Learning by doing*

However innovation should not only be demonstrated. Some participants reflected that despite interesting discussions, innovative products, and a few things to try, there was too much focus on consuming products and factual information. Multiple participants mention the tension of mainly offering products for sale at an event that was promoted as a place where local citizens can engage in sustainable topics. Mentioning a focus on consumerism “kind of misses the point” mentions one of the participants, Suzanne. Most of the participants expressed a desire to have more meaningful contributions. Similar to how one of the participants employed her own experience and professional network to help out an entrepreneur (see 4.5.1). Participants were looking for ways to contribute that focuses less on consumption and more on intellectual depth but in a way that is not information dense and more practical. A hands-on way to try and understand the process, not just the end result. Congruent with the survey results, a lot of the participants were motivated to contribute to a good cause and support considering they all had a high education and years of work experience they hope to be able to contribute more intensively. They had trouble finding ways to participate more intensively in a way that allowed them to bring their experiences such as connecting entrepreneurs to their own professional network, work on creating new solutions or have intellectual discussions. The residents are looking to engage in a more interactive manner and try things for themselves, such as being able to experience hand-on workshops with new materials and seeing how things get made. One of the participants, Suzanne, shares “They could be even more tangible, more practical. That you’ll have more workshops and more things where you can really gain different experiences.”

Not only explaining things but also showing tangible elements and results allows for a better connection with local residents. As Lilly shares “that you can touch, take with you, taste, drink. It’s proof that you’ve been part of it.” It shows how making the process of innovation more tangible allows for more ownership of the process and its outcomes. As people have physical proof of their participation and a stronger emotional connection similar to that of the aforementioned stories.

#### 4.5.3 Co-organising: connecting to local daily life

These ways of having more visibility and involvement through stories and practical examples seem to lower the barrier for participation and make innovation tangible. Though ULLs are perceived as good and innovative, vocalising these desires for more tangible involvement and the aforementioned visibility of people behind the organisations shows that ULLs are also viewed as abstract solutions created by a technological elite that feels distant from their daily life. It seems this lack of transparency results in attracting only the most active citizens. Participants expressed the lack of real influence and missing impact of the ULL in their daily life in their neighbourhood. Projects displayed were often viewed as abstract solutions created by and for the technological elite that does not impact the life of local residents. Participants discussed the notion of co-organising as a mode of participation that allows for more visibility and impact on daily life reaching a wider range of citizens, giving citizens more influence and ownership on the process and lowering the barrier to participation.

##### *Limited influence & connection to daily life*

Most participants expressed a lack of ownership but still described the ULL as valuable. As one participant shared “No, we don't have a say. But I do find it good what you are doing, but it is very invisible.” (Claudia). This lack of visibility and interaction with people from the ULL seems to be a partial cause for the perception of the ULL as a place for young, creative and technologically savvy people that innovate without keeping the needs of citizens in mind. Most participants described the ULL as something of a creative elite. Positively commenting on their technological prowess, creativity or more critically mentioning them simply “sitting behind a desk” (Emma), and making solutions that do not fit or sometimes even overrun local initiatives as the ULL and municipality have the money to bring real change with big projects. Additionally, this could be explained by the mixed previous experiences with participation on ULL projects. Most of the bad experiences shared were from projects where users were more heavily involved. The project's impact being blocked by municipality services, not receiving any follow up to their input or being involved too late in the process when all important decisions were already made. Monique shared her experience with being involved too late in the process. “I think the plans were already made. Then you feel a bit like: the neighbourhood is involved but when it really comes down to it, you don't have enough influence. Or no real power.”

However the blame is not put entirely on the ULL. One of the participants shared her experience about a collaboration between the ULL and the local community garden. The project ended without any results because municipal services blocked implementation. Stating that things need to have a certain scale before they are considered important enough by the people in power. She reflected that this project probably was cancelled due to the local community garden not being important enough to the big developers and municipality. Additional bad experiences were those where primarily students were involved in research without a practical outcome. Five out of six participants voiced a critique about these projects, stating the lack of clear goals and impact. Participant Monique discussed her frustration trying to get projects off the ground but the ULL “pulling a bunch of student researchers out of a can” that were endlessly researching without any results. Leaving her feeling like she wasn’t being taken seriously. The good experiences shared were from the people who connected with a ULL member and entrepreneurs from the ULL. (despite it being measured in the survey can not be concerned. the future survey might include valence of past experience as well) Again the repair cafe was mentioned as a good example of how projects can also have an impact on the neighbourhood.

#### *Co-organising*

Participants discussed that the ULL would have true impact once it is able to get the big innovative projects into people’s households. But in order for that to happen the connection with local citizens should be stronger. A way to focus more on reducing the barrier and becoming more of a partner was the notion of co-organising ULL activities. There were a lot of mentions about ‘crossing the bridge’, where in the case of MALL the terrain is physically separated from the surrounding neighbourhood by an old brick wall and a fairly busy car road. One of the participants, Claudia, shared with me that the one time someone from ULL approached here in her own neighbourhood it “made it [the ULL] feel closer to home”. In the same line of bridging the gap, co-organising ULL events was seen as a way to position the ULL as a partner over a competitor, one participant Emma mentioned to focus less on sharing information about what is happening at the terrain but facilitate the existing (social) infrastructure of community initiatives to “support what is already there”.

All participants mentioned key community leaders multiple times, active residents that do a lot of volunteer work for local grassroots initiatives and neighbours. These citizens, including some of the participants, were very willing to help organise events and employ their social network to spread awareness of ‘the good things that are happening’. As well as a way to decrease the barriers for more hidden or vulnerable communities. One of the participants Claudia (surinamese-dutch) mentioned joining some events because someone with a similar ethnic background invited her

“seeing someone like yourself... it makes it less uncomfortable”. This might be the key to reaching more hidden or marginalised communities that do not have such extensive experience as the others. They also perceive co-organising events as a way to get innovative solutions adopted by the mainstream public. Attaching pieces of innovation to things people already do in their daily life decreases barriers and allows those that are not aware to experiment in their own context. As one of the participants Suzanne put it: “have mainstream things and also some new things which people can try, it could contribute to something becoming mainstream.” Another participant Claudia specifically mentioned bringing innovation within households. “What you do is that you make it big enough for the city, but you should also bring it to those single households. That’s where the people need to change.” However co-organizing also brings some conflicts, as one involved resident Monique mentioned “You don’t only get the nice people involved, but you also get the issues that are happening in the neighbourhood. So you have to be aware of that and try to find good solutions for those issues.”

In summary, participants shared that in order to reach true impact it is important to involve the local community. This would increase transparency and be a start to learn to know the people behind the ULI and start building towards more longer term collaboration.



## 5. Reflections and Conclusion

This chapter reflects upon the implications of these findings to the development of smart cities. First by summarising the findings and answering the research question. Then reflecting on the theoretical and methodological limitations and suggestions for further research. Lastly, I provide recommendations for practitioners on how to practically use these insights to engage the right citizens.

### 5.1 Implications and contributions to literature

This research set out to answer the question: *How does citizens' public participation influence their willingness to participate in Urban Living Labs and how does their participation shape their sense of ownership?* While the survey provided a good background and high level view of what factors play a role in getting people to participate. The interviews allowed for a depth of detail gained from first hand experience. Contextualising some of the findings from the survey around motivations but more than that uncovered a lot of the dynamics behind the awareness and perceived impact of the ULL and the motivations and barriers to impact in the local life of citizens, that were not visible in the results of the survey. Both the survey and the interviews uncovered the same motivations to join the finding hope and inspiration, a way to support a good cause and connect with like minded others.

#### 5.1.1 Which citizens are likely to participate?

As existing research showed limited evidence of known factors influencing citizen participation in ULL's. Existing research on citizen participation in social movements showed civic engagement, pro-environmental behaviour and socio-demographics as two likely important factors. The first research question of this mixed methods research was thus: *To what extent do civic engagement and pro-environmental behaviour influence the willingness of citizens to participate in ULLs?*

The first factor of civic engagement has the first hypothesis: Higher levels of civic engagement leads to a stronger willingness to participate in ULLs was disproven. In terms of civic engagement, there is lack of evidence of civic engagement being an adequate factor. It only shows marginally significant effects on the willingness to participate in ULLs. This contradicts existing literature, which shows dimensions of civic engagement to significantly predict the participation levels in ULLs (Park & Fujii, 2023, p. 103; Remr, 2023, p. 3252). Considering that findings from the interviews seem to indicate that especially citizens who are active in local volunteering are the most likely, or at least the most involved, people to participate. This could mean that there is a validity issue with the measure used for civic engagement (see 5.2). Further research could explore

different measures or dimensions of civic engagement. One recommended dimension would be to focus on volunteering.

The most determining factor has been shown to be pro-environmental behaviour. It was hypothesised that higher levels of pro-environmental behaviour lead to a stronger willingness to participate in ULLs. Thus the citizens most likely to participate are those that have a lifestyle that saves water, waste and energy and are involved with the topic of ecology as a hobby or interest. This is in line with findings from the literature (Irani et al., 2023, p. 7 ; Marres, 2012, p. 8). All interview participants were heavily involved in volunteering work and most had a clear affinity for ecology within their hobbies and volunteer work. However the survey results only showed marginal positive effects of civic engagement and pro-environmental behaviour on willingness to participate. A few possible explanations exist, the first being a methodological one. The scale used might not capture the full range of volunteering work, also the questions were formulated in quite an abstract way. The reliability analysis did show different factors than the ones present in the scale. Another explanation is that the value of participating in a research interview is not considered worth it for other target groups than those who joined.

The control variables of gender, age, education and income are shown to have little influence on the willingness to participate. This seems to add to the mixed effects shown throughout existing literature. Interestingly enough the survey data showed that age was not a significant predictor of willingness to participate but all but one of the interview participants were older than 58 years. A possible explanation might be that senior/retired citizens are at the stage of life where they are free from responsibilities from work and family duties and are taking the time to reorient themselves and build a personal project portfolio of lasting (local) change. One other factor that seemed important when considering the differences in sample descriptions of the survey and interviews was gender. Responses to the interviews were eight women and three men (of which six women were interviewed). Literature did not show any findings on gender difference. This led to the assumption that women were more likely than men to participate. Following up with an analysis of the survey data (see 4.2.3), it shows men and women are equally willing to participate. Possible explanations might be a difference in perceived value or effort of interviews or a small sample size of the survey.

Both the survey and interviews provide evidence that citizens' main motivations to participate are curiosity, inspiration and wanting to contribute to a good cause which is in line with the theory (Puerari et al., 2018, p. 3; Kim-Marriott, 2021, p. 190). Furthermore, the survey shows how awareness is a top barrier for not participating and adds to the evidence of existing literature showing how biographical factors such as distance and work or family commitments (Kim-Marriott, 2021; Klandermans & Oegema, 1987) act as barriers to participation.

### **5.1.2 Improved efficacy through experiential participation**

The second question this research aimed to answer was: *How does citizens' experience with ULLs relate to their sense of ownership and perceived efficacy of ULLs?* Interviews in the second phase of this mixed-methods research showed how citizens who do participate in ULL activities perceive ULLs as positive and are finding inspiration and hope in seeing a diverse range of people and projects aiming to mitigate complex, societal problems. This was congruent with the results from the survey. It did provide more details to what sense of fulfilment means for citizens who participate (Puerari et al., 2018, p. 12).

Although ULLs in general are seen as a good thing. The lack of transparency about project status and goals, limits their view of which projects are actually reaching the desired effects and useful to contribute too and makes them question how these projects could provide value within everyday households. When considering similar results in the survey, this provides ample evidence of the role awareness seems to play as a barrier to participation. Most literature does not mention this although some mentions have been made about the importance of place and awareness (Puerari et al., 2018, p. 12). Further research could look into the details of what information is missing within awareness aside from the aforementioned emotional attachment participants seemed to look for.

In terms of how citizens make sense of their own participation, they seem to lack modes of participation that allow them to learn about new technologies and materials through hands-on experiences and demonstrations that engage their senses. Aside from literature stating that citizens engage with complex topics through everyday practices of engagement such as separating waste or choosing which mode of transport to take for commuting (Marres, 2012, p 76.; Pallet et al, 2019, p. 591) This is a new addition to existing research. Further research could look into a comparative study of how different co-creation methods compare to people's sense of ownership and perceived efficacy of ULLs.

### **5.1.3 Ownership through co-organising events**

Additionally, there seems to be a lack of ownership due to the aforementioned low visibility on the opportunities to participate in meaningful exchanges with the people behind the projects. Being involved too late in the process, which is a common issue in public participation (Pallet et al, 2019, p.591). Literature shows how people already concerned with the topic but not formally invited to a process resort to the organisation of local community action (De Lange & De Waal, 2017, p. 51; De Waal, 2014; Pallet et al, 2019, p.591). This is apparent in the stories from the participants sharing about their local community gardens or creating a neighbourhood community to provide alternative proposals to the municipality as the solution of the municipality was not

deemed suited for the neighbourhood. There seems to be a clear desire for building long-term relationships with the people of the ULL and connecting local grassroots initiatives with those of the ULL in order to increase the influence of positive change within their daily life. When comparing literature it is likely to assume that it is relevant for only the most active citizens (Puerari et al., 2018, p. 13). Citizens discussed co-organising events as the ideal way to do this. The active participants seem to be well positioned within local resident communities as the chosen partners for co-organising these events. Co-organising is a new addition to the existing framework surrounding co-creation (Menny et al, 2021, p. 71). This method of co-organising as a new mode of participation could have wider implications in the way ULLs orchestrate their citizen and stakeholder participation. It might provide a way for ULLs to engage a wider range of citizens that are less likely to participate due to being less often exposed to novel developments in sustainability and technology. AS Puerari et al (2018) mentioned it is hard to involve 'the outer layer' of less active citizens. Co-organising events might provide a path for future studies to investigate the effect of this form of participation on less active citizens.

## **5.2 Reflection and recommendation for future research**

The biggest consideration on both reliability and validity is the focus on this research of one urban living lab. As literature points out, urban living labs are very diverse and heavily dependent on their context (Bulkeley et al., 2019, p. 319; Puerari et al, 2018, p. 2). This makes it hard to extrapolate these findings to other living labs that do not share the same context, therefore a precise description of the research context and the context of this urban living lab has been reported (see chapter 3.2). In order to improve the reliability and validity of this research, future research might explore how a similar research but in a comparative setting of multiple living labs might influence the results. Additionally this research mostly covered residents in the immediate surroundings of the urban living lab, future research could compare how various neighbourhoods differ in their willingness to participate or how citizens of labs in different geographic locations compare. Furthermore only three ULL activities were covered within the time of this research, and the survey only measured the willingness to participate in one of those activities. Future research might take a longer timeframe and improve the dependent variable by having a unique measure per event to collect data on willingness to participate.

Some validity issues might be reflected in the operationalisation of the concepts used. Firstly, the dependent variable of willingness to participate. The data collected could have been influenced based on the accompanying description to the survey question (See appendix A - Survey Instrument). Respondents had no further context of the event outside of the survey. The activity in question could thus have been interpreted as more irrelevant or appealing based on the description

of the activity. Additionally the measure of the dependent variable consisted of a question targeted towards future intent. Intent alone does not capture the full condition as apparent in literature from participation in social movements (Klandermans & Oegema, 1987, p. 529). A measure that also incorporates past behaviour would prove to be a more accurate reflection of behaviour (Kwak, 2021, p. 453). Past participation was originally included as a measure, however since the data did not contain enough variation of the measure it was removed from the dependent variable for analysis. As the original measure was tested for protest participation, future research might explore how this measure reflects the context of participation in ULLs (Kwak, 2021, p. 453). Future studies might explore the differences between, non-participant, first time participant and repeated participant groups to understand if the addition of a past participation measure is indeed for ULLs.

Additionally the measures for civic engagement and pro-environmental behaviour are large multidimensional concepts and might have excluded or overemphasised some dimensions (Adler & Goggin, 2005, p. 238; Irani et al., 2023, p. 3). This is likely to be true, considering the conflicting findings in the survey and the characteristics of the interview participants. However, it could also mean the survey results were perhaps biased. Another additional explanation could be that participating in a qualitative research could be considered more intensive or less valuable than an ULL activity. Considering a fairly high response to the survey question asking for willingness to be contacted for a follow up interview, but a low rate of those people actually scheduling an interview (see chapter 3.4). The most likely explanation will be that of biographical availability, people just simply seeing it as considering their responsibilities and limited time (Klandermans & Oegema, 1987, p. 525; Kim-Marriott, 2021, p. 185). Alternatively, it could mean interviews are considered a less valuable way to participate in ULLs. Data from the interviews showed that participants perceive participating in a research as a form of participation in the ULL. However, there was a low response rate. This would have implications for the participation framework of Menny et al (2018, p. 71).

Some reliability concerns exist that might influence the results. No intercoder reliability check was done within the interviews, only I coded the interview data which could lead to a bias. However in order to improve reliability interviews were held at the same location around similar times and within a short time period after the event as much as possible. Clear notes reflecting on setting, emotions of participants and interviews and observations noted immediately after each interview were collected (see Appendix D - Interview notes). This could increase reliability by shedding light on the context of the interviews. Despite efforts to sample residents at home through mailbox, the collection of was heavily reliant on convenience sampling from those present at the terrain and the audience of local newsletters and snowball sampling through the network of community leaders (see chapter 3.4)

In matters of theoretical implications, this research set out to provide a first attempt at defining and describing the factors and experiences that influence citizen participation in smart city urban living labs. This research provides a groundwork for future researchers to dive deeper into. Questions to be explored could be: a study with a higher response rate and adjusted measures to verify the hypothesis more strongly.

The biggest contemplation towards future studies is the mixed results between the survey findings and the characteristics of interview participants. The sample size of the survey was relatively small ( $N = 143$ ) and slightly skewed towards higher education levels however all other variables were quite diverse. The representativeness of the interview sample is fairly homogeneous with only older, female participants that are actively volunteering and involved in sustainable projects as a hobby or volunteering with others. This brings into question if this group of citizens (older, female, high education, civically active and a sustainable lifestyle or interest) are not those that are more likely to participate. Additional analysis of the survey data (see chapter 4.2) however shows that this is not the case. It seems that the most active citizens are participating. This can have wider consequences for the future city. If only those citizens that are already highly engaged in a topic participate, it causes participation to be skewed in favour of those citizens that are more willing to overlook faults in a solution. This could be problematic when projects want to reach a wider audience beyond the initial testers. If the only citizens involved are those citizens that already engage with experimental solutions it might not reflect the needs of the general public as these citizens are more critical of possible teething aches. Resulting in stagnation when the project aims to scale up from a testing ground to a mainstream environment. This could be one of the factors why ULLs have trouble scaling their impact beyond the local context (Bulkeley et al., 2019, p. 333).

Further qualitative research could look into the role of stories and narration behind the communication and participation in ULLs. Some questions arose as to why participants were looking to connect so much to stories of shared visions, impact and motivations of entrepreneurs. One possible explanation is that the more senior citizens are in their stage of life when they are retired or facing retirement. Which removes a lot of barriers imposed by biographical factors (Klandermans & Oegema, 1987, p. 525; Kim-Marriott, 2021, p. 185). But also makes them reflect on their own motivations and impact more. Essentially creating their own story, as one participant shared:

### **5.3 Recommendations for practitioners and implications to smart city development**

Concluding from this research, two things could improve the impact of ULLs for citizens and their sense of ownership: Firstly, increase visibility and impact by sharing stories and connecting more to local neighbourhood initiatives. Secondly, moving from academic information and end products to more practical demonstrations and workshops that focus on process and short term value. Thirdly, provide more participation opportunities that connect with the daily life of citizens.

#### **5.3.1 Visibility of urban living labs**

The first question for practitioners to reflect on is: How approachable are the Urban Living Lab and its people? By being hidden, ULLs seem to only attract the most active citizens, whereas the survey results show there is a wide range of citizens who are willing to participate.

The citizens most likely to participate seem to be older citizens who are actively volunteering in and concerned with their neighbourhood. They also have a lifestyle and sometimes hobbies that promote sustainable living. Their age is usually accompanied by a lack of responsibilities of work or family. Granting them the time to participate in unpaid events. They seem to have a motivation to contribute to a good cause and an affinity and interest with ULL related topics.

In review of the literature, choosing to involve these active citizens has certain implications. Involving them more could employ their seemingly extensive professional and volunteer experience, as shared by the stories of mutually beneficial exchanges between ULL entrepreneurs and active citizens in the interviews. Additionally, these citizens could facilitate contact with other citizens through their own social network. However, this could mean attracting citizens with a similar background as often social networks are fairly homogeneous (Klandermans & Oegema, 1987, p. 520 ; Kim-Marriott, 2021, p. 190).

On the other hand, involving other citizens might bring the benefits of diversity in the co-creation process (as is often recommended by literature (Menny et al., 2018, p. 71 ). And provide a more representative view of society which could be beneficial for implementation stages of ULL projects (Bulkely et al, 2018, p. 333). Projects transitioning from testing phase to wide implementation might benefit from a more critical perspective of citizens who do not have an affinity with ULL topics of technology or sustainability prior to involvement, as it will help find problems before widespread launch. However these citizens might prove less inclined to participate for various reasons outside the scope of this research.

### 5.3.2 How to involve citizens?

In order to improve visibility, it might prove beneficial to create better visibility of the ULL's projects and communicate about motivational stories of the people working on them. Citizens are motivated by inspiration, hope and interested in the stories of impact and motivation of people. In order to make participation and impact more accessible to the general public, ULL activities should be focused less on information dense explanations of end solutions and instead allow people to try and engage through their senses. Demonstrations and hands-on workshops were expressed as great ways to make abstract innovative solutions tangible, understand the process behind the result and engage with new materials and technology through multiple senses. These methods will allow people to have 'proof' of their participation and connect in a way that they will remember longer. It is also important to be mindful of the positive influence place plays in the awareness of ULLs (Puerari, et al., 2018, p. 13). Many participants expressed how they enjoyed seeing things happening and having physical things to see making the abstract innovations appear closer to their daily life.

It is important to decrease the barriers to participation. This research surfaced a strategy put forward by citizens themselves. That of co-organizing events. These could happen in two ways, becoming an extension of local initiatives or including local residents as co-organisers or event staff of ULL events. Both ways decrease barriers to participation by allowing citizens that are not as actively looking to participate to be part of an event where the topic or the people are more familiar. When opting for the first strategy of extending local initiatives, practitioners could for example show sustainable food options at a community dinner. When opting for the second strategy of co-organising a ULL event with citizens, ULL practitioners could invite the most active citizens as part of the organisation team, and through the network of those active citizens additionally recruit citizens who'd like to help in a less time and resource intensive way such as catering.

Summarising the recommendations, first improve the relationship with the active citizens and through them quite organically the network will grow. Increase visibility, employ stories and practical participation opportunities.



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**Appendix A – Survey instrument**

**Table 1.1**

*Description of the sampling methods used for the survey*

<b>Method</b>	<b>Sample frame</b>	<b>Responses</b>
In person through QR (Marineterrein and neighbourhoods)	93	68
3.4 Tuesday 10:00-12:00, 17:00-18:30	20	18
4.4 Thursday 10:00-12:00, 14:00-16:00	14	10
7.4 Sunday 13:45-15:15	31	18
10.4 Wednesday 10:30-11:00, 17:00-17:45	28	22
Flyers in mailbox	250	≈ 18
Online links	unknown	unknown
Oost online newsletter (local newspaper)	unknown	unknown
Plukbos newsletter (community garden)	460	unknown
Buurtorganisatie 1018 newsletter (residents organisation)	unknown	unknown
Expeditie Oosterdok Newsletter (local entrepreneurs)	unknown	unknown
<b>Total</b>	<b>803</b>	<b>178</b>

Social media post and flyers of the survey respectively.



Amsterdam Institute for  
Advanced Metropolitan Solutions

To the residents and visitors of  
Marineterrein and surroundings

April 2024

### Short survey on citizen participation in neighborhood development

On behalf of AMS Institute I'm researching how involved the local community is in neighborhood activities and developments.

The goal is to ensure the developments of Marineterrein will be better suited to the needs of local residents and its visitors.

### Would you be so kind to complete an anonymous survey of max. 6 minutes?

You can use de QR code or visit [ams-onderzoek.nl](https://ams-onderzoek.nl)



#### Questions?

My contact details are in the survey.

Warm regards,  
Tim Dekker



Amsterdam Institute for  
Advanced Metropolitan Solutions

Aan de bewoners en bezoekers  
nabij het Marineterrein

April 2024

### Korte vragenlijst over de betrokkenheid van buurtbewoners in wijkverbetering

Namens AMS Institute, doe ik onderzoek over de mate waarin burgers betrokken zijn in buurt activiteiten en ontwikkelingen.

Het doel is de ontwikkelingen op het Marineterrein aan te sluiten bij de behoeftes van bezoekers en omliggende bewoners.

### Zou u een anonieme vragenlijst willen invullen van max. 6 minuten?

Dit kan via de QR code of [ams-onderzoek.nl](https://ams-onderzoek.nl)



#### Vragen?

Mijn contactgegevens staan in de vragenlijst.

Met vriendelijke groet,  
Tim Dekker

For the survey please see attached files (it was unfortunately not possible to add in this document)

## Appendix B – Interview topic guide

### Intro

- Welcome: goal of project, purpose of data
- Consent recording & data handling: Anonymous, stored safely, can retreat anytime, can see at any moment
- Background of participant: Tell me a bit about yourself

### Awareness, Motivation & barriers

- [exposure to networks] How did you find out about this event/urban living labs?
- [motivation] What made you decide to join? How important was it to join?
- [overcoming barriers] Were there things that made you doubt if you could or wanted to come?

### General experience with participation in ULL activities

- How was your experience with the living lab today?
  - What activities?
  - Most important /favourite?
  - Least important / favourite?
- [Outcome expectancy] Did it meet your expectations?

### Outcome

*“The main goal of the event is to inspire and showcase solutions to climate change and allow people to contribute”*

- [outcome expectancy] How do you view the effectiveness of the things you’ve experienced today in providing answers to climate change?
  - Impact your **daily life**
  - Impact / reflect **neighbourhood**
  - **Missing anything** that needed addressing?
- [Ownership of outcome] How do you view your own role / contribution to these projects?
  - How do you think your contributions have or will **influence the outcomes** of the projects or discussions?
  - **Who** has the most important role? [responsibility, influence, representation]
  - **Specific examples** of how you contributed to the projects or discussions?

### Means of participating

- [self-efficacy] In what ways did you contribute?
  - How easy or hard?
  - What helped or **prevented you** from contributing actively? [resources for participating]
    - What **role/responsibility** do **organisers** have in this?
  - Favourite activities
  - Were you **missing** any specific way to contribute?
- [future participation] Would you participate in similar events again in the future? Why or why not?

### Outro

- Is there anything else you'd like to share with me? Or summarise/restate
- Thanks, next steps, goal

## Appendix C – Interview topic guide [NL translation]

### Intro

- Welkom: doel van het product, doel van de gegevens
- Toestemming opname & gegevensverwerking: Anoniem, veilig opgeslagen, kan op elk moment terugtrekken, kan op elk moment inzien
- Achtergrond van deelnemer: Vertel wat over uzelf

### Bewustwording, motivatie & barrières

- **[exposure to networks]** Hoe bent u bij dit evenement/ ULL terechtgekomen ?
- **[motivatie]** Wat deed u besluiten om mee te doen? Hoe belangrijk was het om mee te doen?
- **[overcoming barriers]** Waren er dingen waardoor u twijfelde of u wel kon of wilde komen?

### Algemene ervaring met deelname aan ULL activiteiten

- **Hoe was uw ervaring met het living lab vandaag?**
  - Welke activiteiten?
  - Meest belangrijk / favoriet?
  - Minst belangrijk / favoriet?
- **[Resultaatverwachting]** Voldeed het aan uw verwachtingen?

### Outcome

*"Het belangrijkste doel van het evenement is om te inspireren, oplossingen voor klimaatverandering te laten zien en mensen in staat te stellen een bijdrage te leveren."*

- **Hoe kijkt u aan tegen de effectiviteit van de dingen die u vandaag hebt ervaren in het bieden van oplossingen voor klimaatverandering?**
  - Impact op u dagelijks leven
  - Impact op / weerspiegeling van de buurt
  - Heeft u iets gemist dat aangepakt moest worden?
- **[ownership of outcome]** Hoe ziet u uw eigen rol / bijdrage aan deze producten?
  - Hoe denk u dat uw bijdrage de uitkomsten van de producten of discussies heeft beïnvloed of zal beïnvloeden?
  - Wie heeft de belangrijkste rol? **[verantwoordelijkheid, invloed, vertegenwoordiging]**



- **Specifieke voorbeelden** van hoe u heeft bijgedragen aan de producten of discussies?

#### **Middelen om deel te nemen**

- **[self-efficacy]** **Op welke manieren heeft u bijgedragen?**
  - Hoe gemakkelijk of moeilijk?
  - Wat hielp of **verhinderde** u om actief bij te dragen? **[resources]**
    - Welke **rol/verantwoordelijkheid** hebben **organisatoren** hierin?
  - Favoriete activiteiten
  - **Mist u een specifieke manier** om bij te dragen?
- **[future participation]** **Zou u in de toekomst weer deelnemen aan soortgelijke evenementen?** Waarom wel of waarom niet?

#### **Outro**

- Is er nog iets dat u met me wilt delen? Of samenvatten/hervatten
- Bedankt, volgende stappen, doel

Appendix D – Interview notes

Participant info	Methodological reflection	Substantive reflection
<p><b>00/00 Day 00:00</b> <b>Pseudonim</b> Background info</p>	<p>Setting, tone, emotions interviewee, own emotions and experience</p>	<p>General reflection on content, What was important to pp? Notes for answering RQ, Possible edits to interview guide</p>
<p><b>24/04 Wed 18:30</b> <b>P1 Suzanne</b></p> <p>F60, German (moved to NL long ago) Tertiary (higher) education, Part-time teacher, Local resident, Participated in green market multiple times, Volunteer in local community garden</p>	<p>Studio de Kat, cold and rainy day, good chat, she talked a lot, tended to stay abstract and a lot about what she wanted to do with food., emotions were hard to read but mixed from sceptical to little joy, tone was informal but hesitant. Tended to drift off topic to the abstract quite a bit. I was feeling tired and not too sharp.</p>	<p>Concrete solutions for daily life were important. Hated student projects.</p> <p>Interesting tension between wanting small concrete solutions but saying they don't solve the real problem. Did suggest workshops that move from information to experience and social cohesion as answer.</p> <p>I could have asked for more examples.</p> <p><b>Mentioned Roboat as good practical example</b></p> <p>Voor BM: werkplaats, en lokale boer. Meer workshops bij groenmarkt</p>
<p><b>25/04 Thu 13:15</b> <b>P2 Emma</b></p> <p>F38, NL, Tertiary (higher) education, Works part time, Local resident, Participated in green market multiple times, Volunteer in neighbourhood committees, New mother</p>	<p>Rainy, cloudy weather Phone, sceptical, talked a lot and had a lot of critical notes to say. She found it difficult to answer abstract questions but had good temples of what worked for her. I was feeling sharp and energetic. Better interview than the last, after the switch to general participation in urban development.</p> <p>She wanted to be informed of the outcomes.</p>	<p><b>&gt; Need to focus less on events and more on general developments of the terrain and all activities together. Recruitment incl. Repair Cafés, GroenMarkt, Wandeling Chiquita, Innovatie paviljoen.</b></p> <p>For the community, with the community but no actual action.</p> <p><b>Mentioned Roboat as good practical example,</b> but said now it's a black box again.</p> <p>Saw the event more as fun family activity and was obstructed to join workshops due to family planning.</p> <p>Didn't think the green market provided real solutions but it deed feel more connected to the neighbourhood.</p> <p>Finds abstract topics not relevant and looks for things they can use in their neighbourhood.</p> <p>Bad experience with not being listened to during council meetings.</p> <p>Future city as too vague</p> <p>Talked a lot about how their civic engagement helps the neighbour 'act against' not being involved. Banded together with counter proposal.</p> <p>Wasn't sure of how to provide feedback and which organisations are present. Missing a dedicated face.</p>

<p><b>29/4 Mon 14:00</b>  <b>P3 - Helena</b></p> <p>F62,  NL (NL born but lived in Africa and USA, for all her adult life, since 2 years in NL),  Tertiary (higher) education,  Self employed (UN consultant,  Amsterdam resident,  Participated in green market and Amsterdam Economic board meetup once,  Volunteer in multiple organisations,  Has son who worked on Roboat (ULL project) through MIT,</p>	<p>Sunny good weather, Videocall, seemed very eager to join interview, felt like a good chat albeit maybe a little abstract. I was feeling rested and sharp. Happy but serious. She seemed quite serious. I could have been more encouraging, so she would be more comfortable discussing topics.</p>	<p>Lots of talk about awareness and sharing vision. Not so much about participation Could have asked more about what she thinks is the vision.</p> <p>Was talking a lot about needing to figure out “how the Netherlands works” meaning how to make social change happen that will affect policies. Liked examples from the market how the compostable cups caused policy change.</p> <p>Main drivers were inspiration and hope, also exploring where she could contribute with her newfound free time.</p> <p>Main barriers: informal care, kids and fulltime-job</p>
<p><b>30/04 Tue 15:30</b>  <b>P4 - Claudia</b></p> <p>F58,  Surinamese-Dutch (Surinam born, Dutch raised),  Tertiary (higher) education,  Retired but works as artist,  Local resident,  Participated in Green market multiple times,  Volunteer in multiple organisations</p>	<p>Studio de Kat, Sunny day, she was very happy and talkative, smiling and complementing, I was very responsive. Good discussion.</p>	<p>Repair Café was een heel goed voorbeeld van hoe je met de buurt en leeftijdsgroepen werkt.</p> <p>Workshops betekent spelenderwijs leren over klimaatverandering</p> <p>Diversiteit, als ik niemand zie die op mij lijkt. Dan kom ik er minder snel.</p>
<p><b>16/05 Thu 13:30</b>  <b>P5 - Monique</b></p> <p>F67,  NL,  Tertiary (higher) education,  Recently retired (municipality worker)  Local resident (40 years in the neighbourhood, but from western part of Netherlands),  Participated in green market multiple times,  Volunteer in multiple organisations</p> <p><a href="#">Link to transcript</a></p>	<p>Studio de Kat, Good weather, she was pretty positive, very talkative, often off track. I could have been more directive in the interview.</p>	<p>Wide experience with participating. Seemed accepting of not getting results out of pro-active participaitg.</p> <p>Again co-organising as important principle.</p> <p>Reaching non-active participants through community leaders such as her.</p>
<p><b>22/05 Wed 11:30</b>  <b>P6 - Lilly</b></p> <p>F77,  Dutch-Indonesian (NL born, Indonesian mother),  Tertiary (higher) education  Local resident  Participated in green market multiple times,  Volunteer in multiple organisations  Lived in US for 20 years, Husband at MIT</p>	<p>StudioDe Kat, fairly good weather, She was in a good mood, very talkative, lots of side tangents</p>	<p>Talked a lot about being isolated from the masses, her knowledge of science influences her engagement.</p> <p>Again talk about experiential participation.</p>

**Appendix E – Codebook**

Please see attached files (it was not possible to format it in a readable way)

Appendix G – ULL events



**HOE MAAK IK EEN SUCCES VAN MIJN GEVELTUIN?**

Workshop gevel-tuinieren in Buurtkamer Oostenburg, Isaac Titsinghade 123. Meld je gratis aan bij [centrumoostgroen@outlook.com](mailto:centrumoostgroen@outlook.com).

dinsdag 16 april 19.30 - 21.00 uur

**Wie Waar Walvis**

Rondleiding voor het hele gezin in het Scheepvaartmuseum

woensdag 17 april 13.30 - 14.30 uur

Is het een monster, een lekker stuk vlees of een dier dat we moeten beschermen? In dit programma gaan we als kleine onderzoekers in de tentoonstelling aan de slag. Je zintuigen en fantasie worden op verschillende manieren geprikkeld en je wordt uitgedaagd om na te denken over de manier waarop we walvissen beter kunnen beschermen. Schrijf je in via [jaikwileenkraam@gmail.com](mailto:jaikwileenkraam@gmail.com).

**Stadsecologie en groenvisie**

Stadswandeling over de Eilandenboulevard

woensdag 17 april 16.00 - 17.30 uur

Stadsecoloog Els Corporaal en Heleen Verschuren vertellen tijdens een wandeling over de dieren in de stad en wat er nog meer mogelijk is op het gebied van groen in de buurt. Startpunt Witte Boei, Kleine Wittenburgerstraat 201. Graag aanmelden via [oostelijkeilandengroen@outlook.com](mailto:oostelijkeilandengroen@outlook.com).

**Hou jij je bezig met duurzaamheid, groen of biodiversiteit? Huur dan een kraam via [jaikwileenkraam@gmail.com](mailto:jaikwileenkraam@gmail.com)**

Bijdrage naar draagkracht €15 voor buurtbewoners en €25 voor ondernemers

**Geniet van gezond en lekker eten, bijzondere rondleidingen, duurzame producten, muziek en gratis plantjes!**

GREEN

MARKT & FESTIVAL

16, 17 & 21 APRIL

Marineterrein, Kattenburgerplein & Eilandenboulevard

# GREEN

## ZONDAG 21 APRIL

### MARKT & FESTIVAL

**Ontbijt in het Scheepvaartmuseum**  
10.00 - 12.00 uur  
Max. 100 bezoekers. Reserveer je vrijkaartje via [www.hetscheepvaartmuseum.nl/doen/thuishaven](http://www.hetscheepvaartmuseum.nl/doen/thuishaven)

**Inclusief:**  
**SCHILDEREN MET KOFFIEDIK**  
**WIE WAAR WALVIS**  
Tentoonstelling over de walvis als bedreigde diersoort en de plastic soep in de oceanen. (6+)

**PEKEL MEE!**  
Ga mee naar de kombuis van de VOC-replica en leer over het eten aan boord. Wat je dat oude manieren om eten houdbaar te maken nog steeds bruikbaar én lekker zijn? Ontdek en proef het zelf om 10.30, 11.00 en 11.30 uur.

**FOOD FOR THOUGHT**  
Bekijk de voedselindustrie door de lens van Kadir van Lohuizen. In een multimediale beleving met fotografie, film- en dronebeelden, wordt de bezoeker meegenomen op een zoektocht naar de oorsprong van ons voedsel, en de rol van Nederland en de scheepvaart in het voedselsysteem.

**MAAK JE EIGEN TERRARIUM**  
Kom thuis met je eigen doorterrarium van bambinoplantjes, knikkers, schelpen en wat je onderweg vindt! Van 12.00-16.00 uur, materiaalkosten €15.

**BODEMHELDEN**  
Onderzoek de wondere wereld van bodemdierpjes. Misschien kunnen we wel wat die kriebelende kroelers vinden. Maak een bodemdierenkunstwerk met natuurlijke materialen. 12.00 - 16.00 uur.

**Marineterrein**  
12.00 - 16.00 uur  
Spring in het diepe en leer over kroelers, wilde groenten en bacteriën

**GROENMARKT**  
Allerlei kramen op het gebied van duurzame lifestyle, zelfgemaakte creaties, groen en biologische producten, recycle, Ze kans kleding, meubels, kunst etc. tot 17.00 uur.

**SOKKEN WASSEN BIJ FUTURE LAB/DE WAAG**  
Kleur je eigen sokken met natuurlijke pigment. Local Color leert je gebruik maken van planten, bacteriën en andere levende organismen om textiel een nieuw leven in te blazen. Van 12.00-16.00 uur.

**Kattenburgerplein**  
Body & mind met biologische foodtrucks. Het terras van Bar Guzzo is open!  
12.00 - 20.00 uur

**SPORT, SPELEN SKY HIGH!**  
Voor jong en oud met Sciandri en de Brandweer. Zie al het groen in de buurt van grote hoogte! 14.00-16.30 uur

**CLAYTON BARROS SAMBABAND**  
Bruisende Samba-muziek met acrobatische acts van 12.00 - 13.00 uur.

**KLANKPOORT**  
Met Ismael Kaseem en gedichten van Marlou Avontuur  
13.00 - 15.00 uur.

**STEVEN LEFERTY LEWIS**  
Akoestische muziek van 14.00 - 16.00 uur

**GA JE MEE WILDPLUKKEN?**  
Rosa van de Wilde Tuin leert ons waar je op moet letten en hoe je er een heerlijk hartig pannenkoekje mee bereidt. Workshops om 14.00 en om 16.00 uur, max. 7 deelnemers per keer. Meld je aan via: [Facebook.com/deWildeTuin](https://www.facebook.com/deWildeTuin) of [Instagram.com/deWildeTuin](https://www.instagram.com/deWildeTuin).

**COUPLE POSITIVE UPLIFTING COLLECTIVE**  
Een muzikaal avontuur om samen te zijn en te bewegen  
14.00-15.00 uur.

**BLUE JOE**  
Dansen op Arabische muziek  
17.00-18.00 uur

**MARCEL BARLAG**  
De DJ te fiets van 15.00 - 17.00 uur

**MUZIEK**

**DJ GATINHA**  
Swing en zing mee op haar wereldmuziek, van het Amsterdamse levenslied naar alle uiteinden van de wereld van 18.00-20.00 uur

**CARPE DIEM**  
Swingende mix van Zuid-Amerikaanse hits  
16.00-17.00 uur

**Houd jij je bezig met recycling, kleding of zelfgemaakte producten? Huur dan een kraam via [hartvoordebuurtOE@gmail.com](mailto:hartvoordebuurtOE@gmail.com)**  
€15 voor buurtbewoners en €25 voor ondernemers



# Ruilwinkel & Reparatie Café

Kom van 17 tot 21 april gezellig langs in **Studio de Kat** en doe mee aan een gratis workshop, deel je repareer talenten of ruil je mooie kleding die je niet meer draagt voor iets nieuws. De koffie staat klaar!

**KLEDING-RUILWINKEL**  
Ruil je oude outfit in voor een nieuwe  
13.00 tot 18.00

**17 APRIL: KLEDINGREPARATIE EN UPCYCLING**  
Met ROCvAF modestudenten en de naaclub  
13.00 tot 17.00

**18 APRIL: REPAREER JE OUDE APPARATEN**  
Met Repair Café de Witte Boei  
14.00 tot 17.30

**19 APRIL: REPAREER JE FIETS**  
Met UvA Bike kitchen en ROCvAF fietstechnicus-studenten  
10.00 tot 13.00



Studio de Kat, Marineterrein Kattenburgerstraat 5 (Mijnepoort) www.marineterrein.nl



