

Towards more socially inclusive smart sustainable cities

A study of smart city districts in the Greater Copenhagen region

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Abstract

Today cities are in a state of flux exhibiting complex dynamics and at the core of sustainability challenges including climate change and urbanization. At the same time cities have been acknowledged as agents of change when it comes to addressing these challenges. The urgency to address these problems has triggered cities to find smarter and innovative ways to deal with these challenges. Smart city districts are emerging as a new form of urban living with smart solutions, technologies, products and services to address these sustainability challenges and enhance quality of life in cities.

The thesis follows a case study approach to explore how smart city districts can be governed to catalyze co-creation and enhance social inclusion in their planning and development. In the course of the thesis, a combination of two analytical models form the basis for analysis of the cases under investigation. The Democracy Cube which provides institutional design dimensions for understanding of the potential and limits for citizen participation. Also the Participation Stairway that determines the level of citizen participation. For both case studies under investigation, planning and development is still ongoing.

Citizen participation and engagement in the form of collaborative or communicative planning forms the central focus of planning and development in the case studies investigated in this thesis. Information, consultation and dialogue form the main channels for citizen engagement in the planning process. There is also an ongoing need to elevate and foster the level of citizen influence. However, these aspects of social inclusion still remain a challenge since the project are emerging from green fields.

Keywords: Smart city, sustainable, smart city district, social inclusion, co-creation

Executive Summary

"Cities are seen as crystallization points within society – important entities within which people live, work and travel. ... Cities create cohesion and synergy between individuals and businesses. It is in cities that inspiration is found for innovation, renewal and new levels of comfort" (Hajer, 2011). Cities are also at the core of sustainability challenges and their activities linked with climate change, environmental and resource problems as well as social sustainability challenges (Edelstam, 2016). At the same time, smart urbanism is emerging at the intersection of visions for future urban places, new technologies and infrastructures within cities (Luque-Ayala & Marvin, 2015).

City governments are implementing a number of transformative projects in form of smart city initiatives (hereafter referred to as smart city districts) in order to improve the quality of life for and within cities. Smart city districts arise as a new wave of urban living in which smart solutions in the form of technologies, products and services are being implemented to address sustainability challenges and opportunities created by urbanization. Yet being still new, our understanding of the opportunities, challenges and implications of smart urbanism is limited (Luque-Ayala & Marvin, 2015). A lot of focus on such smart city projects has been tailored around smart technologies. However, due to the complexity of smart urbanism, there is a need for city governments to critically address issues of social inclusion when planning and developing such initiatives (Luque-Ayala & Marvin, 2015; Hollands, 2008).

This thesis therefore seeks to investigate how municipal governments currently address issues of social inclusion in their smart city developments. What practices are being developed to more effectively and efficiently improve the social justice dimension involved in the design and governance of smart city districts is the central topic in this thesis.

The following research questions were used to provide a guide to the study:

1. How are smart city initiatives designed and governed to catalyze co-creation and improve social inclusion?
2. Which practices are most and least successful in delivering social inclusion priorities when implementing smart city initiatives?

The thesis followed a case study approach with two cases: Vinge in Frederikssund Municipality, Denmark and Brunnshög in Lund Municipality, Sweden. The primary method for data collection was through interviews primarily with experts from the corresponding municipalities in charge of the case study projects under investigation. Interview data was supported with desktop literature study and analysis. In total, six interviews were conducted with three being representatives from the municipalities and others in the field of smart and sustainable cities. In addition, two informal discussions were conducted with experts as well as site visits and attendance at a workshop on smart sustainable cities in Malmö, Sweden.

The democracy cube and the participation stairway were used as frameworks for analysis of the cases under investigation. The democracy cube provided the three institutional design dimensions for understanding the potential and limits for citizen participation. That is scope of participation, mode of communication and decision, and extent of influence (authority and power) as shown in figure below. Used concurrently, the participation stairway built on five steps, including information, consultation, dialogue, influence and co-decision. The model acted as a framework for determining the different levels of participation of stakeholders (citizens) in decision making activities. It also relates to the amount of power that is devolved.

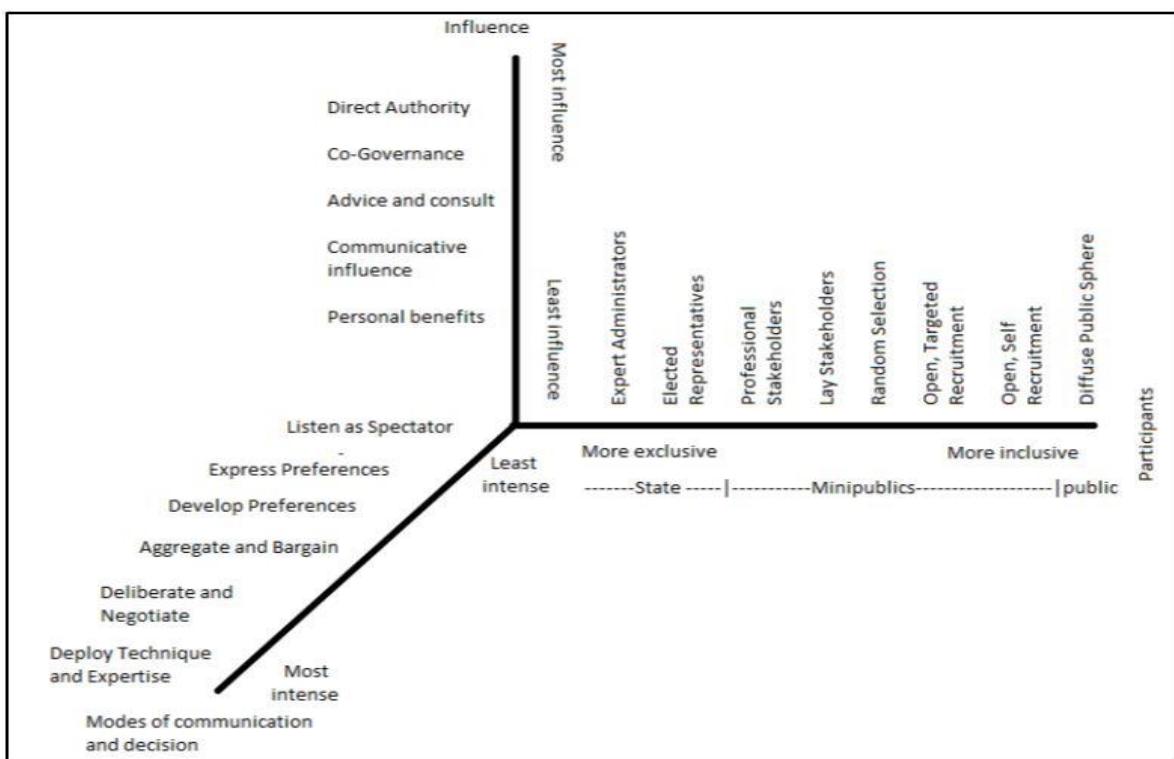


Figure 0-1: The Democracy cube

(Source: Fung, 2006)

In response to the first research question, interview results with municipal officials revealed that both case studies have been developed based on a participatory form of governance. Citizen participation and engagement is central in their planning and development processes for both municipalities. This has been realized in the form of communicative or collaborative planning with citizens amongst other stakeholders. The traditional planning regulations oblige municipalities to involve citizens amongst other stakeholders in planning and development. However, this is more pronounced in the Swedish context that also requires public consultation for detailed municipal local plans.

According to the participation stairway, analysis of the cases revealed that information, consultation and dialogue activities form the main modes of citizen engagement in planning and development activities. Municipalities need to elevate and foster the levels of citizen influence on the participation stairway. This can further enhance the legitimacy and effectiveness of decisions made and ensures that citizens not only express opinions and interests but also involved in the development and determination of priorities that related to the needs and values they hold.

Analysis of the spectrums of citizen engagement in relation with the democracy cube revealed the following. Scope of participation for most activities was classified to be more inclusive to the public. In extension, citizens as lay stakeholders were also realized in Vinge. With mode of communication, activities have evolved over time in both cases from least intense towards the most intense in the form of deliberations. Citizens influence in municipal activities have also evolved from personal benefits to co-governing relationships towards most intense influence.

Social inclusion practices still remain a challenge since both projects are from green field sites and developments still underway. Thus beyond these legal traditional practices, several inclusion mechanisms have been put to test in both cases. These varied from surveys, co-creation workshops, interviews, publications and web applications focus groups and general meetings.

In both cases traditional media forms the leading form of public communication. For Vinge, an analysis and evaluation of the several inclusive mechanisms as the project progresses is yet to be implemented. In the case of Brunnshög, inclusion priorities were influenced by demographics and opinions. A survey by Lund Municipality revealed that public meetings and public dialogues were most effective communication methods to reach those with less favorable views about Brunnshög. Social media was effective for reaching age group 18-30 while Brunnshög newsletter 50+ years of age. In addition, Lund Municipality created several social activities to reach citizen groups traditionally difficult to get to participate in dialogue such as young parents, children and students. These according to interview findings have been successful.

Integrating social inclusion priorities should be central in the planning and development activities of smart city initiatives. This is because cities are not only built physical structures but spaces in which people travel, work and live. Thus involvement of citizens enhances their relationships with municipalities and provides citizens an opportunity to influence decisions made about their future cities. It also presents co-benefits for the municipal governments in that they conceive citizens' perspectives of what defines quality of life in a city and the easiness to receive public approval and support of the decisions they make.

For Vinge, there is a need to carry out evaluation activities for the different citizen engagement priorities in order to draw better conclusions on how to progress in improving social inclusion. Vinge can further enhance social awareness and engagement about the project through different socially engaging activities that attract different demographics including children and young people. As future citizens, this provides them an opportunity to feel that they are included in shaping of the new cities. This strengthens the balance for different social groups to feel integrated.

For Brunnshög there is still need to employ multi-channeled inclusionary approaches that can cover a broader range of demographics and opinions in future. This is because in communicative planning, not all inclusionary mechanisms work appropriately or equally well in all situations and for all municipal goals. A citizen may only participate in a communicative practice only if it directly affects him or her (Wänström, 2013).

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Abbreviations

3D	3 Dimensional
CO ₂	Carbon dioxide
EAP	Environmental Action Program
EEA	European Environmental Agency
EIP-SCC	European Innovation Partnership on Smart Cities and Communities
EPA	Environmental Protection Agency
ESS	European Spallation Source
EU	European Union
ICT	Information, Communication and Technology
IEC	International Electro-Technical Commission
IIIEE	International Institute for Industrial Environmental Economics
IoE	Internet of Everything
ITU	International Telecommunication Union
Lund NE	Lund Northeast
OECD	Organization for Economic Co-operation and Development UNESCO
PBL	Planning and Building
QR	Quick Response
SCID	Smart City Initiative Design
SDGs	Sustainable Development Goals
SKL	Sveriges Kommuner och Landsting
U-city	Ubiquitous city
UNFCCC	United Nations Framework on Conventional Climate Change
UNFPA	United Nation Population Fund
WCED	World Commission on Environmental Development

1 Introduction

The world is undergoing a largest wave of urban population growth in the world's history (UNFPA, 2016). Since 1950, the global urban population has grown from 746 million to 3.9 billion in 2014 (United Nations, 2014). 2007 for the first-time in history marked the year in which global urban population exceeded the global rural population, for the first time in world's history and thereafter, the world population, has remained predominantly urban. Today, 54% of the world's population reside in urban environments and it is projected that by 2050, this number will increase to 66%. Nearly 90% of this increase is expected to take place in urban environments of Africa and Asia (United Nations, 2014). In the European Union (EU), 75% of the population lives in cities (European Environmental Agency, 2016) and this proportion is also expected to grow up to 80% by 2020 (European Commision, 2014). This global wave of urbanization and population growth is putting pressure on the world's cities and is increasingly not likely to stop (UNFPA, 2016). These vast and complex conglomerations of people, often tend to be filled with disorderliness and tend to become messy places (Chourabi et al, 2012; Hadiani & Ghasemi, 2016). This further contributes to overcrowding and social inequality (European Environmental Agency, 2016).

Cities also act as engines for economic production and consumption, providing businesses and services, and serve as centers to foster creativity, innovation and social transformation (European Union, 2011). A study by Navigant Research shows that the global smart city revenue is expected to grow from USD 36.8 billion in 2016 to USD 88.7 billion in 2015 (Navigant Research, 2016). 80 percent of the global gross domestic product is produced within cities. By 2005, cities consumed an estimate of 75 percent of world global energy and material flows which covered just two percent of the land (UNEP, 2013). As cities grow, the global average size of households is expected to decline from 3.2 people to 2.7 people by 2025. This is expected to result in number of households which is 2.3 times the population growth rate of world's top cities. For developed regions of western Europe, the drop is estimated to be from 2.3 to 2.1 (McKinsey Global Institute, 2011). A continued economic and urban demographic growth within cities is expected to culminate into increased demand for resources and a strive for sustainability and resource efficiency per capita (UNEP, 2013).

Cities are therefore in a state of flux exhibiting complex dynamics and at the core of sustainability challenges (Edelstam, 2016; Caragliu, Bo, & Nijkamp, 2009). With increasing economic productivity, today the world is facing grand societal challenges like resource scarcity, air pollution, traffic congestions, climate change, aging populations, human health concerns, social and economic challenges among others (Chourabi et al., 2012; Edelstam, 2016). As economic productivity increases more and more in cities, urbanization is also most likely to spur these challenges (Voytenko, McCormick, Evans, & Schliwa, 2016). Cities are acknowledged as the main agents of change when it comes to addressing these challenges even though they cut across regions, nations and continents (Baccarne, Mechant, & Schuurman, 2014). The urgency for cities to respond to these challenges has triggered cities to find smarter and innovative ways to solve these problems (Chourabi et al., 2012). Therefore, cities are increasingly being described with a notion, "Smart City". Fortunately, understanding of these challenges is increasingly growing (Edelstam, 2016). Under this "Smart City" label, cities are designing and implementing a vast array of new business models and development projects. This is being done in collaboration with different stakeholders on finding new and smart solutions, energy, mobility, resource efficiency and other issues affected by information communications and technology (ICT) revolution (Edelstam, 2016; Cosgrave, Arbuthnot, & Tryfonas, 2013). At the turn of this 21st century, ICT and sustainability are emerging as two sides of the same coin. Both are existing innovations for cities in quest for improving their environmental effectiveness in the context in terms of economic development, climate change, connected societies and change in demographics. Cities are also being linked with information and communication infrastructures which have enhanced

human interaction, communication, mobility and collaborations. Thus cities are emerging into places supported by ICT enabled flows of people, materials, information and services (Mitchell & Casalegno, 2009).

At the EU level, the European commission initiated a platform, European Innovation Partnership on Smart Cities and Communities, in June 2012. This is intended to bring European cities, industries and civil society together speed up the deployment of these solutions in order to smarten European urban areas (European Commission, 2016). At the same time, different forms of governance are being developed and tested within European cities (Voytenko, McCormick, Evans, & Schliwa, 2016). Smart city districts exist as a new form urban living in which smart city solutions in form of technologies, products and services are being implemented in order to address sustainability challenges and opportunities created by urbanization. This thesis will explore how smart city initiatives are designed and governed to catalyze more inclusive and sustainable communities

1.1 Problem definition

According to (Hajer, 2011), "*Cities are seen as crystallization points within society – important entities within which people live, work and travel. ... Cities create cohesion and synergy between individuals and businesses. It is in cities that inspiration is found for innovation, renewal and new levels of comfort.*" At the same time, cities are at the core of sustainability challenges; activities therein have been linked with climate change, environmental and resource efficiency problems as well as social sustainability (Edelstam, 2016; Caragliu, Bo, & Nijkamp, 2009). There is a growing demand for new and innovative ways to manage these complexities of urban living (Manville, et al., 2014). In this context the notion of smart city has emerged and is spreading as a new urban strategy agenda for many governments in Europe and worldwide to create a better life and protect the environment (Luque-Ayala & Marvin, 2015; Chourabi et al., 2012). In its cropping up, the smart city concept has been used too, often in the vocabulary and actions of European union policy, to influence its priorities and mechanisms to allocate community funds (Merli & Bonollo, 2014, p 140). They proceed to illustrate that the notion of a smart city is a new way of interpreting institutional purposes of government, thereby attributed as a vision for local governments (p. 140). That is city leaders are now committing themselves to smart city objectives and at the same time national governments are encouraging cities to become centers for innovation and drivers of sustainable growth (Navigant Research, 2016). The smart city therefore comprises of a number of initiatives with different participants, focal areas, modalities, constituencies and these often overlap. Most of these smart city initiatives are still in their design or early implementation stages (European Commision, 2014).

1.1.1 Smart urbanism

The concept of Smart urbanism is emerging at the intersection of visions for the future of urban places, new technologies and infrastructures within cities (Luque-Ayala & Marvin, 2015). Different scholars and organizational fronts conquer that Smart cities are a flexible and responsive means of addressing the challenges of urban growth, responding to climate change, and building a more socially inclusive society (Chourabi, et al., 2012). Cities are therefore implementing transformational projects in form of smart city initiatives that are geared to improve the quality of life of their citizens (Chourabi, et al., 2012). Cities can be built through smart endowments and activities of self-decutive, independent and aware citizens (Giffinger, et al., 2007). The smart aspect is progressively being connected to both digital infrastructure and the role of human, social and relational capital. Implementing smart city initiatives should involve a form of governance that allows empowerment and active participation of citizens and other stakeholders throughout the project life cycle through a bottom up approach (Merli & Bonollo, 2014, p 141).

However, Chourabi, et al., (2012) reveals that little literature existing on smart cities addresses issues concerning governance. Luque-Ayala & Marvin (2015) also highlight that our understanding of the opportunities, challenges and implications of smart urbanism is still limited and we still lack empirical evidence to assess critically assess this transformative phenomenon. In their work, Luque-Ayala & Marvin (2015) also shows a rise from scholars and practitioners of questions relating to the problem solving power of the smart concept around citizenship. In addition, how smart city designs and ideologies, can alter the contemporary functioning of governance, power and regulation (Gabrys, 2014).

1.1.2 Social inclusion

(Warschauer, 2003) defines social inclusion as the extent that individuals are able to fully participate in society and control their own destinies. Although no clear definition of smart city has been agreed upon, different scholars stress that the smart city should thrive to achieve social inclusion of all urban residents (Caragliu, Bo, & Nijkamp, 2009; Andrade & Doolin, 2016). Within political discourses, government focus on social inclusion is attributed to its economic dimensions such as productively being engaged in work, training among others. This is at the expense of other forms inclusion; cultural identity, social interaction, interpersonal networks, civic and political participation (Selwyn, 2002; Andrade & Doolin, 2016). A lot of focus around smart city paradigm put emphasis on the use of smart technologies (Börjesson, Eriksson, & Wangel, 2015; Chourabi, et al., 2012). However, a smart city should also be inclusive (Hollands, 2008). Due to the complexity of smart urbanism, Luque-Ayala & Marvin (2015) also stress the need to critically engage issues of social inclusion when dealing with different urban contexts. Public consultation of the EU Urban Agenda in the second European CITES forum, (2015), European commission specific priorities around smart cities is set to address the issue of social inclusion among other areas of low carbon economy and climate resilience (European Commission, 2015). At the EU level, a framework programme for research and innovation, Horizon 2020, has been unveiled. One of the facets of the programme is to address societal challenges seeking support for inclusive, innovative and reflective societies; a prerequisite for sustainable European integration (European commission, 2016). Also, Stewart (2000, p 9) reckons, "Inclusion is a matter not only of an adequate share in resources but equally of participation in the determination of both individual and collective life chances."

This thesis therefore seeks to contribute knowledge to the growing body of work investigating smart city initiatives in particular how they are designed, mobilized and governed by municipalities to the development of socially inclusive cities within greater Copenhagen.

1.2 Research questions

With the above background in mind, this thesis seeks to investigate how municipalities currently address issues of social inclusion in their work and what practices are developed to more effectively and efficiently improve the social justice dimension involved in the design and governance of smart city districts. To achieve this, the thesis addresses two research questions:

1. How are smart city initiatives designed and governed to catalyze co-creation and improve social inclusion?
2. Which practices are most and least successful in delivering social inclusion priorities when implementing smart city initiatives?

1.3 Research methodology

The thesis follows an exploratory case study research featuring new city district initiatives as central fields of investigation. In order to address the research questions pertinent to social inclusion in the design and governance of smart city initiatives within greater Copenhagen region, the author has chosen to use several frameworks to form the basis of analysis. First is the

democracy cube model, an invention by Fung (2006). The model is based on three institutional design dimensions, who participates, how participants exchange information and make decisions, and what is the link between discussions and policy or public action? The author uses Fung's (2006) democracy cube to analyze the distinct participation mechanisms that have been employed in order to enhance decision making in design and development of the two smart city district case studies.

Second is the participation stairway, also known as the participation stairs. This model provides insights to the different levels of participation of different stakeholders involved in decision making and relating them to the amount of power that is devolved. Thus the Democracy cube in combination with the Participation stairway are used concurrently by the author to examine the mechanisms and spectrums of citizen participation and influence during participation in the development process of the cases. Both the democracy cube and the participation stairway are further discussed in detail in chapter 3. Several approaches for collecting data have been used which are discussed further below.

1.3.1 Literature analysis

First preliminary research involved literature analysis to provide context and background information on smart city concept, social inclusion and governance of smart city initiatives in order to provide detail on the focus of the research. The main sources of information were recent conference papers on Smart cities, journal articles, literature in form of articles and book chapters in relation to social inclusion, planning and sustainable urban development.

1.3.2 Interviews

Expert interviews were conducted with a twofold focus. First was to further develop the scope for the thesis and secondly the quest to address the research questions under investigation given the nature of the case studies being under development. In the first stance, interviewees were selected based on recommendations from researchers at the International Institute for industrial environmental economics (IIIEE) their work and expertise within the field of smart and sustainable cities and in other instances, the snowballing technique was used. In the second track, the participants were selected based on their level of involvement in the two case studies under investigation. These was the main source of data in order for answers to the research questions under investigation pertinent to the case studies. In total, fifteen potential interviewees were contacted through email in the month of June followed with subsequent follow-ups. However, some did not respond while others declined for various reasons. Among these, some were already leaving office for the summer holiday that starts in that period within Europe while others felt were less knowledgeable about the thesis topic and thus could not help. On the other hand, with some contacted potential interviewees, information was shared in form of informal email discussions and correspondences. In this regard, only six in-depth semi structured interviews were conducted and regarded as expert interviews. An interview guide was developed to steer the conservation during the interviews however, in some cases the guide was modified to suit each interviewee's background and knowledge. The interviews were conducted between the months of June and August 2016. Three interviews were conducted in person (face - to -face interviews); out of which two were with representatives from the municipality of Lund and one from Frederikssund municipality. The other interviews were conducted via skype and phone with experts from business innovations and industry respectively. A complete of interviewees and the interview guide questions is found in Appendix I and II respectively.

1.3.3 Workshops and site visits

In addition, the author attended a workshop in June 2016 in Malmo, Sweden with a theme, "A national Strategic Innovation Agenda for Smart sustainable cities." During the workshop, the host of Speakers discussed several issues among which included citizen involvement and

empowerment, sustainable districts and built environment in the move towards realizing smart sustainable cities. site visits provided the visual impressions of the ongoing developments and also informal discussions that were conducted in due course provided more insights of how social inclusion has been addressed and integrated into the development process.

1.4 Scope and limitations

The thesis work limits the scope of investigation to smart initiatives known as smart city districts developed by municipalities. The key aspect addressed under this scope is how are the smart initiatives designed and governed to deliver social inclusion priorities in their planning and development stages. Smart city districts are emerging within Europe and worldwide, however, for this thesis, the cases under investigation are selected from Greater Copenhagen. The case studies are Brunnshög in Lund municipality, south of Sweden and Vinge in Frederikssund municipality in Denmark.

Brunnshög was chosen because it is a new district emerging from a greenfield around the highest point in the city of Lund one of Sweden's foremost knowledge cities. It is a major development project for Lund municipality as well as the region of Skåne and aims at becoming world's leading research and innovation environment and a European model for sustainable urban planning. Within Brunnshög, are five different development project areas; the two major research facilities MAX IV and ESS, and others being Solbjer, Brunnshög C and the Science Village which will be a mix of housing, offices and recreational areas. This thesis gives an introduction to all the project areas however it puts much focus mainly on Solbjer, which is planned to be the first residential area within the District.

Vinge was also selected because it is emerging as a unique development project from a greenfield, north of Copenhagen in Denmark. It is brand-named as a new city of the future being developed by Frederikssund municipality. Like Brunnshög in Lund, Vinge is being developed to be a smart and sustainable district where it is easy to work, play and live. Vinge will also have its own S-train station, large business areas and an infrastructure that is future proof. And a residential district area, the Delta neighborhood with residents as their own landlords.

One of the limitations within the context of writing this thesis has been the nature of cases under study. Both cases are just under development and aspects of social inclusion have not been studied before and this will influence and impact the nature of results for the thesis. In addition, since the cases are under development from green fields, this thesis addresses the notion of social inclusion is adopted as, "the extent that individuals are able to fully participate in society and control their own destinies (Warschauer, 2003).

Secondly, the author being neither of the native of Sweden and Denmark, has been limited with language. Most of the documentation about the cases is available in Swedish and Danish. The author on several accounts used google translate to generate meaning of defined texts. Thus alterations in the true meaning of a given text may have occurred.

1.5 Ethical considerations

The author of the thesis did not identify any ethical issues regarding the study. While conducting the interviews, participants were informed about the nature and purpose of the study before the interview meetings through email when requesting their willingness to contribute to the thesis. Upon accepting to offer support, the author requested to make an audio recording for every interview and clearly indicated his intentions for using the interview results in his thesis work. All interviewees gave their informed consent to this request as is in accordance to the proposition by (Kvale & Brinkmann (2009). In addition, all information that is directly used from the interviews has been sent to the respective participants for confirmation.

1.6 Audience

The thesis targets a broad audience. Local municipal government officials as host designers and developers of the smart city district initiatives, private sector companies that make partnerships and collaborations with musicality's in providing different services, academics in the field of smart and sustainable city field, policy makers, civil society organizations and citizens living within cities.

1.7 Disposition

Chapter 1 presents the nature of the problem addressed in this research. It briefly describes the method used to collect and analyses data to address the research questions. In addition, research limitations are identified, a description of the thesis outline as well as the audience for which this research may be useful.

Chapter 2 presents an introduction to the concepts of urban sustainability, smart urbanism and social inclusion. The chapter discusses the linkage between them in an attempt to provide a basis for understanding the notion, smart city.

Chapter 3 describes the analytical frameworks used in case study analysis. The section first provides a background to the different modes of citizen participation. it then proceeds to provide of the two models used for case study analysis; the 'Democracy cube' and the 'Participation stairway.'

Chapter 4 presents the analysis of the two case studies under investigation by comparing the findings with the institutional designs for a variety of public participatory mechanisms of the democracy cube. The participation stairway is then used to analyze their levels of participation.

Chapter 5 discusses the research objective based on the case study analysis, expert interviews and literature analysis. This includes spectrum of citizen participation and the social inclusion in the context of smart city initiatives.

Chapter 6 presents a summary of the key findings and insights, methodological reflections, recommendations for municipalities and areas for future research.

2 Background: Linking Urban Sustainability, Smart Urbanism, and Social Inclusion

Through public consultation on the EU Urban agenda (in the second European CITIES Forum), the European commission has identified priorities for future sustainable cities to address common challenges they face (European commission, 2015). The Urban Europe Development Strategy aims to facilitate transforming European cities and communities as intelligent and sustainable human oriented settlements. That is to say cities are environmentally sustainable, attractive for businesses, citizens, visitors and investors regionally and globally (Abdoullaev, 2016).

More specifically, the European Innovation Partnership on Smart Cities and Communities (EIP-SCC) aims to bring together cities, industry and citizens to improve the quality of urban life through more sustainable integrated solutions; innovations, better planning, more participatory approaches, intelligent use of ICT, higher energy efficiency, better transport solutions etc. (European Commission, 2015b). According to the Manville et al., (2014), the notion Smart City has emerged as an important basis for future city expansion in the global urban development profile. Many scholars acknowledge that the smart city concept has gained traction by many governments and within the context of European Union policy. This has even influenced its priorities and the mechanisms for allocation of community funds (Merli & Bonollo, 2014).

In order to provide groundwork for further understanding of the smart city concept, this section seeks to first provide insights on the ongoing and future challenges faced by cities. The chapter proceeds by providing a brief description of smart urbanism and social inclusion and how they relate with the concept of a smart city.

2.1 Urban sustainability

Europe continues to face challenges related to economy, climate, environment and society at large (European commission, 2014). Coupled with the wave of uneven globalization, changing nature of migration and accelerating urbanization, have brought several cities within Europe to the brink of being torn apart (Abrahamsson, 2015, p.21). These challenges are threatening the ability of cities for being viable pillars of sustainable development. At the core of the seventh Environmental Action programme (EAP) for the European Union, lies the promotion of sustainable development. One of the key priority areas is to make cities more sustainable (European Commission, 2015). The concept of sustainable development is not a new one. A widely used definition was introduced by the World Commission on Environmental Development (WCED) in report titled ‘Our common future’ (also known as the Brundtland report) in 1987. The report defines sustainable development as “Development that meets the needs of the current generations without compromising the ability of the future to meet their own needs” (Brundtland, 1987). In the report, a vast array of sustainability issues is addressed including but not limited to ecosystem services, biodiversity, food security, energy, industrial development, water scarcity, poverty etc. and proposing institutional and legal changes geared towards common action for sustainability (Brundtland, 1987). Recently on September 25, 2015, the United Nations General Assembly adopted the 2030 Agenda for Sustainable Development, for transforming our world with 17 Sustainable Development Goals (SDGs) and 169 targets (United Nations, 2015). SDG 11, seeks to ‘make cities and human settlements inclusive, safe, resilient and sustainable.’ All other SDGs are intimately linked to urban areas and SDG 11. This SDG is also in line with the three mutually reinforcing priorities of Europe 2020 strategy, which seeks to make Europe Smarter, more sustainable and inclusive place to live (European Commission, 2014).

2.1.1 Population growth

Today, 54 percent of the world's population lives in cities and this proportion is expected to increase by to 66 percent by 2050. Forecasts reveal an addition of 2.5 billion people between 2014 and 2050, with close to 90 percent of this increase in Asia and Africa. Management of urban areas, thus emerges at the center of development challenges of the 21st century (United Nations, 2014). Urbanization is also an ongoing phenomenon in Europe both in terms of urban expansion and the share of population increase. 75 percent of its population lives in cities (European Environmental Agency, 2016) and this proportion is also expected to grow up to 80% by 2020 (European Commission, 2014). Of specific concern to the area of study, table 2-1 summarizes the population growth trends between 2010 and 2060 within two Scandinavian countries Denmark and Sweden, their older population relations and percentage projection of urban population growths between 2014 and 2050. 86% and 88% of the Swedish and Danish population respectively lives in urban areas and this rate is increasing at a rate of 0.2 percent per year and is projected to reach 90% and 92% respectively by 2050 (United Nations, 2014). The changes in population growth are also expected to cause an increase in aging population with a percentage increase of the population aged 65+ as shown in the table 2-1.

Table 2-1: Population Trajectories for Denmark and Sweden between 2010 and 2060

Country	Country Population growth (Million)		Older population growth (Percentage age 65+)		Urban proportion (Percentage)	
	2010	2060	2010	2060	2014	2050
Denmark	5.5	6.1	16.3	25.5	88	92
Sweden	9.3	11.5	18.1	26.3	86	90

Source: (Eurostat, 2011); United Nations (2014).

Population growth within the European Union is also attributed to the positive net migration (immigration exceeding emigration), among other factors like natural change for some countries. This migration is as a result of a combination of both pull and push complex factors; social, economic and political factors (Richard, Johansson, & Salonen, 2015). Over time, political stability and relative economic prosperity within the EU have been thought to greatly influence the effect for immigrants (Eurostat, 2016). In 2014, a total of 3.8 million people immigrated to one of the EU- 28 member states in relation to 2.8 million emigrants who were reported to have left an EU- member state. The share of immigrants from EU-28 non-member countries was estimated to be 1.9 million people (Eurostat, 2016). Additionally, an era of fluidity and openness, Righard, Johansson & Salonen (2015), reckons has made populations to become more mobile and migration less permanent. And the prevalence of internet enables migrants to connect with their relatives which makes it possible for one to live an everyday life in more than one place simultaneously. This has prevailed as a means of strengthening migrations in a transnational dimension (Righard, Johansson & Salonen 2015).

In figure 2-1, Sweden and Denmark ranked fifth and sixth place in relation to the number of immigrants received in 2014 amongst EU – 28 countries relative to size of resident population. In the Scandinavian countries, Righard, Johansson & Salonen (2015), highlights that integrating migrants has been of major focus within the policy arena. They also indicate that comparative studies of national integration policy revealed Sweden to be inclusive, focusing on structural constraints of integration while Denmark was a restrictionist, attributing the culture of migrants to the integration problems.

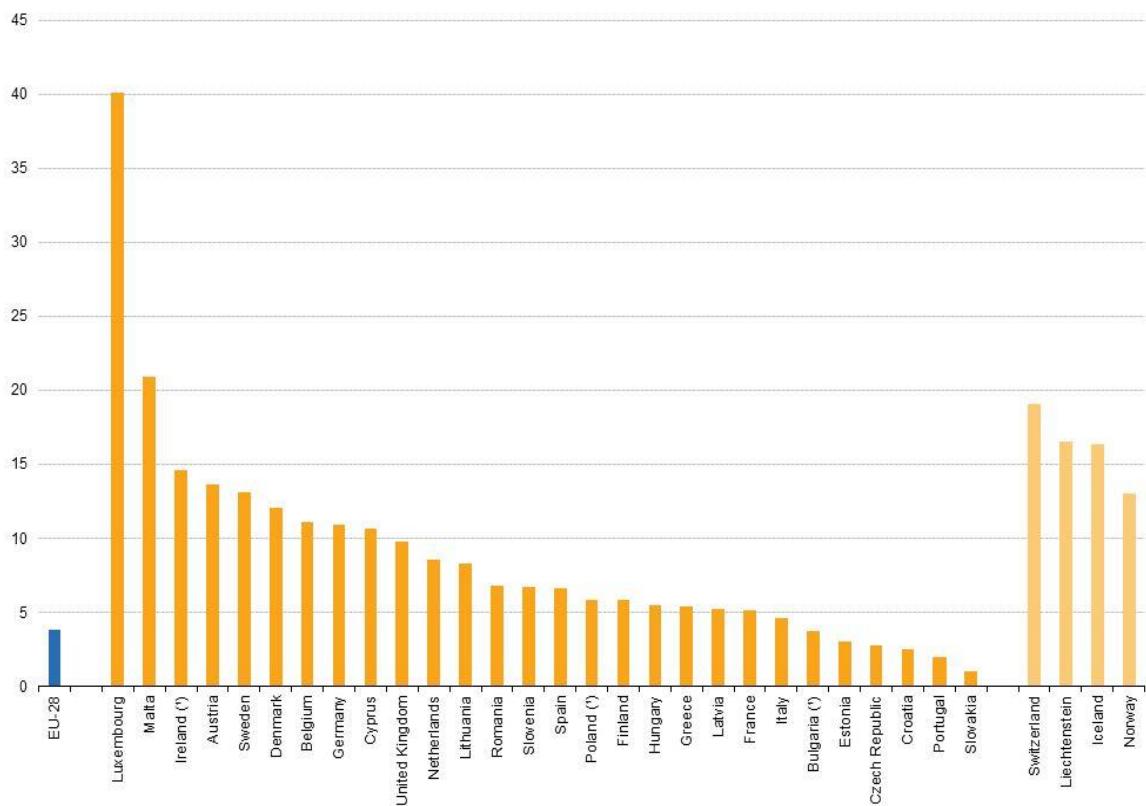


Figure 2-1: Number of immigrants in 2014 relative to size of resident population (per 1 000 inhabitants)

Source: (Eurostat, 2016)

2.1.2 Environmental challenges

Today cities face a plethora of environmental challenges and their associated management is primarily due to the patterns of urban expansion, economic activities and consumption habits of citizens (International Telecommunication Union, 2015). On a global scale, the rate of resource consumption increased by a factor 8, twice approximate to the rate of global population growth between 1900 and 2005. This rate of resource use has been seen to concentrate in cities consuming an approximate of 75 percent of the global energy and material flows (UNEP, 2013). Increasing urbanization has also resulted in increased demand for goods and services making cities ecosystems for high economic and industrial activity which threatens the potential for cities to consume resources sustainably (UNEP, 2013; International Telecommunication Union, 2015). In addition, cities today are facing growing problems associated with waste management, air pollution, human health related issues, deteriorating and aging infrastructures, traffic congestion and climate change (Chourabi, et al., 2012).

2.1.3 Climate change

Cities act as home to innovation, growth, as well as engines for economic development. However, climate change prevails as systematic challenge for many cities strongly intertwined with social and economic factors among others (European Environment Agency, 2016b). The Environmental Protection Agency, (2016) reveals that activities within cities; electricity production, land use, buildings, industrial energy use, and waste management generate over 90 percent of greenhouse gas emissions. Climate change mitigation is still a challenge in form of minimizing emissions or optimizing services that produce greenhouse gases at local levels

(Environmental Protection Agency, 2016; International Telecommunication Union, 2015). Scientific research also reveals that impacts associated with climate change are increasing in intensity and frequency and are projected to worsen. These prevail in form of direct hazards like floods, windstorms, pre mature deaths from heat, forest fires and melting of permafrost. Thus climate change is expected to have immense impacts on different functions, infrastructures and services of cities that may trigger knock on effects that may affect other areas, sectors and people within and outside the city (European Environment Agency, 2016b). Cities are seen as key bodies for implementing climate adaptation and mitigation policies to address climate change and its associated impacts. In Europe and worldwide, this is spurring a drive the cultivation of innovative solutions in form of governance techniques, processes and products that will bring about more climate resilient cities and Europe at large (European Environment Agency, 2016b).

2.2 Smart urbanism

Nowadays, the world's cities are confronted with a myriad of complex problems; population growth, scarcity of resources, difficulty in managing waste, traffic congestions, climate change and deteriorating infrastructures among others (Chourabi, et al., 2012). These challenges are denying cities their potential of meeting objectives of social- economic development and good quality of life for its citizens (Schaffers, et al., 2011). The urgency to address these problems has fostered the world's cities to find a variety of smarter ways of dealing with these problems. Smart urbanism is evolving at the intersection of the visions for future urban places, infrastructures and new technologies within cities (Luque-Ayala & Marvin, 2015). This evolution of cities and urban areas has and is continuing to exist in an era during which information and communication technologies (ICT) has exerted ubiquitous influence on the nature, structure and implementation of urban infrastructure, management, economic activities and everyday life (Kitchin, 2014). Based on its technological and or normative discourses, Luque-Ayala & Marvin (2015), reckon smart urbanism as, *"a futuristic solution brought to the present to deal with a broad array of urban maladies, not limited to congestion, transport, resource limitation, climate change and even the need to fathom democratic access, amongst others."* Smart urbanism today is being promoted by national and local governments, supranational agencies, international organizations and the corporate sectors. They hold the vision to rebuild cities through integration of interactive or networked infrastructure, high-tech urban development digital economy and smart citizens together (Ibid). Smart city notion is gaining more traction in the global urban development profile and is emerging as a future expansion of cities (Manville, et al., 2014). This is evidenced for example, by the recent activity of the European commission, to adopt a strategic energy technology plan (SET plan). The SET plan aims to accelerate the development and deployment of low-carbon technologies in order to reach its 20-20-20 energy targets (Ferro et al., 2013). Secondly, the proliferation of smart city initiatives by countries in Asia, Australia, the United states and other parts of the globe (Manville et al., 2014; Luque-Ayala & Marvin, 2015). And the prevalence of telecommunications and utilities companies such as IBM, Cisco, Google, Toshiba etc. with an aim of development business opportunities in variety of smart urbanism projects across the globe (Kitchin, 2014 & Luque-Ayala & Marvin, 2015). For example, the 'Centro De Operacoes Prefeitura Do Rio' in Rio de Janeiro, Brazil, a citywide instrumented system was built by the city government in partnership with IBM. The system provides real time analysis to manage several aspects of the city, its functions and how it is regulated (Kitchin, 2014).

Put all together, these movements and endeavors highlighted are aimed at creating a lexicon through which the development of today's 'smart' cities are molded. These include but not limited to smart meters, urban apps, big data, intelligent infrastructure, city sensors, smart grids among others. And this move from conventional to smart logics by cities is thought yield network flexibility, achieve greater effectiveness in managing and creating new services, green growth and greater social interaction and connected communities. Implicitly, as Townsend (2013) reckons, governments and supranational bodies expect to realize social economic progress in

which ‘smart’ cities are more livable, secure, functional and sustainable, and allow for the renewal of urban areas as centers for innovation. In this regard smart urbanism has been perceived as a response to almost every aspect of contemporary urban question (Ferro et al., 2013; Kitchin, 2014 & Luque-Ayala & Marvin, 2015). As smart city is increasingly becoming more important in global urban development. Börjesson, Eriksson, & Wangel, (2015) also assert that the emergence and enrolling of ICT for sustainability in urban areas will be a perquisite for global environmental sustainability. In this regard, smart urbanism seeks cities to realize the smart Urban agenda

“A Smart City has embedded “smartness” into its operations, and is guided by the overarching goal of becoming more sustainable and resilient. It analyzes, monitors and optimizes its urban systems, both physical and social, through transparent and inclusive information feedback mechanisms. It commits to continuous learning and adaptation and aspires to improve its inclusivity, cohesion, responsiveness, governance and the performance of its social, economic and physical systems.”

(I.C.L.E, 2016)

However, our understanding of the opportunities, challenges and implications of smart urbanism is still limited. Practitioners and scholars have start to ask the problem solving powers of the notion ‘Smart’ about enhancing democracy and citizenship (Luque-Ayala & Marvin, 2015). Discourses unveiling ‘smart’ still revolve on the aspects, how smart can be developed and the potential benefits and profitability in an urban context. The implications on the multiplicity of ‘coded objectives’ and ‘coded infrastructures’ within the urban area (Kotchin, 2014). Additionally, there is a tendency that smart city solutions are currently more pushed by ICT companies (Vendors) rather than a pull by city governments (Schaffers, et al., 2011). This raises concerns about potential for technological lock-ins on three grounds; First, it that can create monopoly with cities beheld to particular technology platforms and providers for a long period of time. Secondly, it leads to promotion of neo-liberal political economy, deregulation, and privatization that lead to administration of city functions for private profit. And lastly leading to ‘*one size fits all smart city in a box*’ solutions. This often leads to little consideration of the uniqueness of people, placers and cultures, but also restrains cities to a corporatized technocratic form of government (Kotchin, 2014).

2.3 Social inclusion

Overtime, cities have existed as centers of both opportunities and concentrations of social problems. As highlighted earlier, they are attractive interiors for migration but also creative works, innovations and job opportunities. They also provide opportunities for creating new meeting places, and often act as hubs for social networks (Abrahamsson, 2015). In addition, cities bring about proximity of people, businesses and services together opening doors for building a more resource efficient Europe (European Environment Agency, 2016b). However, cities also exist as centers for acute forms of poverty, substandard housing and homeless (Abrahamsson, 2015). These have been accelerated by the rapid rate of urbanization and the consequent un even levels of development. An approximate of 24% of the EU population is at the risk of poverty or social exclusion. This problem has been exacerbated by the recent economic crisis and this is undermining the overall target of Europe 2020 strategy to lift at least 20 million people out of the risk of poverty or social exclusion by 2020 (European commission, 2016; Eurostat, 2015). Differences existing performance between welfare systems of different EU countries, with countries having best reduced risk of poverty by 60% and the least effective by less than 15% (European Commission, 2016). Poverty always connects with other forms of inequality and exclusion within cities in areas like education, housing, health, participation and employment. Altogether, this burden, makes cities to become spaces of contestation and politicization of economic agenda which raises marginalization, social exclusion and or uneven development (Abrahamsson, 2015). Abrahamsson further demonstrates that urban areas are home to a diverse group of people who live side by side but with different cultures, group

identity and different chances of living decent lives. In addition, labor markets in many developed countries are beginning to split and widen the gap between high income jobs that workers lack qualifications for and low paid jobs on which citizens cannot thrive (*Ibid*). The process of gentrification is also on the rise exacerbated by the high skilled and well educated workforce creating differences between housing areas and often a shoot in prices. In the end this causes residents to relocate to new housing areas with lower prices. Wacquant (2009), describes this process of gentrification as one that strengthens the segregation in the realm of societal development. In his work, Abrahamsson, (2015) also acknowledge that strong social tension still exists between the affluent people and those who find themselves excluded and marginalized within European cities. Furthermore, the danger of reinforcing xenophobic attitudes and social exclusion increases as the number of ‘gated communities’ increases. The potential of a city to remain an innovative and creative site for learning and as a knowledge city deteriorates with such urban division and ghettoization (*Ibid*)

With regard to this, many cities are provoked with a level of uncertainty of becoming arenas for contributing towards sustainable development or social struggle and conflict due to an increasing gap in both income and health (Abrahamsson, 2015; Eurostat, 2015). Traversing through this dilemma, depends on how citizens and decision makers value aspects of security, development and justice. According to Abrahamsson (2015), these constitute the basic needs of citizens and how to meet the resulting demands for social sustainability. The understanding of these three concepts and their conditions greatly varies according to the social environment in which someone associates them to. At the same time, security, development and justice are core concepts that have influenced political ideals and thus social development in modern history. A lowering in one of the concepts leads to weakening of social sustainability. However, in the midst of the contradicting goals and trade-offs that may exist, an equilibrium between the three concepts forms the foundation of strong social sustainability (*Ibid*).

For these three Abrahamsson (2015) reckons that;

Security, “*today is more often about peoples’ day- to-day security about jobs and predictability rather than external military protection,*”

Issues of Development are concerned with, “*how to become more inclusive so that citizens can increase their participation in the collective process of building society. Also having a greater say in the everyday life irrespective of their or parents’ places of birth. Development is about improving quality of life, public health and education.*”

Justice is about, “*political influence and cultural recognition. Having access to spaces where political and economic decisions are taken that affect the livelihood of people.*”

Thus a socially sustainable city is one that safe and just with numerous public spaces free from discrimination and one that builds a sense of trust and fellowship for people who live and work there. This provides a means for balancing exclusion by being more inclusive as much as possible (Abrahamsson, 2015).

3 Analytical framework

According to the white paper by the international electro-technical commission (IEC), the wave of development of smart city projects has transitioned from being recipients of technical solutions from technology providers procured by city authorities to integrating citizens in shaping them (Breining, et al., 2014). Involving people and communities in such developments according to Merli and Bonollo (2014) minimizes dominion by few and the risk of being perceived as elitist or built by decree (Breining, et al., 2014). Manville et al., (2014) considers citizens as important stakeholders who should strategically be involved in the development and implementation of smart city projects.

The necessity to integrate citizen voice and behavior presents a daunting challenge in front of city authorities (Breining, et al., 2014). City authorities have to develop governance mechanisms that make it possible and encourage citizens to play an active role as active contributors to smart city projects and future of the city in which they live (Manville et al., 2014). According to the United Nations Economic and Social Council, development governance constitutes planning, budgeting, monitoring and accountability of socio-economic development policies and programmes. And a participatory form of governance constitutes the vast strategies of development governance while engagement citizens is a desired outcome of participatory governance (United Nations, 2007).

This chapter gives first an introduction to the background of different modes of participation. It then proceeds to describing the frameworks used for understanding and analyzing the institutional participatory approaches used in the governance of cases under study. The chapter starts by providing a description of the democracy cube which provides institutional designs for a variety of public participatory mechanisms. This then follows the participation stairway model which also provides different kinds of participation and involvement, arranges them in progressive stairs or steps depending on the amount of power delegated or devolved. Subsequent section of the chapter explains how these two models are used in chapter 5 to explore the mechanisms and levels of citizen involvement in the development of smart city projects known as smart city districts.

3.1 Modes of citizen participation

According to Reed (2008), approaches to participation have evolved through a series of phases. Reed presents the progress from raising awareness in 1960s, to incorporating local perspectives in the 1970s, recognition of local knowledge in the 1980s, through an increase in the use of participation as a norm in sustainable development agenda of the 1990s. This was followed by the subsequent critiques and disillusionment of participation over its limitations and failings and of recent the growing post-participation consensus on best practice which has been achieved as a result of learning from the mistakes and successes of the long historical path. Participation according to Reed (2008) is defined as a process where individuals, groups and organizations choose to take an active role in making decisions that affect them. With this evolution and application in different contexts, Lawrence (2006), denotes that participation has become loaded with vast ideological, social, political and methodological meanings. This has given rise to a wide range of interpretations (Reed, 2008). At the same time, several typologies have been developed over time to understand the differences between these forms of interpretation (Lawrence, 2006 & Reed, 2008) together with their related approaches, methods and contexts in which they are most suited. The typologies can serve two functions, choosing the method of participation based on type of participation required and or used to categorize the type of participation that has occurred (Reed, 2008).

Arnstein (1969) in her seminal article, 'The ladder of citizen participation' provides the first typology which distinguishes the degree to which citizens can be engaged. The ladder of citizen participation serves as a starting point and describes different forms of participation from passive dissemination of information (which she called manipulation, and the lowest in the group for

non-participation steps), to citizen control (active engagement). This is the highest degree of citizen power within the ladder. However, Fung (2006) critiques Arnstein's participation ladder on grounds that it mixes the empirical scaling which describes the level of influence individuals have over some collective decisions with normative approval. Fung argues that in some scenarios, public empowerment may be desirable while in others a consultative role may be more suitable for public citizens than full citizen control. Secondly, little or no consideration is given to the link between the goals of involvement, those who actually participate and ways in which they are invited to participate (Tritter & McCallum, 2006). Fung, (2006) proposes an alternative institutional design space which maps different arenas of decision making along three dimensions; i) scope of participation, ii) mode of communication and decision, and iii) extent of authority. Putting these three dimensions together, yields the democracy cube discussed in the next section in detail.

3.2 The democracy cube

The Democracy Cube is an invention of Archon Fung's (2006) work on the varieties of participation in complex governance. Fung denotes three questions of institutional design for understanding the potential and limits of participation for people in public matters that is; who participates, how do they communicate and make decisions and what is the connection between their conclusions and opinions one hand and public policy and action on the other hand? From these questions Fung develops three institutional design dimensions, participation selection, mode of communication and extent of influence and puts them together to yield the democracy cube. A democracy cube therefore presents an institutional design of choices according to which varieties of participation mechanisms can be situated and contrasted in order to understand their suitability while addressing governance problems (Fung, 2006). The three spectrums or dimensions of the democracy cube are briefly described below according to Fung (2006).

Scope of participation

Within a given field of contemporary governance, Fung addresses this dimension with key questions, who is eligible to participate, and how do individuals become participants? The dimension produces eight selection mechanisms for identifying and selecting actors to participate in discussions or decisions of public matters. *Self-selected* represents a subset of the general population who choose by themselves to participate in a public participation open to all. *Selective recruit* is participant selection from subgroups that are less likely to engage like low income and minority communities and this may occur passively by providing incentives to those less likely to participate. *Random selection*, here participants are selected randomly to discuss public issues through citizen juries, deliberative polling etc. *Lay stakeholders* are unpaid citizens who have deep interest in public concern(s) and therefore have substantial time and energy to represent and serve others similar interests but have decided not to participate. *Professional stakeholders*, involves participants of organized interests and public officials who are paid frequently. *Professional politicians*, are selected through competitive elections to represent interests of others and *expert administrators*, who staff public bureaucracies. Lastly is the *public*; presents a diffuse sphere of mass media, secondary associations and informal venues of discussion etc. The scope of participation thus provides an array of the most exclusive or inclusive participatory process (Fung, 2006).

Mode of communication

In this dimension, Fung puts emphasis on how intense is the actual engagement of participant in a process thus how they interact within the realm of public discussion or decision. The dimension has six main modes of communication in participatory settings with listening as least intense while expert analysis as most intense at the end of the spectrum. *Spectators*, just receive information about a project (or policy) within a public hearing or community meeting. This is not always common participants may be given an opportunity to *express preferences* to the audience officials therein. In other settings, participants may *develop preferences* and or even transform them.

Aggregation and bargaining, presents a mode in which participants know what they want and the influence and power that they bring leads to aggregation of preference to influence their social choices. Through exploring and give-and-take bargaining, are able to find best alternatives to achieve joint preferences. *Deliberation and negotiation*, this involves mechanisms in which participants deliberate to figure out what they want per person and as a group. They exchange perspectives, reasons and experiences together in order to discover their interests and develop new ideas. In this context, deliberative mechanisms always seek to reach at principled agreements, clarify persistent disagreements and identify new ideas which reflect what participants value. *Technical expertise*, is always held by officials that have attained training and specialization to solve particular problems. This form does not include citizens but planners, regulators and others of the same order (Fung, 2006).

Authority and power

This is the third dimension gauges how the say or voice of participants influences public action that is how much decision making power is given to participants. Within the spectrum are five modes of authority described below. For majority of the participation avenues, one may participate to gain *personal benefit* for enlightenment or just to fulfill the sense of civil or public obligation. Second is *communicative influence* in which participants exert influence on members of the public or officials. These are stirred by their testimony, reasons, conclusions or rectitude of the process itself. *Advice and consultation*, here officials commit to receiving inputs from participants by preserving their authority and power. Forth is *Co-governing partnership*, where citizens who participate join together to make plans and strategies for public action with officials. Lastly is *direct authority*, where actual decision is made by the citizens through a given participation mechanism (Fung, 2006). The spectrum identifies personal benefits as the least authority and direct authority as the most type of influence and authority.

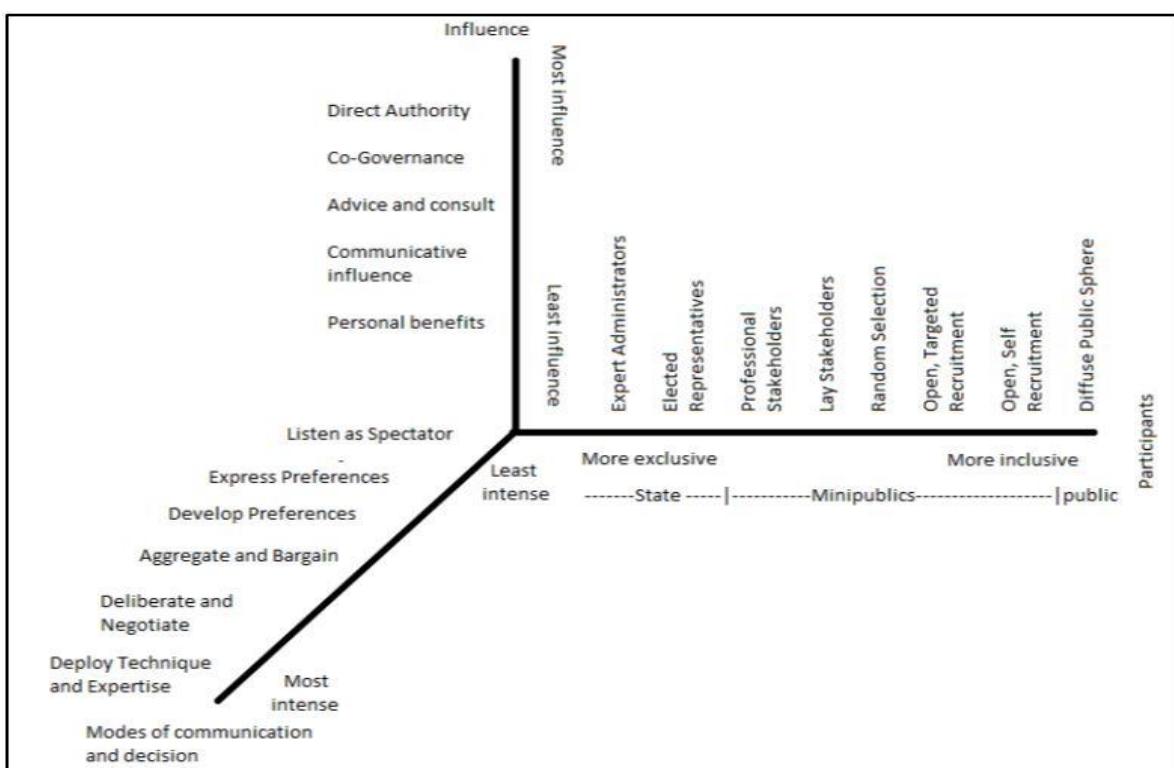


Figure 3-1: The Democracy Cube

Source (Adapted from Fung, 2006)

Thus the democracy cube highlights several unique features summarized below. First, it unveils the notion of participatory democracy across all the three dimensions although it does not explain in detail their connections. It can therefore be argued that the three dimensions are independent of each other as far as the framework is concerned (Pablo, et al., 2013). Second is that each of the three dimensions is linked to a spectrum of values for example scope of participation ranges from more inclusive to more exclusive, mode of communication, from most intense to least intense and power and authority ranging from most authority to least authority. In addition, each spectrum reveals a variety of arrangements or measures that are characteristic of different points within that given spectrum. Lastly, although the model presents democracy at its epitome, it does not propose that all issues should always be addressed by the most democratic arrangements (Pablo et al. 2013). Rather the model presents an array of arrangements available in governance, with the notion that they can be combined to achieve democracy (Fung, 2006).

This thesis work therefore builds on Fung's (2006) democracy cube discussed above to analyze the distinct participation mechanisms to enhance decision making in governing the development of the two smart city district case studies. Contrasting the democracy cube model to other participatory models, Pablo et al. (2013) argues that, it is founded on 'proximate' values and not very abstract concepts and this allows operationalizing the model feasible. The three dimensional framework enables the cube to capture greater complexity within democratic arrangements. This allows diversity of participation measures in a given public action or development arena (Pablo et al. 2013). The thesis therefore draws on the features of the democracy cube to address the first research question, "*How are smart city initiatives designed and governed to catalyze co-creation and improve social inclusion?*"

3.3 The participation stairway

The participation stairway also known as 'participation stairs' is a reinvention of Arnstein's (1969) classical 'ladder-of-participation' model by the Swedish Association of Local Authorities and Regions – a national association known as SKL in Swedish (Castell, 2012; SKL, 2009). Similar to Arnstein's Ladder, the participation stairway version was developed by SKL to address participation and involvement of citizens within urban developments in the Swedish context (SKL, 2009). It therefore reflects several aspects and a close relation with the components of the democracy cube. The participation stairway provides an insight to the possible different levels of participation in decision making and relates them to the amount of power devolved (Castell, 2012; Tahvilzadeh, 2015). Arnstein's ladder has eight levels of participation. Two of the lowest levels, 'manipulation and therapy' which she called nonparticipation, and the highest level, 'citizen control' are not included in the SKL model. The stairway therefore presents five (5) steps namely; information, consultation, dialogue, influence and co-decision. Relating with the Arnstein's participation ladder, these steps partly correspond with level three (a participation technique that provides citizens with information on progress of planning process) to seven (where citizens are actually involved in decision making process) as shown in figure 4-2. The stairs are summarized below (SKL, 2009).

Information. This is the distribution of knowledge by city authorities and exchange of information to and with citizens.

Consultation denotes gathering opinions of citizens in form of responses or feedback on analysis, suggestions, alternatives, such as the ability to decide options they think as most appropriate to implement on a current issue. It may also involve to receive and consider citizens' comments, requests, and complaint.

Dialogue – involves exchange of thoughts on several occasions by giving an opportunity for citizens to meet others to engage in dialogue about a given urban development project. The ideal is for everyone to bring forth their opinions and argue his views on the issue and a consensus is not necessarily needed be reached.

Influence. This means collaborating with citizens and city officials in planning and implementing of activities. Citizens have an opportunity to participate for a longer period on the basis of an overall theme, and in this process influence from identifying needs, development of options, and choice of solutions to implementing final proposal.

Co-decision denotes joint decision making. The citizen representatives are assigned by the council or another political board to as body with decision making power regarding development issues (SKL, 2009 & Tahvilzadeh, 2015).

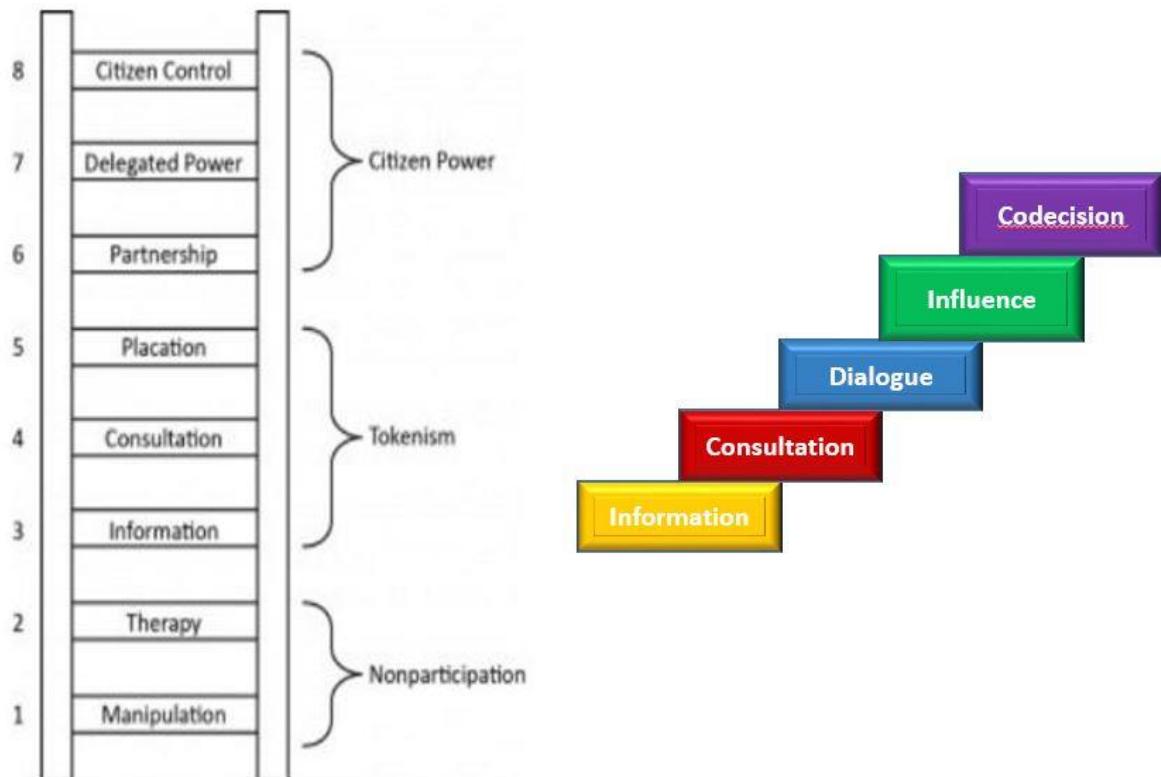


Figure 3-2: Arnstein Participation ladder and the SKL Participation Stairway

Source: Adapted from Arnstein, 1969; SKL, 2009 in Castell, 2013)

Reflecting on the SKL model and Arnstein's Ladder, Arnstein indicated that the level of 'information', 'consultation' and 'placation' are degrees of tokenism however, she disqualifies them that they do not change power positions or influence capabilities of participants when it comes to decision making. One would argue that these five levels in the participation stairway can count as tokenism in Arnstein's vocabulary based on their definitions (Castell, 2013 & Tahvilzadeh, 2015). Dialogue in the participation stairway best matches with consultation, (Castell, 2013) while the top two levels appear to match with Arnstein calls placation that is citizens are invited to give opinions, advice and exchange ideas but the final decision still lies in the hands of those who have the power. (Tahvilzadeh, 2015). Castell, (2013) on the other hand denotes that it is the forth level, 'influence' in the participation stairway with Arnstein's model because it still does not involve any formal influence over the decisions. It entirely depends on powerholders while making decision. He also corresponds the top level, co-decision of the stairway to be closely related 'partnerships' the within the Arnstein's ladder which allows for redistribution of power between citizens and those in power through negotiations. Also,

Arnstein's ladder depicts directional progress which is seen as steps towards legitimate participation by moving up the ladder. However, in the matrix graph by Lindholm & Moritz (2007), which is a prequel to the five levels in the stairway, the allegory does not prevail. The objective is not to step from lower to higher levels but rather to use participation on a level that suits a given situation. Participation can be promoted at all level parallel where information may be sufficient at a given stage or process to a point of involvement or delegation in other circumstances (Tahvilzadeh, 2015).

In recent years, participation stairway has become widespread and is used by many municipalities in Sweden as a concept to sort various forms of participation and put them into context (Castell, 2013). Different scholars have employed the framework in different studies relating to participatory planning and governance in Sweden for example municipality of Gothenburg (Castell, 2012 & Tahvilzadeh, 2015). Contrasting it with Arnstein's ladder, which theorists use for analysis, the participation stairway is used as a domestic tool which politicians and officials use to design their practices (*Ibid*). In the realm of empowerment and community capacity building, Castell, (2012) denotes that classical issues such as social exclusion until now have not lost their significance and still prevail as one of the most crucial urban challenge. Fung and Wright (2001) thus envisaged participation to take the form of empowered participatory governance basing it on principles of concrete public concerns, grassroots participation and deliberative reasoning. In addition to institutionalization of grass root initiatives, and their coordination, they also denote that these principles can be enabled when there is a 'rough equality of power between participants when making deliberative decisions.

In the thesis, the participation stairway is used to determine the level of influence and participation for citizens in the development process of the case studies and the mechanisms or practices in which this is achieved. In this respect, the stairway will be combined with mainly the institutional dimensions of the democracy cube to address the first research question. Analysis of the findings will be used to identify the most and least successful practices for delivering social inclusion priorities. From the analysis, these will provide answers to the second research question, *Which practices are most and least successful in delivering social inclusion priorities when implementing smart city initiatives?*

4 Description and Analysis

The chapter starts with an introduction to literature analysis of the smart city concept; history, definitions and their governance. The chapter then presents the two cases under study, which are Vinge and Brunnshög from the greater Copenhagen region. It then proceeds to provide an analysis of the governance mechanisms and tools that are prevalent for participation of different societal groups (citizens) in decision making processes for development of the case studies. During the analysis both the participation stairway and the democracy cube models are used concurrently. The case studies presented have a close relationship in a way that both are still in the planning and development phases (ongoing developments) although both projects have been in existence for different time periods.

4.1 The smart city concept

The concept of smart cities has gained considerable attention in the urban development policy arena in recent years to prepare cities of the future (schaffers et al., 2011; Caragliu, Bo, & Nijkamp, 2009). One of the important reason is that the label ‘smart city’ is multidisciplinary, impacting on humans, social, economic and technical fields thus also gaining increasing attention within the research arena (Dameri & Rosenthal-sabroux 2014). A lot of debate and discussion on the value, function and future of smart cities still exist and a standard and widely accepted or shared definition of a smart city is yet to be determined (Caragliu, Bo & Nijkamp, 2009, Chourabi et al. 2012). However, at its core, according to (Manville et al., 2014) the notion of a smart city is embedded in the creation and connection of human and social capital, and ICT infrastructure to generate more sustainable economic development and better quality of life.

4.1.1 History of smart cities

The concept smart city is not a new one, it first emerged in literature in the mid-nineties, however, it has gained significant popularity in recent years (Harrison & Donnelly, 2011; Nam & Pardo, 2011; Dameri & Rosenthal-sabroux 2014). It tresses its origin from the smart city growth movement in the late 1990s. This advocated cities and governments to develop new policies for urban planning as a reaction to addressing impacts of growing wave of urbanization such as, traffic congestion, air pollution, overcrowding etc. (Harrison & Donnelly, 2011; Nam & Pardo, 2011; Cocchia, 2014).

In the international context, was the adoption of the Kyoto Protocol in 1997 by the United Nations Framework Convention on climate Change (UNFCCC) in Kyoto Japan. The protocol is an international agreement with the purpose to limit and reduce carbon dioxide (CO₂) emissions (UNFCCC, 2014). Entering into force in 2005, the Kyoto Protocol has played a crucial role in driving countries and their cities to design and implement environmental policies and smart strategies. These have aimed to limit their CO₂ emissions according to emission reduction targets in order to safeguard the environment. This has greatly influenced the perception and thought about cities especially in modern and industrialized cities with high levels of urbanization (Cocchia, 2014).

A number of information technology (IT) companies adopted the concept since 2005 (Cocchia, 2014). In 2005, Cisco devoted to a five years’ research programme ‘Connected Urban development Programme’ that involved use of networks, sensors and analytics to make cities more efficient, productive and habitable. This was made in partnership with three cities; San Francisco, Amsterdam and Seoul to prove the potential of the technology of the pilot projects (Swebey, 2012). Years later in 2008, IBM launched a ‘Smarter Planet Initiative’. This as a comprehensive programme to investigate the application of the three I’s, ‘Instrumentation,

Interconnectedness, and Intelligence' to address the problems and challenges faced by the world. IBM envisioned a world of smartness from smarter power grids, to smarter food systems, smarter water, smarter healthcare and smarter traffic systems (IBM, 2010; Swebey, 2012). These initiations overtime, have resulted into an evolutionary technology-based innovation trend in planning, management, development and operation in cities (Harrison & Donnelly, 2011; Cocchia, 2014). Today, for example several other global IT companies (such as Ericcson, Intel, HP, Siemens, General Electrics et cetera) and global consultants (Accenture and Arup) are promoting these solutions to cities and social and educational programmes. The International Telecommunication Union (ITU) Focus Group on Smart Sustainable Cities was born in 2013. It acts as a platform for stakeholders to exchange knowledge and identify how well to support the integration of ICT services in smart sustainable cities (International Telecommunication Union, 2015).

Of recent, in 2010, the launch of Europe 2020 strategy by the European Union has increased the wide use of the concept smart city (Cocchia, 2014; Manville et al., 2014). Europe 2020 is a ten years' program intended to create conditions for smart, sustainable and inclusive growth within Europe. It targets to embrace five different fields that is employment, research and development, climate change and energy sustainability, education, social inclusion and poverty reduction. (European commission, 2014). European countries are carrying out smart initiatives in order to achieve these objectives. By doing so, the Europe 2020 strategy has increased the wide spread of the smart city concept (Harrison & Donnelly, 2011; Cocchia, 2014; Manville et al., 2014 Dameri & Rosenthal-sabroux 2014).

4.1.2 Definitions of smart cities

Literature analysis on smart city discourses revealed that there is not a comprehensive and widely accepted definition by academics, institutions and businesses of a smart city concept (Hollands, 2008; Nam & Pardo, 2011; Cocchia, 2014; Chourabi et al., 2012 & Manville et al., 2014). This difficulty has been related to, first the adjective 'Smart', a range of conceptual variants are being attributed to the word. For example, several typologies of a city can refer a smart city label to being a wired, knowledge, digital, information or intelligent city among others. Secondly, the notion smart city is still a fuzzy concept used in ways that are not consistent (Ojo, Curry, & Janowski, 2014: Nam & Pardo, 2011; Caragliu, Bo & Nikamp, 2009). Even when many cities call themselves Smart City, every single one is unique, with its own path, characteristics, historic development and future dynamics thereby varying enormously (Cocchia, 2014; Manville et al., 2014). There is a growing surge of the smart city discourse in debates for urban planners about the future of cities. Even with this gist, Neirotti et al., (2014) argue that it is still difficult to identify a shared definition because dissemination of smart city initiatives within countries is done to meet different needs and in different contexts. Hollands, (2008) acknowledged that little is known about smart cities, particularly in terms of what the label ideologically reveals as well as hides within the urban context. Evidence from literature analysis and interview work reveals that the smart city concept envelopes a number of aspects of urban life including urban planning, sustainable development, environment, energy grid, economic development, technologies, social participation etc. (Hollands, 2008; IBM, 2010). Table 3-1 therefore presents the different definitions of a smart city building on work of several publications on smart city definitions such as Chourabi et al., 2012; and Nam & Pardo, 2011, Cocchia, 2014, and Hollands, 2008 and Neirotti et al., (2014)

Table 4-1: Overview of Smart City definitions

Definition	Reference
“A city well performing in a forward-looking way in economy, people, governance, mobility, environment, and living, built on the smart combination of endowments and activities of self-decisive, independent and aware citizens.”	Giffinger et al., (2007)
“A city is smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory governance.”	Caragliu, Bo and Nijkamp (2009)
“Any adequate model for the smart city must focus on the smartness of its citizens and encourage the processes that make cities important: those that sustain very different - sometimes conflicting activities.”	Haque, (2012)
“A city that monitors and integrates conditions of all of its critical infrastructures, including roads, bridges, tunnels, rails, subways, airports, seaports, communications, water, power, even major buildings, can better optimize its resources, plan its preventive maintenance activities, and monitor security aspects while maximizing services to its citizens.”	(Hall, et al., 2000)
“A city “connecting the physical infrastructure, the IT infrastructure, the social infrastructure, and the business infrastructure to leverage the collective intelligence of the city.”	Harrison, et al., (2010).
“A Smart City is a city that gives inspiration, shares culture, knowledge, and life, a city that motivates its inhabitants to create and flourish in their own lives.”	Rios, P. (2008)
“A smart city is a well-defined geographical area, in which high technologies such as ICT, logistic, energy production, and so on, cooperate to create benefits for citizens in terms of well-being, inclusion and participation, environmental quality, intelligent development; it is governed by a well-defined pool of subjects, able to state the rules and policy for the city government and development.”	Dameri, (2013)
Defines smart cities “as places where information technology is combined with infrastructure, architecture, everyday objects, and even our bodies to address social, economic, and environmental problems”.	Townsend, (2013)

Literature analysis also revealed an extensive conceptual overlap of the smart city concept with several other labels or terminologies. Nam and Pardo (2011), defines them as cousins of the smart city concept and categorizes them in three dimensions according to their shared characteristics. i.) *Technology*; This is based mainly on the infrastructures for example ICT to improve and transform life and working conditions within a city. ii.) *Human*; This is based on people, education, learning and knowledge. iii.) *Institutional*; This highlights governance and policy among stakeholders because it is important to have corporation in order to implement smart city initiatives. Details of these conceptual relatives and their categorization are provided in Appendix III.

4.2 Smart city governance

The white paper on European governance, bases the concept of good governance on five pillars: openness, participation, accountability, effectiveness and coherence (European Commission, 2001). This aligns with the OECD definition of good urban governance. That is, good governance is participatory, consensus oriented, accountable, transparent, responsive, effective and efficient, equitable and inclusive and follows the rule of law (OECD, 2001). According to Ferro et al., (2013), a general consensus realized by politicians, professionals and academics that ICT is emerging as an important tool in the governance of cities. This form of governance is called e-governance. By definition, it is “the use of ICT by the public sector with the aim of

improving information and service delivery, encouraging citizen participation in the decision-making process and making government more accountable, transparent and effective" (UNESCO (2011). Today Smart Governance is used as an advanced form for E-Governance (Kumar, 2015) and many cities have benefited from it (Chourabi et al., 2012). Belissent (2011) in Forrester Research reveals that smart governance is the core of smart city initiatives. Different academic scholars have identified one or more factors for governance of a smart city. Mooij, (2003), addressed the need for leadership as a key factor for good governance; Lam (2005) puts emphasis on the prevalence of a 'Champion' who will collaborate with all stakeholders for smart city initiatives and projects that based on citizen participation as Giffinger et al., (2007) reckons. For Johnston and Hanssen (2011), they indicate need for accountability, responsiveness and transparency while implementing smart governance (Mooij, 2003).

Work by Ojo, Curry & Janowski (2014), in developing a framework for smart city initiative design (SCID) reveals that governance and partnerships form the basic mechanisms for addressing success factors and challenges faced by smart city projects. Within their study, they identify four types of governance actions i) coordination and integration; ii) service integration; iii) policy and regulations; and iv) participation and co-production. With participation and co-production actions, they found it key to include establishing multi-stakeholder partnerships with industry, academia and above all residents in addition to building participation with internal firms in the development of smart cities. Merli and Bonollo (2014, p.141) puts further emphasis on the role of human, social and relational capital in developing smart city projects. They highlight the need for active participation of all or everyone who lives and works within the geographical areas of the development projects right from the start in the planning phase. In so doing this allows integration and application of views and needs of various actors and groups within the local government context. In addition, Merli and Bonollo (2014) and Schaffers et al. (2011) acknowledges that citizen participation is at the heart of the bottom up approach to the success of smart city developments.

4.3 Case study 1: Vinge

4.3.1 Background, vision and development

Vinge emerges as a unique development project north of Copenhagen in Denmark. It is brand-named as a new city of the future. Frederikssund Municipality has taken the initiative to develop Vinge from a green field site. This is giving Frederikssund an exciting opportunity to secure the ambitious town development project right from the start. Vinge is a completely new sustainable and smart city, being constructed on a green field site and is expected to have its own S-train station, large business areas and an infrastructure that is future proof. Thus the municipality aims to create a modern town of the future where sustainability, life, innovation and business all meet and work together. Vinge is appreciated as the largest town development area in Denmark on an area of 370 hectares. The development was initiated in 2014 and is projected to last for over 20 years. Within the first five years, it is expected that the center of Vinge, and S-train station will be established, and the district will be home to 4,000 inhabitants. When Vinge is fully developed, it is expected that there will be space for 20,000 (twenty thousand) residents and an approximation of 4000 jobs (Frederikssund Kommune, 2015).

The vision for Vinge is to create a town where it is easy to work, play and live. The center of the Vinge, will be the 'Green Heart' of the city, an attractive and vibrant city common. This green urban space spreads out like a natural carpet interlinking neighborhoods of Vinge, combining landscape, urban life and soft infrastructure. The Green Heart forms the key element for Vinge master plan. It is within and around the 'Green Heart' that the life of the city will be primarily found with mixed functions. Different institutions, schools, cafes, apartments, shops and other communal facilities are expected to be situated in or around this area and the S-train also forms part of the Green Heart. It is at this center that residents, people working in Vinge, children, and

visitors meet and interact in common green areas within buildings. The philosophy guiding the development of Vinge therefore is to gather all town facilities around the green urban common, and make it a lively gathering point while at the same time making everyday life easier for all people. North of Vinge is going to be a business area of Haldor Topsøe Park with a focus on sustainability, high and clean technology, and industrial symbiosis. Vinge is expected to be host for both large and small companies which will eventually grow and expand (Frederikssund Kommune, 2013)

In the center of Vinge, is a circular station, Vinge train station which is part of the larger plan to connect the future city of Vinge to the regional public transport system. The development of the S-train station in Vinge was proceeded after the traffic agreement of 2014 that was reached after hard work by the municipality. Vinge station and the S-train form the point of departure of Vinge's development. The space and landscape of Vinge station has designed to stretch and meet the rails in order to ensure that the railway does not divide the town in two parts. The train station's undulating topography creates a calm center, as the non-directional elliptical shape brings the surroundings together. The train station is to offer convenient access to public transport being located in the center of the city area. This means that more people will be encouraged to use a train as a means of transport for example to work and schools as opposed to going by car. This development arena forms one of the aspects of Vinge (Henninglarsonarchitects. (n.d); Frederikssund Kommune, 2013). At Vinge station, the natural environment of the Green Heart meets urban life the S-train. Vinge master plan provides space for erection of taller buildings around the station that will also bring public institutions, residences and businesses in closer in an active urban environment. This dense urban agglomeration is based on the idea of furthering sustainable development, transport and a good urban life within the town (Frederikssund Kommune, 2013). A major ongoing infrastructural development around Vinge is the bridge link from Frederikssund to Hornsherred and is expected to be completed in 2019. A connection of the bridge to the Green heart and train station is going to be established. Also it will take half an hour from Vinge station to the international airport of Copenhagen. Thus Vinge station will serve to merge accessibility, high traffic service level, the town and its recreational natural environment. This reveals the strategic location of the new city within the region (Frederikssund Kommune, n.d.).

Vinge is being built as a smart city district with fiber connections and intelligent design for example intelligent lighting and traffic systems, and new heating systems. This is aimed at creating a town that can adjust to the needs of the future and technological solutions among others. Vinge is being built with the premises that it can optimize consumption, maintain and solve problems before they arise in order allow for a good quality of urban living. To enhance smartness, a good and well-functioning internet has been secured by Frederikssund municipality in collaboration and agreement with one of the leading information technology company Cisco. The agreement provides Vinge an opportunity for international interests being on the green field projects that Cisco is a part of. The Internet of Everything (IoE) is about connecting people, data, processes and items via internet. For Vinge as smart city district, IoE is to bring people and machines together but most of all the data generated, to deliver services to the residents (Frederikssund Kommune, n.d.).

Sustainability is also at the forefront of the development of Vinge within fields of energy, economy and social sustainability. Vinge is being constructed to fit into the energy strategy for Denmark which aims to convert to 100% sustainable energy for all electricity and heat production by 2035. To achieve this, all buildings are to be constructed as low energy or passive. Vinge is expected to be fully electrified and smart grid-ready city from wind and solar, which constitutes an increasing share of Denmark's electricity production. The city is going to be the foundation for future types of energy and sustainability concepts through energy-symbiotic co-operation

with national and international enterprises, that develop smart grid and smart city solutions. (Frederikssund Kommune, 2015).

The Delta neighborhood is Vinge's first residential district area. Like the rest of Vinge, Frederikssund aims to create a sustainable Delta district, that integrates closeness and a sense of community between the residents. The uniqueness of the project is that municipality sells the land of 300 m² of single family houses and buyers decide which houses they want to put on rather than contract developers. One condition is that all construction within Delta will be made 'close-low' meaning that buildings will have two storeys. All houses in the Delta district are planned to have a view of nature. Some houses will also have private gardens while others large green common areas. This forms basis of one of the key principles in the development of Vinge, to generate active, dynamic urban life that is close to nature (Frederikssund Kommune, 2013) The design is to have your nearest neighbor as nature just outside your door. First housing projects started in early August 2016 and it is expected that, a total of 23 detached family houses and 36 town houses will form Delta neighborhoods (Frederikssund Kommune, n.d.). A plan to have social housing is also underway. The goal is to attract new residents by offering them a unique blend of nature, being strategically close to Frederikssund town and a half an hour away from Copenhagen central station. Vinge master plan also has a focus on the sustainable use and management of natural resources for example rainwater. Large volumes of rain water are collected by the shape of Vinge's landscape and this gives a unique identity to Delta district in which water is visible. A delta has been established to form recreational waterways. During the heavy rain seasons, the delta will provide recreational facilities like boat sailing and in dry periods the waterways will be like tracks in the landscape (Frederikssund Kommune, 2015).

4.3.2 Spectrum of participation

Participation and engagement of citizens in the development of Vinge has been considered key by Frederikssund municipality. Vinge is being built to become a sustainable and smart city district and the municipality has employed various participation mechanisms in order to engage citizens as key stakeholders in realizing this visionary goal. These mechanisms are varied including information provision/website, public meetings, focus groups, surveys, to workshops and exhibitions and other social arrangements. The plans have been to engage different citizen groups in the design and development of how the future city should look like with the municipality and its development partners. One of the key aspect is that Vinge being a green field, no one wanted to live there for which the municipality selected to work closely with the first 50 families. The municipality made a strategic architectural planning for different housing to accommodate different social groups of people. There are plans to have spacious villas to attract strong families, townhouses, apartments and social housing to attract other different social groups. Strong families were selected first because they had interest in the idea of smart city and sustainability. It would also be easy then to attract other people with relatively lower income, mix together and have a dynamic society (T. Sichelkow, personal communication, 13, June, 2016).

Information provision

Vinge project development team created a social media Facebook platform¹, "The city Wing" in order to enhance social involvement. It serves as an information channel, and is easily accessible and direct form of communication with different stakeholders. The platform is open to the general public and information in form of messages, news and other forms of updates about Vinge are communicated within a few minutes' notice. Through the platform, Team Vinge and Frederikssund municipality communicated the sale of housing units in the delta residential area. In turn, the platform acted as a means for the first 23 families who have already purchased land

¹ The Facebook page is available at: <https://www.facebook.com/ByenVinge/>

to meet and communicate with each other. Vinge project also has a webpage² that provides information about the different development facets. The webpage is a one-way channel for information dissemination in which citizens are passive. Placed on the democracy cube, these information channels are more inclusive being open to the public and mainly for personal benefit in terms of authority. Information provision acts more as a precondition for citizen participation.

Consultations

Frederikssund municipality since its official publication of the master plan framework design for Vinge has carried out a number of public consultations. These have been conducted in form of public meetings, focus groups and surveys. The first consultation was held on May 8, 2013 in accordance with the requirement of the Danish Planning Act. The consultation was aimed at obtaining information and opinions from the public about the upcoming development. Citizens were viewed as recipients and providers of information from and to the municipality. The scope of participation was considered to be more inclusive open to a broader involvement of citizens and the public. The consultation focused on several aspects such as sports, nature, traffic problems and solutions and the use of wind turbines. Citizens were not only spectators, but also actively participated through expressing their points of view about the above aspects of the plan. The exchange on information, provided a channel for the self-selected participants to exert a communicative influence on the development plan. The municipality adopted these responses to incorporate them as corrections to the master plan of the new city (Frederikssund Kommune, 2013). Of recent, on June 22, 2016, a decision was made for unveiling the local plan for Vinge center for public consultation for a period of eight weeks. The local plan is the guiding framework for the design of Vinge town center and the road courses among others.

Several similar open meetings have been continuously organized by the municipality in Copenhagen and Frederikssund and the Delta district areas. These include ‘open café meetings’ and ‘open house meetings’ on organized days. However, some of them have been selectively implemented targeting different citizen groups for example, the first land owners in the Delta district, middle class education, and young people. Others have targeted the elderly people of 50 + years because they could be the ones to develop a green field 30 years ago. One result from such elderly consultative meeting for example was their need for high speed internet and skate ramps in the future city. The elderly based this on the fact, “if their grandchildren visited and yet they do not have these two, then they may never visit them again because they would not be connected to internet or for example.” This created an understanding of what the elderly would like to have in a future city a rational which was not perceived by the expert planners before. Lastly were the large scale open meetings with paid dinner which mainly targeted families. In the meetings, families first received information from municipality representatives, and those who opted to stay, were engaged in small groups table discussions. The municipality representatives then held further discussions, received their views and feedback regarding the existing plans for the development.

A special form of social meeting organized by the municipality was the “**meet-your-neighbor**” event. Here families (as landowners) in the first residential area, Delta neighborhood met and got to know each other more, as residents who will form part of each other’s lives in the future.

² The webpage for Vinge is: <http://www.byenvinge.dk/>



Figure 4-1: Impressions from Meet-your-Neighbor Event in Frederikssund, Denmark, October 26, 2015.

Source: Vinge development Team, Frederikssund

These families constituted of a mix of middle class families, older families (50 +), immigrant families, young and traditional families with a potential of living together. By the time the community starts building up their houses, they will already know each other by name and how to support one another. These people have further formed sub groups in which they often met and voiced and developed ideas and preferences of what they would like to have within the future city. These varied from technical solutions like type of energy solutions to creation of social spaces where they could meet up together. Whenever they came up with such ideas, the municipality took them up which elevated the level of planning even higher (T. Sichelkow, personal communication, 13, June, 2016). In so doing, these citizen roles exert a level communicative influence in the planning process when placed on the democracy cube and expression of preferences.

The interview results revealed that most of these social events have been a success with exception of some social meetings like at cafés where the turn up of people was low but those interested attended. However, from the meetings above, rose a special group of people some of whom wanted to be involved in Vinge development and sometimes would know each other. The municipality identified them as champions for the project. This special group was involved in meetings every after two months with Vinge development team to be informed of any progresses of the project. Most of them were elderly and often submitted adequate comments and complaints to the development and were conceived as ambassadors of the region. Some other people in this special group would move a step ahead to talk about Vinge and its uniqueness with sustainability on different social platforms such as radio talks. This was not the bureaucratic initiative by the municipality but rather an initiation of the people from the interest social group and families. The municipal expert acknowledged that this has contributed to the success of the project (T. Sichelkow, personal communication, 13, June, 2016). Placed on the democracy cube, this special group of people can be identified as lay stakeholders who would be involved in aggregation and bargaining in terms of communication. In terms of authority, the 'champions' provided communicative influence but also consultation and advice to Vinge development team.

The municipality has also involved people through web survey and focus group interviews as another form of public consultation. The web survey targeted people in the metropolitan area who could consider moving while the focus group targeted potential newcomers to Vinge. The objective of both studies was to obtain knowledge and a better understanding of the needs, desires and priorities for persons and families for a place they would live as newcomers. And in addition the extent to which they are interested in participating in the design and construction of the city. The study was also seeking to establish a permanent contact channel for potential new comers in form of Vinge web platform (Facebook) and later through email. The web survey was spread through 'The city Vinge' Facebook page and it received 15,000 views, and advertised on "Boligsiden.dk," it received 50,000 views. However, only a total of 109 people answered the questionnaire. The questionnaire was designed so that respondents reveal their priorities in line with regional location of their future housing, facilities in the area, the local environment qualities and price amongst others. In the study, majority of the respondents were between 25 – 40 years, one large majority with university education, an approximate of 80% married or cohabiting and 61% had children. Half of the respondents preferred to live in the metropolitan area or near a rail line thus had a positive interest to stay in a place like Vinge. Also the presence of natural and green surroundings with everyday services like train station, day care and schools etc. And a third would consider sustainability as one of the main factors in selecting a place to live. In addition to the web survey, were focus group face to face interviews with similar goal of information exchange. Participants had an age distribution of 24 to 43 years with varied educational backgrounds (Frederikssund Kommune, 2013). The scope of participation in both the web survey and the focus group was towards the more inclusive end of the spectrum with opportunities to express opinions and preferences and lie low in terms of authority.

Dialogue

Going beyond public consultations, the municipality has also promoted direct citizen involvement through dialogues in form of workshops. The citizens actively participated through face to face exchange information and arguments pertaining the development of the new city. The first workshop was held on June 19, 2013 in St. Rørbæk hall with participation of 120 residents. The workshop was characterized a two-way communication mechanism where citizens gathered information, exchanged thoughts and gave feed back to the municipality. The workshop involved two tracks; the Master plan' and the 'The first stage of Vinge' and participants could select which tract they would like to work with. In the first track, 'the master plan' was divided into subthemes and in each were a series of questions ranging from 1 to 6. In the second track, 'The first stage of Vinge' participants were to organize and adapt the first urban located in the eastern part of Vinge based on three themes, Roads and trails, buildings and spaces between houses. The workshops were open to interested parties of the general public. They created a space in which participants could deliberate to figure out what they want not only as an individual but also as a group and then came to an agreement. They also had an opportunity to provide advice and exercise influence on the planning process. This places citizens' role in the middle on the spectrum for authority and influence. The results were adopted and revised to further elevate development to suit interests of the people (Frederikssund Kommune, 2013). Moving forward, the municipality has continued to organize several stakeholder dialogues.



Figure 4-2: Impression of a dialogues with the citizens in Frederikssund, November 18, 2015

Source: Vinge Development Team, Frederikssund.

Influence

Beyond dialoging, the selected citizen group of the 23 new landowners is evolving into a form of corporation with the municipality. This has been manifest in the joint participation in the long term planning and designing of their residential areas in the future city. These corporations have involved the municipality working with its partners making consultations, and creating awareness before installation of given smart solutions for example sensor devices. People voting on their likes and dislikes has also been common in this setting. From these arrangements, the municipality is seeking to frame the balance between how Vinge should be and how it is today (T. Sichelkow, personal communication, 13, June, 2016). This level of participation, places citizens at a more influence end of the spectrum, co-governing partnership and deliberations and negotiations as modes of communication and decision making on the democracy cube.

4.4 Case study 2: Brunnshög

4.4.1 Background, vision and development

Brunnshög is a new city district being developed in the north eastern part of the city of Lund, south of Sweden. Brunnshög is being developed around the highest point in Lund, 89 meters above sea level and located just beside the Kungsmarken nature reserve and one of the oldest golf courses in Sweden. The new city is just 20 minutes from Malmö-Sturup Airport and 40 minutes from Copenhagen International Airport. Brunnshög is being developed from a greenfield on an area of 250 hectares. By 2050, it is presumed that up to 40,000 people will live and work in the new district of Brunnshög It is being as Sweden's pilot project to demonstrate sustainable and attractive urban development where it is possible to test new solutions for everything from construction to venues (Lund Kommune, 2014).

The city of Lund is Scandinavia's largest education and research center and is endowed with a science road, which is a unique concentration of science, research and innovative companies gathered in a broad area that stretches from the medieval city Centre through north east of Lund. Within the area is the main players are Region Skåne, Lund University, University House, Ideon Medicon Village, and area property owners. The science road has the highest density of

workplaces within the region. The science road connects the historic city center of Lund with Brunnshög. The development of Brunnshög is to create innovative and attractive urban environments closely related to the existing one through sustainable development (Lund Kommun, 2014).

Planning of some project areas in Brunnshög began early in the 1998 comprehensive plan of the municipality and was further developed in the revised plan of 2006. Within the 2006 revised plan, a decision was made that Brunnshög should consist of mixed developments that is to have a variety of services, businesses, residential housing, offices and culture. It was at this point that both MAX IV and ESS projects were added to the detailed comprehensive plan of the municipality. In 2010, the municipality of Lund developed a new master plan by updating the 2006 revised version to further address sustainability and partly due to the expansion of Brunnshög. The plan is intended to craft scenarios of how the city of Lund as a whole should look like by 2050 (Lund Kommun, 2012).

The development of Brunnshög now rests on a visionary goal along three main ideals; Brunnshög to become the world's leading research and innovation environment, a European model for sustainable urban development, and a regional destination for science, culture, and recreation (Lund Kommune, 2012). Sustainability is at the core in planning of Brunnshög including ecologic, economic, social and cultural aspects. Pertinent to sustainable urban development, the city of Lund has put focus on three areas for Brunnshög. One is reducing the impact of climate change – the development is expected to enable City of Lund to realize its climate target to half carbon dioxide emissions by 2020 through channels like using renewable local wind and solar power as well as biogas. Second is balancing fertile soils – about half of the Sweden's food is produced in Scania and Brunnshög being built on a farmland area. Planning of the development recognizes this aspect and has a goal to be able cultivate half of the developed area as farmland in the future. Third is creating an urban environment that stimulates human senses making Brunnshög a livable city. From the service area, sustainability targets at least two thirds of the traffic to and from Brunnshög to be made by bicycle or public transport and only one third by car (Lund Kommun, 2012).

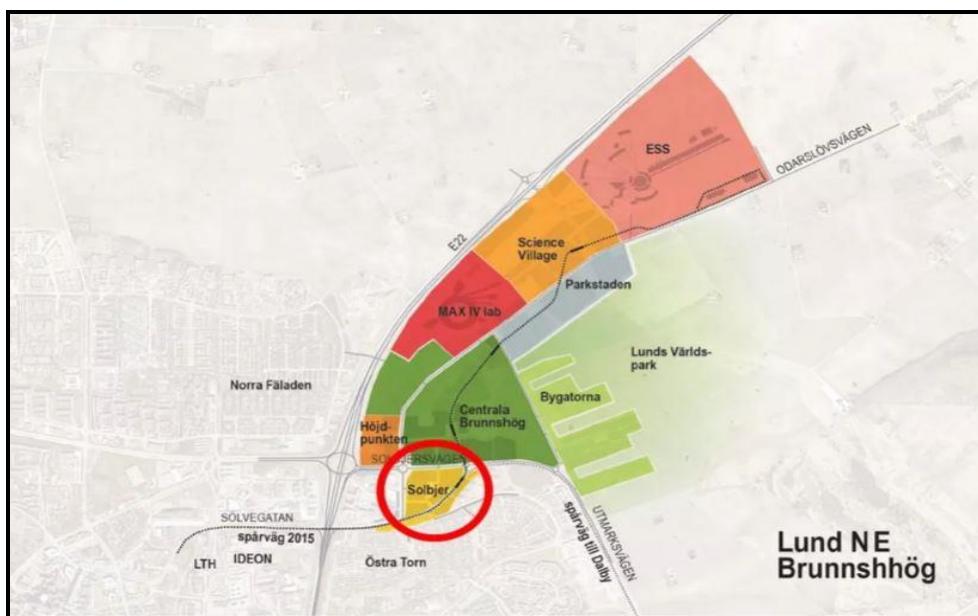


Figure 4-3: Brunnshög Project areas

(Source: Lund Kommun, 2015)

Brunnshög is host of five project areas; ESS (European Spallation Source), MAX IV, Solbjer, Brunnshög Central and the Science village as shown on the map in figure 4-3.

(European Spallation Source) is a European research center with an aim to build the world's most powerful newton source. Scientists at the ESS will study materials of the future- everything from plastics and proteins to medicines and molecules. The ESS is an international project and involves 17 partner countries in Europe and with at least 50 laboratories and research institutes around the world that expressed their intent to build the facility in Lund (Lind Kommun, 2016). ESS is being built furthest from the city in relation to all other projects (see figure 4-3).

MAX-Lab, Lund University, is a Swedish national laboratory that supports three distinct research areas: accelerator physics, research based on the use of synchrotron radiation and nuclear physics using energetic electrons. MAX Lab has been constituted of MAX I-III. The planning and building of MAX IV was in corporation with the city of Lund has been recently inaugurated in June 2016. MAX IV is aimed to provide the next generation research in synchrotron radiation that is highest quality of X-rays available to scientists and industry in the whole world. It is set to enable scientific progress and advances in diverse fields such as biomedicine, environmental science, Nano-technology and materials science Both the two world leading facilities MAX IV and ESS complement each other and have a potential to create significant synergies, valuable research and serve as a hub in European research infrastructure. (Quitmann, 2016 & Lund Kommun, 2016).

The science village is an area located directly between the two research facilities MAX IV and ESS figure 4-3. The area is planned to be a meeting place for different categories of people, scientists, professionals and citizens of Lund and is to contain an information center, a science center, short-term or temporary residencies for visiting researchers, offices for various Swedish and European universities, and offices for MAX IV and ESS. The aim of science village is to create an innovative space close to the research facilities. It is expected to be an urban area where science, culture, sport and greenery brings different kinds of people together and to interact with each other. In the southern part of the area, is a new large green recreational area for outdoor recreation and expected to contribute to the attractiveness of Science Village. Because of its strategic uniqueness, science Village is projected to be a place where people from the larger region of south Sweden and northern continental Europe will want to come to experience a special atmosphere (Lund Kommun, 2015).

Solbjer is located south of all other Brunnshög projects (see figure 4-3). South of Solbjer is a town house area Djingis Kahn and a banana park, a water tower and Höjdpunkten the west. While east of Solbjer are tower blocks both with rental apartments and condominiums, and an urban forest which is yet to be developed for public use. Both Solbjer and Höjdpunkten are planned as the first residential areas within Brunnshög. Local planning of the first building steps is already in place and development kick started in 2014. Solbjer will have an approximate to 700 new living spaces, 2 000 m² of space for stores, and 12 000 m² dedicated for office spaces. Solbjer is planned to have a dense urban building structure that will provide protection from the windy conditions of the area while at the same time providing good sunny spaces and view opportunities. The area will have a varied urban area with diverse urban architectural designs that is heights for buildings will vary between 2 and 6 stories and blocks with different sizes. A diverse range of establishments is also being planned in the area including cafes, restaurants, small retail stores, play grounds, urban gardens among others. For the new housing, it should be both condominiums and tenancies. Discussions about having self-owned apartments and some part of the Solbjer to be created to a requested individual occupancy are underway. Höjdpunkten like Solbjer is planned to be a traditional office area, but with assets such as restaurants and a few shops. Between office buildings, there will be lanes and streets offering a glimpse of the business world and opportunities for walking and strolling (Lund Kommun, 2015). The city of Lund

seeks to make urban environment in Solbjer as sustainable as possible to live. Housing buildings will be either energy plus houses or meet the passive housing standards. In terms of transport, City of Lund is planning to build a tramway in 2017 and this will connect Brunnshög central with Lund central station offering quick and convenient travel. Upon completion, the tram will form the backbone of transport and urbanity in the northeast of Lund. This will minimize need for use of a personal car and will also allow to take a tram to nature. Brunnshög is also planned to a walking and cycling city through prioritizing on pedestrian and bicycle traffic (Lund Kommun, 2015). From the social perspective, plans are to have mixed housing, ranging from small first apartments, bigger family apartments, senior housing to other forms of housing designed by residents to meet their interests and needs. Several meeting places are being planned to be a natural part of Solbjer and designed to meet people with different interests from farming to music among others (Lund Kommun, 2012).

4.4.2 Spectrum of participation

Elevating further from the traditional planning process, it has been within the premises of Lund municipality officials test a variety of mechanisms to inform and involve citizens in the planning and development of Brunnshög. The intent is to give citizens a higher level of influence in the planning process and in accordance with the participation stairway, to elevate their degree of influence in at the *influence* step. The municipality is convinced that a vast number of methods can be employed to foster social inclusion of different societal groups especially those that are traditionally difficult to get to participate in planning and urban development. The variety of methods used have included school projects, do together, films, exhibitions and open meetings, walk and talk and publications/website. These mechanisms have been iterative and have increased knowledge of how the municipality can involve citizens in the planning process (E. Dalman, personal communication, 17, June, 2016).

Information Provision

Lund municipality, Brunnshög project team opened a webpage³ for Brunnshög project and the first version was published in June, 2010 which regularly updated. Later on in 2012 Brunnshög joined Facebook under the name Lund NE/Brunnshög⁴. These are information channels available to the general public about Brunnshög. Facebook is also a platform for information exchange between users about different ongoing activities under Brunnshög. Further still is the municipality uses a newsletter as a communication channel and sends it to everyone who expresses interest on the project webpage. At the webpage is also a film (movie) about the future of Lund which gives transformational visualizations and descriptions about the future of Lund. These are mainly passive means of communication between the municipality and the public, that act as preconditions for participation. Placed on the democracy cube these information channels lie on the more inclusive end of the participation spectrum and mainly for personal benefit in terms of authority and influence.

Another socially active form of information provision has been in form of fairytale walks and future hiking Brunnshög. Fairytale walks were designed to enable citizens get a feeling of the current state of Brunnshög projects and to have an understanding of the plans for the area in the future. The municipality makes provisions for groups of citizens of at least six people to have a free guide to walk them through the project area. During these walks the guide provides information at every location (project area) and participants get an opportunity to ask questions about their planning activities. Fairytale walks been used mainly to get to social groups that are difficult to reach, the young mothers and children. This form of information provision positioned on the democracy cube, participants mainly listens as spectators although may ask

³ Brunnshög project webpage: <http://www.lund.se/Brunnshog/>

⁴ Brunnshög Facebook page: <https://www.facebook.com/Brunnshog/>

questions and this is for personal benefit in terms of authority and influence (E. Dalman, personal communication, 17, June, 2016). Like fairytale walks, future walks also aim is to enable one to get an idea of how Brunnshög looks today and how it will look like in the future. It requires a person only to have a mobile phone with internet access, ability to read quick response (QR) codes in Brunnshög and following the route on the map. Each point on the map has a short movie with vision pictures and description of the site plans in general. There is also a sign with more information. Alternatively, one can watch the films on Brunnshög webpage without visiting the area or download sound tracks to films from Brunnshög webpage and listen to them at an appropriate point as you walk through the area. Future hikes and fairytales are open to the general public (E. Dalman, personal communication, 17, June, 2016). From the democracy cube, these future walks are also one-way communication and passive and citizens only listen and spectate for personal benefits.

Lund municipality Brunnshög project team has also used several summer activities as information channels to residents and citizens of Lund municipality. The summer activities have involved 'Fly a Kite' and 'Kojskogen Brunnshög.' The activities were intended to bring people to meet together at and involve in different social activities while at the same time they get exposed to ongoing development projects in Brunnshög area. During 'Fly a kite' event, people had an opportunity to make their own kites meet and fly them together with others. 'Kojskogen' involved visitors to an area building huts near Brunnshög forest. In the activity, participants constructed tree houses together with a nonprofit group of Architects without borders with the help of an expert artist. The activity is an inspiration of what can be socially done by future residents together. In the process, participants have been involved in discussing building plans for the residential area, Solljer. The starting point for building were drawings that were pre-designed by children from preschool and huts were quite similar. The building of huts has been an attraction to many young families, children and students (E. Dalman, personal communication, 17, June, 2016).



Figure 4.4: Impressions of Kojskogen in Brunnshög in 2015

Source. Lund Kommun, 2016

These summer activities on the democracy cube lie on the more inclusive side of the participation spectrum being open to the public. Residents and citizens are enlightened and mainly spectate while in the project area. Although some form of expression of preferences occurs but this lies mostly among the participating citizens themselves. Thus the activities lie in the lower end of communication mode and influence on the spectrum.

Consultations

The municipality has conducted several consultations through different means to gain information and opinions of citizens about Brunnshög development. These have included public open meetings, surveys and focus groups amongst others. First consultative meetings were in form of ‘information meetings.’ These were organized in a way that municipality officials would face a crowd of attending citizens and give informative presentations about Brunnshög. This was then followed with several question and answer sessions. Several of these forms of meetings have been organized as an information channel to groups that were affected by the planned development projects for example residents from neighboring villages to Brunnshög area. Placed on the democracy cube, attending citizen served the role of being spectators and later on exercised some form of communicative influence through expressing their thoughts about the development in the question and answer session.



Figure 4-5: impressions of an open information meeting with residents of Northeastern Lund about Brunnshög development on June 14, 2010.

Source. Lund Kommun, 2016

Another form of consultative meetings was in form of ‘breakfast seminars’ at Lund central station. These were arranged under different themes for example the future of urban life and urban culture, future traffic, policy vision of future buildings, etc. Up to 20 people attended each of these breakfast meetings and they were selectively invited. At the meetings was a panel of experts from different areas linked to the theme including municipal officials, politicians and external experts. The panel discussions involved two-way communication and information exchange in form of consultations and opportunities for deliberate expression of preferences and or perspectives on a given theme (Lund Kommun, 2016). At the democracy cube these form of seminar meetings lies towards the middle of the spectrum for influence and authority.

Of recent, on August 30, 2016, the municipality conducted an open meeting at the municipal building with a theme, "Brunnshög exciting future in focus." The meeting was attended by many curious Lund residents who were interested in knowing more about Brunnshög development progress. At the meeting, residents had an opportunity to know about overall development and visions for Brunnshög, and conclusion of Tramway Lund C-ESS. The resident participants also heard an opportunity to express their opinions about the project with the Brunnshög project team, other municipality representatives but also with developers and operators in building Brunnshög. The meeting marked the sixth year the municipality is organizing public meetings to directly involve the public in the development process through obtaining their opinions and suggestions for better planning of Brunnshög (Lund Kommun, 2016).

Consultation in form of 'Focus Groups' involved children, high school and university students in several planning and development activities for Brunnshög. The municipality worked with schools under the theme, "future people about future of Lund". Under this theme, the municipality offered to go to classes and also offer schools future walks in order to educate children and students about Brunnshög development and in turn provide an opportunity for them to make expositions on the future city. The ideal for these initiatives was that Brunnshög is a future city in which they will grow and live. In addition, recently in June, 2016, Lund municipality in cooperation with the university of Lund organized a workshop with international masters' students with diverse academic backgrounds. The aim of the workshop was to develop ideas and propositions on how the municipality can build up Brunnshög to become a socially integrated and sustainable district. The winning proposal was that the municipality should work in ways that are scalable upwards, from a lowest level to larger and more global levels. Several contributions from these school projects will be considered in the development work of Brunnshög (E. Dalman, personal communication, 17, June, 2016). These focus groups in the democracy cube lie towards the more inclusive open target end of participation spectrum. And since the groups were involved not only listening but also expressed opinions and developed opinions, they lie towards the middle of mode of communication. They also exerted communicative influence in terms of authority.

Lund municipality conducted a web survey titled; "Brunnshög: Taking the Pulse of the Public." The survey has been made recently in 2016 in partnership with the University of Virginia. The primary objective of the survey was to assess the awareness and sentiment of the public towards the upcoming Lund Northeast development-Brunnshög. That is "*what do people living next to Brunnshög know about the project, what do they like about it, and what are their concerns? How does knowledge and opinions compare to Lundians?*" The survey was sent out to 14,180 people and received 526 responses, a rate of 3.7%. Majority of the respondents were Lund university doctoral students and faculty, club members from Lund Kommune website and a handful of Lund residents found in public spaces. A major finding under the scope of awareness and opinions was that of those surveyed, 79% showed prior awareness of Brunnshög. Of this, 72 % had a positive opinion towards Brunnshög and 21% had not previously heard about Brunnshög project. In addition, respondents of 51+ years were more away of Brunnshög than the younger respondents. The survey also identified that different communication methods had been successful at reaching different age groups. Brunnshög newsletter has most effective at reaching the 51+ age group as well as those who are already more favorable towards the Brunnshög project. On the other hand, social media was a preferred channel for reaching the 18-30 age group. And public meetings, while not being as preferred as social media and newsletters for communication have been the most effective method to reach those with less favorable views of the Brunnshög project most negatively (Lund Kommun, 2016). The scope of participation in the web survey was towards the more inclusive end of the spectrum and provided opportunities for participants to express opinions and preferences, for the communication mode. However, it lies low in authority as participants only exert communicative influence.

The municipality also conducted a test panel in the invent of a public call for citizens who wanted to live in Brunnshög. This was made in form of an advertisement in the local newspaper. The test panel had a theme, ‘who want to be part of Brunnshög planning’ and was open to the public. It was an activity that was initiated following the national housing expo. Up to 100 people turned up, with 90% being women over 50 years of age. Participants thought it was exciting and wanted to move in the new area. The interest of the municipality was that potential new residents would get to know and establish a network with each other. The test panel involved direct involvement a two-way communication and exchange of information of question and answer of what their opinions for the future new homes would be. However, the turn-up was very low when houses were ready for rent (E. Dalman, personal communication, 17, June, 2016). The test panel lies more towards the inclusive end on the spectrum being open to the public. The question and answer session stands at expression of preferences along the mode of communication spectrum and not more than communicative influence in terms of authority.

Dialogue

The municipality has also entered into several dialogues in form of workshop meetings. Some of these have been with citizens affected by the project. Among others, are residents of Djingis Khan neighborhood. Djingis Khan is a residential area with a community of politically active families which is located closest to the new residential area of Solbjer. In a statement during the interview, it was said, “there were claims that the Lund municipality wanted to split the community.” The municipality and Brunnshög project team through collaboration with Djingis Khan association engaged in several dialogues with the residents in form of small group round table meetings for detailed discussions. As a basis of dialogs, the municipality provided materials in form of aerial photographs and maps, planning document for Solbjer and 3D sketch views for the area. In effect during these dialogues a space was created in which residents exchanged thoughts or opinions and made arguments on different issues together with the municipality representatives. However, the level of being positive about Solbjer project is still low more by the representatives of Djingis Khan association than the residents themselves (E. Dalman, personal communication, 17, June, 2016). In terms of communication and mode of decision at the democracy cube, the dialogues were characterized with deliberation and negotiation. Authority has been mainly in form advice and consultation and extending towards co-governing partnership with Djings Khan association. All dialogues have been more inclusive in terms of participation.

A recent form of dialogue has been organized in form of a competitive workshop, “The future city game.” This is a game prepared for urban development and planning under the overall comprehensive plan of the municipality. The city game was organized as a creative workshop that would bring citizens to take part in civic dialogue about the future of Lund for two days in August 2016. The theme for the city game is tailored to, “How do you want to work and live in Lund in the future?” As a game for planning and development of the future municipality, it encompasses Brunnshög as well. It marks the start of the consultation work by the municipality in the plan for revising the comprehensive plan. The future game was made open to the for public participation within the confines of Lund but targeted citizens with all other backgrounds with exception of fields in architecture and urban planning. Information channels to the public was through advertisement in the municipal local newspaper, use of flyers, the municipality website and dissemination of flyers during social events like the pride parade in the municipality. 103 persons expressed interest from the young, 16years, to the elderly of 82 years with rough even number of men and women. However only thirty (30) people representative of different social groups will be selected to take part in the city game. Participants will be divided in groups in order to express their preferences, and put them to test through deliberations and negotiations before each group presents their ideas to others to identify the best ideas. The rational is that citizens can exercise directly in influencing the decisions for designing their future city (E.

Dalman, personal communication, 17, June, 2016 & U. Dagård, personal communication, 21, July, 2016).

#Popupsolbjer initiative. This was an activity in which Lund municipality in corporation with the school of architecture in Lund university organized a one-week workshop with recycled building materials carnival on Solbjer. The workshop involved other participants; local residents, and companies that were involved in the first stage of Brunnshög expansion. In the workshop were questions raised about future housing and urban life. That is how would one want to stay if given a choice yourself, what is important to you, and what kind of town attracts? During the workshop, students displayed their thoughts and projects of the first residential area, Solbjer through temporary and experimental installations, sculptures and prototypes. These were made on the yet to be built area opposite the water tower in Brunnshög. The workshop ended with vernissage and some items that were created were transferred to the museum of sketches in Lund (Skissernas Museum) while others were left to remain in Solbjer. Materials were once again recovered but now in form of houses or installations. The workshop placed along the democracy cube was characterized with aggregation of citizen choices and communicative influence in terms of authority. The scope of participation lies along the more inclusive end of the spectrum.



Figure 4-6: Impressions of installations at #POPOUPSOLBJER workshop, May 19 - 24, 2014.

(Source: Lund Kommun, 2014)

5 Discussion

This chapter seeks to discuss the design and governance of smart city initiatives to enhance social inclusion based on literature review, expert interviews and the case study analysis from chapter 4. The section starts with a discussion on the citizen participation spectrum. The second half of the section proceeds to discuss social inclusion in the context of smart city initiatives.

5.1 Spectrum of citizen participation

5.1.1 Legal frameworks

In Denmark, the local councils (Municipal councils) have a great deal of responsibility in for planning at both town and country level. Within every first two years of local election period, the local councils publish a strategy for planning which includes the political strategy for development and information on the planning that occurred since the local authority plan was revised. The strategy for planning always concludes with a decision for revision of the entire plan, parts of the plan or to leave the plan unchanged. The local authority plan then adopted forms the basis and framework for preparing municipal detailed local plans. The Danish Planning Act, No. 813 of 2007 requires involvement of the public in the planning processes at all levels from the municipality, regional or national levels. At the municipal level (similar to other levels), the act requires that before adopting the local authority plan, a proposal and a report on its premises be published for the public to make comments, objections or protest. These involve various stakeholders including public authorities, non-governmental organizations, property owners, neighbors and others for a period of at least eight weeks. The planning act only demands the minimum rules of public participation and it is upon a planning authority to decide further whether to organize mechanisms for actively engaging citizens in the determination of the development plans through arranging citizen's meetings, establishing working groups, detailed information and material among others (The Danish Nature Agency, 2012).

Likewise, in Sweden, municipalities have a monopoly to physical planning. This is governed by the Planning and Building Act (PBL) of 1987, which was later revised in 2011. The PBL is the main act that forms a framework for urban planning and development for municipalities. The PBL obliges every municipality to develop a comprehensive plan which covers the whole municipality. It is the municipality's declaration of intent – indicating how the municipality projects the long term development of physical environment. The plan is however not legally binding to individuals (users) and authorities but it is used as a strategic document to form a basis for political decisions on the use of land by the municipality. It should be politically approved by the municipal council at least once members' four-years term of office. Thus planning and development are political processes ultimately governed by elected leaders of the municipality. At the same time, a municipality develops a detailed development plan in order to realize the planning decisions and intentions of the comprehensive plan and this is legally binding. The detailed plan only covers a limited part of the municipality stipulating its specific use, density and accessibility (Nylund, 2014 & Boverket, 2016). Within the physical planning process, the PBL stipulates regulations for public participation. It requires that both the comprehensive and detailed plans become adopted by a municipal council after a process of public consultation and exhibition. Upon drafting the first proposal or amending the comprehensive plan, the municipality must make consultation with a broad range of stakeholders. These include the county administrative board⁵, municipal residents, public authorities, special interest organizations and other individuals who may have substantive interest in the proposal have an

⁵ The county administrative boards are responsible for ensuring that right from the early stages of planning, the national and public interests are considered, but also coordinate the planning issues between two or more affected municipalities. The boards also provide municipalities with basic data and advice on public interests.

opportunity to participate in the consultation. Consultation should start as early as possible and progress in the process of planning and results of consultation documented and published.

As welfare states, both Denmark and Sweden have long been considered as state-centered societies in which the state primarily forms, guides, governs people and events on uniform policies (Dehlstedt, 2015; Richard, Johansson & Salonen 2015). However, over time these societies have changed and advanced into neo-liberal societies (*Ibid*). Arguably, this neo-liberal surge which permeates in these countries' political systems has also influenced the field of urban planning. A close relationship can be noticed in both countries in a way that urban planning is decentralized at municipal levels. In both cases, the traditional law requires public consultation in the planning process when developing the local authority or comprehensive plan for the municipality. However, in the Swedish system, the law requires public consultation in development of detailed local plans. This is can be of advantage as it further allows for engagement of the citizens in planning for development. The planning process may then take long, but the combined results will be better. Ultimately, it can be said that the urban planning system strives towards involvement of citizens in planning and development processes.

The decentralized responsibility of municipalities is a manifestation that politicians at municipal levels have the power and authority to influence the decisions for urban planning process. How much of this power has been distributed with all stakeholders involved including citizens in the planning and developing of these new districts still remains a question. By involving different stakeholder groups and citizens, it is always hard to satisfy the needs of everyone and therefore, always a decision is made best on a consensus and equilibrium level and developments like Brunnshög and Vinge are no exceptions. An example is the development of a new residential area in Brunnshög which received a low positive response from the association of Djings khan, a residential neighborhood (E. Dalman, personal communication, 17, June, 2016).

From activities of municipalities and the legal requirements, construction of the new districts has been characterized with communicative processes of planning and development. In this process, values of citizens are mixed with the facts that officials or authorities ascertain before making a decision (Wänström, 2013). Communicative planning advocates for principles like social construction of knowledge and the replacement of authoritarian expert planning with participative governance. And this form of governance should be based on deliberative reasoning with different stakeholders preferably on similar or equal levels (Castell, 2012). However, for traditional communicative planning and public consultations, there arises concerns and questions about the role and actual results of these forms of democratic intentions especially in projects in which they are affected. Citizens expect that such processes are an alternative or a complement to the regular representative political decision making process. Wänström (2013) reckons that, the practical ability to influence such a process is usually not as extensive as the legal codes may imply.

5.1.2 Engagement levels

Citizen involvement in the development of a new neighborhood as a city district from a green field is challenge. First, there are no people living in that area to involve in the planning process. Such a project is always abstract starting from scratch, and less people would have interest. A poll conducted by Lund municipality on the pulse of the public about Brunnshög for example revealed a lack of interest for people to live in Brunnshög because people were fine with where they live. Being a greenfield, it remains a dream to live there (E. Dalman, personal communication, 17, June, 2016). In this respect, municipalities have tested various methods to involve citizens in addition to the traditional planning systems.

Based on the participation stairway, in both projects, the municipalities have tried at all levels to provide citizens with information through different mediums, as a precondition for citizen

participation. In this case, citizens are being kept up to date with the ongoing development. Consultations have taken the form of public meetings, surveys and focus groups. The purpose of these consultation is to improve the basis for decisions, ensure transparency for those affected by the planned development and have an opportunity to influence the design of a given outcome. In other words, Consultation rests on the argument that it is seldom for decisions made without public participation to receive public approval and public consultation is essential to guarantee thorough support of decisions as possible (Hedström & Lundström, 2013; Boverket, 2016). In other meetings and workshops, municipalities have come to dialogue with citizens on different development aspects of the projects. Public dialogues involving citizens especially on such large and complex development projects are usually characterized with conflict and in some cases failures (Castell, 2012). Dialogues involve citizens deliberating to make decisions and rather than just expressing their preferences and predefined interests. They also influence each other through different mechanisms of persuasion, reason and evidence etc. in order to obtain a result that represents what they value. Much concern in this regard is timing as Castell (2012) notes, '*At what stage should the citizens be involved and for how long?*' Experiences from Brunnshög project confirm that citizens should be involved at an early stage and be open as much as possible. This can improve collaboration (E. Dalman, personal communication, 17, June, 2016; T. Sichelkow, personal communication, 13, June, 2016). These requirements can improve and elevate the level at which citizens would influence a decision for the new development which has been the goal for both municipalities. It must be acknowledged that the level of influence is highly dependent on the nature and type of projects in each cases.

Ultimately, in the participation stairway, for the two cases; Brunnshög and Vinge, information and consultation have been primarily fulfilled in most of the development projects. In both projects the strive to achieve a high degree of citizen influence has furthered two-way detailed communication system that has enabled municipalities to achieve dialogues. In effect, most of the activities for involving citizens still remain at the dialogue and influence levels. Little or no activity have yet involved the last step of co-decision in the participation stairway. This could be closely associated with the domestic laws in either cases that do not have provisions to grant ultimate power for decision making in urban planning and development. The laws only make provisions for opinions, thoughts and or contest.

Addressing from the democracy cube, the different kinds of meetings discussed earlier in the sub-sections above, provide citizens with the opportunity in which they are recognized and get a sense of civic duty to voice their views in an open public setting. As Fung (2006) puts it, most of these public meetings act as venues in which officials or authorities commit to no more than receiving participants' testimony and considering their views in subsequent deliberations. However, in the case studies presented, the municipality officials have tried to go an extra mile to put the preferences and opinions of participants into a collective views geared towards making decisions in the planning processes. On the democracy cube, the participants express and formulate preferences and exercise communicative influence in terms of authority. The scope of participation was revealed to be more inclusive in several of the organized activities for citizen involvement. However, sometimes open meetings may be accompanied with a risk of self-selection or inclusion biases resulting in fewer voices and interests being expressed and heard. The mode of communication and decision in both cases varied along the spectrum however, it climaxed at deliberations and negotiations. The last level (Technical expertise) does not apply in the case because it includes mainly officials that have attained training and specialization to address particular problems. These may however work with the citizens in a co-creative manner. On the other hand, an in-depth participation in the planning process through the varied modes of communication and decision, not only benefits the authorities (municipalities) but also results in informed citizens. These according to Irvin & Stansbury (2004), "may become citizen experts that hold an understanding of difficult conditions and able to perceive holistic communitywide solutions." Under authority and control, the planning and development phases of the cases have

been dominated mainly by communicative influence advise and consultation. A special form of co-governing partnership existed in Vinge project. According to interview results, new residents of Vinge residential area (Delta neighborhood) were involved planning the construction of housing together with Vinge project team. This is different for Solbjer in Brunnshög. The plan and decision for the kind of housing depends on the development investors. The Direct authority cannot be exercised by citizens as discussed earlier above.

5.2 Social inclusion and smart city initiatives

5.2.1 Foundations of social inclusion

The term inclusive society prevails as a widespread aspiration at the turn of the 21st century and yet there is no clear consensus to what an inclusive society means and the concept social exclusion which underpins it (Lister, 2000). In the relational character of both concepts, the main axes of inclusion have simultaneously been the axes of exclusion such as market, gender, state, race among others (Stewart, 2000). Thus their definitions and connotations are context dependent (Silver, 2007). However, Lister (2000) acknowledges that the various exemplars of social exclusion, reveal different conceptions of citizenship, and inform policy making at national and or regional levels. Social exclusion is a multidimensional concept that embraces both economic and social aspects. Silver (2007) denotes that the economic dimension includes monetary poverty, while other scholars acknowledge exclusion from land, credit and other resources, labor markets among others. Socially, it involves gender, regional and cultural variations. Lister (2000, p. 38) takes another view saying that multidimensional nature of social exclusion involves the variety of ways in which people may be denied full participation in society and full effective rights of citizenship in the social, civil and political spheres. He also adds that social exclusion relates to consideration of processes rather than simply outcomes. Implicitly, exclusion means someone or something is excluding someone or something else. Thus social exclusion encourages examination of the processes or mechanisms involved (*Ibid*). Based on the above realms, Silver (2007) definitive summary for the term social exclusion as “a dynamic process of progressive multidimensional rupturing of the ‘social bond’ at the individual and collective levels. Hitherto, Social bonds are social relations, institutions, and imagined identities of belonging constituting social cohesion, integration, or solidarity.”

With regards to the above, Gray (2000), perceives the idea of inclusion as the possibility of every member of society to fully participate in it. In other words, common membership prevails as the social ideal for an inclusive society in which everyone has access to the activities and practices that are central in the life of society. He also adds that inclusion should focus on all classes of people not only the underclass of unskilled and marginalized groups (often at the bottom) but also those at the top (over class groups) that may opt out of public services and civil obligations. Therefore, Warschauer (2003, p. 8) defines social inclusion as, “the extent that individuals...are able to fully participate in society and control their own destinies”. This aligns well with the definition of Stewart, 2000, p.9) as “Inclusion is a matter not only of an adequate share in resources but equally of participation in the determination of both individual and collective life chances.” However, Ratcliffe, (2000) clearly states that social inclusion is not simply social exclusion despite their close relationship as discussed above. To fight social exclusion is to mitigate its shortcomings (Phipps, 2000) while Gray, (2000, p.29) notes that attempts to promote social inclusion involves components for creating fair opportunities, and satisfaction of basic needs.

5.2.2 Social inclusion in practice

Within the realm of smart city development, several scholars, (for example Andrade & Doolin, 2016; Phipps, 2000 & Slewyn, 2002) affirm that much of government discourses on social inclusion address its economic dimension at the expense of other forms of inclusion such as cultural identity, social interactions and interpersonal networks, and political participation

addressed by Lister, (2000). By focusing on social relations instead of resource distribution, Phipps, (2000), argues that, this builds and strengthens issues of participation and empowerment. It's upon this that (Selwyn, 2002) emphasizes, seeing social inclusion as dynamic process, will involve analyzing mechanisms that act to promote an inclusive society. Lister, (2000, p. 38) highlights that social exclusion should focus on processes rather than outcomes. This provides surety that Social inclusion is something done by people rather than to them (Taket et al. 2009). Due to the complexes that revolve around smart urbanism, Luque-Ayala & Marvin (2015) stress the need to critically engage issues of social inclusion while dealing with different urban contexts. In addition, Hollands (2008) argues that smart cities should be inclusive. However, one of the main challenge is how to the balance between different social groups to enable proper integration (T. Sichelkow, personal communication, 13, June, 2016).

Within the European Union, a market place, The European Innovation Partnership on Smart Cities and Communities (EIP-SCC) has been born. Its aim is to bring together cities, industry and citizens to improve urban life through more sustainable integrated solutions. The EIP-SCC among other things envelops spheres of innovation, better planning and a participatory approach (European commission, 2015b). Within the EIP-SCC, a 'Citizen Focus' action cluster ensures that cities are inclusive of their citizens across Europe through different arenas which include among others "*Enabling citizens with the tools and opportunities to create and problem-solve and*" and "*facilitating conversation between stakeholders, so citizens' voices are not only heard, but instrumental in designing solutions.*"

The Citizen Focus action group identified a list of principles and enablers (general guidelines) for engaging citizens that are relevant while implementing smart cities and related projects. These are illustrated in Table 5-1 below:

Table 5-1: Principles and enablers of Citizen engagement

Guideline	Description
Simple	"Aim to facilitate understanding and usage"
Reciprocal	"Give for getting to create fair and lasting relationships"
Participative, balanced with representative	"Understand benefits and limits of approaches"
Inclusiveness	"Ensure solutions that are representative of the whole population"
Push approach not pull	"Go where people are instead of assuming they will come to you"
Online – Offline balanced interventions	"Understand benefits and limits of different settings"
Conscious of privacy and rights	"Build trust from the start"
Conscious of citizens' emotions	"Understand the feelings that flow on or under the surface"
Change-enablers with city stakeholders	"Make the municipality a partner"
Wallet-savvy	"Use citizens' own funds in smart ways that benefit citizens"

For the EIP-SCC Citizen Focus, in order to address inclusiveness, it is crucial that solutions implemented in smart city and related projects are endorsed by entire population within the defined geographical area not only the digital savvy. And in addition, to effectively engage citizens, it is important to address needs of various citizens including those of women, migrants, people in poverty, the elderly, and other social groups right from the beginning (European commission, 2015b). Chourabi et al., (2012) highlighted that people and communities have been traditionally neglected as part of smart cities at the expense of understanding more technological and policy aspects of smart cities. Making people as key players presents them an opportunity to influence the success or failure of the initiatives, he adds. Also master thesis work by Kogan and Lee (2014), on success factors for smart city projects revealed that citizen engagement is a predominant factor for success. However, participation of every citizen in every decision making process may not be possible to implement. To this end, the EIP-SCC Citizen Focus, encourages that the participatory approach should always be designed also to embrace representation in such situations. However, Amis & Kumar (2000) stated that an inclusive decision making is at the heart of good urban governance and failure to integrate all forms of people in the decision making process is a function of inertia, and bureaucratic and unresponsive forms of government.

In addition, encouraging inclusive decision making process acts as an avenue for putting in practice norms of good urban governance (Ibid).

5.2.3 Co-creation: An approach to social inclusion and smart urbanism

In a study according to Rose (1996, p. 41), today we are living in an “advanced liberal society”, which “does not seek to govern through ‘society’, but through the regulated choices of individual citizens, now constructed as subjects of choices and aspirations to self-actualization and self-fulfillment”. Forms of governance in cities can be associated with what Rose (1996) also calls the creation of ‘responsible citizens’ who can take charge and influence the entire course of their lives and environment in which they live. One of the more pro-active approaches is the bottom up approach. It establishes new channels in which citizens have opportunities to participate directly and more fully in influencing processes or decisions in urban planning, policy and development processes in order to bring about positive change (Fung & Wright, 2001; Manville et al., 2014). Edelstam, (2016) suggests that this can best be achieved through setting up a citizen engagement strategy. This can set momentum for transition from urban politics to a form of urban governance that is characterized with increased partnerships, important policy choices, and demands for co-creation from citizens and decision makers (Abrahamsson, 2015). Co-creation forms part of the whole decision making process from formulation of issues, identification of measures all through to their implementation. This leads to a shared responsibility for both the output and outcome (Abrahamsson, 2015). Realizing co-creation in constructing of new city neighborhoods, can be achieved through what Abrahamson (2015, p.37) proposes as city governments empowering citizen dialogues that are open ended and inclusive. The dialogues make citizens feel that their perspectives are visible, respected and listened to while making decisions that shape urban living (Edelstam, 2016; Abrahamsson, 2015). People empowerment in this setting always remains a question *power to do* something rather than *power over* something (Abrahamsson, 2015). Citizens should not be perceived only as customers for products the companies supply, recipients of services the city authorities, but as co-creators of new solutions or as initiators of city innovation initiatives (Edelstam, 2016). This can open doors for such new development areas also to be local innovation areas that attracts external innovation partners and together with citizens. Solutions can be tested and demonstrated thus building a local innovation ecosystem. In both case studies, it was revealed that new solutions will be tested for example in the residential area of Solbjer in Brunnshög (E. Dalman, personal communication, 17, June, 2016) and in the delta neighborhood in Vinge (T. Sichelkow, personal communication, 13, June, 2016).

In addition to expressing voice and views in dialogues, city governments can enhance co-creation through organizing several social community projects that can encompass all age groups from young to elderly. Such projects bring citizens together in form of social gatherings and ideate on how to be actively involved and run them. People can exercise their creativity which in turn conveys new and fresh feeling for the future residents in the area. An example can be giving chance for people to take care of a small park area or community lot where people mainly live.

6 Conclusions and Reflections

The city notion has long been observed as a crystalline point within society that is an important entity within which people live, work and travel. While at the same time cities are at the core of both sustainability and social challenges. There is therefore a growing demand across the globe for new and innovative ways to manage these urban complexities. At the intersection of the visions of future urban places, is rising the smart city concept as an urban agenda for many governments. Smart cities are being presented as a flexible and responsive means of addressing the sustainability challenges while building more socially inclusive societies. Cities are therefore implementing transformational projects in the form of new smart initiatives that are geared towards improving the quality of life of their citizens.

In this regard, this thesis was seeking to contribute knowledge to the growing body of work in describing smart city initiatives particularly by investigating how municipal governments address issues of social inclusion while designing and governing development of smart city districts. To achieve this, the thesis addressed two research questions

1. How are smart city initiatives designed and governed to catalyze co-creation and improve social inclusion?
2. Which practices are most and least successful in delivering social inclusion priorities when implementing smart city initiatives?

In addition to interviews and literature analysis, this thesis used two analytical models, the democracy cube and the participation stairway, which were used to answer the posed research questions. The thesis employed a case study approach. Two emerging smart city districts from green fields were investigated; Vinge from Frederikssund municipality in Denmark and Brunnshög from Lund municipality in Sweden.

6.1 Main insights

Smart city initiatives hitherto referred to as new smart city districts in both cases have been developed based on a participatory form of governance. Citizen participation and engagement have been central in their planning and development processes for both municipalities. This has been realized in form of communicative (or collaborative) planning has been a central theme and focus in both cases. The design to involve and engage citizens in planning and development process is primarily fostered by the traditional national planning regulations. The regulations require that the proposed overall (comprehensive) municipal plans should undergo a state of public consultation and exhibition. In Swedish context, the regulation further requires that detailed plans for realizing the comprehensive plans should also undergo through a state of public consultation before they are adopted.

The traditional form of communicative planning and public consultation has been mainly in form of public meetings organized by the municipalities. Since the development of the cases is from green fields, municipalities in both cases have gone a step further and put to test several citizen participation and engagement mechanisms beyond the traditional legal practice. These included surveys, co-creation workshops, interviews, publications and web applications (Facebook, website, films, and emails), focus groups and general meetings. In addition, Lund municipality has also created several social activities/events intended to reach citizen groups that are traditionally difficult to get to participate in dialogue for planning and development of Brunnshög. These include fairytale walks, future hikes, building huts and fly kites and have been targeted to meet young parents, children and students amongst others. Even then, the

organization of these different participation and engagement mechanisms has been steered towards being open to the general public as possible.

Information, consultation and dialogue activities form the main mode of citizen engagement in planning and development activities of the municipalities. In both cases, the main interest is not just for citizens to express their views and opinions on development projects but further to elevate their level of influence in decisions about the future of their cities. The variant mechanisms for involving citizens in the planning and development of Vinge is yet to be evaluated. However, interview results revealed that traditional social media has been the most common method for which citizens have been made aware and informed about Vinge. In the case of Brunnshög, a recent survey on awareness and opinions of the public in an attempt to bridge the gap between urban planners and land community revealed a number of key points. Traditional media (newspapers and printed advertisements) has been the most common method for which citizens have been made aware and informed about the project. Brunnshög publication (newsletter) is the most preferred form of future communication reaching the elderly (51+ age) and amongst those who are already more favorable towards the project. Social media on the other hand preferred for reaching the age group of age group 18-30. Public meetings and public dialogues as most effective communication methods to reach those with less favorable views of Brunnshög project most negatively. Interview result revealed that social events/activities (fairytales and future walks, building huts, fly kites and school projects) and exhibitions have been successful in reaching those social groups that are difficult to participate in dialogues.

6.2 Key conclusions

The smart city concept has gained momentous attention in urban development policy arena in preparing cities of the future. The concept has multi-disciplinary number of aspects of urban life including urban planning, sustainable development, environment, energy grid, economic development, technologies, social participation. The transformative initiatives in form of smart city initiatives by municipalities are intended to better serve their citizens and improve their quality of life (Chourabi et al., 2012). However, since many of the smart city initiatives are in the design or early phase of implementation their definitive outcomes are yet to be accurately determined (Manville et al., 2014; Dameri & Rosenthal-Sabroux, 2014). The smart city districts under study, are under the same pattern, their planning and development is still underway. The focus is not only at creating wired or connected smart city districts. Sustainability has been put at the forefront of the planning and development to include both ecological and economic, social and cultural aspects.

Social inclusion is a multidimensional concept that encompasses various aspects of social economic and political spheres. Thesis adopted Warschauer (2003) and Stewart (2000) conception of the term as the extent to which citizens are able to fully participate in the determination of both their individual and collective life chances. In this respect, the term encompasses the active involvement of human capital all the way in planning, decision making and the different forms of innovation activities that may transpire in the arena. Integrating social inclusion priorities should be central in the planning and development activities of smart city initiatives. As Maniville et al., (2014) reckons, smart city is not only a collection of smart technologies but also a community of people.' Citizen involvement in planning and decision making hastens their relationships with municipalities and provides them an opportunity to influence decisions made about their future cities. Intuitively, smart city neighborhoods should be shaped by their current and or future inhabitants. Involving citizens and with other stakeholders provides an opportunity through which municipal governments can conceive the different perspectives of what defines quality life to citizens. Further still, such decisions easily receive public approval and support than when they are just divulged.

Decisions that receive public support can be considered legitimate. In addition, participatory mechanisms that advocate for being more inclusive as indicated by the democracy cube with opportunities for exercising higher influence, enhances justice in democratic governance (Fung 2006). Additionally, sometimes municipal experts may not have the know-how and ingenuity to address particular problems pertinent to citizens' social life and quality of living. Thus by involving several citizen social groups in a plethora of activities, municipalities present an opportunity in which citizens are in position to frame problems and priorities in ways different from the professional or expert conceptions while they match closely with needs, values and preferences they hold (Fung, 2006). This also enhances the effectiveness of decisions in addition to being legitimate and just. This form of inclusive decision forms the core of the attributes of good urban governance. That is; openness, participation, accountability, effectiveness and coherence in accordance to European Commission, (2001) white paper. In return, a failure to integrate all forms of people in the decision making process is a function of inertia, and bureaucratic and unresponsive form of government (Amis & Kumar 2000).

However, ensuring social inclusion priorities in smart city projects that are emerging from green fields is a challenge. Such projects are always abstract starting from scratch, and less people would have interest (E. Dalman, personal communication, 17, June, (2016) & T. Sichelkow, personal communication, 13, June, 2016). There is a laxity for people to move to such areas because they are content with where they live. And being a greenfield, it remains a dream to live there. This form of laxity however can be contended on different accounts since these new smart city developments done to meet different needs and in different contexts as Hollands (2008) denotes. Addressing this challenge necessitates municipal governments to enhance what Gaventa (2004) called "working both sides of the equation." This means, "*municipal governments going beyond 'civil society' or 'state-based approaches' and focus on their intersection through new forms of participation, responsiveness and accountability.*" By implementing holistic participative approaches, e.g. co-creation or co-development and collaborative or communicative planning processes, success in combating these challenges are realized. Often these holistic approaches open the window for an unlimited generation of creative solutions when municipal officials engage with citizens on what Wänström (2013) stressed as "how something should be done." Additionally, this brings affected and interested citizens also to align their needs and values with solutions in a way that is productive and constructive thus enhancing 'user influence' (Wänström, 2013).

6.3 Methodological reflections

The thesis followed a case study research approach featuring new city district initiatives as central fields of investigation. Two research questions were posed pertinent to social inclusion in the design and governance of smart city initiatives in form of new smart city districts. The thesis employed a combination of research methods; literature analysis, expert interviews and framework models for analysis.

Literature analysis looked at the plethora of scholarly work about the smart city concept. The scope was limited to the conceptualization, characterization, governance and relation with aspects of social inclusion and citizen participation. For this thesis, the scope was adequate, and much work focusing on smart city concepts prevails. However, one corresponding to social inclusion is still developing with many scholars highlighting the need for cities to address social inclusion priorities while implementing such new project initiatives.

Expert interviews were conducted with a twofold focus. First was to further support the development of the scope for the thesis. Second was the quest to address the research questions under investigation given that the nature of the case studies were under development. In the first stance, interviews were conducted with three selected experts within the field of smart and sustainable cities. While in the second track, the interviewees were selected based on their level of involvement in the two case studies under investigation. These was the main source of data in

order for answers to the research questions under investigation pertinent to the case studies. In total, fifteen potential interviewees were contacted, however level of response was low and only six in-depth interviews were conducted. Low response is attributed to the timing period as some invitees were leaving for holidays and thus unavailable while others responded not to the requests. Three interviews were face-to-face involving representatives from municipalities developing the cases, while two were via skype and one by phone. All interviews were enlightening and insightful for the purpose of the thesis. I would argue that for the interviews conducted, there was a general degree of transparency in information dissemination.

The workshop attended, was also useful as it provided more insights on the Strategic Innovation Agenda for Smart sustainable cities in Sweden as a whole. It was also a source to valuable information and literature used in the thesis.

For the two models employed for case study analysis, it can be argued that models had a high degree of relevance for the thesis. First, the democracy cube is built on the institutional design dimensions, *who participates, how participants exchange information and make decisions, and what is the link between discussions and policy or public action?* As according to Fung (2006), these three questions for institution design provides an understanding of the potential and limits for participation of people in public matters. In this context, the thesis used the democracy cube to analyze the distinct participation mechanisms that have been employed in order to enhance decision making in design and development of the two case studies under investigation. In addressing social inclusion practices, the three institutional dimensions were useful in the following contexts.

- Scope of participation. This provides a spectrum of who is eligible to participate and how individuals become participants. It thus supported the identification of how exclusive or inclusive a given participation process was. At the exclusive end, is the expert administrators and elected officials, and a possibility for everyone to participate at the inclusive end. More expansive selection forms of wider set of participants lie in the middle. With the thesis focus on citizen's involvement, majority of the activities are variants from the middle of the spectrum and more towards the more inclusive end.
- Mode of the communication. This spectrum then moves to investigate the participants level of engagement in due process within the realm of public discussion and other participatory activities. It thus investigates how intense is the citizen's engagement in any process or activity. Just listening and expression of interest is least intense while development of preferences and bargaining in the middle. At the most intense end of the spectrum is deliberations and expert analysis. Most activities have evolved in both cases from least intense end of spectrum to most intense in form deliberations.
- Authority and power. This dimension was used to gauge how voices of citizens influence decisions. It revealed the decision making power given to citizens. Least authority involved expression of personal benefits, which follows a kind of communicative influence exercised in the power of an individual's argument. More authority is seen in the ability for citizens to provide advice or consultation. Towards the most influence is co-governance and direct authority. Most of the activities have laid in the middle of the spectrum and an ongoing strife is to further elevate to the co-governance.

The second model was the participation stairway, also known as the participation stairs. The model is built on five steps namely; information, consultation, dialogue, influence and co-decision. Information relates to dissemination of knowledge by municipal officials and also the exchange of information. Consultation concerns gathering citizens' opinions while dialogue relates to exchange of thoughts on several organized occasions. Influence involves collaborating

with citizens and municipal officials in the planning and implementation. While co-decision means joint decision making. The model thus provides insights to the different levels of participation of different stakeholders in decision making. It also relates to the amount of power that is devolved.

These two models, the 'Democracy cube' by Fung (2006) and the SKL participation stairway have been applied to a greater extent in the case study analyses. A few situations in which the certain aspects of the Democracy cube model have not been applicable. For example, most authority under the authority and influence spectrum has not been applied. This is because it contravenes with the restrictions of the traditional planning regulations in the geographical locations of the case studies. Secondly, technical expertise along the mode of communication and decision spectrum is also not applicable to the thesis. This relates mainly to planners, regulators and others of the same kind. Even when the SKL participation stairway is a Swedish invention, it was found fitting in the analysis of Vinge case study from another geographical boundary. This can be relatively linked to the fact that both Sweden and Denmark as Scandinavian countries have much in common in terms of population and historical development as welfare states (Richard, Johansson & Salonen, 205).

6.4 Recommendations

6.4.1 Recommendations for case studies

As discussed in the chapter 4, Vinge has carried has taken several fronts to involve of citizens in planning and development process. I would therefore recommend that Vinge development team carries out an evaluation and analytical study of the different citizen engagement priorities. The evaluation will provide an opportunity to draw better conclusions on how to progress in improving social inclusion priorities in the process.

With lesson learned from Brunnshög case, Vinge development team can further enhance social awareness and engagement about the project through different socially engaging activities that attract different demographics including children and young people. Such social groups will form part of future citizens. Through these socially engaging activities (applicable in local context) such groups can be made aware and in addition availed opportunities in which they can exercise their creativity on different aspects about Vinge. This opens possibilities to feel that they form part and included in shaping of new cities. Thus this strengthens the balance for such social groups to feel integrated.

For Brunnshög, there is still need to employ multi-channelled inclusionary approaches that can cover a broader range of demographics and opinions in future. In the survey mentioned in section 4.4.2, mechanisms involved in communicative planning are dominantly influenced by demographics and opinions. This is because in communicative planning, not all inclusionary mechanisms work appropriately or equally well in all situations and for all municipal goals. Therefore, citizens may participate only if they are directly affected by the project. (Wänström, 2013) in this regard concluded that citizen groups that choose to participate in communicative planning and consultative meetings may not form a good representation of all citizens in that geographical location. This often forms the basis for which politicians deny participants at such consultative meetings definitive power to control and influence decisions (*Ibid*). This also relates to Vinge case study.

6.4.2 Recommendations for further research

As discussed in chapter 4 above, smart city districts are being developed as a new form of urban living with smart solutions, technologies, products and services to address these sustainability challenges and enhance quality of life in cities. These initiatives are supported amongst other

things with investments in ICT infrastructure as Caragliu, Bo and Nijkamp (2009) denotes. Sweden and Denmark are recognized as information societies Andrade & Doolin (2016) indicates that in such a society the ubiquity of ICT does not necessarily promote social inclusion. In the same way, it cannot be assumed that an increase in the use of the ICTs, that people then feel actively engaged or included (*Ibid.*). In this context, I would recommend further research to investigate how can municipal governments use ICT to promote social inclusion of a diverse demographic audience. And focus would be on how can citizens actively participate in the planning or development activities using ICT in what Andrade & Doolin (2016) calls “a self-determined manner.”

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Appendix

Appendix I. List of Interviewees and email correspondences

List of Interviewees

Name	Affiliation	Brief description
Eva Rydén Dalman	Lund Municipality, Sweden	Head of Brunnshög projects, and the department of Brunnshög
Ulrika Dagård	Lund Municipality, Sweden	Works with office of the strategic development department
Mikael Edelstam	Region Skåne, Sweden	A consultant and expert in the EIP Smart Cities and Communities Action Cluster on Business Models, Financing and Procurement. He has also been coordinating the regional innovation strategy for smart cities in the Skåne region in Sweden and working with governance and development of the regional innovation ecosystem
Thomas Sichelkow	Gate 21, Copenhagen Denmark	He is an International Smart City Business Development Manager. Former Head team Vinge and Project manager Frederikssund municipality until end of March 2016.
Roland Zinkernagel	City of Malmö, Sweden	European union coordinator/project manager at City of Malmö
Tina Karlberg	Siemens AB, Sweden	Current City Account Manager at Siemens

Informal discussions and email correspondences list

- Kim Luu – Project manager Vinge, in Frederikssund municipality.
- Andres Luque-Ayala – Researcher/Lecturer, Durham University, cities and climate change.

Appendix II: Semi Structured Interview Guide

Background information

Interviewee:

Organization:

Title:

Interview Date:

I have chosen to write about smart or sustainable cities with a tentative topic; "Towards more socially inclusive Smart Sustainable Cities: A comparative study of smart city districts in Greater Copenhagen region." My research will seek to examine the potential for smart urbanism to create more socially inclusive and sustainable communities. I intend therefore to carry out a comparative study of two municipalities, Frederikssund and Lund with an interest of looking at their ongoing development projects "Vinge Smart City" and "Brunnshög" respectively.

The interview is planned to last for an approximated time 30 minutes. I request to make an audio recording for purposes of future reference.

As discussed in our meetings, I am trying to attempt the following research questions:

- How are smart city districts designed and governed to catalyze co-creation and improve social inclusion?
- Which practices are most and least successful in delivering social inclusion priorities when implementing smart city initiatives?

Interview guide questions

1. The concept of the Smart City has gained traction in recent years and it has been coined for a variety of purposes. How would you describe a smart city?
 - Is it aspirational discourse, or a set of practices, a narrative; a re-packaging of old ideas; or a new way of doing urban development; and if it is new, then what is actually new about it?
2. Different cities have labeled themselves as smart and or sustainable, what does it mean to use them together for the new city developments/ initiatives?
3. Who are the main advocates for developing smart city districts/initiatives and why?
4. What are the guiding principles in designing and governance of smart city districts/initiatives?
5. Who are the main actors involved in the designing and governance of smart city districts/initiatives?
6. What is the process considered when selecting different stakeholder involvement?
7. How would you describe the concept of social inclusion in relation to a smart city initiative?

8. Discourses around smart urbanism have been rooted in seductive and normative visions of the future where technology is a primary driver for change. What role does social inclusion and engagement play in smart cities/districts?
9. What practices are used to deliver social inclusion priorities when implementing smart city initiatives (how would you achieve social inclusion of different citizen groups)?
 - Which practices have been most and least successful in ensuring social inclusion?
10. What are the possible challenges for social inclusion when implementation smart city initiatives?
11. Has ICT played a role in fostering social inclusion practices in the development process.

Appendix III: Definitions for conceptual relatives of Smart City Concept

Concept	Definition	Dimension
Learning City	“The term ‘learning’ in ‘learning cities’ covers both individual and institutional learning. Individual learning refers to the acquisition of knowledge, skills and understanding by individual people, whether formally or informally. It often refers to lifelong learning, not just initial schooling and training. By learning, individuals gain through improved wages and employment opportunities, while society benefits by having a more flexible and technological up-to-date workforce”	Human
Knowledge City	“A Knowledge City is a city that aims at a knowledge- based development, by encouraging the continuous creation, sharing, evaluation, renewal and update of knowledge. This can be achieved through the continuous interaction between its citizens themselves and at the same time between them and other cities’ citizens. The citizens’ knowledge-sharing culture as well as the city’s appropriate design, IT networks and infrastructures support these interactions”	
Sustainable City	“Sustainable city uses technology to reduce CO2 emissions, to produce efficient energy, to improve the buildings efficiency. Its main aim is to become a green city”	Institutional
Green City	“Green City follows the Green Growth which is a new paradigm that promotes economic development while reducing greenhouse gas emissions and pollution, minimizing waste and inefficient use of natural resources and maintaining biodiversity”	
Smart Community	“A geographical area ranging in size from neighborhood to a multi-county region whose residents, organizations, and governing institutions are using information technology to transform their region in significant ways. Co-operation among government, industry, educators, and the citizenry, instead of individual groups acting in isolation, is preferred”	
Wired City	“Wired cities refer literally to the laying down of cable and connectivity not itself necessary smart”	Technology
Virtual City	“Virtual City concentrates on digital representations and manifestations of cities”	
Ubiquitous City	“Ubiquitous city (U-City) is a further extension of digital city concept. This definition evolved to the ubiquitous city: a city or region with ubiquitous information technology”	
Information City	“Digital environments collecting official and unofficial information from local communities and delivering it to the public via web portals are called information cities”	
Digital City	“The digital city is as a comprehensive, web-based representation, or reproduction, of several aspects or functions of a specific real city, open to non-experts. The digital city has several dimensions: social, cultural, political,	

	ideological, and also theoretical”	
Intelligent City	“Intelligent cities are territories with high capability for learning and innovation, which is built-in the creativity of their population, their institutions of knowledge creation, and their digital infrastructure for communication and knowledge management”	

Sources: (Nam and Pardo 2011; Coccia, 2014)