TURUN YLIOPISTO
UNIVERSITY OF TURKU

GOVERNING THE FUTURE:
Creation and Mobilisation of Futures Knowledge in the Context of Urbanising Society

Hanna Heino

GOVERNING THE FUTURE:

Creation and Mobilisation of Futures Knowledge in the Context of Urbanising Society

Hanna Heino

University of Turku

Faculty of Science
Department of Geography and Geology
Human geography
Doctoral programme in Biology, Geography and Geology

Supervised by

Professor Jussi S. Jauhiainen
Department of Geography and Geology
University of Turku
Finland

Research Director Jari Kaivo-oja
Finland Futures Research Centre
University of Turku
Finland

Reviewed by

Professor Oliver Ibert
Leibniz Institute for Research on
Society and Space
Germany

Professor Emeritus Markku Tykkyläinen
Department of Geographical and
Historical Studies
University of Eastern Finland
Finland

Opponent

Professor Carlo Salone
Department of Urban and Regional
Studies and Planning
University of Turin
Italy

UNIVERSITY OF TURKU
Faculty of Science
Department of Geography and Geology
Human geography
HANNA HEINO: Governing the Future: Creation and Mobilisation of
Futures Knowledge in the Context of Urbanising Society
Doctoral Dissertation, 136 pp.
Doctoral Programme in Biology, Geography and Geology
April 2020

ABSTRACT

Recently, governing the future has become a topical issue for many actors and organisations. The future is uncertain, it can contain threats or new possibilities that should be managed, and therefore, future becomes an object of governance. States, regions and cities are trying to anticipate the future in order to make sustainable decisions and be prepared for surprises. Futures knowledge and strategic thinking are therefore important elements and tools for governing the future. In this thesis, I study governing the future in the context of urbanising society in Finland. The processes of urbanisation involve several actors in different levels of society, yet the state and municipalities are key actors, which can influence the development and prepare for it. Governing the future is a recent interest in the field of geography, and in this thesis, I combine the ideas and concepts from the fields of human geography and futures studies.

In this thesis, I study the governance of the future through the concepts of strategic thinking, futures knowledge and knowledge mobility. Strategic thinking is a method to look further in the future and evaluate the organisational competencies and capabilities needed in planning purposes. Futures knowledge is interpretations of possible future developments and it can be used to support decision-making. Knowledge mobility allows knowledge utilisation and reinterpretation in new context and by new actors. In this thesis, I answer three main research questions. Firstly, I ask: How do cities and municipalities try to govern the future? I study this in two different contexts related to urbanisation of society, namely, planning for immigration and achieving sustainable development in municipalities. Secondly, I ask: How can futures knowledge be created and utilised to govern the future? I study this especially through two futures workshops that aimed to identify alternative paths to the future of the urbanised Finland. Lastly, I ask: How does the mobility of futures knowledge influence the governance of the future? I answer this question in larger scale study considering strategic research funding in Finland. The evidence from this thesis suggests that there is an aim and desire to govern the future in Finland, yet capabilities and resources are lacking.

The main methods of my study are surveys, interviews and participant observation. This method triangulation confirms the reliability of the results. The findings of my thesis show that strategic thinking is necessary to govern the future and futures knowledge is vital part of a future oriented decision-making. Futures knowledge is constructed together, but it is interpreted from the different basis. The mobility of futures knowledge is a complex process and it involves the transformation and reinterpretation of knowledge depending on context and individuals. This thesis contributes to our understanding about the concept of futures knowledge and the governance of the future.

KEYWORDS: Governing the future, futures knowledge, knowledge mobility, strategic thinking, future, urbanisation

TIIVISTELMÄ

Tulevaisuuden hallinta on noussut yhä tärkeämmäksi asiaksi monille eri toimijoille viime aikoina. Epävarmuus tulevasta ja sen mukanaan tuomat uhat, mutta toisaalta myös mahdollisuudet ovat tehneet tulevaisuudesta yhä tärkeämmän hallinnan kohteen. Valtiot, alueet, kaupungit ja muut organisaatiot yrittävät ennakoida tulevaa, jotta voisivat tehdä parempia päätöksiä tai varautua yllättäviin muutoksiin. Tulevaisuustieto ja strateginen ajattelu nousevat merkittäviksi tekijöiksi tulevaisuuden hallinnassa. Käsittelen väitöskirjassani tulevaisuuden hallintaa kaupungistuvan yhteiskunnan näkökulmasta Suomessa. Kaupungistumisen prosesseissa on mukana monia toimijoita eri tasoilta, mutta erityisesti valtio ja kunnat ovat niitä, jotka osaltaan voivat kehitykseen vaikuttaa ja siihen varautua. Tulevaisuuden hallinta on maantieteelle suhteellisen uusi kiinnostuksen kohde ja yhdistänkin tutkimuksessani maantieteen ja tulevaisuuden tutkimuksen näkökulmia.

Väitöskirjassani tarkastelen tulevaisuuden hallintaa strategisen ajattelun, tulevaisuustiedon ja tiedon liikkumisen käsitteiden kautta. Strategisen ajattelun avulla voidaan katsoa pitkälle tulevaisuuteen ja arvioida organisaation ominaisuuksia ja kyvykkyyttä toimia tulevissa tilanteissa. Tulevaisuustieto on tulkintoja mahdollisista tulevaisuuden kehityskuluista ja se voi toimia päätöksenteon tukena. Tulevaisuustiedon liikkuvuus taas mahdollistaa uusien tulkintojen ja ymmärryksen synnyn uusissa konteksteissa laajentaen tulevaisuuden hallinnan mahdollisuuksia eri tahoilla. Väitöskirjassani vastaan kolmeen isompaan tutkimuskysymykseen. Ensin kysyn: miten Suomen kunnissa pyritään hallitsemaan tulevaisuutta? Tutkin tätä kahdessa kaupungistumiseen vaikuttavassa kontekstissa, kestävän kehityksen tavoittelussa ja moninaisuuden suunnittelussa kuntatasolla. Toiseksi tutkin: miten tulevaisuustietoa jalostetaan ja miten tämä vaikuttaa tulevaisuuden hallintaan? Tätä kysymystä tutkin erityisesti kahden tulevaisuustyöpajan avulla, joiden tarkoituksena oli selvittää Suomen kaupungistumisen tulevia kehityskulkuja. Lopulta kysyn, miten tulevaisuustiedon liikkuminen vaikuttaa tulevaisuuden hallintaan? Tähän kysymykseen vastaan tutkimalla strategisen tutkimuksen rahoitusta, jonka on tarkoitus tuottaa tietoa suomalaisen päätöksenteon tueksi. Väitöskirjatutkimukseni osoittaa, että myös Suomessa on tavoitteena ja toiveena hallita tulevaisuutta kaupungistuvan yhteiskunnan kontekstissa, mutta aina eivät kyvyt ja resurssit mahdollista tulevaisuuden huomioimista.

Tärkeimpinä menetelminä tutkimuksessani ovat kyselyt, haastattelut ja havainnointi. Tämä menetelmä triangulaatio varmistaa tulosten luotettavuutta. Tutkimukseni löydökset osoittavat, että strateginen ajattelu on välttämätöntä tulevaisuuden hallitsemiseksi ja että tulevaisuustieto on tärkeä osa tulevaisuusorientoitunutta päätöksentekoa. Tulevaisuustietoa rakennetaan yhdessä eri toimijoiden kanssa, mutta sitä tulkitaan eri lähtökohdista. Tulevaisuustiedon liikkuminen eri toimijoiden välillä ei ole suoraviivaista ja vaatii myös uusia tulkintoja toimijasta riippuen. Väitöskirjani lisää ymmärrystä tulevaisuuden hallinnasta ja avaa tulevaisuustiedon käsitettä.

ASIASANAT: Tulevaisuuden hallinta, tulevaisuustieto, tiedon liikkuminen, strateginen ajattelu, tulevaisuus, kaupungistuminen

Table of Contents

List of Original Publications

This dissertation is based on the following original publications, which are referred to in the text by their Roman numerals:

I   Heino, H., & Jauhiainen, J. S. (2020). Immigration in the Strategies of Municipalities in Finland. *Nordic Journal of Migration Research*, *10*(3), 73–89.

II   Kettunen, P., Heino, H., Rasinkangas, J., & Jauhiainen, S. (2020). Addressing Local Sustainability: Strategic Thinking in the Making. *Scandinavian Journal of Public Administration*, 24(2), 21–41.

III   Heino, H. (2021). Knowledge Creation and Mobility in and through Futures Workshops. *Futures & Foresight Science* 2021;e63

IV   Heino, H., & Hautala, J. (2021). Mobile futures knowledge: From research policy to research and public policy ? *Geoforum*, *118*, 83–92.

The original publications have been reproduced with the permission of the copyright holders.

1   Introduction

The world has become increasingly uncertain and ambiguity affects many decisions (Burrows & Gnad, 2018; Derbyshire, 2019; van Dorsser et al., 2018), with politicians and decision-makers facing difficult questions and opposing interests in everyday policymaking (Jenkins, 2017). Global sustainability challenges have local effects (John et al., 2015), which vary from environmental sustainability to social problems, digitalisation to economic decline, and pandemics to climate change (Echebarria et al., 2017; Edwards & Bulkeley, 2018; John et al., 2015; P. N. Mishra et al., 2020). Local actions also influence the global level (Heinrichs & Schuster, 2017; Ji & Darnall, 2018); for example, the United Nations' 17 Sustainable Development Goals (SDGs) aim to manage worldwide sustainability challenges but underpin policy at the local level. In these challenging situations, decision-making requires anticipation and future orientation to facilitate lasting and sustainable change (Burrows & Gnad, 2018; Granjou et al., 2017; Pawson et al., 2011; van der Duin et al., 2009; van Dorsser et al., 2018). Naturally, the main challenges vary depending on country and location. In this research, the context of my study was the urbanising of Finnish society.

People have always been interested in forthcoming events and predictions, but attitudes towards futures have changed during history (Masini, 2006). Human geography has rarely engaged with the concept of the future and only recently has there been increasing interest in the future and the uncertainty it involves (Anderson, 2010; Derbyshire, 2019; Jones, 2019). Geography has used statistical modelling and data analysis to tackle future uncertainties and improve policymaking; however, the distinction between epistemological and ontological uncertainty has been overlooked (Derbyshire, 2019). Epistemological uncertainty describes known uncertainties (i.e. 'known unknowns') and ontological uncertainty deals with surprises and 'unknown unknowns' (Derbyshire, 2019; Pawson et al., 2011).

Despite the lack of futures research in geography, other fields have been working with the topic of the future. The field of futures studies, dedicated to the subject, developed in the 1960s, although prognosis and anticipation were practiced and discussed long before (de Jouvenel, 1967; Granjou et al., 2017; Masini, 2006). Futures studies examine and evaluate probable, possible, and preferable futures (Bell, 2003). The future is undetermined and many possible futures could arise; therefore, 'futures'

is a plural word (Bell, 2003; Sardar, 2010). We can actively influence the future by the choices and decisions we make today (Bell, 2003; Masini, 2006; Sardar, 2010), but different attitudes and predispositions towards the future can impact human behaviour (Hideg & Nováky, 2010; Kuosa & Basden, 2000). Attitudes may be passive, reactive, pre-active, or proactive (Godet & Roubelat, 1996), influencing the strategies and actions taken and the management of knowledge (Aven, 2015; Godet & Roubelat, 1996; Hideg & Nováky, 2010; Kuosa & Basden, 2000).

States, regions, and cities are increasingly considering the future as an object of governance, perhaps because they are afraid of the future, expect something positive from the future, or think that knowing the future will make things easier (Jones, 2019). The meaning of knowledge is therefore important because knowledge is an increasingly important resource for states, regions, and cities (May & Perry, 2016). Knowledge results from a process of gaining understanding and applying expertise, which involves people's values (Alavi & Leidner, 2001; Nonaka, 2013). Without adequate and multi-perspective knowledge, it is impossible to ensure a better future, which could mean a more sustainable, egalitarian, just, and/or economically stable society. Knowledge is important for urbanising societies and for urban planning, as demonstrated by the increased demand for knowledge- or evidence-based decision-making (Legrand, 2012; Pawson et al., 2011; Yigitcanlar, 2009). Governing the future requires futures knowledge or anticipatory actions, and strategic thinking and the management of futures knowledge are vital practices in this regard (Habegger, 2010; Zeemering, 2018); however, the desire to control the future is expressed differently in different locations and is consequently an important theme to study in geography (Jones, 2019).

In this research, ideas from the fields of human geography and futures studies were combined and complemented each other. One key concept of this research was *futures knowledge*, which comes from the field of future studies. This concept is connected with the related concepts of knowledge, *knowledge creation*, and *knowledge mobility*, which are actively studied in human geography. Furthermore, this research combined the concept of futures knowledge with the concept of *strategic thinking,* which is a future-oriented practice. These concepts, and the governance of the future, were examined in the context of urbanising society, and are defined and discussed in Sections 2, 4, and 5.

1.1 Urbanising society

The urbanisation of society has many effects that are particularly visible in cities and nearby areas. Urbanisation has placed cities at the heart of many evolving and turbulent issues (John et al., 2015). A vast amount of literature has described its effects on the environment, economy, and social issues; for example, the issues of sustainability and pluralism are intertwined with the processes of urbanisation and

form complex issues in cities. Pluralism refers to increasing heterogeneity, multiculturalism, variety, and mixing in urban populations (Arkesteijn & Volker, 2013; Fincher et al., 2014; Gressgård & Jensen, 2016). Urbanisation leads to growing cities that increase consumption, trade, and production, in turn influencing natural resources. Health issues, social segregation, and inequality affect the well-being of urban populations (John et al., 2015). Larger cities offer many opportunities and therefore attract migrants and immigrants to these cities. The increasing diversity of populations creates new challenges for urban planning and governance (Bernt, 2019; Fincher et al., 2014; Gressgård & Jensen, 2016; Kühn, 2018); thus, this research considered both sustainability and pluralism in municipalities.

Urbanisation is a global phenomenon, and the urban proportions of populations are increasing worldwide. Europe is already a heavily urbanised continent, with the world's largest megacities located in densely populated areas (United Nations, 2019). Urbanisation has many positive and negative effects. The 'urban paradox' is that both challenges and benefits accrue in cities (EuroStat, 2016; Florida & Mellander, 2018; Glaeser, 2014). They offer many opportunities and are places for innovation and prosperity, but inequality, pollution, crime, and social problems accumulate in larger cities. Rapid urbanisation has posed many challenges for cities, and city planners and politicians are lagging behind in providing adequate services for inhabitants (Ratcliffe & Krawczyk, 2011).

In Finland, the process of urbanisation started to develop later than in other Western European countries (Kokkinen et al., 2007; United Nations, 2019), but the country is now transforming swiftly into the most urbanised society in Europe (EuroStat, 2016). Trends towards urbanisation can be seen in the demographic development of Finland, like in dependency ratio (Aho & Kaivo-oja, 2019). Consequently, changes in the society associated with the urbanisation process need to be taken into account during planning and preparation for possible futures (John et al., 2015; Nevens et al., 2013; Nilsson et al., 2014). Urbanisation and its drivers and consequences in Finland require further study. Natural population growth in the country has typically been minimal or, in recent years, even negative, but its largest cities are continuing to expand (Aho & Kaivo-oja, 2019; Tilastokeskus, 2020). By contrast, depopulation is a major problem in rural areas (Cvetkovic, 2009; Verma & Taegen, 2019). Immigration is the main driver of the increasing urban population in Finland (Kaivo-oja, 2014; Tilastokeskus, 2016a); hence, pluralism has major implications for cities, since it recognises different interest groups and shares power between them (Fincher et al., 2014; Gressgård & Jensen, 2016), requiring the use of different planning perspectives and tools (Arkesteijn & Volker, 2013). Pluralism is more than a political issue; instead, it privileges individuals and their social contexts (McAuliffe & Rogers, 2018, 2020), which is an uncomfortable concept for municipalities (Gressgård & Jensen, 2016).

Reflecting various perspectives, this thesis discusses the governing of the future in the context of urbanising society, which resulted in four research articles. Increasing urbanisation requires more knowledge and understanding to underpin strategic urban planning and development (Karuri-Sebina et al., 2016; Yigitcanlar, 2009), which should aim to understand the processes of urbanisation and their consequences. Knowledge about urbanisation is also essential, since knowledge-based decision-making is increasingly important in societies (Davoudi, 2015; Legrand, 2012). One aspect of such decision-making is planning for immigration and pluralism, which was the subject of the first article. Immigration is a particularly urban phenomenon (Righard et al., 2015) and planning for pluralism means ensuring equality for all inhabitants, taking different views and cultural traditions into account in the planning process (Fincher et al., 2014; Gressgård & Jensen, 2016). To avoid structural inequalities, pluralism requires more than regular community engagement (McAuliffe & Rogers, 2018). Immigration has rapidly increased in Finland and has had many effects, especially in urban areas (Tilastokeskus, 2016b; Wessel et al., 2017), increasingly leading to segregation and social inequalities in cities. It is essential that municipalities address immigration in their strategies (Bernt, 2019; Kühn, 2018), but planning for pluralism is still unfamiliar for many municipalities in Finland (Article I). Municipalities have individual paths towards it, even though general trends and politics influence them (Fincher et al., 2014).

An important future-oriented urban issue is sustainability, which I discussed in Article II. Sustainability refers to the environmental, economic, social, and sometimes cultural wellbeing of citizens (Echebarria et al., 2017; Soini & Birkeland, 2014). Sustainability is a vital contemporary issue for urbanised societies, with international agreements and the SDGs set by United Nations recognising the importance of sustainable development for all humans (United Nations, 2020). A substantial number of information and knowledge management needs are associated with the SDGs; the variables relating to them are correlated and there are different synergies between them (Kuribayashi et al., 2018; Mainali et al., 2018). Sustainability considers both current and future generations. Sustainable development and all the dimensions of sustainability are handled at different levels of society, but cities and local governments are the key players in sustainability work (Echebarria et al., 2017; Heinrichs & Schuster, 2017; Ji & Darnall, 2018). Local governments can influence the well-being of local inhabitants, the environment, and the economy.

Understanding potential future developments facilitates planning and decision-making; hence, futures knowledge can lead to improved policymaking (van Dorsser et al., 2018). Relative to the third and fourth articles, futures knowledge creation was studied in the context of urbanising Finland. More knowledge is needed about urbanisation processes in Finland to support decision-making processes at different

levels of society. It would benefit the whole society if decisions were anticipatory and proactive, taking into account different perspectives and possibilities.

The context of urbanising society in this research aligned with the Urbanization, Mobilities and Immigration (URMI) research project funded by the Strategic Research Council (SRC) of the Academy of Finland. The URMI project was part of the SRC's *Urbanising Society* programme and consisted of a large consortium of seven partner organisations and more than thirty researchers. The main aim of the project was to study the future of urbanisation in Finland. I worked as a project researcher for the project, and all the research articles related to the URMI project. Two extensive questionnaires, distributed electronically to all the Finnish municipalities, were used for Articles I and II and were part of the project data collection. The futures workshops studied for Article III were organised by an URMI project partner. The SRC's *Urbanising Society* programme was the focus of Article IV, and URMI was consequently also a subject of my research.

1.2   Research questions

This thesis was based on two levels of questions. The first-level research questions were formulated for this synopsis and founded on the more specific research questions that underpinned the research articles. Research question 1 was answered in Articles I and II, and research questions 2 and 3 were answered in all the articles, together with the specific sub-questions. The sub-questions were posed and answered in the research articles.

Research questions

1.   How do cities and municipalities try to govern the future?

- Article I

  - How do urban, semi-urban, and rural municipalities in Finland anticipate immigration flows in the next ten years?

  - How do those municipalities consider immigration in their municipal strategies?

  - Do those municipalities plan and execute strategies that address pluralism?

- Article II

  - To what extent do local governments engage in strategic thinking?

  - Does engagement with strategic thinking contribute to sustainable development?

The first research question concentrated on the local level of futures governance. Articles I and II discussed two different topics—immigration and sustainability—although both relate to the governance of the future in urbanised Finnish society. The different tools and ideas concerning anticipation, municipal strategies, and strategic thinking were all linked to the governance of the future.

2. How can futures knowledge be created and utilised to govern the future?

- Article III

  - How is futures knowledge created in participatory futures workshops and which factors of a workshop influence knowledge creation?

The second research question was important for increasing understanding of the processes of futures knowledge creation and utilisation in Finland. Futures knowledge creation and utilisation were also discussed in Articles I and II, which concentrated on the municipal level. In the third article, I examined participatory futures workshops as a method of creating futures knowledge. In futures workshops, different stakeholders meet, discuss, and create visions and futures knowledge, and the aim of the two inter-organisational futures workshops was to identify alternative paths to the future of urbanised Finland.

3. How does the mobility of futures knowledge influence the governance of the future?

- Article III

  - How is post-workshop futures knowledge mobilised and possibly utilised in workshop participants' organisations?

- Article IV

  - How is futures knowledge mobilised between research policy actors, researchers, and public sector stakeholders?

The third research question focused on the mobility aspect of knowledge. For Article III, I studied how and when futures workshop participants, following the workshop, mobilised the futures knowledge they had created. In Article IV, my aim was to examine futures knowledge mobility between different actor groups in the context of research funding (in relation to urbanising society). The mobility of futures knowledge is vital for facilitating knowledge utilisation in different locations and contexts.

In the next section, I will present the theoretical framework and key concepts that underpinned the research. The key concepts are *futures knowledge*, *knowledge mobility,* and *strategic thinking.* The literature review presents an overview of the

geographical and futures studies literature about governing the future. I also discuss the concept of knowledge and knowledge-based decision-making. In Section 3, I explain the methods of data collection and analysis, along with the ethical considerations, and introduce the research case studies. In Section 4, I present and discuss the main empirical results of the research and, in Section 5, answer the research questions and discuss the implications of the findings.

2 Theoretical framework and key concepts

2.1 Key concepts

2.1.1 Futures knowledge

Futures knowledge is future-oriented knowledge. A general assumption is that futures knowledge is useful knowledge (Bell, 2003; de Jouvenel, 1967); however, usefulness is determined by those who choose to use the futures knowledge. We need futures knowledge when making decisions about the future to enable us to manage our lives in efficient and more sustainable ways (Wilkinson, 2016). Furthermore, futures knowledge is beneficial for developing society and is needed in many tasks at different levels (Bell, 2003). Futures knowledge is utilised in everyday decision-making, but it is also vital for organisational and political decision-making (Pouru et al., 2019; Schmidt, 2015; Van der Steen & Van Twist, 2013; van Dorsser et al., 2018). Rapid (global) changes and turbulent social and political environments present continuous challenges for decision-making. Conventional policy analysis, which is used to support decision-making, concentrates primarily on history and past trends, but when it is combined with futures knowledge, it benefits decision-making and helps in avoiding pitfalls and dealing with uncertainties (van Dorsser et al., 2018; Wilkinson, 2016); hence, organisations and governments are increasingly eager to gain futures knowledge (Habegger, 2010). They have a need and will to govern the future, for which futures knowledge is vital. Of course, the motives for wishing to govern the future are myriad and futures knowledge can potentially be used for the benefit of a few, rather than the whole society; for example, military organisations are keen to create scenarios and engage in thinking about the future (Kuosa, 2011).

Futures knowledge, however, is a contradictory concept. There are no facts about the future because the future has not yet been realised, even though we need that knowledge to prepare for the future (de Jouvenel, 1967; Gabriel, 2014; Wilkinson, 2016). Accordingly, futures knowledge is not factual; the future has not yet transpired and is therefore open and has many possibilities (Sardar, 2010). This is why 'futures' is a plural word. There are always alternative futures that we can

evaluate and consider. A decision made today will direct us towards a certain path, and different paths lead to alternative futures. We can influence the future, despite it being impossible to predict exactly (Bell, 2003). Gabriel (2014) argued that considering the future scientifically leads only to an illusion of knowledge; however, although the future is basically unknowable, it still allows for anticipation and strategic thinking about possible futures (Gabriel, 2014; Habegger, 2010).

Futures knowledge can be created in several ways, but a combination of different kinds of knowledge from past and present is necessary for envisioning the future (Bell, 2003; Malaska, 2000). Many futures research and foresight methods can be used to produce future-oriented knowledge (Giaoutzi & Sapio, 2013; Maness, 2014). A way to define futures knowledge is to think of it as a result of these methods (Eerola & Miles, 2011). Futures knowledge has been defined as 'contingent plausibility' (Dufva & Ahlqvist, 2015) and as 'ridiculous knowledge' that it is difficult to understand or believe (Dator, 1995). When creating futures knowledge, it is vital to keep in mind the complexity of the world and the interrelation of different subjects. Evaluating futures knowledge requires discursive scepticism because alternative futures are mentally constructed (Gabriel, 2014). Individuals' imaginations, thoughts, and related combinations are central tools for futures knowledge creation. Since futures knowledge is commonly understood as socially constructed, meaning that interaction with other people develops the thinking (Fuller & Loogma, 2009), profound dialogue is important in the production, evaluation, and utilisation of futures knowledge (Wilkinson, 2016).

One central characteristic of futures knowledge is that it is not value-free. Futures knowledge is mentally constructed, and the values of the individuals and organisations who participate in knowledge creation are embedded in the results (Baškarada et al., 2016; Bell, 2003; Fuller & Loogma, 2009). This is also evident in knowledge utilisation situations, such as decision-making, when it is necessary to choose and aim for a preferred future (Habegger, 2010). Values guide individuals and are part of their beliefs and knowledge; therefore, values are inseparable from futures knowledge (Bell, 2003; Fuller & Loogma, 2009; Masini, 2006).

Ahlqvist and Uotila (2020) presented a relational theory of futures knowledge that combined the features of positions and relations to constitute futures knowledge. In this theory, signals (or objects) of the future are connected to other signals and examined in different contexts, and the positions and perspectives of observers influence the interpretation of the signals. Perspective refers to the sense-making capacity of an observer who has a certain viewpoint on a signal or issue (Ahlqvist & Uotila, 2020). Futures knowledge is formulated by combining existing knowledge about the past and present, which is then interpreted, evaluated, and justified in social processes (Bell, 2003; Fuller & Loogma, 2009; Masini, 2006); thus, 'futures knowledge is the interpretation of potential futures gathered and validated in justified

ways' (Article III). Futures knowledge seldom consists of clear pieces of information, yet futures knowledge can be seen as a change in a mental model that directs thinking and decision-making (Chermack & van der Merwe, 2003; Eerola & Miles, 2011). The use of futures knowledge may therefore be revolutionary. Decisions made with futures knowledge influence future outcomes, and it is possible to change the course of actions; for example, considering the governance of future sustainability challenges in Finland can lead to decisions that actually mitigate those emerging sustainability challenges. Futures knowledge can help decision-makers to choose their aims for the future (Bell, 2003; Masini, 2006). In summary, 'futures knowledge relates to agreement on plausible future developments, but it is not a fact or a prediction; only a plausibility' (Article III).

2.1.2   Knowledge mobility

For wider knowledge utility, for example in decision-making, it is essential that knowledge becomes mobile. This can occur when knowledge is mobilised by people and processes, allowing knowledge to circulate (Weller, 2017). Knowledge mobility permits several entities or individuals to benefit from the knowledge, but it differs from the idea of knowledge transfer. In the field of policy studies, transfer means a voluntary process to transfer the best policy practices from one location to another (Stone, 2012). In policy transfer, the content of the policy or knowledge remains unchanged from the starting point to the end point; however, the idea ignores several characteristics of transfer, such as social practices or processes (Mccann & Ward, 2012). The transfer of models, texts, or patents is more a transfer of information than knowledge because knowledge is dynamic. Knowledge is generated through a process that involves creation, contesting, and individual understanding, which are difficult to transfer (Hautala, 2018; Mccann & Ward, 2012; Temenos & Mccann, 2013). Knowledge mobility consequently includes a 'mutation' of the knowledge that takes place simultaneously with the movement (Mccann & Ward, 2012; Peck, 2011). Mutation is a transformative process in which interactive connections are constantly renewed (Peck, 2011; Peck & Theodore, 2010). It takes place when various actors interpret the knowledge or policy while it is in transit from one place to another (Mccann & Ward, 2012). Different actors influence the knowledge/policy and some pieces are removed or new pieces added to formulate knowledge/policy that better suits the local conditions (Jenkins, 2017; Mccann & Ward, 2012; Peck & Theodore, 2010).

Accordingly, knowledge mutates when it is mobilised between cognitively distant groups, such as between academic and non-academic actors (Boschma, 2005; Kębłowski & Bassens, 2018; Mccann & Ward, 2012). Academic ideas and theories may differ greatly from the practices used, for example, in city administration. Policy

mobility between these two specific actor groups has been described as *circuits of knowledge* (Kębłowski & Bassens, 2018) . Both the actor groups have their own networks and knowledge resources; thus, they have cognitive distance between them and different *frames of resonance* (Boschma, 2005; Kębłowski & Bassens, 2018). To facilitate knowledge mobility between these actor groups and diminish the cognitive distance, a shared understanding of main objectives and concepts is necessary (Boschma, 2005; Bowman, 2016). The groups have cognitive distance because they have different knowledge bases and their absorptive capacity varies. Some cognitive proximity is thus required for them to be able to communicate and process new knowledge (Boschma, 2005). Cognitive proximity supports individuals in understanding each other when they share a common knowledge base. Microspaces, such as meetings and consultations, can develop common understanding and advance cognitive proximity; therefore, they are used by different interacting groups to co-create policy objectives and adapt them to local conditions (Boschma, 2005; Jenkins, 2017).

2.1.3   Strategic thinking

Utilising knowledge and gaining long-range benefits from knowledge-based decisions depends on strategic thinking. The word *strategy* has many definitions depending on context, and it is used in the military, politics, and business (Mishra & Mohanty, 2020). The etymology of the word 'strategy' derived from ancient Greek and related to warfare, but the idea of business strategy was adopted in 1960 (Freedman, 2013). Strategy has been considered as something that can be owned or as something that people do (Jarzabkowski, 2004; Whittington, 2006). Strategic thinking is one method of facilitating the governance of the future. The vast amount of literature regarding strategic management in public organisations has demonstrated varied and controversial practices in the field, and various frameworks for strategic management have been developed (Walker, 2013). Strategic management is strongly future-oriented, and strategies are guiding paths towards futures that are not immediately achievable (Johnsen, 2015). Strategic thinking is an essential part of strategic management and planning; it is a facilitated method for considering a context and long-term future (Bryson, 2010; Ravetz & Miles, 2016). In a local government context, strategic thinking is often emphasised, especially regarding urban planning and urban sustainability. Strategic thinking enables local governments to look deeply into the future, assists in the formulation of the vision and goals of an entity or organisation, and helps in understanding the aims and effects of current decisions (Baumgartner & Korhonen, 2010; Bryson, 2010; Bryson et al., 2010; Ravetz & Miles, 2016; Zeemering, 2018).

Strategic thinking has been described as a synthesis when strategic planning as an analysis (Mintzberg, 1994). Bryson (2010) defined strategic thinking as 'thinking in context about how to pursue purposes or achieve goals'. It is essential to understand the context and the content of the handled topic and evaluate how it might or should be changed. Strategic thinking also involves evaluating what competencies and capabilities are needed and how they can be used to achieve planning purposes (Bryson, 2010). Strategic thinking is an integrated perspective that involves creativity and intuition (Mintzberg, 1994); therefore strategic thinking can be described as seeing from different perspectives and angles—seeing ahead and behind, down and below, beside and beyond, and ultimately seeing the strategy through (Mintzberg et al., 2005). This means that inspecting issues from different angles can help different details that are not visible from other directions to be seen and thus provide a holistic understanding and vision. Strategic thinking means considering different circumstances and complexities, since in complex situations the cause and effect are not always clearly related (Kurtz & Snowden, 2003). Strategic acting and strategic learning generally follow strategic thinking (Bryson, 2010).

Four different essential elements of strategic thinking for local governments emerged from the literature review. The first was thinking about the context and content; the second was developing long-term plans and strategies; the third concerned involving stakeholders; and the final one was knowledge gathering for strategy formulation (Baumgartner & Korhonen, 2010; Bryson, 2010; Zeemering, 2018). Understanding the context and content involves studying and evaluating both the operational environment and the topic. Strategic thinking supports the understanding of an organisation's mission and goals (Baumgartner & Korhonen, 2010; Bryson, 2010); for example, on the topic of sustainable development, it is essential to recognise the different dimensions of sustainability and understand the interconnection of these dimensions. Usually, three dimensions of sustainability are recognised: ecological, economic, and social (Echebarria et al., 2017). Sometimes cultural sustainability is added as a fourth dimension (Soini & Birkeland, 2014). Without understanding the interconnections of these dimensions, it is difficult to realise possible future developments or issues that need changing. Misunderstanding can also lead to problem displacement (Baumgartner & Korhonen, 2010), meaning that solving a current problem may cause new problems in related systems; for example, solving some economic problems of local government might cause severe and more costly social difficulties at a later date. Strategic thinking prevents this problem displacement by considering the context, related connections, and the far future.

This leads to another element of strategic thinking: long-term planning. Strategic thinking materialises in strategic planning. Bryson (2010) stated that strategic planning

can be considered partially routinized strategic thinking. Long-term strategies require the ability to consider the future with a longer perspective, including considering the influences of current decisions on the future. Long-term strategies for municipalities may aim 10 years ahead, depending on the context. Often, thinking and policymaking are limited by budgetary and election cycles, which are closely linked with the present (Kambites, 2010; Malekpour et al., 2017; van der Duin et al., 2009). This narrows the thinking and prevents future challenges and opportunities from being considered. A longer perspective helps to overcome such limitations and recognise future possibilities. Strategic thinking is also a method for considering emerging challenges and future uncertainties (Mintzberg et al., 2005), including recognising developing trends, new habits, or innovative technologies that could influence the future enormously. Strategic thinking also prepares for uncertainties and surprises, since short-term benefits might be disadvantageous in the long term. Long-term plans require keeping an open mind and considering issues from a wider perspective. Long-term planning is one element of strategic thinking, since a wider and longer perspective directs long-term planning.

Stakeholder involvement is the third important element of strategic thinking (Baumgartner & Korhonen, 2010; Ravetz & Miles, 2016; Zeemering, 2018). Stakeholders generally represent different groups, such as the business sector, academia, education, or civic organisations. Involving stakeholders in discussion and collective strategic thinking improves the quality and depth of thinking. Different stakeholder groups contribute different perspectives and wider understanding of discussed issues. Stakeholder involvement increases collaboration and results in co-learning and capacity development (Malekpour et al., 2017; Zeemering, 2018). Collaboration increases knowledge sharing and, therefore, co-learning between stakeholders. Learning, in turn, increases individuals' and organisations' capacity and ability to think and act strategically (Bradfield et al., 2016; Chermack & van der Merwe, 2003). Stakeholder involvement also works as a value-creation process (Zeemering, 2018). By involving stakeholders, value can be co-created for issues such as sustainable development, which is helpful for local governments. Collaboration and common values between stakeholders can provide local government with an opportunity to coordinate and direct other actors that are participating in sustainability work (Malekpour et al., 2017). Involving stakeholders also supports problem identification and idea generation (Hofstad & Torfing, 2015; Malekpour et al., 2017). Stakeholders have different practices, experiences, solutions, and ideas. Collaboration enables the integration of ideas that can lead to novel and better strategies and practices. Collaboration is also likely to be a suitable method for creating innovative solutions (Hofstad & Torfing, 2015).

Finally, strategic thinking includes knowledge gathering. Gathering and combining different types of knowledge, such as statistical data or knowledge about

practices and experiences, can increase understanding of current local circumstances. A wider knowledge base facilitates the assessment of risks and opportunities and directs discussions about desired future directions (Kazadi et al., 2016; Ratcliffe & Krawczyk, 2011; van der Duin et al., 2009). Knowledge gathering forms the basis of strategic thinking and planning and enables the creation of novel practices (Mintzberg et al., 2005; Ravetz & Miles, 2016). Systematic collection of relevant data enables an understanding of a current situation and identification of trends and emerging tendencies. A solid knowledge base is vital for strategic thinking (Mintzberg et al., 2005). It is important to be familiar with present situations in order to consider different possibilities for the future. This is the link between strategic thinking and futures knowledge; futures knowledge can be used in strategic thinking.

Strategic thinking is a future-oriented method of thinking, learning, planning, and acting. Strategic thinking increases organisational learning and knowledge management (Bryson, 2010; Bryson et al., 2010; Mintzberg et al., 2005; Ravetz & Miles, 2016). Strategy work and strategic thinking are needed in municipal organisations in Finland to foster the well-being and success of municipalities and their inhabitants (Einola & Kohtamäki, 2015; Kanninen & Akkila, 2015). With strategic thinking, it is easier to plan the future, use the futures knowledge, prepare for uncertainties, and benefit from emerging opportunities. Strategic thinking is a precondition for strategic foresight that supports organisations' preparedness for the future (Ravetz & Miles, 2016).

2.2   Governing the future

Governance of the future has emerged as a recent interest in geography (Anderson, 2010; Jones, 2019). States, regions, cities, and organisations try to govern the future for a variety of reasons: the future contains threats and therefore needs to be managed; knowing the future will ease decision-making and improve governance; and the future contains hope for a better life that can be pursued (Jones, 2019). To handle these motives, governance aims for anticipation, preparedness, precaution, and prevention (Anderson, 2010; Jones, 2019); therefore, the future becomes an object of governance for many states and organisations (Jones, 2019). These kinds of activities are well-known in socialist states that introduced long-term plans decades ago. In fact, the Soviet Union was aiming to be a world leader in forecasting and *prognostics* in the 1950s (Andersson, 2012; 1421), although its plans were somewhat mechanistic and sometimes failed to consider possible future developments. Western countries also used linear prognoses to consider, for example, population projections. Nevertheless, anticipatory actions (i.e. preventing, mitigating, adapting to, and preparing for the future) are nowadays 'an integral part

of liberal-democratic life' (Anderson, 2010). Various actions are taken in anticipation of the future, for the reasons mentioned previously.

Three different motivations for governing the future can be identified (Jones, 2019). Firstly, impending situations need governing. Future threats are diverse, but the most well-known are climate change, global population explosion, pollution, infectious diseases or pandemics (e.g. COVID-19), and the threat of terrorism (Anderson, 2010; Jones, 2019). These threats require advance action to prevent them materialising; they also justify many restrictions, rules, and actions, as we recently experienced with the COVID-19 pandemic, when severe restrictions on the movement of people were imposed globally. Likewise, the war on terrorism—or the threat of something happening to unbalance the oil market—have justified bombings in Iraq and Afghanistan (Massumi, 2007). Similarly, studies about ecological disaster and the threats posed by climate change have motivated states to endorse global agreements (United Nations, 2020) and strive for local sustainability (Echebarria et al., 2017; Swann & Deslatte, 2019).

The future can be thought of as something that is predictable, which in turn facilitates governance and improves society (Jones, 2019). This can be seen in the need to build models, scenarios, and projections to make the future more predictable and manageable. These scenario-building methods have been used for decades by companies and other organisations, and various methodologies have been developed over the years (Spaniol & Rowland, 2018). The need to manage the future also led to the emergence of cross-disciplinary futures studies in the 1960s. The concerns about ecological futures that emerged at that time strongly influenced futures studies and its assignments (Granjou et al., 2017). Nowadays, in futures studies as well as other disciplines, a vast and increasing amount of literature about planning and projecting for the future exists in local and central governments (Fuerth, 2009; Ratcliffe & Krawczyk, 2011; Ravetz, 2013; Van der Steen & Van Twist, 2013; Williamson, 2015).

The third normative aspect of governing the future relates to the aim of creating hope for a better and more equitable society. This perspective includes the notion that the present is complex and the future is open and contains many possibilities (Anderson, 2010; Jones, 2019). This is also a basic assumption of futures studies; the future is not predetermined, and our current actions and decisions shape the future, allowing for alternative futures (Bell, 2003; Sardar, 2010). Envisioning gives a strong promise about the future and is a tool for empowering people (Saunders & Jenkins, 2012). Similarly, due to the fear of uncertainty, the hope for a better society is a strong motive for governing the future (Jones, 2019; Saunders & Jenkins, 2012).

Anderson (2010) argued that anticipatory actions are taken through different 'styles, practices and logics'. Styles refer to different statements about the future and the possibilities of influencing it. Practices include acts that make the future visible,

such as calculating or imagining. Logic means a coherent way of influencing the future and justifying current actions taken towards it. The logics may be precaution, pre-emption, or preparedness, but perhaps also deterrence. The aim of all these logics is to protect valued life by defusing threats to that life (Anderson, 2010); for example, fighting terrorism justifies killing some people to protect others (Massumi, 2007). The 'presence' of the future influences actions and decisions in the present, since the future is the cause and justification for all current actions, which is somewhat paradoxical (Anderson, 2010).

The need to control the future manifests itself differently in different places (Jones, 2019), with local variations and different scales; therefore, it is important to study how the governance of the future is embedded in local governance in different localities (Jones & Ross, 2016). Finnish rural and urban municipalities have distinctive starting points for governance and planning. Governing the future can appear in the movement of people, goods, and ideas from one place to another (Jones, 2019), with active measures taken by policymakers catalysing different movements (Bok & Coe, 2017; Jenkins, 2017; Ortegel, 2017). In addition, governing the future can open up new kinds of engagement between state organisations and civil society when the aim is to develop a society that is more inclusive (Jones, 2019).

Different approaches and attitudes towards the future can influence human behaviour and, thus, governance (Hideg & Nováky, 2010; Kuosa & Basden, 2000). Accordingly, attitudes may be passive, reactive, pre-active, or proactive (Godet & Roubelat, 1996). People with passive attitudes are not thinking about the future or preparing for it. People with reactive attitudes start acting when they notice that something is happening or changing. Pre-active people anticipate possible changes in the future and prepare for them. Lastly, people with proactive attitudes take action before anything has happened, since their aim is to intervene in the future. In practice, different attitudes towards the future often overlap and mingle (Godet, 1994), thus affecting adopted strategies and interests in managing knowledge (Aven, 2015; Godet & Roubelat, 1996; Hideg & Nováky, 2010; Kuosa & Basden, 2000).

The ultimate aim of all anticipatory actions is to prevent adverse events happening (Anderson, 2010) and introduce positive changes (Granjou et al., 2017; Ravetz & Miles, 2016). This requires observation of the environment, knowledge gathering, and the ability to combine issues and understand connections. Future-oriented thinking and knowledge benefit all actions and are key capabilities for governments, enabling them to act in advance. Futures knowledge and strategic thinking are needed to govern the future and to ease decision-making (Habegger, 2010; Zeemering, 2018).

Knowledge is a vital tool and resource for governance, especially in modern knowledge-based societies, in which the capacity to create knowledge influences competence and competitiveness (Chen & Hassink, 2020; May & Perry, 2016). In a

knowledge-based society, knowledge should also be available for citizens (Laurini, 2020). In the quadruple helix model of innovation, knowledge and innovation production takes place in the context of a knowledge society (Carayannis et al., 2012; Carayannis & Campbell, 2009). The model focuses on four subsystems: academia, industry, government, and society, as represented by 'media- and culture-based public' (Carayannis & Campbell, 2009). According to the model, knowledge resources should be exchanged and circulated between and within these subsystems (Carayannis et al., 2012). This circulation allows knowledge and innovation generation that can provide solutions to the challenges that society encounters; however, the model's functionality depends on knowledge management and sharing in these different subsystems: 'The competitiveness and superiority of a knowledge system is highly determined by its adaptive capacity to combine and integrate different knowledge and innovation modes' (Carayannis & Campbell, 2009). In the more advanced quintuple helix model, the natural environment is the fifth subsystem that drives innovation and knowledge production (Carayannis et al., 2012).

The key concepts of this study were futures knowledge, strategic thinking, and futures knowledge mobility. To govern the future, future-oriented knowledge or futures knowledge is crucial. Futures knowledge guides decision-making and supports comprehensive understanding; therefore, creating and mobilising futures knowledge is vital. Strategic thinking is needed to evaluate and utilise futures knowledge. Knowledge is an important resource for societies (May & Perry, 2016) and gathering, producing, and managing knowledge is gaining importance. An important leadership challenge is how many organisations focus on the future instead of solving only current problems (Schoemaker, 2019). The next sections discuss knowledge-based decision-making, knowledge as a concept, and knowledge creation and management.

2.3   Knowledge based decision-making

Societies today are knowledge-based, with knowledge, innovation, and learning providing competitive advantages, but they face an increasingly uncertain future due to turbulent circumstances, including rapid technological development, environmental problems, changing political situations, and global challenges such as pandemics; hence, a broad knowledge base is necessary to support decision-making. Simultaneously, national and local governments are struggling to manage knowledge and utilise relevant knowledge for decision-making (Jalonen et al., 2012; Kaivo-oja et al., 2015; Laurini, 2020). May and Perry (2016: 3) argued that knowledge will be 'the resource that changes the structures of society, the economy and political worlds'. Knowledge sharing, learning from others, and reorganising and synthesising knowledge are vital for creating equitable and sustainable societies.

There has been an increasing emphasis on evidence-based policymaking in recent decades. Better evidence should lead to better policies, but can also lead to high expectations of policymakers, who should be able to assimilate and interpret knowledge from various fields (Davoudi, 2015; Legrand, 2012; Pawson et al., 2011). Evidence-based policy-making requires the accumulation of data and research findings and, at the same time, understanding that the evidence rarely results in certainty. There are always 'knowns' and 'unknowns' that need to be taken into consideration (Derbyshire, 2019; Pawson et al., 2011).

Achieving sustainability, equality, and equity are contemporary issues in democratic societies that require a broad knowledge base for decision-making. These issues are intertwined, and it is therefore vital to understand how one decision on a particular issue influences other issues (Baumgartner & Korhonen, 2010); for example, a decision to improve economic sustainability may decrease environmental sustainability or the equality of citizens. The decision and policies relating to these issues are made at the global, national, and local levels; hence, the knowledge and interaction of different actors are needed at all these levels. May and Perry (2016) claimed that the knowledge practices of cities exhibit a gap between the content of knowledge and the context in which it is applied: knowledge is produced in one place and practice is conducted in another, but the knowledge might not be available in the place of practice (Agrifoglio et al., 2020). Relational understanding is limited by different sectors and specialisations. The discussion and interaction between different actors shape knowledge and allow the 'what' and 'how' of knowledge to connect (May & Perry, 2016). It is also worth asking whose interests are served and whose claims supported. The inclusion of all groups of citizens opens up new perspectives and alternatives (Richard & David, 2018) for city development, as an alternative to the vision of the urban elite (May & Perry, 2016).

A broad knowledge base supports understanding of the background of issues and the interconnections between different issues and fields. In political decision-making, the benefits of diverse interest groups and different values often conflict. Broad knowledge bases assist in understanding different perspectives and help in evaluating the consequences of decisions and policies. Policies arise from the intersection of knowledge and practice and are often negotiated between different actors (Jenkins, 2017), but coordinating the interests of different groups requires a delicate balancing act.

Knowledge management is problematic and complex in many kinds of organisations (Agrifoglio et al., 2020). The knowledge and information flows are vast, and the necessity of acquiring and using knowledge is increasing. Organisations should be able to combine knowledge, understand what knowledge is relevant, and integrate knowledge into decision-making. The knowledge management problems in municipalities are often reflected in the provided services, thus leading to friction

between different sectors (Jalonen et al., 2012). Knowledge management applications are often problematic in the public sector due to organisational hierarchy and bureaucracy (Agrifoglio et al., 2020).

Cities compete with each other in many respects: knowledge becomes an instrument of competition and global positioning for cities striving for smartness, creativity, adaptive functions, connectedness, and competitiveness (May & Perry, 2016). Nevertheless, cities and governments also learn from each other and implement similar or modified ideas for policies that are used somewhere else. Policy transfer consequently relates to evidence-based policy-making (Legrand, 2012).

Davoudi (2015) argued that it would be better to recognise that policies are informed by evidence. It is important to improve the knowledge base, but a problem lies in the fact that evidence is often understood as comprising quantitative and measurable facts (Davoudi, 2015), which ignores the complexity of real-world problems that cannot be solved straightforwardly based on facts or statistics. Uncertain and complex problems require the understanding and combination of different types of knowledge and evidence, and strategic thinking and future-oriented knowledge support such decision-making.

In Finland, this requirement for evidence-based policy-making influenced the establishment of the new SRC funding instrument of the Academy of Finland (Mickwitz & Maijala, 2015; VNK, 2011). The SRC funds research that is future-oriented and supports decision-making. There is a specific requirement for funded projects, in that the co-creation and dissemination of knowledge should benefit knowledge mobility and, ultimately, policy-making.

2.4   What is knowledge?

If societies are knowledge-based, and knowledge is an important resource (Laurini, 2020; May & Perry, 2016) what is knowledge? Traditional epistemology often defines knowledge as 'justified true belief' (Nonaka, 2013; Nonaka & Takeuchi, 1995). The theory of knowledge creation claims that individuals play an important role; therefore, it is possible to consider knowledge as a personal belief that requires justification (Nonaka, 2013). Individuals' values are considered important because they influence personal beliefs and guide people's actions. According to Davoudi (2015), knowledge is always affected by values, making knowledge imperfect. Also, depending on the situations, practices, and contingencies, there may be differences in what is deemed to be 'knowledge' and who is reckoned an 'expert' (Davoudi, 2015). Knowledge is justified in social contexts by relevant individuals and groups (Hautala & Jauhiainen, 2014; Nonaka, 2013; Rutten, 2017), but this means that the validity of knowledge depends on mixed sources of norms, values, practices, and politics (Davoudi, 2015).

There are many understandings of knowledge. Knowledge can be perceived as an object, a process, a state of mind, a condition of having access to information, or a capability (Alavi & Leidner, 2001). Knowledge as an object means that knowledge can be stored, transferred, and deployed; owned by an organisation; or exist independently of individuals. This perception considers knowledge to be an external truth (Ibert, 2007). When knowledge is considered as a process, it includes the creation, sharing, and distribution of knowledge and the application of expertise (Alavi & Leidner, 2001). Knowledge as a state of mind emphasises individuals' capacity to expand and apply knowledge. According to the fourth view, knowledge is a condition of having access to information, which means that, in an organisation, people need to have easy access to a data repository or storage; however, this might not be adequate for exploiting knowledge (Boschma, 2005). The last perception—knowledge as a capability—means that knowledge has the potential to influence action. The latter four perceptions could be referred to as a *performative* approach to knowledge (Ibert, 2007) in which the verb 'knowing' is used to underpin an action that takes place in practice. Knowing is embedded in social action, and knowledge is constructed in interaction and practiced by communities and networks (Hautala, 2018; Ibert, 2007). Knowing is part of individuals' or groups' actions (Paraponaris & Sigal, 2015); for example, Davoudi (2015) argued that urban planning is 'a process of knowing and learning'. Knowledge is not merely a tool for planning, but knowledge and action are interlinked. Knowledge is a part of planners' actions and is inseparable from practice. Knowing in planning includes multiple forms of knowing: knowing what, knowing how, knowing to what end, and doing (Davoudi, 2015). The different forms of knowing are mixed and contribute to planners' wisdom or 'practical judgement'. Local context also influences knowing, since the practice of knowing is a dynamic process engaged in by planners and the community (Davoudi, 2015).

Knowledge is commonly perceived to have two dimensions: tacit and explicit (Alavi & Leidner, 2001; Ibert, 2007; Nonaka, 2013; Nonaka & Takeuchi, 1995). Tacit knowledge is embodied in individuals and is difficult to express or formalise. Explicit knowledge can also be called codified knowledge because it is easily transmittable and understandable in the form of codes (e.g. numbers) or language (Nonaka, 2013; Nonaka & Takeuchi, 1995). Tacit and explicit knowledge are intertwined and difficult to separate (Paraponaris & Sigal, 2015). There are other classifications of knowledge types, such as individual and social knowledge, or more pragmatic categories of best practices, know-how, and similar, which are considered useful in organisations (Alavi & Leidner, 2001).

It is vital to mobilise the tacit dimension of knowledge when creating new knowledge (Nonaka, 2013). In earlier studies, four different knowledge conversion processes were identified (Nonaka, 2013; Nonaka & Takeuchi, 1995) and new

knowledge was understood to be produced in the interaction between tacit and explicit knowledge. These four processes are socialisation (from tacit to tacit), externalisation (from tacit to explicit), internalisation (from explicit to tacit), and combination (from explicit to explicit). However, certain (social) preconditions facilitate these conversion processes; for example, mutual trust is required to exchange tacit knowledge (Ibert, 2007). Building trust takes time and staying in the same location supports the process. The knowledge creation process is discussed in the next section.

There is also a difference between knowledge and information. Knowledge is personalised and thus needs to be articulated so that others can interpret it (Alavi & Leidner, 2001). Information is a stream of messages, and knowledge is created from that stream and anchored by its owner in beliefs and commitments (Nonaka, 2013). Information is material for knowledge, and it is linked to human activity.

In geography, knowledge is studied in different spaces: territorial and relational (Hautala & Höyssä, 2017). In territorial thinking, a defined area in geographical space forms the boundaries for studying knowledge processes, and a phenomenon is studied in specific geographical areas. In relational thinking, space is considered a perspective and the study of knowledge-related processes focuses on actors and networks (Bathelt & Glückler, 2011; Hautala & Höyssä, 2017).

Hautala and Höyssä (2017) identified four knowledge rationales in human geography: economic, policy, empowerment, and methodological. The first rationale was the most popular and considered knowledge to be a resource. In the policy rationale, knowledge is an instrument to achieve better policies. The empowerment rationale sees knowledge as a personal interpretation that supports the creation of inclusive space to empower minorities or support the environment. In the final rationale, theories and methods are developed to understand knowledge creation processes.

Knowledge is also related to power in geography. Power relations influence knowledge production and delivery because the values and norms of powerful actors are often embraced (Lo & Chen, 2019; Ortegel, 2017). Knowledge can be a tool for using power and limiting the power of others. Power–knowledge relations contribute to policy discourses, thus relating knowledge to domination and exploitation as well as marginalisation and exclusion (Akıncı et al., 2020; O'Riordan et al., 2019).

In this research, all the rationales were employed, although the policy rationale was perhaps the strongest. Knowledge is vital for policymaking and must be utilised to govern the future. At the same time, the future is considered to be a possibility for a more just and equitable society, and the knowledge of minorities and non-professionals is valued. Knowledge can also be a resource enabling cities and other organisations to perform well. Lastly, there is an aspiration to understand knowledge-creation processes in different contexts.

2.5 Knowledge creation and knowledge management

Knowledge creation is commonly acknowledged as an interaction between individuals; thus, individuals or groups create knowledge (Hautala, 2018; Mitchell & Nicholas, 2006; Rutten, 2017). Individuals interpret knowledge in their own ways, and individuals may have different interpretations of the same original knowledge (Hautala, 2018). The previous experiences, knowledge, and mental models of individuals influence their interpretations of knowledge (Hautala, 2018; Mitchell & Nicholas, 2006; Rutten, 2017; Voros, 2008), which transform information into knowledge (Hautala, 2018). If an individual is unable to interpret information, the information is useless and it is impossible for it to become knowledge. Existing knowledge can be transformed into new knowledge by combining different knowledge components. This constructionist-cognitive view of knowledge creation (Hautala, 2018), in which knowledge is co-created but interpreted individually, was used for this study.

Knowledge is personal because individual experiences, ideas, and interpretations influence knowledge (Rutten, 2017; Voros, 2008); however, social interactions with other individuals shape personal knowledge. Knowledge creation occurs in a *social space,* and *social dynamics* are recognised as vital factors for the process (Rutten, 2017). A distinct social group forms a social space, with their relationships producing the space. Social space can be a professional or social network or, for example, a team in an organisation, and can be formed in a physical or virtual space. Social dynamics shape a 'shared frame of experience, interpretations and meanings' (Ibert, 2007; Rutten, 2017). Social dynamics include trust and values, together with norms and habits (Rutten, 2017). A safe environment in which a group of individuals feels comfortable supports knowledge creation, since mutual trust in a group facilitates exchanges of tacit knowledge (Ibert, 2007).

Since individuals play key roles in the process of knowledge creation at an organisational level (i.e. in organisational knowledge creation), attention should be focused on the dynamic and personal characteristics of knowledge (Nonaka, 2013). Organisational knowledge creation is usually goal oriented and more formal than individual knowledge creation (Nonaka, 2013; Rutten, 2017). For an organisation that aims to create knowledge and innovation, individual knowledge creation must be connected to organisational resources, such as equipment and financing (Rutten, 2017). Organisations can arrange events and situations for knowledge creation, but Informal groups are also important for organisational knowledge creation because individuals act within organisations (Chermack & van der Merwe, 2003; Nonaka, 2013). These individuals may include customers, other stakeholders, and even competitors (outside the formal organisation) who can contribute ideas and perspectives for new knowledge creation and innovation; for example, in the game

industry, any individuals outside an organisation can participate in its creative development processes and provide input to the company's innovation (Paraponaris & Sigal, 2015).

Knowledge creation can be accidental or intentional depending on circumstances (Rutten, 2017); for example, a workshop is a form of organised knowledge creation, in which participants are intentionally invited to collaborate but knowledge creation is still incidental. Accidental knowledge creation is often referred to as 'local buzz', with individuals happening to share the same space and incidentally creating knowledge (Bathelt et al., 2004; Rutten, 2017). Ongoing conversations between individuals in an organisation are part of intentional knowledge creation, but a discussion in a conference (about an ongoing conversation) might lead to accidental knowledge creation (Rutten, 2017). Organisations constantly produce new knowledge, but it is essential to estimate the value of knowledge for organisations or society. This requires a 'justification' process by which the value of knowledge is determined (Nonaka, 2013). In companies, managers are usually the people who assess the value of new knowledge, but in local governments officials or decision-makers may take that role.

Different understandings of knowledge influence knowledge management (Alavi & Leidner, 2001). Probably the most well-known knowledge management model is the socialisation, externalisation, combination, and internalisation (SECI) model, which concentrates on knowledge transfer practices (Nonaka & Takeuchi, 1995). Knowledge transfer became a strategic challenge for organisations, especially large companies, because it was considered to influence the success of the organisations (Paraponaris & Sigal, 2015). It is vital for companies to share experiences and facilitate the diffusion of technologies, but the transfer of knowledge itself is not the key issue; instead, the interaction and knowledge creation are important elements of knowledge management. Knowledge management has been developed and studied in the business sector, particularly, and is vital for all organisations. Snowden's Cynefin framework was first built to support companies' knowledge management in complex environments but has since been applied to national and organisational strategies (Kurtz & Snowden, 2003). Extensive literature exists regarding knowledge management, but relatively little attention has been paid to studying how the knowledge creation process can best be managed (Agrifoglio et al., 2020; Nonaka, 2013). In this research, the production of knowledge was understood as a process and the interest was in (and knowledge management should concentrate on) knowledge flows and related processes of knowledge creation, sharing, and distribution.

3   Methods and data

The data of this study were gathered and analysed using mixed methods. In mixed methods research, components of both qualitative and quantitative research approaches are combined to achieve breadth and depth of verification and understanding (Morgan, 2017). Mixed methods research has several definitions, but the main idea is to mix different approaches and research strategies to answer the same research question (Flick, 2018). The use of mixed methods helps to reduce biases that are often inherent in a single method. Mixed methods research has also been called a 'third paradigm' of research (Morgan, 2017). I gathered comprehensive quantitative and qualitative material and studied processes (e.g. knowledge creation and mobility) extensively using surveys, and intensively using interviews and participant observation. The use of mixed methods provided a more complete view of the topic. Mixed methods research can be conducted in several ways, and mixing can occur in all stages of the research from data collection to analysis (Morgan, 2017). In this research, for Article I, the quantitative data from the questionnaire was first analysed and, based on the results, the case studies were selected and thematic interviews were conducted. Ultimately, the results of the quantitative and qualitative data were compared and links between them were identified.

The use of mixed methods could also be called triangulation (Flick, 2018; Kaivo-oja, 2017; Morgan, 2017). Triangulation has the broad meaning of using different methods to confirm results, but it can also mean using multiple qualitative methods instead of combining qualitative and quantitative methods (Flick, 2018). The latter approach was used in this study, which combined the methods of participant observation and interviews for Article III. The goal of triangulation can be applying '(1) multiple sources of data, (2) multiple methods, (3) multiple theoretical perspectives, (4) multiple observers, and (5) multiple methodologies' (Flick, 2018; Kaivo-oja, 2017). Many of these applications were employed in this research, and underpinned the subsequent articles; for example, Article III was based on multiple observers observing participation in futures workshops. Table 1 presents the methods and data sources for the articles.

Table 1.   Different data sources and methods used.

	ARTICLE I	ARTICLE II	ARTICLE III	ARTICLE IV
Survey	194 answers	113 answers		
Interviews	6		25	23
Observation			4 + 3 observers	
Documents analysis	Municipal strategies			
Statistics	Immigration statistics			
Analysis	Descriptive statistics Thermal content analysis	Descriptive statistics	Thematic content analysis	Thematic content analysis

3.1   Questionnaires

Two extensive online (Webropol) surveys were used in this research, which were sent by email to all 311 municipalities in Finland. The first questionnaire targeted immigration coordinators or officials responsible for immigration issues, and the second targeted officials with strategic views in municipalities. These data sets were both gathered in collaboration with several researchers who worked for the URMI research project. I took part in the planning of the questionnaires and followed the data-gathering processes closely. The first questionnaire was distributed and analysed with the help of the research team at the University of Turku. The semi-structured questionnaire was sent in autumn 2016 and aimed to investigate the futures of immigration in various municipalities: how respondents anticipated the future of immigration and how the municipal strategies acknowledged immigration. After several reminders, the response rate for this survey was very good (63%).

The second questionnaire concentrated on sustainable development and was sent to the municipalities in spring 2017. This questionnaire was planned with researchers from different organisations who worked for the URMI project. Researchers from the Åbo Akademi University, Department of Social Sciences, were mainly responsible for the practicalities of conducting this survey. The survey questions investigated types of local government strategies, the timeframes of strategies, participation and knowledge utilisation in strategy formulation, and the prioritisation of sustainability. My interest was in discovering whether strategic thinking in the municipalities addressed sustainable development. Despite the reminder emails, the response rate for this survey was 36%, but the sample was representative, including different types of municipalities from different areas of the country.

Both of these questionnaires were analysed using IBM SPSS® software and primarily descriptive analysis, with some statistical testing. Descriptive statistics are helpful for explaining the basic features of data, so they were employed for the second survey to determine statistical significance using Pearson's chi-squared test to analyse the strength of the observed correlations between variables (e.g. how the local sustainability strategy correlated with long timeframes or stakeholder involvement in municipal planning).

3.2   Interviews

Interviewing is a common qualitative method used when the aim is to deepen and gain a comprehensive understanding of a topic rather than a broad overview (Lichtman, 2017; McDowell, 2018). Interviewing is 'an interpretative methodology' (McDowell, 2018) that helps a researcher to understand the underlying meanings and ideas behind an interviewee's comments (Lichtman, 2017). To achieve high quality in this kind of qualitative research, the validity, reliability, and rigour of the research methods must be considered (Tobin & Begley, 2004; Tracy, 2010). The rigour of interviews relates to the number and length of the interviews, the types of questions asked, and the level of transcription accuracy (Tracy, 2010), which should be adjusted for the purpose of the interview. Rigour increases the validity and reliability of a study, which can also be referred to as its goodness (Tobin & Begley, 2004).

Interviews underpinned three of the research articles (Articles I, III, and IV). The three sets of interviews differed because they had different aims. Thematic interviews are relatively informal discussions on predetermined themes. Thematic interviews facilitate the acquisition of knowledge on less well-known topics and seek to understand the meaning of the interviewees' words (Schorn, 2000). Thematic interviews with immigration coordinators (or the people responsible for the immigration issues) in the selected case municipalities provided the basis for the first article. The aim of these thematic and open-ended interviews was to deepen understanding of their immigration strategies and planning for pluralism. These interviews were conducted by phone to save resources and time because the interviewees were from different municipalities in different areas of Finland. The municipal officials were usually quite busy, meaning that they only had limited time for the discussion—one of them called me back saying that she only had 15 minutes before a meeting—hence, the interviews were restricted to 15–30 minutes and were not recorded, but notes were taken during the discussions. Thematic interviews were suitable for these discussions because the situations and practices in municipalities varied. Thematic interviews allowed each interviewee to explain their views and practices on immigration issues and their ideas about planning for pluralism (Schorn,

2000). These interviews were triangulated with the questionnaires for all the municipalities (Flick, 2018).

The second set of interviews, underpinning Article III, was conducted with 25 participants of a futures workshop. A futures workshop is a futures studies method to create alternative future visions or futures knowledge. The traditional futures workshop includes five phases: preparation, critique, imagination, implementation, and follow-up (Jungk & Müllert, 1987). The two workshops that I studied were organised by an URMI project partner, and their aim was to find the drivers of urbanisation and different paths to urbanised society in Finland. The aim of the interviews was to study futures knowledge creation during the workshops and knowledge mobility after the workshops. These telephone interviews were semi-structured and conducted in two phases: 12 interviews after a futures workshop in autumn 2016 and 13 after another futures workshop in autumn 2017. These interviewees were also living in different areas of Finland, representing municipalities, ministries, state agencies, companies, and associations. The semi-structured interviews allowed for deepening of the discussion and the asking of additional questions when needed, although the general structure was the same for all the interviews (Lichtman, 2017). A master's degree student, who was working as a research assistant for the URMI project in 2017, conducted seven of the interviews (with municipal officials) for use in her own thesis. The duration of each interview was slightly less than 30 minutes, and all interviews were recorded and transcribed. The interviews were triangulated with participant observation to deepen understanding of the knowledge creation and mobilisation processes (Flick, 2018).

For the fourth article, I conducted 23 interviews with experts. The interviewees represented three different actor groups (research policy actors, researchers, and public sector stakeholders) in the process of futures knowledge creation in the context of strategic research funding. The interviewees were selected from these three groups to discuss one thematic area of the funding relating to *Urbanising Society*. Four interviewees from the first group represented the research funding instrument (i.e. the SRC of the Academy of Finland). Two of them were staff members of the strategic unit of the Academy of Finland, responsible for practical issues regarding the funding instrument, and two were members of the SRC, which is the decision-making body. The second group included seven interviewees from the three funded research projects relating to the theme of *Urbanising Society*. The project consortium leaders and communication coordinators of all three projects were interviewed because they had a general overview of the project aims, activities, results, and stakeholder interactions. These interviewees were asked for the names of their key public sector stakeholders, who were then also invited to be interviewed. Twelve public sector stakeholders, who were collaborators and possible knowledge users of the research projects, belonged to this last group. The aim of the interviews

was to discover how the SRC funding instrument facilitated futures knowledge creation and knowledge mobility. The structure of the interviews was modified slightly for the different groups of interviewees because they had different roles in knowledge creation, mobility, and utilisation; however, the general semi-structured format was unchanged (Lichtman, 2017). These interviews were conducted face-to-face and were recorded and transcribed. Each interview generally lasted for one hour.

All the notes and transcribed interviews were analysed using thematic content analysis (Guest et al., 2012; Nowell et al., 2017). In this method, the data set is read through several times and key aspects and themes are identified. The method is inductive and aims to capture the complexities of meaning within the data (Guest et al., 2012). The NVivo program was used to manage the data analysis for the last two sets of interviews. Thematic content analysis can be used in different ways to analyse written qualitative data, such as (in this research) the interview transcripts, open-ended questionnaire responses, and observation notes (Brooks et al., 2015; Guest et al., 2012). The analysed texts had to be reread many times to enable the researchers to become familiar with the content and identify key themes (Guest et al., 2012; Nowell et al., 2017). The first step was familiarisation with the data, and discussion of the content with other researchers if there were many researchers involved in the analysis (Nowell et al., 2017). In the second step, initial codes were inductively created from the data, which required systematic review of the complete data sets (Braun & Clarke, 2019; Nowell et al., 2017). Codes related to interesting ideas and topics in the data. After the initial coding, it was possible to identify themes (Nowell et al., 2017). There are different conceptualisations of themes and how they can be identified (Braun & Clarke, 2019), however, I considered themes to be 'meaningful clusters of codes' (Brooks et al., 2015) that constituted 'interpretative stories about the data' (Braun & Clarke, 2019). In the next step, the themes were reviewed and necessary adjustments were made or subthemes created before the themes were defined and named (Nowell et al., 2017).

3.3 Participant observation

For the third research article, I conducted participant observation in two different futures workshops. Participant observation is a method of collecting data about people, processes, and cultures in qualitative research (Kawulich, 2005). In particular, the situations in which people interact with each other (e.g. in a workshop) can be conveniently studied with participant observation (Guest et al., 2017), facilitating a holistic understanding of a phenomena (Kawulich, 2005). Combining participant observation with other methods increased the validity of the research (Guest et al., 2017; Kawulich, 2005). The aim of the participant observation was to witness the knowledge creation process during the workshop and discover the

elements that influenced the process. Both futures workshops were full-day events organised by one of the URMI project partner organisations, and their aim was to identify the drivers of urbanisation and create scenarios for the future. The first workshop was arranged in autumn 2016 and the second a year later. Multiple observers in both events conducted the participant observation, thus contributing to triangulation (Flick, 2018). In the first workshop, I conducted the observation with two research assistants and one colleague, and in the second workshop, two research assistants conducted the observation with me. All the observers took part in the workshop as participants and were involved in group work with different groups. I formulated a semi-structured observation form to help the observers and guide the observation (Corbetta, 2011). Before the event, I also organised a small training session for the observers to ensure a common understanding of the features we were observing. The participant observation helped me to understand how the participants experienced the event, simultaneously increasing the validity of the results and complementing the post-workshop interviews (Kawulich, 2005). After the workshop, all the observers discussed the event and their experiences. The observation notes were analysed and related to the interview transcripts and the thematic content analysis (Guest et al., 2012; Nowell et al., 2017).

3.4   Document analysis and statistics

Document analysis is a process that produces empirical knowledge and develops understanding (Bowen, 2009). For Article I, the municipal strategy documents of the selected six case municipalities were studied profoundly with the aim of exploring how they accounted for immigration. Document analysis was combined with other methods as a means of triangulation, as it is commonly practiced (Bowen, 2009). The strategy documents were available online, and I read them carefully to identify all the statements or allusions relating to immigration. Document analysis is an iterative process whereby the meaningful parts of documents are first identified and then studied more carefully (Bowen, 2009). Elements of the thematic and content analysis were used in the document analysis, but the interpretative process was a vital part of the method (Bowen, 2009; Braun & Clarke, 2019). The general structure of the strategy documents was quite similar across all the municipalities, stating the vision, discussing the operational environment, and outlining the strategic goals and implementation plans. Firstly, I identified the sections that discussed immigration or immigrant-related issues, although these sections were rather limited and, in some cases, even missing from the document. Secondly, I studied these sections more closely to understand how immigration was addressed in the municipalities. The absence of immigration-related discussion also provided some information.

For the same article, national statistics (Tilastokeskus, 2016b) were used to calculate and determine the magnitude and significance of the immigration phenomenon. Since the national statistics did not cover all aspects of immigration, some new calculations were developed (e.g. the percentage growth of immigration during the last ten years) based on figures from Statistics Finland (Tilastokeskus, 2016b).

In relation to Article IV, several background documents concerning the founding of the SRC funding instrument were studied, including early reports and amended laws regarding the new instrument. These were not analysed in depth, but provided background knowledge for the study.

3.5 Research ethics

In this research, I followed the responsible conduct in research guidelines set by the Finnish National Board on Research Integrity. This meant that the research was conducted according to the principles of accuracy, honesty, and conscientiousness, which were applied to all phases of the data acquisition, research, evaluation, and publishing of the results.

The research participants (interviewees and questionnaire respondents) participated voluntarily in the research, and I informed them about the purpose of the study and the aim to publish related articles. Only for the participant observation were the participants not informed that their group work was being observed, so as not to distract them from the knowledge creation process. They knew, however, that I was a researcher doing a thesis on the topic. The observation investigated group, rather than individual, processes. I obtained the interviewees' consent to record the interviews. The anonymity of the research participants was maintained throughout the research although, in the case of research funding, the funded projects were named, which made it possible to identify the individuals working for the projects. The participants, who were all researchers, understood this. The interviewees (in this same case) also had the opportunity to read the article manuscript before it was submitted to the journal to ensure accuracy, but only a few took this opportunity.

All the research data were stored in electronic form in a secured cloud file provided by the university, and the backed-up data were stored on the university's network drive. Most of the data was accessible only by some URMI project employees and myself. All the research data will be preserved, along with other URMI research data, on the network drive and in the cloud file. The originality of this thesis has been checked in accordance with the University of Turku quality assurance system using the Turnitin OriginalityCheck service.

3.6   Research case studies

Article I. Immigration in the Strategies of Municipalities in Finland

In this first research case, using a questionnaire and interviews, I studied how Finnish local governments (i.e. municipalities) attempted to govern the increasing phenomenon of immigration. Finland depends on immigration to maintain a steady population, and it is the key element influencing the growth of cities (i.e. the number of inhabitants). In this case, I studied how municipalities' representatives anticipated changes in immigration and how the municipal strategies addressed the subject. Strategies are long-term tools for municipal operations, so they should account for relevant future issues and changes. I found that, despite the commonly expected increase in immigration, the strategies inadequately addressed the issue. The concept of planning for pluralism was also poorly understood. The municipalities in Finland faced four main challenges in their strategic planning of immigration: (1) negative attitudes towards immigration, (2) difficulties maintaining a local perspective in strategy formulation, (3) difficulties in achieving a long-term perspective, and (4) challenges regarding deeper consideration of planning for pluralism. With this research, I addressed the research gap between immigration and strategic urban planning in a Nordic context (Gressgård & Jensen 2016) and broadened the research scope from urban to semi-urban and rural municipalities.

Article II. Addressing Local Sustainability: Strategic Thinking and Sustainability Governance

In this research case, my aim was to investigate how local governments in Finland strategically addressed sustainability and its challenges. The local level is important for achieving sustainable development (Heinrichs & Schuster, 2017; Ji & Darnall, 2018), but sustainability is a long-term challenge that requires long-term thinking. Sustainability is a complex concept with different intertwining dimensions. This research was conducted in collaboration with three other researchers from the URMI project. We asked how municipalities strategically addressed sustainability, what kind of plans they had, who participated in strategy development, and how knowledge was used in this process. We found that only some municipalities had a separate document or plan for sustainable development. Those municipalities worked with longer timeframes and tended to emphasise the gathering of future-oriented data. These are the important elements of strategic thinking (Zeemering, 2018). The municipalities that were involved with the four elements of strategic thinking were also more likely to engage in sustainable development. Confirming

that strategic thinking is beneficial to the consideration of sustainability-related issues in municipalities was the major contribution of this study.

Article III. Knowledge Creation and Mobility in and through Futures Workshops

In this research, I studied how futures knowledge was created in the futures workshops and how the created knowledge was then mobilised and utilised by the workshop participants. Futures workshops are commonly used futures research methods for creating future-oriented knowledge that can be utilised in organisational decision-making (Eerola & Miles, 2011; Jungk & Müllert, 1987; Nygrén, 2019). The two studied futures workshops were organised by the URMI project. Both workshop topics considered the future of urbanising society in Finland, and I attended these workshops as a participant. My aim was to follow the knowledge creation process during these workshops, investigate the elements influencing the process, and find out what happened after the workshops. The data was gathered at two different time points and in two separate phases of knowledge creation: the collective construction phase and the individual interpretation phase. The results showed that participants individually interpreted the futures knowledge even though it was socially constructed. The individual positioning of this knowledge influenced knowledge utilisation. Some elements of the workshop, such as facilitation, had clear effects on the knowledge creation process. This research increased understanding of the concept of futures knowledge and futures knowledge creation and mobility processes. It also supported the improvement of the futures workshop method.

Article IV. Mobile Futures Knowledge: From Science Policy to Science and Policy

In this fourth research, I focused on futures knowledge mobility through a research funding instrument. The SRC of the Academy of Finland was founded in 2014 and is one approach for governing the future. This instrument funds high-quality scientific research, the results of which can be utilised in decision-making. The aim is to benefit national and local government organisations by providing them with a better knowledge base to understand future developments. In this research, I examined how futures knowledge is created through the SRC and mobilised between three actor groups: research policy actors, researchers, and public sector stakeholders. One important element of this SRC framework is the co-creation of knowledge by researchers and stakeholders. The results showed that co-creation can help stakeholders to use futures knowledge to create futures; however, the SRC's neoliberal logic of measuring the movements of knowledge seemed to result only in an illusion of knowledge transfer.

4 Results and discussion

4.1 Strategy documents as a method for governing the future

The first research question of this study was: how do cities and municipalities try to govern the future? This question was answered in Articles I and II, which both focused on municipalities. Finnish local governments are important actors in many respects and have considerable autonomy in decision-making (Heinrichs & Schuster, 2017; Ji & Darnall, 2018; Kanninen & Akkila, 2015). Strategies are a method for governing the future that all municipalities can use (Bryson, 2010; Bryson et al., 2010; Einola & Kohtamäki, 2015). Municipal strategies were discussed in both Articles I and II. Municipalities in Finland should have strategies that are future-oriented and support municipal planning in various fields. Municipal strategies are compulsory documents (required by the Local Government Act 2015), which might influence the willingness to use them properly. For some municipalities, as discussed in Article II, strategy seemed to be something that was developed with little thought or further commitment (Strandman, 2010); however, for others, strategy documents were important documents that provided guidance for the future. Larger municipalities often understand the importance of strategy (Articles I and II), and they had strategy units and staff dedicated to strategic planning. In larger municipalities, more time is needed to react to changes; therefore, anticipation and preparedness are vital. In this respect, strategies, and strategic planning and thinking, are useful methods for municipalities, but were not used actively by all municipalities or municipal actors (Einola & Kohtamäki, 2015); on the contrary, some small rural municipalities seemed to 'live in their own little worlds' without thinking about the future (or, at least, the long-term future). This was evident in both studies for Articles I and II.

For Article I, I studied the municipalities' opinions about immigration. The article found answers to the problem of anticipating changes in immigration and addressing immigration issues in municipal strategy. For Article I, the anticipated changes in immigration flows were first obtained from questionnaire respondents and the discussions then identified how these changes were addressed in municipal strategies. Futures knowledge benefits anticipation by taking into account past

development and current trends. The findings demonstrated that major differences existed between municipalities in their strategies and ways of approaching immigration. In general, the respondents expected immigration to increase in their municipalities. Immigration is typically concentrated in urban areas (Righard et al., 2015) and, thus, urban municipalities often included immigration in their strategies; nevertheless, many other municipalities overlooked immigration in their strategies. In general, the current number of immigrants in municipalities was influenced by the extent to which immigration was addressed in municipal strategies (Article I): the larger the number of immigrants, the more topical the issue in municipal strategy. Immigration is increasingly a local issue, which has attracted substantial interest in the literature (Bernt, 2019; Kühn, 2018); nevertheless, some municipalities largely ignored immigration (Article I). A similar strategy gap was also identified in earlier studies and explained as a dependence on national politics and company responsibilities, as well as supply politics (i.e. a focus on providing infrastructure and housing; Kühn, 2018). Cities and municipalities have limited opportunities to govern immigration flows because they are influenced by socioeconomic push and pull factors (Bernt, 2019; Kühn, 2018). Another political reason might be municipalities' reluctance to include immigration in strategies. For some political parties, immigration is a sensitive issue, and for others it is something that needs to be resisted. These attitudes are likely to lead to ignorance of the issue, since politically elected municipal councils are responsible for approving municipal strategies. Immigration could be seen as either a problem or a solution (Bernt, 2019; Kühn, 2018). If it was considered a problem, then it was more easily ignored in strategic planning, even though immigration is likely to increase substantially in municipalities (Article I). Overall, immigration was more frequently addressed in the strategies of urban municipalities than in those of semi-urban or rural municipalities in Finland. In urban municipalities, the significance of immigration and its effects on the future were understood (Fincher et al., 2014; Gressgård & Jensen, 2016).

According to the literature, municipal strategy documents can help municipalities to govern the future (Bryson, 2010; Bryson et al., 2010; Einola & Kohtamäki, 2015; Johnsen, 2015; van der Duin et al., 2009); however, only some municipalities used them for this purpose. For others, it was merely a necessary document that had little to do with practice (Articles I and II). Of course, municipalities have many other planning practices and documents that can be used to govern the future, but their focus is often quite narrow. The perspectives and decisions of municipalities are often short-sighted and disconnected from other topics (Ravetz & Miles, 2016), which seemed to be the case in Finland. The strategy documents should be more inclusive, holistic, visionary, and flexible, and municipalities should engage more stakeholders as a tool for governing the future

(Bryson, 2010; Ravetz & Miles, 2016; van der Duin et al., 2009; Zeemering, 2018). Next, I discuss planning for pluralism and the challenges for strategic planning in municipalities.

4.2 Planning for pluralism in municipalities and challenges for strategic planning

For Article I, I studied municipalities' perceptions of immigration and their approaches to planning it. The concept of planning for pluralism was used to describe planning for diversity and multiplicity in municipalities. Planning for pluralism refers to the inclusion and equity of all inhabitants (Gressgård & Jensen, 2016), which means including different perspectives in planning (Arkesteijn & Volker, 2013) and valuing the individual and social more than the political (McAuliffe & Rogers, 2018, 2020). The findings of Article I showed that, in Finnish municipalities, planning for pluralism was poorly understood and handled. Often, the idea was restricted to the level of social mixing in housing or the fostering of social cohesion in cities. It was quite uncommon to involve immigrants in any planning processes that concerned them or considered their views (Gressgård & Jensen, 2016; Maununaho, 2016). For some smaller rural and semi-urban municipalities, planning for pluralism seemed unnecessary due to the small number of immigrants; however, in other municipalities, private enterprises in need of labour were key agents in immigration issues. This was an example of immigration being considered to be companies' responsibility, with the municipality largely ignoring the issue (Kühn, 2018). In some municipalities, local inhabitants initiated activities for the integration of immigrants. Fincher and colleagues (2014: 47) stated that planning for pluralism is a joint task of local inhabitants and municipal planners, which was supported by the findings for Article I. When locals were actively involved in refugee activities, all the parties (inhabitants, immigrants, and officials) felt that the life in the municipality was enriched. Planning for pluralism should be a part of municipal processes because pluralism is increasing in Finland and all planning policies regarding populations should acknowledge multiculturalism. When municipal planners and inhabitants work together, the results are generally more innovative and improve the lives of all inhabitants (Fincher et al., 2014; Hofstad & Torfing, 2015). Smaller municipalities might have some advantage in this, because it can be easier to involve people in smaller communities.

The four main strategic planning challenges for immigration in Finnish municipalities were identified in Article I. The first challenge related to attitudes, since some decision-makers had negative attitudes towards immigrants. If the topic is ignored and despised, it is impossible to plan for pluralism. A similar problem was identified in earlier studies regarding immigration, which found immigration to be

considered a problem (Bernt, 2019; Kühn, 2018). The second challenge related to maintaining a local perspective in strategic planning. Often, strategies were mechanistically constructed and local characteristics were not considered, despite municipalities having different socioeconomic contexts and diverse resources.

A lack of future orientation was the third challenge, which was also acknowledged in the literature as a common problem for public organisations (Ravetz & Miles, 2016; van der Duin et al., 2009). Although the municipalities in Finland all had strategies, their decisions were often short-sighted regarding immigration issues, which may lead to unnecessary future costs (Malecki, 2014; Malekpour et al., 2017). In particular, smaller municipalities seemed to 'live in the moment' with little consideration of the future. Larger and urban municipalities used strategies and strategic thinking more often, but their strategies were sometimes inflexible and mechanistic (Möttönen & Kettunen, 2015) despite strategic thinking and planning for the future being important for public organisations (Bryson, 2010).

The last challenge was developing a profound understanding of planning for pluralism. This would mean avoiding generalisations about social groups based on their ethnicity and involving immigrants in strategic planning (Fincher et al., 2014; Gressgård & Jensen, 2016; McAuliffe & Rogers, 2020). Better understanding of pluralism considers various perspectives and benefits strategic thinking and planning. Accordingly, involving different stakeholder groups in discussions would be a new and better approach for planning and strategy formulation (Fincher et al., 2014; Rijkens-Klomp & Van Der Duin, 2014). Combining different perspectives and understandings would develop a wider, holistic view and therefore benefit decision-making and governance of the future.

These challenges, reflected in Articles I and II, indicated that strategic thinking was lacking in many municipalities, and the role of strategic thinking should be emphasised (Bryson, 2010; Mintzberg et al., 2005). Similar challenges for strategic planning for immigration could be seen in other areas of strategic planning (Burrows & Gnad, 2018; Zeemering, 2018) and, in the next section, I discuss the connection between strategic thinking and the management of sustainable development in municipalities.

4.3   Strategic thinking guiding a sustainable future

In addition to strategies, strategic thinking is necessary for governing the future (Bryson, 2010; Burrows & Gnad, 2018; Mintzberg et al., 2005; Zeemering, 2018). Strategic thinking has different elements, and strategy documents are only one of these elements. Understanding the context is another element and a precondition for strategic thinking (Baumgartner & Korhonen, 2010; Bryson, 2010; Mintzberg et al., 2005). To govern particular issues effectively, the issues must be

understood, and this can best be achieved by gathering knowledge and involving stakeholders (Baumgartner & Korhonen, 2010; Bryson, 2010; Zeemering, 2018). In Article II, the connection between strategic thinking and the achievement of sustainable development was evident. The results showed that municipalities that engaged with the elements of strategic thinking were more likely to address sustainability issues.

For Article II, two groups of municipalities were compared with respect to the elements of strategic thinking. One group consisted of municipalities that had distinct sustainable development plans or strategies (25%), and the other group comprised municipalities that did not (75%). The main finding of the study was that municipalities that had sustainable development strategies or plans looked further into the future and were keener to gather relevant future-oriented data. Nevertheless, the involvement of stakeholders in the strategy development process or the understanding of sustainability did not differ significantly between groups. This finding demonstrated that, in most cases, local development strategies in Finland were still top-down practices, which challenged a broad understanding of sustainability by limiting the variety of viewpoints (Zeemering, 2018). Furthermore, the local economic requirements in Finland appeared to hamper engagement with the broader sustainability agenda by closing down and shortening perceptions. The economic situation was a major factor behind different decisions and sometimes limited the discussion about long-term benefits; hence, local sustainability efforts often focused on reducing costs, which has only short-term benefits (Ji & Darnall, 2018).

The argument elaborated in Article II was that the presence, timeframe, method, and quality of strategic thinking may indicate local governments' contributions to sustainability. Sustainability is a long-term issue that extends to future generations and therefore requires anticipation of contextual risks and opportunities (Baumgartner & Korhonen, 2010; Schmidthuber & Wiener, 2018; Zeemering, 2018). Article II demonstrated that strategic thinking was beneficial for municipalities' sustainable development ambitions. In addition to strategy formulation and knowledge gathering, the involvement of stakeholders would benefit the understanding of sustainability (Schmidthuber & Wiener, 2018), but stakeholder involvement was poorly supported in most of the municipalities. Sustainability is a broad topic that is relevant for all municipal sectors; therefore, a broad understanding of the context is vital, including the various perspectives of different stakeholder groups (Hawkins et al., 2016; Schmidthuber & Wiener, 2018; Zeemering, 2018). Strategic thinking benefits cross-sectional co-operation and the achievement of sustainability goals, but goes beyond mere strategy formulation (Bryson, 2010; Bryson et al., 2010; Mintzberg, 1994; Mintzberg et al., 2005).

These results demonstrated that strategic thinking is beneficial for governing the future, but municipalities experienced some challenges in utilising it. Strategic thinking should play a greater role in the public sector to secure a sustainable future (Baumgartner & Korhonen, 2010; Zeemering, 2018). Next, I present the results of studies regarding futures knowledge that are vital for governing the future.

4.4   Futures knowledge supporting planning and decision-making

The second question of this research was: how is futures knowledge created and utilised to govern the future? Knowledge gathering is an element of strategic thinking, and knowledge is created by gathering and combining different types of knowledge (Bell, 2003; Malaska, 2000; Masini, 2006). Futures knowledge aids in understanding the interconnections between issues and forms a holistic picture, thereby supporting decision-making (van Dorsser et al., 2018; Wilkinson, 2016); hence, futures knowledge was discussed in all the articles at some level, but more profoundly in Articles III and IV. For Article II, knowledge gathering as a municipal behaviour was studied as an element of strategic thinking that can lead to futures knowledge creation. For Article III, the futures knowledge concept and creation process was studied, and in Article IV, the focus was on futures knowledge creation through a research funding instrument.

Article III addressed in more detail the process of futures knowledge creation in a futures workshop, which is a futures research method. The study showed that futures knowledge is socially constructed but individually interpreted (Dufva & Ahlqvist, 2015; Fuller & Loogma, 2009; Voros, 2008). Futures knowledge creation involves phases of interaction, integration, and interpretation/sensemaking (Bowman, 2016; Chermack & van der Merwe, 2003; Mitchell & Nicholas, 2006). In addition, social dynamics are important for the knowledge creation process and can either benefit or hinder it (Rutten, 2017). Workshop participants agreed that futures knowledge was created during the group discussions. Futures knowledge rests on agreement about plausible future changes (Article III), but it always involves personal experience (Voros, 2008): individual interpretation is necessary before futures knowledge can be utilised (Bowman, 2016; Hautala, 2018). After the workshop, participants had different perceptions of the created knowledge and how they could use it. This was explained by the fact that previous experiences and mental models influenced the interpretation and absorption of new knowledge (Baškarada et al., 2016; Bowman, 2016; Chermack & van der Merwe, 2003; Hautala, 2018; Voros, 2008).

The findings of the study also demonstrated that some workshop factors influenced the knowledge creation process (Article III). The five factors that

emerged from the analysis were like those discussed in the literature: the structure of the workshop, facilitation, participant selection, possible distractions, and individual capabilities. Too strict a structure can hinder creativity and therefore futures knowledge creation (van Vliet et al., 2012). Adequate facilitation supports workshop participants in the knowledge creation process (Wright & Cairns, 2020) and broad participant selection increases the interaction of various perspectives that stimulate knowledge creation (Nygrén, 2019). Distractions such as noise can hamper knowledge creation (Article III) and, of course, individual capabilities influence how individuals engage with the process and how much knowledge they can absorb (Baškarada et al., 2016).

For Article IV, the research studied the process of futures knowledge creation through a new research funding instrument: the SRC of the Academy of Finland. The SRC was founded to benefit futures knowledge mobilisation and allow research-based futures knowledge to be used in decision-making (Mickwitz & Maijala, 2015). Accordingly, founding the SRC was an attempt to govern the future. The SRC framework, at its best, requires futures knowledge to be co-created through close interaction between researchers and public sector stakeholders. These groups have different knowledge bases or 'frames of resonance', which makes then cognitively distant (Boschma, 2005; Kębłowski & Bassens, 2018) and close interaction is therefore needed to support mutual understanding (Kębłowski & Bassens, 2018), which was confirmed by the study. However, the study showed that it can be demanding for public sector stakeholders to use futures knowledge created in research projects, since it may be difficult to understand or apply in practice. One element influencing this was the different understandings and time perspectives of researchers and stakeholders regarding futures knowledge. Close interaction and the co-creation of futures knowledge support individual reinterpretations of knowledge and are therefore beneficial for knowledge utilisation.

Articles III and IV contributed to discussions about the concept of futures knowledge and how it can be created and possibly utilised. The articles demonstrated that futures knowledge is co-created but individually interpreted, which is natural since the co-created futures knowledge can be used for different purposes (Baškarada et al., 2016; Boschma, 2005; Kębłowski & Bassens, 2018). Futures knowledge can be a tool for decision-making and planning (Ravetz & Miles, 2016; Schmidt, 2015; van der Duin et al., 2009; van Dorsser et al., 2018), providing guidance on choosing between different options because decisions made today influence the future. The results of Article III can also be utilised to improve the futures workshop method. Next, I discuss the results for futures knowledge mobility presented in Articles III and IV.

4.5   Future knowledge mobility

The last question of this research was: how does the mobility of futures knowledge influence the governance of the future? The mobility of futures knowledge was the subject, particularly, of Articles III and IV. Futures knowledge mobility allows knowledge to be used by different actors, and Article III explored mobility following the futures workshops. Futures knowledge became mobile through individuals and processes. Individuals use futures knowledge in their actions and decisions, and futures knowledge can therefore influence their organisations (Chermack & van der Merwe, 2003). In futures knowledge mobilisation, knowledge is always reinterpreted in a new context and by new individuals (Article III).

Different channels were used to mobilise the futures knowledge (Alavi & Leidner, 2001). Personal channels in face-to-face situations were commonly used and described as the most efficient way of mobilising knowledge, which was confirmed by the literature (Paraponaris & Sigal, 2015). Formal (e.g. meeting or training) and informal (e.g. lunch or coffee break discussion) channels were also used. The findings for Article III demonstrated the need for boundary objects (Bowman, 2016), which could be, for example, written documents about workshop results or scenarios. Boundary objects help to cross the boundaries that often exist in organisations (Paraponaris & Sigal, 2015). Many workshop participants noted the absence of this kind of document and claimed that it would have helped them to explain their ideas to their colleagues or superiors. Boundary objects benefit knowledge mobilisation because these objects support the creation of a common understanding (Bowman, 2016).

Article IV discussed futures knowledge mobility between different groups (research policy actors, researchers, and public sector stakeholders) in relation to the framework for SRC funding. Three different phases for mobilisation were identified in the study. In the first phase, futures knowledge was mobilised in the form of research themes from research policy actors to researchers and then to the stakeholders of the research projects. In this phase, the research themes were interpreted to form the basis of research projects, since knowledge mobility always involves the interpretation or mutation of knowledge (Mccann & Ward, 2012; Peck, 2011; Peck & Theodore, 2010) In the second phase, futures knowledge was mobilised through co-creation processes between researchers and stakeholders. Since these groups have different knowledge bases, it is vital to create a common understanding of needed futures knowledge between them (Boschma, 2005; Kębłowski & Bassens, 2018). The mobilisation started with co-creation and continued through the different processes of information and futures knowledge mobility between researchers and stakeholders (Jenkins, 2017; Mccann & Ward, 2012; Peck & Theodore, 2010). In the third phase, futures knowledge was mobilised from researchers for stakeholders to utilise; however,

in this phase, immobility problems often occurred. Immobilisation relates to an inability to interpret knowledge or information (Jenkins, 2017), meaning that interpretation and reinterpretation of knowledge are necessary before another group can utilise the knowledge. Different values, attitudes, and interests can prevent knowledge from moving (Concu et al., 2020; Niu & Ragasa, 2018). In the study, the limited time participants spent together, improper timing of knowledge sharing, or lack of ability to interpret the knowledge were major reasons for knowledge immobility.

In addition, a 'neoliberal illusion of knowledge transfer' was identified in Article IV. The SRC framework requires a research project to measure all the dissemination events and messages in related social media. A vast number of dissemination events may create a perception of enormous knowledge transfer, but without interpretation, knowledge cannot be utilised; thus, quantifying the dissemination may lead to an illusion of knowledge transfer and actually prevent knowledge from moving (Leathwood & Read, 2013; Moore et al., 2011).

Another finding in Article IV was that the future orientation of the three actor groups varied. The future perspective was shortest in the public sector stakeholder group and longest in the researcher group. This variation created challenges for knowledge mobilisation when the public sector stakeholders only considered the near future instead of taking a longer-term perspective. Futures knowledge based a longer-term perspective was sometimes considered useless or irrelevant for short-term decision-making. This short-term perspective has been acknowledged as challenging in public sector decision-making (Ravetz & Miles, 2016; van der Duin et al., 2009; van Dorsser et al., 2018). It is also problematic for the idea of governing the future, which requires a long-term perspective to be considered (Anderson, 2010; Granjou et al., 2017; Jones, 2019).

The study for Article IV demonstrated that the co-creation of futures knowledge is beneficial for knowledge mobility. During the co-creation process, individuals interpreted the knowledge, meaning that it was easier to utilise and share later. In addition, the study recognised that public sector stakeholders need support in interpreting the knowledge in their own contexts to enable them to utilise it effectively; therefore, supporting knowledge co-creation and the knowledge interpretation process in the SRC framework would benefit knowledge mobility.

The results showed that futures knowledge mobility has an essential influence on the governance of the future. The mobility of futures knowledge includes the interpretation of futures knowledge in a new context (Ahlqvist & Uotila, 2020; Jenkins, 2017); thus, futures knowledge can be vital for different actors (van Dorsser et al., 2018). Immobility of futures knowledge hinders knowledge usability and therefore future-oriented decision-making. The findings of Article IV contributed to

the knowledge transfer and policy mobility literature by conceptualising knowledge; acknowledging the processes of transfer, mobility, and co-creation; and introducing the concept of futures knowledge.

5   Conclusion

The purpose of this research was to study how futures knowledge was created and utilised in the context of urbanising society. Another aim was to investigate the desire to govern the future at different levels of public administration in Finland. The findings from this research made several contributions to the current literature. Firstly, they contributed to our understanding of the concept of futures knowledge by discussing the different forms of futures knowledge, futures knowledge creation, and the mobilisation of futures knowledge. Secondly, they combined strategic thinking concepts with futures knowledge, which are usually discussed in different spheres of the literature. Thirdly, the research confirmed that strategic thinking is beneficial for governing the future because it is a method that supports long-term thinking and acting. Lastly, the research provided deeper insight into the idea of governing the future in public administration in Finland. I examined municipal practices for the governance of the future, and I also studied the strategic research funding that is steering the research according to the wishes of the Government of Finland. These have important implications for both research and future governance.

Governing the future is a concern at different levels. The results of this research showed that, at the national, regional, and municipal levels in Finland, there are ambitions to govern the future. Cities, regional councils, and the national government are taking part in futures work. The urbanisation of society brings challenges as well opportunities that require anticipation and preparedness. This was indicated in all four research articles and was observed at the local, regional, and national levels. Similarly, futures knowledge creation was encouraged by different actors at the state, regional, and municipal levels. An indication of this was the establishment of the SRC funding instrument to benefit decision-making and prepare for the future, clearly with the aim of governing the future. Next, I summarise the answers to the three research questions that underpinned this research.

How do cities and municipalities try to govern the future?

Cities and municipalities in Finland have ambitions to govern the future, but most of them lack appropriate tools. Cities, meaning larger urban municipalities, have better resources for governing the future, but also greater pressure to do so. Cities have

more challenges due to the larger number of inhabitants and wider public sector services and administration. The administration and services are divided into different sectors that often have difficulty communicating and exchanging ideas. Anticipation and preparedness are important for large organisations, such as municipalities, to avoid major challenges and pitfalls. Smaller municipalities might be more agile in their decision-making and reactions to sudden changes, but anticipation would benefit them as well. Smaller municipalities often have fewer resources for knowledge-based decision-making.

A municipal strategy is a method for governing the future; however, strategies were often formulated mechanistically and local characteristics, challenges, and opportunities were disregarded. The reasons for this seemed to be difficulties in understanding strategy tools, a lack of resources to evaluate forthcoming challenges, and too-short future outlooks. Bigger cities seemed to better understand the value of having a strategy, and their strategies addressed several forthcoming challenges and embraced a longer-range perspective. Naturally, there were exceptions to this tendency, with some smaller municipalities performing well in strategy formulation.

Futures knowledge and strategic thinking are vital ingredients of strategy formulation; however, these elements seemed to be lacking for most of the municipalities. This was exemplified in Article II, which linked strategic thinking with the achievement of sustainable development. The majority of the municipalities inadequately gathered knowledge for the purpose of decision-making. Similarly, there seemed to be difficulties in understanding the context of handled issues, such as the complexity of sustainable development and the interlinkages between its different dimensions. Strategy formulation was often a top-down management process that rarely considered stakeholder perspectives.

How can futures knowledge be created and utilised to govern the future?

Article III discussed futures knowledge creation and utilisation in relation to futures workshops, and Article IV addressed the SRC funding framework. As stated previously, futures knowledge creation is encouraged at the national, regional, and local levels. Futures knowledge is created socially through interaction and by combining diverse forms of knowledge, evaluating them critically, and applying values and imagination. Since knowledge is always individually interpreted and modified according to individual mental models, futures knowledge can be considered a personal belief justified by a social process (Article III).

Futures knowledge is created in various contexts and situations, and all kinds of organisations demand futures knowledge: governments, ministries, regional councils, cities, and municipalities have their own processes for creating and acquiring futures knowledge. Some organisations are more eager to engage in such

processes and develop their own methods and approaches for it, although others lack the necessary tools or resources. Futures research methods, such as scenario development or futures workshops, are commonly recognised methods for producing futures knowledge.

In a workshop context, participant diversity, workshop structure, and facilitation can significantly influence the knowledge creation process, either positively by enhancing the process or negatively by hindering it. Naturally, distractions can also hamper the knowledge creation process, since individual capabilities influence knowledge creation and interpretation. Previous knowledge and experience, and the capability to absorb new knowledge, formulate individual mental models and understanding of the new knowledge.

The findings of this research showed that only some municipalities were able to acquire futures knowledge and those were usually larger urban municipalities (in cities) that had greater resources. At the regional level, futures knowledge was produced to benefit regional development and planning, which was evident from the interviews. An example at the national level was SRC funding, which aims to encourage the production of futures knowledge for the benefit of decision-making at both the national and local levels. The Finnish Government approves the themes for research funding calls, thus directing the futures knowledge created by research projects.

The findings of this research indicated that, in general, active futures knowledge utilisation was quite uncommon in municipalities. At the municipal level, even thinking about the long-term future seemed to require considerable effort, let alone actively creating and utilising futures knowledge. The regional and national levels might have more opportunities to use futures knowledge, but this is still an unusual practice. Since futures knowledge is created in a social context but individually interpreted, individuals participating in futures knowledge creation processes can utilise futures knowledge in their own contexts, and individual beliefs and understandings of futures knowledge shape and influence organisational decision-making (Chermack & van der Merwe, 2003).

How does the mobility of futures knowledge influence the governance of the future?

Futures knowledge becomes mobile when individuals take part in knowledge creation, as proved by the observation of workshop participants. Individuals mobilise futures knowledge in their own workplaces and contexts and can also influence the people they are in contact with. The mobilisation of knowledge also involves its transformation, and futures knowledge is therefore shaped by individual understandings and the context in which it is mobilised.

The mobility of futures knowledge allows knowledge to be utilised in different places and contexts, shaping decision-making in different locations; therefore, the governance of the future depends on the mobility of futures knowledge. This was evidenced, for example, in the context of the inter-organisational futures workshops studied in relation to Article III. The futures knowledge created during the workshops travelled with the individuals to different locations and contexts. The individuals then discussed the workshop outcomes with their colleagues and other parties, thus transforming the knowledge according to new contexts. In some cases, it seemed that the futures knowledge provided a novel perspective and opened up discussion in municipalities or other organisations, influencing their plans and strategies (Article III). Similarly, in a wider national context, futures knowledge created and mobilised in accordance with the SRC framework aimed to improve decision-making at different levels. The futures knowledge created by research projects was mobilised and integrated into the practices of public sector stakeholders; hence, the mobility of futures knowledge contributed to enhancing the governance of the future.

Taken together, these findings suggest that governing the future is indeed on the agenda in Finland and futures knowledge, futures knowledge mobility, and strategic thinking are important mechanisms for achieving this. Organisational decision-making at different levels needs many improvements to benefit from such mechanisms. Firstly, it is necessary to understand that considering and evaluating the future and potential future developments is beneficial for decision-making but requires active practices of knowledge gathering, combination, and evaluation. A wide knowledge base supports decision-making and choices between different options. Secondly, involving stakeholders is constructive and can provide a much wider perspective on any issue. Discussions with stakeholders and hearing their opinions and ideas would increase the knowledge base and lead to innovation and better governance. Thirdly, knowledge mobility and the interpretation of knowledge in new contexts are vital processes for knowledge creation and utilisation. When futures knowledge is mobilised and interpreted in a new context, it can support future oriented decision-making.

However, several obstacles hinder the above-mentioned improvements in organisations, including a lack of resources and abilities. The wish to govern the future is inadequate if there is no understanding of what to do, or a shortage of personnel or money, even though governing the future might help to develop these necessary resources. Other obstacles might be ignorance or reluctance to handle difficult issues. Whatever the reasons, the findings of this study showed that a lack of appropriate tools was quite common among the organisations. Knowledge utilisation and mobility are uncertain processes and depend on individuals' capabilities and values. Furthermore, knowledge creation and utilisation require social understanding (i.e. understanding of others), which is vital in all organisations, especially public ones.

Acknowledgements

There have been also numerous research assistants working for URMI, which has eased my work in many ways. Research assistants have helped me in transcribing some of my interviews, drawing figures, inserting survey data, and some have even conducted participant observation with me. Thank you Lotte, Lari, Johanna, Jani, Pekka, Aleksi, Justus, Roosa, Suvi, Olli, Tommi, Petteri and others that I may have forgotten to mention. It has been a pleasure to work with such skilful geography students.

Finland Futures Research Centre was the place where my interest and aspiration toward research and academic work arouse. I am grateful that I was able to work there almost five years and have the most wonderful colleagues. Director Juha Kaskinen was always supportive and encouraged me to start PhD studies. Anne-Mari Vilola, Anne Arvonen, Riikka Saarimaa, Ira Ahokas, Leena Jokinen, Johanna Ollila, Sari Miettinen and Johanna Kärki thank you for being cheerful and compassionate colleagues and friends. Thank you Olli Hietanen, Timo Nurmi, Ville Lauttamäki, Maria Höyssä, Hanna-Kaisa Aalto, Sari Söderlund, Leena-Maija Lauren and all the others for invigorating discussions and fresh ideas. In addition, the Tampere office staff has an important place in my mind. Jarmo Vehmas, Jyrki Luukkanen, Jari Kaivo-oja and Burkhard Aufferman I am grateful of the possibility to participate in your fascinating research projects and related journeys to Beijing, Brussels, Barcelona and Naples. Thank you Jari also for being my second supervisor and maintaining my connection to futures research. I was keen on sustaining the lively connection with futures research after starting to work in a new department and therefore I joined the research seminar for PhD student of futures research. I am grateful to Professor Petri Tapio that he let me join the research seminars and provided different perspectives to my study. Professor Toni Ahlqvist thank you for discussions and advises. Of course, I need to acknowledge all the PhD students of futures research. Thank you for discussions, interesting findings and inspiring presentations Matti, Nina, Marjukka, Sanna and others.

From the first day, the Department of Geography and Geology has provided a comfortable surrounding for me to conduct my research. I want to thank all the staff members for pleasant and supporting atmosphere. The morning coffee/tea moments have been an important source of inspiration and good mood. Special tanks for Leena Laurila for solving problems with devises and lunch companionship, Sanna Mäki for wise words and support, Johanna Hautala for co-authorship and possibility to help you in courses, Lauri Hooli for encouraging words. All the professors, lectures and researchers have provided some important moments to my daily work and I want to thank you for that. Thank you also pre-examiners Professor Emeritus Markku Tykkyläinen and Professor Oliver Ibert for your perceptive and bright, yet encouraging comments.

Similarly, all the fellow PhD students in geography have had a vital role during my journey and it has been rewarding to meet people in different phases of their PhD processes. Rebekka, Elina, Riina, Pauliina, Sara, Virve, Salla, Tikli, Linnea, Jukka, Timo, Lasse, Siiri, Roosa, Thomas, Rima, Umer, Joni, Jouni, Mia, Johanna and Meeli, I want to thank you all for good discussions and mutual support.

Finally, I want to thank my friends and family. You have kept me busy with other things and thus provided a natural balance between the PhD thesis and other life. I have aimed not to work in the evenings and during weekends; instead I have spent the time with my family and friends. This choice has proven to be excellent and has helped to go forward with research. Thank you, my husband Mikko and our children Oskari, Tuomas and Veera, my mother, my brother Juha and Heli and Aarre. My gratitude also goes to Tuija, my Scout friends Sini, Tiina, Marika, Mari K., Mari A. and Sape and so many others. Unfortunately, the pandemic still seems to prevent me organising traditional post-doctoral party where I would have liked to invite you all.

Turku, March 2021
Hanna Heino

List of References

Agrifoglio, R., Metallo, C., & di Nauta, P. (2020). Understanding Knowledge Management in Public Organizations through the Organizational Knowing Perspective: a Systematic Literature Review and Bibliometric Analysis. *Public Organization Review*. https://doi.org/10.1007/s11115-020-00480-7

Ahlqvist, T., & Uotila, T. (2020). Contextualising weak signals: Towards a relational theory of futures knowledge. *Futures*, *119*(February), 102543. https://doi.org/10.1016/j.futures.2020.102543

Aho, S., & Kaivo-oja, J. (2019). Suomen väestöllisen- ja taloudellisen huoltosuhteen kehitys suuralueilla ja maakunnissa vuosina 1990 – 2017. *Kansantaloudellinen Aikakauskirja*, *2*, 270–288.

Akıncı, Z. S., Bilgen, A., Casellas, A., & Jongerden, J. (2020). Development through design: Knowledge, power, and absences in the making of southeastern Turkey. *Geoforum*, *114*(June), 181–188. https://doi.org/10.1016/j.geoforum.2020.06.011

Alavi, M., & Leidner, D. E. (2001). Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly*, *25*(1), 107–136.

Anderson, B. (2010). Preemption, precaution, preparedness: Anticipatory action and future geographies. *Progress in Human Geography*, *34*(6), 777–798. https://doi.org/10.1177/0309132510362600

Andersson, J. (2012). The great future debate and the struggle for the world. *American Historical Review*, *117*(5), 1411–1430. https://doi.org/10.1093/ahr/117.5.1411

Arkesteijn, M. H., & Volker, L. (2013). The power of pluralism for urban strategies. *Cities*, *31*, 328–336. https://doi.org/10.1016/j.cities.2012.10.001

Aven, T. (2015). Implications of black swans to the foundations and practice of risk assessment and management. *Reliability Engineering and System Safety*, *134*, 83–91. https://doi.org/10.1016/j.ress.2014.10.004

Baškarada, S., Shrimpton, D., & Ng, S. (2016). Learning through foresight. *Foresight*, *18*(4), 414–433. https://doi.org/10.1108/FS-09-2015-0045

Bathelt, H., & Glückler, J. (2011). *The Relational Economy Geographies of Knowing and Learning*. Oxford University Press.

Bathelt, H., Malmberg, A., & Maskell, P. (2004). Clusters and knowledge: local buzz, global pipelines and the process of knowledge creation. *Progress in Human Geography*, *2128*(1), 31–56. https://doi.org/10.1177/088541220602100106\r10.1191/0309132504ph469oa

Baumgartner, R. J., & Korhonen, J. (2010). Strategic thinking for sustainable development. *Sustainable Development*, *18*(2), 71–75. https://doi.org/10.1002/sd.452

Bell, W. (2003). *Foundations of Futures studies: Human science for a new era. Vol 1. History, Purposes, Knowledge*. New Brunswick: Transaction Publishers.

Bernt, M. (2019). Migration and Strategic Urban Planning: The Case of Leipzig. *DisP - The Planning Review*, *55*(3), 56–66. https://doi.org/10.1080/02513625.2019.1671002

Bok, R., & Coe, N. M. (2017). Geographies of policy knowledge: The state and corporate dimensions of contemporary policy mobilities. *Cities*, *63*, 51–57. https://doi.org/10.1016/j.cities.2017.01.001

Boschma, R. A. (2005). Proximity and innovation: A critical assessment. *Regional Studies*, *39*(1), 61–74. https://doi.org/10.1080/0034340052000320887

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, *9*(2), 27–40. https://doi.org/10.3316/QRJ0902027

Bowman, G. (2016). The Practice of Scenario Planning: An Analysis of Inter- and Intra-organizational Strategizing. *British Journal of Management*, *27*(1), 77–96. https://doi.org/10.1111/1467-8551.12098

Bradfield, R., Derbyshire, J., & Wright, G. (2016). The critical role of history in scenario thinking: Augmenting causal analysis within the intuitive logics scenario development methodology. *Futures*, *77*, 56–66. https://doi.org/10.1016/j.futures.2016.02.002

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Brooks, J., McCluskey, S., Turley, E., & King, N. (2015). The Utility of Template Analysis in Qualitative Psychology Research. *Qualitative Research in Psychology*, *12*(2), 202–222. https://doi.org/10.1080/14780887.2014.955224

Bryson, J. M. (2010). The Future of Public and Nonprofit Strategic Planning in the United States. *Public Administration Review*, *70*(December), 255–267. https://doi.org/10.2307/40984136

Bryson, J. M., Berry, F. S., & Yang, K. (2010). The State of Public Strategic Management Research : A Selective Literature Review and Set of Future Directions. *The American Review of Public Administration*, *40*(5), 495–521. https://doi.org/10.1177/0275074010370361

Burrows, M. J., & Gnad, O. (2018). Between 'muddling through' and 'grand design': Regaining political initiative – The role of strategic foresight. *Futures*, *97*(January 2017), 6–17. https://doi.org/10.1016/j.futures.2017.06.002

Carayannis, E. G., Barth, T. D., & Campbell, D. F. (2012). The Quintuple Helix innovation model: global warming as a challenge and driver for innovation. *Journal of Innovation and Entrepreneurship*, *1*(1), 2. https://doi.org/10.1186/2192-5372-1-2

Carayannis, E. G., & Campbell, D. F. J. (2009). "Mode 3" and "Quadruple Helix": Toward a 21st century fractal innovation ecosystem. *International Journal of Technology Management*, *46*(3–4), 201–234. https://doi.org/10.1504/ijtm.2009.023374

Chen, Y., & Hassink, R. (2020). Multi-scalar knowledge bases for new regional industrial path development: toward a typology. *European Planning Studies*, *0*(0), 1–19. https://doi.org/10.1080/09654313.2020.1724265

Chermack, T. J., & van der Merwe, L. (2003). The role of constructivist learning in scenario planning. *Futures*, *35*(5), 445–460. https://doi.org/10.1016/S0016-3287(02)00091-5

Concu, G. B., Atzeni, G., Meleddu, M., & Vannini, M. (2020). Policy design for climate change mitigation and adaptation in sheep farming: Insights from a study of the knowledge transfer chain. *Environmental Science and Policy*, *107*, 99–113. https://doi.org/10.1016/j.envsci.2020.02.014

Corbetta, P. (2011). Participant observation. In *Social Research: Theory, Methods and Techniques* (pp. 235–263). SAGE Publications Ltd. https://doi.org/https://dx.doi.org/10.4135/9781849209922

Cvetkovic, A. (2009). The integration of immigrants in northern Sweden: A case study of the municipality of Strömsund. *International Migration*, *47*(1), 101–131. https://doi.org/10.1111/j.1468-2435.2008.00502.x

Dator, J. (1995). WHAT FUTURES STUDIES IS, AND IS NOT. *University of Hawaii, Hawaii Research Center for Futures Studies*. http://futures.hawaii.edu/publications/futures-studies/WhatFSis1995.pdf%5Cnhttp://www.futures.hawaii.edu/publications/futures-studies/WhatFSis1995.pdf

Davoudi, S. (2015). Planning as practice of knowing. *Planning Theory*, *14*(3), 316–331. https://doi.org/10.1177/1473095215575919

de Jouvenel, B. (1967). *The Art of Conjecture*. Basic Books, Inc. https://doi.org/10.2307/1953339

Derbyshire, J. (2019). Answers to questions on uncertainty in geography: Old lessons and new scenario tools. *Environment and Planning A*, *0*(0), 1–18. https://doi.org/10.1177/0308518X19877885

Dufva, M., & Ahlqvist, T. (2015). Knowledge creation dynamics in foresight: A knowledge typology and exploratory method to analyse foresight workshops. *Technological Forecasting and Social Change*, *94*, 251–268. https://doi.org/10.1016/j.techfore.2014.10.007

Echebarria, C., Barrutia, J. M., Eletxigerra, A., Hartmann, P., & Apaolaza, V. (2017). Local sustainability processes worldwide: a systematic review of the literature and research agenda. *Journal of Environmental Planning and Management*, *61*(8), 1289–1317. https://doi.org/10.1080/09640568.2017.1342611

Edwards, G. A. S., & Bulkeley, H. (2018). Heterotopia and the urban politics of climate change experimentation. *Environment and Planning D: Society and Space*, *36*(2), 350–369. https://doi.org/10.1177/0263775817747885

Eerola, A., & Miles, I. (2011). Methods and tools contributing to FTA: A knowledge-based perspective. *Futures*, *43*(3), 265–278. https://doi.org/10.1016/j.futures.2010.11.005

Einola, S., & Kohtamäki, M. (2015). *Osallistava strategiaprosessi kunnassa* (p. 59). http://www.vaasa.fi/sites/default/files/osallistava_strategia_kunnassa_loppuraportti.pdf

EuroStat. (2016). Urban Europe. In *Statistical books for European Union*. https://doi.org/10.2785/91120

Fincher, R., Iveson, K., Leitner, H., & Preston, V. (2014). Planning in the multicultural city: Celebrating diversity or reinforcing difference? *Progress in Planning*, *92*, 1–55. https://doi.org/10.1016/j.progress.2013.04.001

Flick, U. (2018). *Doing Triangulation and Mixed Methods*. SAGE.

Florida, R., & Mellander, C. (2018). The Geography of Economic Segregation. *Social Sciences*, *7*(8), 123. https://doi.org/10.3390/socsci7080123

Freedman, L. (2013). *Strategy: A History*. Oxford University Press.

Fuerth, L. S. (2009). Foresight and anticipatory governance. *Foresight*, *11*(4), 14–32. https://doi.org/10.1108/14636680910982412

Fuller, T., & Loogma, K. (2009). Constructing futures: A social constructionist perspective on foresight methodology. *Futures*, *41*(2), 71–79. https://doi.org/10.1016/j.futures.2008.07.039

Gabriel, J. (2014). A scientific enquiry into the future. *European Journal of Futures Research*, *2*(1), 31. https://doi.org/10.1007/s40309-013-0031-4

Giaoutzi, M., & Sapio, B. (Eds.). (2013). *Recent Developments in Foresight Methodologies*. Springer. https://doi.org/10.1007/978-1-4614-5215-7

Glaeser, E. L. (2014). A world of cities: The causes and consequences of urbanization in poorer countries. *Journal of the European Economic Association*, *12*(5), 1154–1199. https://doi.org/10.1111/jeea.12100

Godet, M. (1994). *From anticipation to action. A Handbook of Strategic Prospective*. UNESCO Publishing.

Godet, M., & Roubelat, F. (1996). Creating the Future: The Use and Misuse of Scenarios. *Long Range Planning*, *29*(2), 164–171. https://doi.org/10.1016/0024-6301(96)00004-0

Granjou, C., Walker, J., & Salazar, J. F. (2017). The politics of anticipation: On knowing and governing environmental futures. *Futures*, *92*(May), 5–11. https://doi.org/10.1016/j.futures.2017.05.007

Gressgård, R., & Jensen, T. G. (2016). Planning for pluralism in Nordic cities- key terms and themes. *Nordic Journal of Migration Research*, *6*(1), 1–8. https://doi.org/10.1515/njmr-2016-0005

Guest, G., MacQueen, K. M., & Namey, E. E. (2012). *Applied Thematic Analysis*. SAGE.

Guest, G., Namey, E. E., & Mitchell, M. L. (2017). Participant observation. In *Collecting Qualitative Data: A Field Manual for Applied Research* (pp. 75–112). SAGE Publications Ltd. https://doi.org/https://dx.doi.org/10.4135/9781506374680

Habegger, B. (2010). Strategic foresight in public policy: Reviewing the experiences of the UK, Singapore, and the Netherlands. *Futures*, *42*(1), 49–58. https://doi.org/10.1016/j.futures.2009.08.002

Hautala, J. (2018). Now together, next apart: knowledge creation processes through repeated geographical dispersion. *Geografiska Annaler, Series B: Human Geography*, *100*(3), 220–243. https://doi.org/10.1080/04353684.2017.1375383

Hautala, J., & Höyssä, M. (2017). Knowledge rationales in human geography: Economic, policy, empowerment, and methodological. *Norsk Geografisk Tidsskrift - Norwegian Journal of Geography*, *1951*(October), 1–19. https://doi.org/10.1080/00291951.2017.1340907

Hautala, J., & Jauhiainen, J. S. (2014). Spatio-temporal processes of knowledge creation. *Research Policy*, *43*(4), 655–668. https://doi.org/10.1016/j.respol.2014.01.002

Hawkins, C. V., Krause, R. M., Feiock, R. C., & Curley, C. (2016). Making meaningful commitments: Accounting for variation in cities' investments of staff and fiscal resources to sustainability. *Urban Studies*, *53*(9), 1902–1924. https://doi.org/10.1177/0042098015580898

Heinrichs, H., & Schuster, F. (2017). Still some way to go: institutionalisation of sustainability in German local governments. *Local Environment*, *22*(5), 536–552. https://doi.org/10.1080/13549839.2016.1233951

Hideg, É., & Nováky, E. (2010). Changing attitudes to the future in hungary. *Futures*, *42*(3), 230–236. https://doi.org/10.1016/j.futures.2009.11.008

Hofstad, H., & Torfing, J. (2015). Collaborative innovation as a tool for environmental, economic and social sustainability in regional governance. *Scandinavian Journal of Public Administration*, *19*(4), 49–70. http://ojs.ub.gu.se/ojs/index.php/sjpa/article/view/3300

Ibert, O. (2007). Towards a Geography of Knowledge Creation: The Ambivalences between 'Knowledge as an Object' and 'Knowing in Practice.' *Regional Studies*, *41*(1), 103–114. https://doi.org/10.1080/00343400601120346

Jalonen, H., Laihonen, H., & Lönnqvist, A. (2012). Tietojohtaminen osaksi kunnan strategista johtamista. *Hallinnon Tutkimus*, *31*(2), 138–147.

Jarzabkowski, P. (2004). Strategy as Practice : Recursiveness , Adaptation , and Practices-in-Use. *Organization Studies*, *25*(4), 529–560. https://doi.org/10.1177/0170840604040675

Jenkins, M. (2017). Knowledge and practice mobilities in the process of policy-making: The case of UK national well-being statistics. *Political Geography*, *56*, 24–33. https://doi.org/10.1016/j.polgeo.2016.10.005

Ji, H., & Darnall, N. (2018). All are not created equal : assessing local governments' strategic approaches towards sustainability. *Public Management Review*, *20*(1), 154–157. https://doi.org/10.1080/14719037.2017.1293147

John, B., Keeler, L. W., Wiek, A., & Lang, D. J. (2015). How much sustainability substance is in urban visions? - An analysis of visioning projects in urban planning. *Cities*, *48*, 86–98. https://doi.org/10.1016/j.cities.2015.06.001

Johnsen, Å. (2015). Strategic management thinking and practice in the public sector: A strategic planning for all seasons? *Financial Accountability and Management*, *31*(3), 243–268. https://doi.org/10.1111/faam.12056

Jones, R. (2019). Governing the future and the search for spatial justice: Wales' Well-being of Future Generations Act. *Fennia - International Journal of Geography*, *197*(1), 8–24. https://doi.org/10.11143/fennia.77781

Jones, R., & Ross, A. (2016). National sustainabilities. *Political Geography*, *51*, 53–62. https://doi.org/10.1016/j.polgeo.2015.12.002

Jungk, R., & Müllert, N. (1987). *Future Workshops: How to create desirable futures*. Institute for Social Inventions.

Kaivo-oja, J. (2014). Has European Immigration Policy Changed? a Benchmarking Analysis of Immigration Trends To 30 European Countries in 1998-2011. *European Integration Studies*, *8*, 66–73. http://10.0.22.123/j01.eis.0.8.6897%5Cnhttp://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=97722053&site=ehost-live

Kaivo-oja, J. (2017). Towards better participatory processes in technology foresight: How to link participatory foresight research to the methodological machinery of qualitative research and phenomenology? *Futures*, *86*, 94–106. https://doi.org/10.1016/j.futures.2016.07.004

Kaivo-oja, J., Virtanen, P., Jalonen, H., & Stenvall, J. (2015). The effects of the internet of things and big data to organizations and their knowledge management practices. *Knowledge Management in Organizations, Lecture Notes in Business Information Processing*, *224*, 495–513. https://doi.org/10.1007/978-3-319-21009-4_38

Kambites, C. J. (2010). Sustainability and attitudes to locality: The discourse of town and parish councillors. *Local Environment*, *15*(9), 867–878. https://doi.org/10.1080/13549839.2010.531253

Kanninen, V., & Akkila, I. (2015). *Kaupunkiseutujen strateginen suunnittelu – mitä opittavaa Suomella ?*

Karuri-Sebina, G., Haegeman, K.-H., & Ratanawaraha, A. (2016). Urban futures: anticipating a world of cities. *Foresight*, *18*(5), 449–453. https://doi.org/10.1108/FS-07-2016-0037

Kawulich, B. (2005). Participant Observation as a Data Collection Method. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *6*(2), 1–20. http://nbn-resolving.de/urn:nbn:de:0114-fqs0502430.

Kazadi, K., Lievens, A., & Mahr, D. (2016). Stakeholder co-creation during the innovation process: Identifying capabilities for knowledge creation among multiple stakeholders. *Journal of Business Research*, *69*(2), 525–540. https://doi.org/10.1016/j.jbusres.2015.05.009

Kębłowski, W., & Bassens, D. (2018). "All transport problems are essentially mathematical": The uneven resonance of academic transport and mobility knowledge in Brussels. *Urban Geography*, *39*(3), 413–437. https://doi.org/10.1080/02723638.2017.1336320

Kokkinen, A., Jalava, J., Hjerppe, R., & Hannikainen, M. (2007). Catching up in Europe: Finland's convergence with Sweden and the EU15. *Scandinavian Economic History Review*, *55*(2), 153–171. https://doi.org/10.1080/03585520701435996

Kühn, M. (2018). Immigration strategies of cities: local growth policies and urban planning in Germany. *European Planning Studies*, *26*(9), 1747–1762. https://doi.org/10.1080/09654313.2018.1484428

Kuosa, Tarja, & Basden, A. (2000). Predispositions as determinants of the future. *Futures*, *32*(9), 833–852. https://doi.org/10.1016/S0016-3287(00)00034-3

Kuosa, Tuomo. (2011). Evolution of futures studies. *Futures*, *43*(3), 327–336. https://doi.org/10.1016/j.futures.2010.04.001

Kuribayashi, M., Hayashi, K., & Akaike, S. (2018). A proposal of a new foresight platform considering of sustainable development goals. *European Journal of Futures Research*, *6*(1). https://doi.org/10.1007/s40309-017-0130-8

Kurtz, C. F., & Snowden, D. J. (2003). The New Dynamics of Strategy sense-making in a complex-complicated world. *IBM Systems Journal*, *42*(3), 462–483. https://doi.org/10.1147/sj.423.0462.

Laurini, R. (2020). A primer of knowledge management for smart city governance. *Land Use Policy*, *June 2019*, 104832. https://doi.org/10.1016/j.landusepol.2020.104832

Leathwood, C., & Read, B. (2013). Research policy and academic performativity: Compliance, contestation and complicity. *Studies in Higher Education*, *38*(8), 1162–1174. https://doi.org/10.1080/03075079.2013.833025

Legrand, T. (2012). Overseas and over here: Policy transfer and evidence-based policy-making. *Policy Studies*, *33*(4), 329–348. https://doi.org/10.1080/01442872.2012.695945

Lichtman, M. (2017). Interviewing. In *Qualitative Research for the Social Sciences* (pp. 241–278). SAGE Publications.

Lo, A. Y., & Chen, K. (2019). Policy selection of knowledge: The changing network of experts in the development of an emission trading scheme. *Geoforum*, *106*(July), 1–12. https://doi.org/10.1016/j.geoforum.2019.07.021

Mainali, B., Luukkanen, J., Silveira, S., & Kaivo-oja, J. (2018). Evaluating synergies and trade-offs among Sustainable Development Goals (SDGs): Explorative analyses of development paths in South Asia and Sub-Saharan Africa. *Sustainability (Switzerland)*, *10*(3). https://doi.org/10.3390/su10030815

Malaska, P. (2000). Knowledge and information in futurology. *Foresight*, *2*(2), 237–244. https://doi.org/10.1108/14636680010802582

Malecki, E. J. (2014). Connecting the fragments: Looking at the connected city in 2050. *Applied Geography*, *49*, 12–17. https://doi.org/10.1016/j.apgeog.2013.09.004

Malekpour, S., Brown, R. R., de Haan, F. J., & Wong, T. H. F. (2017). Preparing for disruptions: A diagnostic strategic planning intervention for sustainable development. *Cities*, *63*, 58–69. https://doi.org/10.1016/j.cities.2016.12.016

Maness, J. (2014). *Techniques, Methods & Applications in Futures Studies*. World Technologies.

Masini, E. (2006). Rethinking futures studies. *Futures*, *38*(10), 1158–1168. https://doi.org/10.1016/j.futures.2006.02.004

Massumi, B. (2007). Potential Politics and the Primacy of Preemption. *Theory & Event*, *10*(2). https://doi.org/doi:10.1353/tae.2007.0066.

Maununaho, K. (2016). Political, Practical and Architectural Notions of the Concept of the Right to the City in Neighbourhood Regeneration. *Nordic Journal of Migration Research*, *6*(1), 58–64. https://doi.org/10.1515/njmr-2016-0008

May, T., & Perry, B. (2016). Knowledge for just urban sustainability. *Local Environment*, *22*(1), 23–35. https://doi.org/10.1080/13549839.2016.1233527

McAuliffe, C., & Rogers, D. (2018). Tracing resident antagonisms in urban development: agonistic pluralism and participatory planning. *Geographical Research*, *56*(2), 219–229. https://doi.org/10.1111/1745-5871.12283

McAuliffe, C., & Rogers, D. (2020). Value pluralism in urban planning. *Planning Theory*, *19*(2), 242–248. https://doi.org/10.1177/1473095219900350

Mccann, E., & Ward, K. (2012). Policy Assemblages, Mobilities and Mutations: Toward a Multidisciplinary Conversation. *Political Studies Review*, *10*(3), 325–332. https://doi.org/10.1111/j.1478-9302.2012.00276.x

McDowell, L. (2018). Interviewing: Fear and liking in the field. In *The SAGE Handbook of Qualitative Geography* (pp. 156–171). SAGE Publications. https://doi.org/10.4135/9780857021090.n11

Mickwitz, P., & Maijala, R. (2015). Strateginen tutkimus ja Strategisen tutkimuksen neuvosto. *Tieteessä Tapahtuu*, *33*(6), 29–33.

Mintzberg, H. (1994). The fall and rise of strategic planning. *Harvard Business Review*, *72*(1), 107–114.

Mintzberg, H., Ahlstrand, B., & Lampel, J. (2005). *Strategy safari. A guided tour through the wilds of strategic managent*. Free Press.

Mishra, P. N., Das, S. S., Yadav, S., Khan, W., Afzal, M., Alarifi, A., Kenawy, E.-R., Ansari, M. T., Hasnain, M. S., & Nayak, A. K. (2020). Global Impacts of Pre- and Post-COVID-19 Pandemic: Focus on Socio-Economic Conseqences. *Sensors International*. https://doi.org/https://doi.org/10.1016/j.sintl.2020.100042.

Mishra, S., & Mohanty, B. (2020). Approaches to strategy formulations: A content analysis of definitions of strategy. *Journal of Management & Organization*, 1–28. https://doi.org/doi: 10.1017/jmo.2019.86.

Mitchell, R., & Nicholas, S. (2006). Knowledge creation in groups: The value of cognitive diversity, transactive memory, and openmindedness Norms. *The Electronic Journal of Knowledge Management*, *4*(1), 67–74.

Moore, K., Kleinman, D. L., Hess, D., & Frickel, S. (2011). Science and neoliberal globalization: A political sociological approach. *Theory and Society*, *40*(5), 505–532. https://doi.org/10.1007/s11186-011-9147-3

Morgan, D. L. (2017). Mixed methods research. *The Cambridge Handbook of Sociology*, *1*, 153–161. https://doi.org/10.1017/9781316418376.015

Möttönen, S., & Kettunen, P. (2015). Kuntien strategiadokumentit . Systeemiteoreettista pohdintaa suurten kaupunkien strategioista. *Kunnallistieteellinen Aikakauskirja*, *2*, 126–143.

Nevens, F., Frantzeskaki, N., Gorissen, L., & Loorbach, D. (2013). Urban Transition Labs: Co-creating transformative action for sustainable cities. *Journal of Cleaner Production*, *50*, 111–122. https://doi.org/10.1016/j.jclepro.2012.12.001

Nilsson, K., Nielsen, T. S., Aalbers, C., Bell, S., Boitier, B., Chery, J. P., Fertner, C., Groschowski, M., Haase, D., Loibl, W., Pauleit, S., Pintar, M., Piorr, A., Ravetz, J., Ristimäki, M., Rounsevell, M., Tosics, I., Westerink, J., & Zasada, I. (2014). Strategies for Sustainable Urban Development and Urban-Rural Linkages. *European Journal of Spatial Development*, *March*, 1–26. http://www.nordregio.se/Global/EJSD/Research briefings/article4.pdf

Niu, C., & Ragasa, C. (2018). Selective Attention and information loss in the lab-to-farm knowledge chain: The case of Malawian agricultural extension programs. *Agricultural Systems*, *165*, 147–163.

Nonaka, I. (2013). A Dynamic Theory of Organizational Knowledge Creation. *Organization Science*, *5*(1), 14–37.

Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation*. Oxford University Press.

Nowell, L. S., Norris, J. M., White, D. E., & Moules, N. J. (2017). Thematic Analysis: Striving to Meet the Trustworthiness Criteria. *International Journal of Qualitative Methods*, *16*(1), 1–13. https://doi.org/10.1177/1609406917733847

Nygrén, N. A. (2019). Scenario workshops as a tool for participatory planning in a case of lake management. *Futures*, *107*, 29–44. https://doi.org/10.1016/j.futures.2018.10.004

O'Riordan, M., McDonagh, J., & Mahon, M. (2019). Unlikely alliances? Knowledge, power and the collaborative governance of Irish peatlands. *Geoforum*, *100*, 188–198. https://doi.org/10.1016/j.geoforum.2019.01.010

Ortegel, M. (2017). "Creative city" policy mobilities as transformation of dispositives - Arrangements of "networking" in the European Metropolitan Region of Nuremberg. *Geographica Helvetica*, *72*(2), 157–169. https://doi.org/10.5194/gh-72-157-2017

Paraponaris, C., & Sigal, M. (2015). From knowledge to knowing, from boundaries to boundary construction. *Journal of Knowledge Management*, *19*(5), 881–899. https://doi.org/10.1108/JKM-01-2015-0034

Pawson, R., Wong, G., & Owen, L. (2011). Known knowns, known unknowns, unknown unknowns: The predicament of evidence-based policy. *American Journal of Evaluation*, *32*(4), 518–546. https://doi.org/10.1177/1098214011403831

Peck, J. (2011). Geographies of policy: From transfer-diffusion to mobility-mutation. *Progress in Human Geography*, *35*(6), 773–797. https://doi.org/10.1177/0309132510394010

Peck, J., & Theodore, N. (2010). Mobilizing policy: Models, methods, and mutations. *Geoforum*, *41*(2), 169–174. https://doi.org/10.1016/j.geoforum.2010.01.002

Pouru, L., Dufva, M., & Niinisalo, T. (2019). Creating organisational futures knowledge in Finnish companies. *Technological Forecasting and Social Change*, *140*, 84–91. https://doi.org/10.1016/j.techfore.2018.06.048

Ratcliffe, J., & Krawczyk, E. (2011). Imagineering city futures: The use of prospective through scenarios in urban planning. *Futures*, *43*(7), 642–653. https://doi.org/10.1016/j.futures.2011.05.005

Ravetz, J. (2013). Urban futures – what will we need to know? *Town & Country Planning*, *October*, 443–446.

Ravetz, J., & Miles, I. D. (2016). Foresight in cities: on the possibility of a "strategic urban intelligence." *Foresight*, *18*(5), 469–490. https://doi.org/10.1108/FS-06-2015-0037

Richard, E., & David, L. F. (2018). The future of citizen engagement in cities—The council of citizen engagement in sustainable urban strategies (ConCensus). *Futures*, *101*, 80–91. https://doi.org/10.1016/j.futures.2018.06.012

Righard, E., Johansson, M., & Salonen, T. (2015). *Social transformations in Scandinavian cities: An introduction' in Social transformations in Scandinavian cities*. Nordic Academic Press.

Rijkens-Klomp, N., & Van Der Duin, P. (2014). Evaluating local and national public foresight studies from a user perspective. *Futures*, *59*, 18–26. https://doi.org/10.1016/j.futures.2014.01.010

Rutten, R. (2017). Beyond proximities: The socio-spatial dynamics of knowledge creation. *Progress in Human Geography*, *41*(2), 159–177. https://doi.org/10.1177/0309132516629003

Sardar, Z. (2010). The Namesake: Futures; futures studies; futurology; futuristic; foresight-What's in a name? *Futures*, *42*(3), 177–184. https://doi.org/10.1016/j.futures.2009.11.001

Saunders, A., & Jenkins, S. (2012). "Absent fear": Re-envisioning a future geography. *Futures*, *44*(5), 494–503. https://doi.org/10.1016/j.futures.2012.02.002

Schmidt, J. M. (2015). Policy, planning, intelligence and foresight in government organizations. *Foresight*, *17*(5), 489–511. https://doi.org/10.1108/FS-12-2014-0081

Schmidthuber, L., & Wiener, M. (2018). Aiming for a sustainable future: conceptualizing public open foresight. *Public Management Review*, *20*(1), 82–107. https://doi.org/10.1080/14719037.2017.1293145

Schorn, A. (2000). The "Theme-centered Interview". A Method to Decode Manifest and Latent Aspects of Subjective Realities. *Forum: Qualitative Social Research*, *1*(2). https://doi.org/10.17169/fqs-1.2.1092

Soini, K., & Birkeland, I. (2014). Exploring the scientific discourse on cultural sustainability. *Geoforum*, *51*, 213–223. https://doi.org/10.1016/j.geoforum.2013.12.001

Spaniol, M. J., & Rowland, N. J. (2018). The scenario planning paradox. *Futures*, *95*(June 2017), 33–43. https://doi.org/10.1016/j.futures.2017.09.006

Stone, D. (2012). Transfer and translation of policy. *Policy Studies*, *33*(6), 483–499. https://doi.org/10.1080/01442872.2012.695933

Strandman, K. (2010). "Valutetaan, sulautetaan, välitettään, maastoutetaan" - Rationaalisesta strategian viestinnästä moniääniseen vuoropuheluun kunnissa. *Kunnallistieteellinen Aikakauskirja*, *4*, 441–450.

Swann, W. L., & Deslatte, A. (2019). What do we know about urban sustainability? A research synthesis and nonparametric assessment. *Urban Studies*, *56*(9), 1729–1747. https://doi.org/10.1177/0042098018779713

Temenos, C., & Mccann, E. (2013). Geographies of Policy Mobilities. *Geography Compass*, *7*(5), 344–357. https://doi.org/10.1111/gec3.12063

Tilastokeskus. (2016a). *Maahanmuuttajataustaisten määrät ja osuudet alueittain 1990-2015 muuttujina Alue, Vuosi ja Tiedot*.

Tilastokeskus. (2016b). *Natural population growth, net migration and population change*. Http://Pxnet2.Stat.Fi/PXWeb/Pxweb/Fi/StatFin/StatFin__vrm__kuol/070_kuol_tau_202.Px/?Rxid=293f4907-A318-4b27-98da-973e85faa2f3.

Tilastokeskus. (2020). *Väestömuutokset ja väkiluku 1749–2019*. https://pxnet2.stat.fi/PXWeb/pxweb/fi/StatFin/StatFin__vrm__muutl/statfin_muutl_pxt_11ad.px

Tobin, G. A., & Begley, C. M. (2004). Methodological rigour within a qualitative framework. *Journal of Advanced Nursing*, *48*(4), 388–396. https://doi.org/10.1111/j.1365-2648.2004.03207.x

Tracy, S. J. (2010). Qualitative quality: Eight a"big-tent" criteria for excellent qualitative research. *Qualitative Inquiry*, *16*(10), 837–851. https://doi.org/10.1177/1077800410383121

United Nations. (2019). *World Urbanization Prospects: The 2018 Revision*. https://population.un.org/wup/Publications/Files/WUP2018-Report.pdf

United Nations. (2020). *Sustainable Development Goals*. https://www.un.org/sustainabledevelopment/

van der Duin, P., van Oirschot, R., Kotey, H., & Vreeling, E. (2009). To govern is to foresee: An exploratory study into the relationship between futures research and strategy and policy processes at Dutch ministries. *Futures*, *41*(9), 607–618. https://doi.org/10.1016/j.futures.2009.04.008

Van der Steen, M. A., & Van Twist, M. J. W. (2013). Foresight and long-term policy-making: An analysis of anticipatory boundary work in policy organizations in the Netherlands. *Futures*, *54*, 33–42. https://doi.org/10.1016/j.futures.2013.09.009

van Dorsser, C., Walker, W. E., Taneja, P., & Marchau, V. A. W. J. (2018). Improving the link between the futures field and policymaking. *Futures*, *104*, 75–84. https://doi.org/10.1016/j.futures.2018.05.004

van Vliet, M., Kok, K., Veldkamp, A., & Sarkki, S. (2012). Structure in creativity: An exploratory study to analyse the effects of structuring tools on scenario workshop results. *Futures*, *44*(8), 746–760. https://doi.org/10.1016/j.futures.2012.05.002

Verma, I., & Taegen, J. (2019). Access to services in rural areas from the point of view of older population—a case study in Finland. *International Journal of Environmental Research and Public Health*, *16*(23). https://doi.org/10.3390/ijerph16234854

VNK. (2011). *Poliittisen päätöksenteon tietopohjan parantaminen – tavoitteet todeksi. Politiikkatoimien vaikuttavuusarvioinnin kehittämistyöryhmän raportti.* Valtioneuvoston kanslian julkaisusarja 8/2011.

Voros, J. (2008). Integral Futures: An approach to futures inquiry. *Futures*, *40*(2), 190–201. https://doi.org/10.1016/j.futures.2007.11.010

Walker, R. M. (2013). Strategic management and performance in public organizations: Findings from the miles and snow framework. *Public Administration Review*, *73*(5), 675–685. https://doi.org/10.1111/puar.12073

Weller, S. (2017). Fast Parallels? Contesting Mobile Policy Technologies. *International Journal of Urban and Regional Research*, *41*(5), 821–837. https://doi.org/10.1111/1468-2427.12545

Wessel, T., Andersson, R., Kauppinen, T., & Andersen, H. S. (2017). Spatial Integration of Immigrants in Nordic Cities: The Relevance of Spatial Assimilation Theory in a Welfare State Context. *Urban Affairs Review*, *53*(5), 812–842. https://doi.org/10.1177/1078087416638448

Whittington, R. (2006). Completing the Practice Turn in Strategy Research. *Organization Studies*, *27*(5), 613–634. https://doi.org/10.1177/0170840606064101

Wilkinson, A. (2016). Using strategic foresight methods to anticipate and prepare for the jobs-scarce economy. *European Journal of Futures Research*, *4*(12). https://doi.org/10.1007/s40309-016-0094-0

Williamson, B. (2015). Governing methods: Policy innovation labs, design and data science in the digital governance of education. *Journal of Educational Administration and History*, *47*(3), 251–271. https://doi.org/10.1080/00220620.2015.1038693

Wright, G., & Cairns, G. (2020). Does the facilitator of a scenario development activity need substantive knowledge of the focal topic? *Futures & Foresight Science*, *2*(2), 2–4. https://doi.org/10.1002/ffo2.29

Yigitcanlar, T. (2009). Planning for knowledge-based urban development: global perspectives. *Journal of Knowledge Management*, *13*(5), 228–242. https://doi.org/10.1108/13673270910988079

Zeemering, E. S. (2018). Sustainability management, strategy and reform in local government. *Public Management Review*, *20*(1), 136–153. https://doi.org/10.1080/14719037.2017.1293148