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Published in:
International Planning Studies

DOI:
10.1080/13563475.2023.2259109

Published: 01/01/2024

Document Version
Publisher's PDF, also known as Version of record

International Planning Studies

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/cips20

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To cite this article: Annamari Kiviaho & Saija Toivonen (2024) Reimagining alternative future development trajectories of shrinking Finnish cities, International Planning Studies, 29:1, 1-18, DOI: 10.1080/13563475.2023.2259109

To link to this article: https://doi.org/10.1080/13563475.2023.2259109

Published online: 15 Sep 2023.

INTERNATIONAL PLANNING STUDIES
2024, VOL. 29, NO. 1, 1–18
https://doi.org/10.1080/13563475.2023.2259109

Reimagining alternative future development trajectories of shrinking Finnish cities

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ABSTRACT

Shrinking cities are seen as places with poor development prospects, as places that should adjust to given future realities of shrinkage. However, because the future is open to many alternative possibilities, shrinking cities also have a variety of alternative futures to which earlier research has paid less attention. This study aims to identify and analyse the alternative future development trajectories of shrinking cities. In this study, the futures research method called *futures wheel* is utilized to analyse possible future consequences of 24 different forces of change that can steer the future development of shrinking cities. By combining the futures wheel method with qualitative data from eight shrinking Finnish cities, we can reveal possible future development paths that may result from the forces. Overall, our results show that shrinking cities have various alternative future development trajectories leading to various outcomes. Some of the forces may intensify the current negative effects caused by urban shrinkage. By contrast, other forces can radically change future development.

ARTICLE HISTORY
Received 18 January 2023
Accepted 11 September 2023

KEYWORDS
Shrinking cities; futures wheel; futures studies; alternative futures

1. Introduction

The common narrative in urban economics has been that the biggest cities and the largest agglomerations represent the future (Rodríguez-Pose 2018). Thus, there are no intentions to focus on declining places, such as shrinking cities suffering from significant population losses due to demographic changes, deindustrialization or economic restructuring and characterized by many negative socioeconomic implications, such as high unemployment, poverty, segregation and housing abandonment (Haase et al. 2016; 2014; Pallagst et al. 2009). Because these kinds of cities seem to have poor development prospects, a strong belief has emerged that these kinds of declining places do not matter and that these places have 'no future' (Rodríguez-Pose 2018). However, this is not the whole truth; as the future is open to many alternative possibilities, declining places may also develop in several alternative directions.

Previous studies have shown that urban shrinkage does not represent a straightforward development (Haase, Nelle, and Mallach 2017; Turok and Mykhnenko 2007). It can be temporary or episodical, and it can be followed by renewed growth (Haase, Nelle, and Mallach 2017; Wolff and Wiechmann 2018). The direction of the future development of these cities can be influenced by

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the political choices of national or regional governments or local policymakers along with urban and regional planning. For instance, the previously shrinking cities of Leipzig and Liverpool have experienced regrowth that has been driven not only by economic regeneration and the creation of new job opportunities but also by strong public engagement in developing more attractive living conditions (Haase et al. 2021). In particular, urban planning and urban planners have an important role in promoting the future development of shrinking cities, and they can point the way that will lead to a more sustainable future (Hollander et al. 2009). Urban shrinkage can even provide 'the opportunity to re-imagine cities and their development' (Hollander et al. 2009).

This paper's contribution is to assist urban planners and decision-makers to reimagine the future development of shrinking cities by focusing on alternative future development trajectories. Unlike previous studies, this study attempts to shed light beyond the typical consequences of urban shrinkage, which have been identified in several previous studies (Bernt et al. 2014; Haase et al. 2014; 2016; Rieniets 2009; Weinsziehr et al. 2017). Together, these and many other studies have shown that urban shrinkage causes many problems, such as a decrease in real estate values and prices, segregation, housing abandonment and underused infrastructure, which are leading to serious planning challenges for local cities. Many of these studies have focused on so-called first-order consequences and direct consequences that can be fairly easy to discover. However, these first-order consequences are usually followed by second-, third- and fourth-order consequences to which shrinking city research has paid less attention, although these kinds of less obvious consequences may even be the most important (Bengston 2016). Against this background, the aim of the study was to identify and analyse the alternative future development trajectories of shrinking cities. More precisely, the present article addresses the following research question: what are the possible future development trajectories resulting from forces of change manifested in the real estate market environment of shrinking cities? In our research process, 24 forces of change steering the future development of shrinking cities were analysed with a futures wheel method. By utilizing this method, we intended to deepen the understanding of these forces by focusing on future consequences that follow from the forces. By analysing and categorizing these various future consequences, it is possible to reveal alternative future development trajectories.

To uncover not only direct consequences but also second- and third-order consequences of trends, events and emerging issues related to urban shrinkage, we used the futures wheel method. This method is particularly useful in studying the consequences of urban shrinkage for many reasons. First, the futures wheel can be used to study the consequences of shrinkage in more depth. For example, this method can help reveal unforeseen consequences that would not otherwise have been found (Bengston 2016). By using this method, it is possible to contribute to a more comprehensive understanding of the various future impacts of urban shrinkage, not only focusing on direct effects, such as high vacancies, oversupply and decreasing real estate prices, but also going beyond these impacts and constructing alternative future development paths.

In this study, the futures wheels were formed based on comprehensive qualitative data, including 872 newspaper articles and 45 semi-structured interviews with different stakeholders from eight shrinking Finnish cities. In Finland, shrinking cities and regions are a significant challenge due to many reasons. Firstly, the Finnish population is ageing rapidly. In 2000, the proportion of the ageing population was 15.2% while in 2021 the proportion of the ageing population was as high as 23.1% (Statistics Finland, 2002). Secondly, intensifying urbanization relies upon shrinking cities and regions that are losing their populations so that large major cities can grow. According to (Moisio and Sirviö 2021), after the year 2003, more than 200,000 working-age Finns moved to the country's largest urban areas. Even though many regions are losing their populations, Finland has a long tradition of multi-local living, and, especially during the summer months, many regions are filled with new life when owners of second homes travel from large cities to the countryside and smaller cities to enjoy nature (Pitkänen 2008). It has been estimated that 61% of the Finnish population own or have access to a second home (Strandell and Hall 2015). Thus, we see that Finland provides an interesting context for exploring the futures of shrinking cities.

The results of this study will benefit several decision-makers and planners at the local, national and supranational levels. Because the future is fundamentally open (Dator 2002), it can be influenced by decisions taken in the present. To take the right decisions that could drive development towards the desirable or preferable direction, information about the alternative futures is needed. This research could help decision-makers and urban planners to recognize different alternative futures and show them the opportunities that may exist in the future. In other words, this research increases the understanding of what could be. As shown by (Schlappa and Neill 2013), some shrinking cities might have been stuck in a so-called crisis stage that could prevent them from seeing development opportunities and making new choices. If the planners and decision-makers of shrinking cities cannot see the alternative, novel future development paths and opportunities, they cannot choose the direction in which they want the city to develop. Thus, there is an urgent need for future-oriented research that can assist urban planners and decision-makers to reimagine the futures of shrinking cities and expand their view of what could be. However, when reading the article, it should be kept in mind that the paper examines the future consequences from the perspective of the real estate markets. This, in turn, limits the extensive applicability of the research results, and thus, decision makers should also consider other aspects when generating strategies for shrinking regions.

The rest of this paper is structured as follows. In order to understand the underlying assumptions about alternative futures and future development trajectories, the paper starts with a short literature review focusing on shrinking cities. After his paper present an introduction to futures research and alternative futures. The third section of this paper concentrates on the futures wheel method and the implementation of the method in this study. The fourth section introduces the results, focusing on the possible future development paths of shrinking cities. The fifth section discusses the findings of this study. The final section provides the conclusion.

2. Causes and consequences behind shrinkage

Academics have proposed several different explanations for why cities are shrinking. Most of these explanations focus on economic or demographic changes (Bogataj, McDonnell, and Bogataj 2016), while others consider 'shock' events such as natural hazards or a combination of different factors, as in the study by Haase et al. (2016). However, due to the complexity of the phenomenon, it is difficult to differentiate the causes and consequences of one another. Causes and consequences overlap and intertwine (Haase et al. 2016), creating a complex web of causes and effects that affect one another. Haase et al. (2016) presented a heuristic model that explains the causes of urban shrinkage. This cross-contextual model considers various drivers of shrinkage, such as economic decline, demographic change, suburbanization, urban sprawl, political conflicts, and natural hazards at different spatial levels.

Previous studies have shown that population decline has complex consequences that affect not only the real estate market but also the surrounding cultural and socioeconomic environment. Perhaps the most significant effect on the real estate market is the decrease in real estate values and prices due to reduced demand (Haase et al. 2016; 2014; Pallagst et al. 2009). Other commonly identified consequences are decay of buildings and an increase in vacant buildings (Wiechmann and Pallagst 2012). While the negative effects on the real estate market and regional planning are significant, these are only one part of the complex entity, as population decline also has other negative consequences for society as a whole. Previous studies have established that the young and educated, the so-called creative class, are moving away from shrinking cities (Lima and Eischeid 2017). Due to decreasing social capital and human resources, some shrinking cities struggle with low levels of innovation (Martinez-Fernandez and Wu 2007). Such a trend may undermine the vitality and economic growth of the areas in the future. Massive job losses in manufacturing industries due to deindustrialization may also lead to a significant increase in unemployment, job seekers' outmigration (Wiechmann and Pallagst 2012) and drive people into poverty.

3. Benefiting from the premises of futures research for reimaging the future development of shrinking cities

To identify and analyse the alternative future development trajectories of shrinking cities, this study utilizes futures research methods. Futures research denotes critical, systematic, holistic and multidisciplinary research that focuses on futures topics or images of the future. Although futures research focuses on the future, the future is not the object of inquiry in the research (Voros 2007). Because the future does not exist, it cannot be accurately predicted (Bengston et al. 2016) or precisely explored (Dator, 2019). However, it is possible to get clues about futures by researching and forecasting alternative futures (Bengston et al. 2016; Dator, 2009).

A key constitutive element of futures research is the plurality of futures. Several different futures are the object of futures research, because the future is fundamentally open and plural (Dator 2002). Therefore, the future can be described as a branching tree with alternative possibilities, and it needs to be examined as a whole in which each branch can produce a different future (Niiniluoto 2001). Alternative futures can be understood as several possible future states that can be pursued in the present moment (Mäkelä 2018). There are a variety of alternative trajectories leading to different kinds of future state, but these are not manifested at the present moment (Patomäki 2006). By utilizing futures research, we can outline some of these different possibilities.

It is essential not only to draw pictures of alternative futures but also to understand and explain the paths that might lead to some future state (de Jouvenel 2000, as cited by (Tiberius 2011)). The trajectories leading to different states of the future can be a linear continuum of the past and present, waves of change (such as cycles of booms and busts), a leap of change or an exponential change (Kamppinen and Malaska 2002). As concluded by (Tiberius 2011), many futurists argue that it is impossible to conceptualize future developments without having a history in mind. The future can be seen as a continuum of things and events that happened in the past or present (Dator 2006). In other words, past and present things and events could have impacts that extend to the future and thus shape future development. As summarized by (Niiniluoto 2001), in futures research, the object of research is the past and present, and the knowledge about the present is utilized as evidence for statements about the future. One example of using information from the past and present in aiming to uncover future developments is scenarios, which can be seen as one of the common forms that are used by futurists but also by some companies and organizations to create alternative images of the future (Bezold 2009). However, as noted by (Bengston 2016; Bengston et al. 2016), if we look only at the past, we can easily conclude that many things occurred differently than we expected. Surprising and unexpected events can occur and change the direction of future development. Thus, as explained by (Ahlqvist, Uotila, and Hietanen 2015), alternative futures may vary from obvious and probable megatrends to surrealistic and improbable wildcards that only a few of us can even imagine.

One of the basic assumptions of future research is that the future is shaped in the present moment and that, thus, future developments can be influenced. As noted by (Patomäki 2006), we do not have to accept future realities as given, because we have opportunities to influence a world that has not yet been realized. Niiniluoto (2001) suggests that future research is fundamentally design science that aims to help plan the future. Similarly, (Bell 2009) argues that the purpose of futures research is to 'add tools and knowledge that help people design and shape the future, to help them achieve good futures for themselves, and for all humankind'. Because the future is open and depends on chance events and, in particular, on human choices, futures research can be used to determine what kind of future we want to be realized and what we want to avoid happening (Niiniluoto 2001; Toivonen, Rashidfarokhi, and Kyrö 2021). Futures research can help us to see and be aware of different alternative possibilities and to draw a rich picture of what could be. This knowledge provides an opportunity to make choices and actions that can lead towards the desirable or preferable future development. Such knowledge provided by futures research can be used as the basis of planning and decision-making.

Futures research can help us to reimagine the future of shrinking cities by drawing a picture of alternative development trajectories. Shrinking cities have been seen as places with poor development prospects, as places that should resign themselves to given future realities of shrinkage. However, shrinking cities also have a variety of alternative futures that have not yet been realized. The mapping of these possible future development paths is extremely important, as the future is shaped by decisions and actions that are made in the present moment. In order to take decisions that aim to shape a preferable future for shrinking cities, we need information on alternative development paths. In the next chapter, we describe the methods and data that were utilized in this study, aiming to expose trajectories that can shape the futures of shrinking cities.

4. Study design and methodology

In this study, we applied a futures research method named the futures wheel to reveal the alternative future development trajectories of shrinking Finnish cities. In the following section, the method is briefly explained. After this, the use of the method in this study is described in more detail.

4.1. Futures wheel

The futures wheel method can be used to organize information and widen the understanding of trends or events (Glenn 2009). The futures wheel is a simple way of structuring thoughts about the possible future consequences of the phenomenon under study. Therefore, this method is typically used in workshops, where a group of people try to identify, analyse and explore the future consequences of some specific phenomenon, which can be a trend, decision, event or emerging issue (Glenn 2009). However, according to (Bengston 2016), the method is flexible and can be applied to a variety of needs and situations. For instance, in studies by (Toivonen 2011; Toivonen and Viitanen 2015), futures wheels were created in internal research teams based on separate interview data.

The futures wheel is an easy way to visualize the possible future impacts of a studied phenomenon. To begin this process, the phenomenon to be examined is placed in the centre of the wheel. Next, the primary impacts or consequences of the phenomenon are identified and recorded on the wheel, which resembles a mind map. In the follow-up phase, the idea is to forget the initial phenomenon in the centre of the wheel and focus on the consequences of the primary impacts. These secondary impacts are also recorded on the futures wheel, after which the focus is directed to the consequences of the secondary impacts. The process continues with the same formula to the tertiary-level consequences. Finally, a complex map describing the implications of the phenomenon in the middle of the wheel has taken shape (Bengston 2016; Glenn 2009; Toivonen 2021; Toivonen and Viitanen 2016).

A major advantage of the futures wheel method is that it allows a transition from linear, hierarchical and simplistic thinking to network-oriented and complex thinking (Glenn 2009). Consequently, unforeseen implications can be uncovered (Bengston 2016). Thus, academics have utilized this method in different types of study. Researchers such as (Benckendorff 2008; Benckendorff et al. 2009) used this method to examine how different trends are impacting tourism. This method has been used to examine future challenges in the mining industry (Prior et al. 2013) and to study the impacts of the Covid-19 pandemic (Daffara 2020). The method is also applied in the real estate field, and the common view among researchers has been that the method has many strengths that support its applicability, especially in this field. For instance, (Toivonen and Viitanen 2016) utilized the method to analyse the possible future themes of the commercial real estate market, stating that the method provides significant potential in examining the phenomena of the real estate market. (Toivonen, Rashidfarokhi, and Kyrö 2021) explored the use of the futures wheel method in the context of empowering future city developers to integrate futures literacy skills in decision-making processes. According to them, the method is very useful in the real estate sector,

as it can be used to show and visualize different future development paths, and, by using the method, it is possible to achieve a holistic picture of the possible impacts of complicated phenomena (Toivonen, Rashidfarokhi, and Kyrö 2021). The use of the method in the real estate sector was also studied by (Toivonen 2021), who proposes that the method could be added to the curriculums at different education levels in the real estate field, as it enhances futures thinking, which is important in the complex and constantly changing real estate market environment.

4.2. Implementation of the futures wheel method

This paper builds on previous research (Kiviaho and Toivonen 2023) in which the forces of change impacting real estate market development in shrinking cities were recognized and on (Kiviaho and Einolander 2023) where a similar methodology was used to assess the impacts of digital transformation and ICT on residents' well-being in shrinking communities. This paper attempts to deepen the understanding of these forces by focusing on future consequences and future development paths that may result from the forces. To achieve the objective of this study, the empirical part of the study was conducted as follows. First, 24 forces of change were examined by futures wheels, which were formed to identify possible future consequences. After this, the created futures wheels were analysed with a focus on future consequences related to real estate market development, and alternative futures development trajectories were shaped. The following subsections describe the research process in more detail.

4.2.1. Case cities

This study is based on empirical findings from eight shrinking Finnish cities. In accordance with other studies, the case cities were selected based on the Shrinking Cities International Research Network (SCiRN) definition of a shrinking city. According to this definition, a shrinking city is 'a densely populated urban area with a minimum population of 10,000 residents that has faced population losses in large parts for more than two years and is undergoing economic transformations with some symptoms of a structural crisis' (Hollander et al. 2009; Wiechman 2007). Therefore, the case cities were selected based on demographic and economic statistics, such as population change, inter-municipal net migration, jobs and unemployment as well as real estate market–related statistics, such as vacancy rates, transactions and prices. Eventually, eight shrinking cities, namely Lieksa, Savonlinna, Pieksämäki, Kurikka, Kemi, Kouvola, Jämsä and Imatra, were selected. All the selected cities have lost more than 10% of their population compared to the year 1990, and many of these cities have been shrinking continuously since 1990. It is essential to note that, in this study, the term *city* refers to an administrative unit that formally identifies geographical city boundaries, including both the city centre and surrounding rural areas. In the Finnish municipal system, municipalities can choose whether they want to adopt the status of a city. All the case cities have city status; thus, in this study, we use the term *city* rather than *municipality*.

4.2.2. The forces of change

As explained by (Toivonen and Viitanen 2015), forces of change, including megatrends, trends, wild cards, driving forces and weak signals, not only describe a current situation but can also shape and give indications of future development. Thus, the forces of change provide a good basis for exploring the alternative future development paths of shrinking cities. The previous part of a research project (Authors) identified various forces of change manifested in the real estate market environment of shrinking Finnish cities. Of the identified 106 forces of change, the 24 forces that appeared most strongly in the data were examined in this study by the futures wheel method to identify their future impacts that may be seen as steering the development of shrinking cities. These forces represent several different elements in the PESTE framework, which classifies forces into political (P), economic (E), social (S), technological (T) and environmental (E) dimensions. The

Table 1. The forces of change.

P	E	S	T	E
Competition between cities	Job losses	Population ageing	Digital property transactions	Abandoned buildings
The concentration of universities in major cities	Banks' tightened standards for house mortgage loans	The concentration of population in city centres	Distance learning	Environmental awareness in housing
Developing local tourism	Challenges of real estate redevelopment projects	The growing popularity of rental housing	E-commerce	The concentration of retail in shopping centres
	Oversupply of real estate in shrinking cities	Multi-local living	Online services	Revitalisation of the housing market via demolition
	Declining real estate values and prices in shrinking cities		Telecommuting	Vacant retail properties in the city centre
	Weakening municipal economy			

selected forces are summarized in Table 1, and, as can be seen in the table, some of the forces can be classified in more than one dimension.

4.2.3. Data

The possible futures consequences resulting from the forces were examined by futures wheels, which were formed based on interview and newspaper data. The data included transcribed semi-structured interviews with 9 land-use experts, 13 bank representatives and 23 real estate appraisers and brokers from the 8 case cities. These participants we selected for several reasons. First, land-use experts are responsible for local land-use planning and have a significant impact on the long-term development of the case cities and their real estate market development. Second, bank representatives need to consider the future development of local real estate when they are providing mortgages with a loan term of decades. Finally, real estate appraisers and brokers have valuable information about the current market atmosphere. The interviews addressed their perceptions of the forces of change impacting local real estate market development. The interviews were conducted remotely via Zoom in May–November 2020. In addition, our data contained 872 newspaper articles, of which 24% were from national newspapers published between January 2011 and April 2020 and the rest from local newspapers in the case cities published between January 2019 and April 2020. The newspaper articles covered a wide range of different changes, events and phenomena manifested in the real estate market environment of shrinking cities. Newspapers were utilized because they can reveal public discourse that reflects perceptions of the market atmosphere and overall changes in the market environment.

4.2.4. The formation of futures wheels

In this study, futures wheels were utilized as a visualization and analysis tool for the gathered data, intended to deepen the analysis and identify various future consequences following from different forces of change. Thus, the 24 forces of change were placed at the centres of the wheels, and the futures wheels were formed as explained in section 3.1. As in the studies of Toivonen (2011) and Toivonen and Viitanen (2015), in this study, the futures wheels were formed by the internal research team based on interview and newspaper data. As Toivonen and Viitanen (2015) explain, using an internal team to form the wheels is a recommended option in situations in which a high number of different forces for change are studied. In addition, in their research, Toivonen and Viitanen (2015) show that the method can be used so that the wheels are built based on several data sources, such as blogs, magazines, newspapers and interviews. Figure 1 below demonstrates the futures wheel.

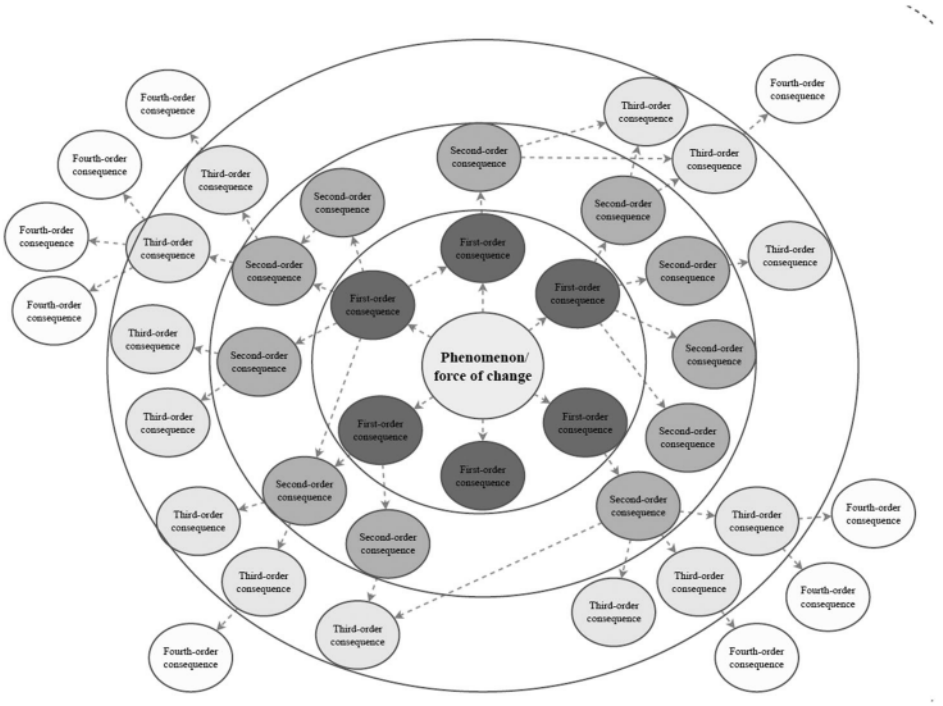

Figure 1. Futures wheel.

4.2.5. Analysis of future development paths

After the formation of the futures wheels, the primary-, secondary-, tertiary- and quaternary-order consequences of each futures wheel were analysed. Our analyses focused specifically on future consequences related to real estate market development. During the analysis, future consequences were thematically categorized into different categories. Such categories can capture those different development trajectories that lead to a similar outcome. After this, the 14 formed categories presenting the future development trajectories were merged on the basis of their content into four main themes: (1) **reinventing 'location, location, location'**, (2) **changes in the use of spaces**, (3) **intensifying polarization of the real estate market** and (4) **public response strategies to manage the negative effects of urban shrinkage**. Next, these different trajectories are presented.

5. Results

In this study, futures wheels were utilized to reveal alternative future development trajectories of shrinking cities. Based on our analysis, we uncovered 14 future development trajectories, and these were further merged based on their content into four main themes, which are described in the following subsections. These results are summarized in Table 2.

5.1. Reinventing 'location, location, location'

5.1.1. Centralization

Based on the futures wheels, various forces of change may lead to development that intensifies the centralization development of the urban structure. Population ageing and the concentration of services, such as public services, lead to the concentration of the population in the city centre and its proximity. Banks are also reinforcing the concentration development by financing new construction and refurbishments mainly in the vicinity of the city centre.

Table 2. Future themes and possible future development trajectories of the case cities.

Future themes	Future development trajectories
Reinventing 'location, location, location'	Centralization
	Urban sprawl
	Location independence
Changes in the use of spaces	Changes of office premises
	Changes in urban spaces
	The blurring line between primary home and secondary home
Intensifying polarization of the real estate market	Polarization between the city core and sparsely populated areas
	Polarization within neighbourhoods
	Polarization between buildings
	Luring new residents and second homeowners
Public response strategies to manage the negative effects of urban shrinkage	Land-use policy responses to encourage job creation
	Increasing pressure for demolitions

5.1.2. Urban sprawl

Although many forces of change may lead to centralization, the futures wheels revealed the trend of urban sprawl. Many of the case cities have zoned new plots in the proximity of lakes and river shores far from the city centre, aiming to lure new residents and increase new construction in these areas. Additionally, in the light of the results of the study, the ongoing rise of telecommuting can act as an enabler of multi-local living, causing a growing demand for second homes. These second homes are usually located in the proximity of lakeshores, in sparsely populated areas and far from city centres. This kind of development may intensify the development of urban sprawl in the future. Telecommuting enables people to choose the location of their home or place of residence regardless of the location of their workplace. Thus, people can live farther away from the physical location of the workplace, which might also contribute to urban sprawl, leading to longer commutes if people must travel to the workplace once or twice a week. Such development applies especially to shrinking cities located in the proximity of major cities. Overall, attractive residential environments and the importance of different aspects that support quality of life, such as nature, the ease of everyday life, safety and the availability of recreational opportunities and activities, could be emphasized in the choice of residence and might reinforce urban sprawl.

5.1.3. Location independence

In particular, the forces of change related to digitalization and the development of information and communications technology intensify location independencies. Teleworking, distance learning, online services and e-commerce enable working, studying and access to services regardless of the physical location of workplaces, services, schools or universities. Location-independent remote working enables people to live even in different countries from the physical location of the workplace. This kind of development can reinforce multi-local living, in which everyday life can be divided between different places. For instance, people can spend more time in their second homes. In addition, distance learning may have a positive impact on the regional development of shrinking cities through increased innovation and a higher-skilled workforce.

5.2. Changes in the use of spaces

5.2.1. Changes in the use of office premises

The futures wheels revealed that several forces of change may lead to changes in space requirements and the use of office spaces. Increasing telecommuting and online services reduce the need and demand for office space. At the same time, many cities and companies are trying to optimize the use of their office premises. Consequently, the volume of vacant office spaces may increase in the

future. Meanwhile, teleworking, distance learning and multi-local living are generating needs for new types of workspace solution, such as co-working spaces, telecommuting hubs and multi-purpose facilities. As a result, uses can be found for vacant office spaces. However, increasing teleworking might increase the need for home offices and co-working spaces in apartment blocks. Compared to major cities, where housing costs are high and residents live in small apartments, shrinking cities can offer affordable and spacious single-family houses with plenty of space for home offices. This might change the competitive environment between cities to benefit some shrinking cities.

5.2.2. Changes in urban spaces

According to the futures wheels, there may be changes in the uses of urban spaces in the future. For instance, teleworking, e-commerce, online services and the concentration of commercial services in shopping centres outside the city core weaken the attractiveness of the city centre. This, in turn, reduces potential retail customers in the city centre and causes challenges for local retailers. Consequently, the volume of brick-and-mortar retail shops located in city centres may decrease, and the number of vacant retail premises may increase in the future. Due to weak demand, the values of commercial real estate in the city centre are likely to decrease.

It seems that people may need other reasons to visit city centres. Several case cities have already organized different kinds of urban events to attract residents and tourists to the city centre. In the future, city centres may become an important meeting place for people and platforms for different types of events. Furthermore, increasing e-commerce generates needs for storage, distribution and pick-up facilities in central locations, which might lure residents to the city centre.

5.2.3. The blurring line between primary home and secondary home

Interestingly, the futures wheels also emphasize changes in housing needs related to second homes. Unlike traditional cottage types of second home with minimal amenities, many new second homes include the same characteristics and a similar level of equipment as permanent homes.

Our results also indicate that, as multi-local living increases, the line between primary (permanent) home and countryside-located recreational second home becomes blurred. In Finland, a person can be registered in only one municipality or city of permanent residence. In addition, a dwelling or building can be defined as permanently occupied by a person's declaration to the Population Information System of the Population Register Centre. Our data indicate that second homeowners have aims to convert the registration of second homes into permanent homes. However, this process means the alteration of the intended use of a building, and thus the process requires a building permit, granted by a local city. If many second homes are converted to permanent homes, statistically, the number of permanent residents increases in the city, and the city's tax revenues may rise as income taxes are paid to the municipality or city where the resident is permanently registered. However, local cities need to offer statutory services to permanent residents, such as education and care as well as water and waste management. If a second home is located in a sparsely populated area, the provision of these services can be costly for the city. In addition, the building must be technically suitable for permanent use. For example, energy efficiency and drainage must comply with building regulations. This could lead to major renovations so that the equipment level of the second home corresponds to that of a permanent home.

5.3. Intensifying polarization of the real estate market

5.3.1. Polarization between the city core and sparsely populated areas

Differences between regions, such as the city core, sparsely populated areas and smaller regional centres, seem to be intensifying already as well as in the future due to polarization of services. Many cities have concentrated public services in larger units in city centres and near city centres. Overall, city authorities actively develop the city centre by demolishing dilapidating (rental) housing stock and replacing these with new ones. In addition, banks grant loans for major renovations of

housing companies located in city centres and urbanized areas. At the same time, many services are reduced in smaller regional centres and sparsely populated areas. In addition, the attractiveness of sparsely populated areas may decrease due to the deterioration of road infrastructure due to the aim of balancing the municipal budget through spending cuts, which reduces the accessibility of these areas. This could weaken the demand for housing in these areas and further intensify concentration. Likewise, financing new construction or renovations can be challenging in locations far from the city centre, which is also widening the gap between the city core and other areas.

5.3.2. Polarization within neighbourhoods

In the light of the results of this study, regional differences can also intensify within the city centre and urban areas of shrinking cities. Although real estate demand, prices and values have decreased in shrinking cities, there are areas where the decline has been stronger than in other areas. For instance, there are some areas or neighbourhoods in city centres and proximities where demand for real estate has diminished because of the negative reputation of the area. However, as real estate in those areas can be sold at low prices but rental income is reasonable, many of these have been purchased for investment purposes. Such a development could cause a significant concentration of rental housing. Meanwhile, local owner-occupiers favour other neighbourhoods and even avoid the aforementioned areas, leading to neighbourhood-level variation in housing demand. Consequently, differences between neighbourhoods may be intensifying and even lead to segregation in the future. These challenges can be exacerbated by the fact that, typically, buildings in the same neighbourhood were built in the same era. Thus, old buildings in older neighbourhoods have more repair debt than buildings in newer residential areas, which can further increase the differences between neighbourhoods. The situation can be exacerbated by the bank's unwillingness to grant renovation loans for buildings with significant repair debt.

Interestingly, according to the results of this study, regional differences in value development between holiday resort areas and ordinary neighbourhoods may intensify in the future. Currently, in some of the case cities, the prices of second homes located in holiday resort areas can be higher than the prices of single-family homes located near city centres. In light of the futures wheels, this gap may widen in the future, because increasing teleworking and multi-local living allow people to spend more time in their second homes or rental cottages located in these resort areas. The attractiveness of these areas is based on the surrounding nature as well as various recreational activities, such as skiing, downhill skiing and spas.

5.3.3. Polarization between buildings

Differences between real estate are highlighted in the futures wheels. Old single-family houses with minimal amenities and a lot of repair debt are difficult to sell, as many buyers prefer well-maintained and relatively new buildings. Because there is more supply than demand in the real estate market, poorly maintained houses cannot be sold, and they may be left vacant. Some real estate owners do not even try to sell this type of real estate, assuming no one will buy it. The situation is also exacerbated by the fact that banks do not want to finance purchases or renovations of properties with significant repair debt. In addition, the demand for old oil-heated buildings has declined, since buyers are more environmentally conscious than before. For these reasons, in the future, more and more single-family houses may be left vacant, exposing them to risks of vandalism and accidents. Vacant real estate can be dilapidated and drift into an uninhabitable condition. By contrast, well-maintained and relatively new buildings are more likely to be inhabited and to receive necessary renovations. This gap between buildings seems to be widening in the future, as there is not enough new construction, and the building stock is ageing.

The results of this study indicate that differences between apartment blocks may also be intensifying. In some housing apartment blocks, the estimated amount of repair debt is higher than the market value of the building. Therefore, the necessary repairs are difficult to finance unless residents finance renovations with personal loans. If necessary renovations are delayed further into the

future, these buildings can drift into such poor conditions that there is no other choice than demolition.

5.4. Public response strategies to manage the negative effects of shrinkage

5.4.1. Luring new residents and second homeowners

Through zoning and planning, many case cities have been trying to attract new residents and second homeowners to the city. For instance, by building new schools, zoning affordable plots for single-family homes and investing in outdoor and recreational areas, several case city authorities have been trying to attract families to the shrinking cities. In addition, some shrinking cities have been luring new residents by offering monetary incentives, such as offering rent-free housing months or so-called child money, which is paid to families with a newborn child. If these actions succeed in attracting new residents, the demand for real estate and new construction in these areas may increase in the future.

5.4.2. Land-use policy responses to encourage job creation

Cities have also tried to lure new companies into the area by zoning and developing plots for industrial activities. The idea behind these actions is to create an infrastructure where companies and enterprises can be located in the city on a fast schedule, without the delay of zoning and infrastructure construction. If companies decide to locate in the area, local cities receive many benefits, such as an increase in tax revenues and job opportunities. In the light of the futures wheels, increasing job opportunities could benefit the local real estate market in many ways, such as increasing demand for real estate and rental housing, reducing uncertainty related to financial security, committing people to the area and improving their ability to acquire mortgages.

5.4.3. Increasing pressure for demolitions

According to the futures wheels, many forces of change can lead to developments by which more and more buildings end up being demolished by local cities. Some of the case cities have already invested heavily in demolition. Due to the concentration of public services and municipal amalgamations, many case cities own vacant buildings, such as schools, kindergartens, offices and small health centres. These buildings, which typically include plenty of repair debt, are difficult to sell in a market suffering from oversupply. In addition, in many case cities, municipal rental stock suffers from high vacancy rates and a large amount of repair debt. Likewise, poorly maintained vacant single-family houses located on rental plots may also end up being demolished by local authorities. Demolitions of these kinds of buildings increase the expenditures of local cities and may weaken the local economy. However, cities may save the maintenance costs of vacant buildings. Cities with a significant number of demolished buildings may even become large materials banks from which building materials can be transferred and utilized in growing areas. Demolitions can also stabilize housing markets by reducing vacancies and thus reducing the oversupply.

6. Discussion

This paper aimed to uncover alternative future development paths resulting from the forces of change by utilizing the futures wheel method. By utilizing future research methods, particularly the future wheel method, we were able to broaden the debate about the consequences of shrinking cities even further. Based on our analysis, we uncovered 14 future development trajectories, and these were merged based on their content into four main themes. The first one, **reinventing 'location, location, location'**, includes changes in the spatial development of shrinking cities that have an impact, for instance, on potential new construction and real estate demand related to certain locations. The second main theme, **changes in the use of spaces**, highlights changes related to the use of spaces, such as offices and urban spaces. The third theme, **intensifying**

polarization of the real estate market, emphasizes the regional differences in local real estate market development. The fourth theme, **public response strategies to manage the negative effects of shrinkage**, includes different acts of local public authorities trying to address the negative consequences of urban shrinkage.

The results of this study reveal many different future consequences, and some of these can be seen even to contradict one another, leading to different types of future development trajectory. For instance, centralization, urban sprawl and location independence might lead to truly different regional structures of cities. However, as the future is open, all these alternative developments are possible, but, at the same, these are dependent on human choices and chance events (Niiniluoto 2001). For example, location-independent future development is strongly dependent on the choices of companies and employers that decide whether they want to promote location-independent teleworking or presume that employees return to offices and physical workplaces. Additionally, local urban planners can promote the development of urban sprawl by zoning new plots in the proximity of lakes and river shores, far from the city centre. Such land-use alternatives may succeed in luring families, teleworkers and second home buyers who are looking for larger houses with access to nature and, thus, increase or stabilize the population development of the city. However, previous studies have shown that urban sprawl may also lead to other serious challenges, such as increasing costs of service provision due to, for example, unprofitable bus routes and taxi services for school children (Hytönen et al. 2016). In addition, urban sprawl may also exacerbate the shrinkage of city centres.

The research has shown that some consequences of the forces of change may increase the desirability of shrinking cities and offer new lifestyle choices, especially for well-educated teleworkers. Digitalization-related forces of change, such as teleworking, online services, distance learning and e-commerce, create new freedom to choose a place of residence according to people's preferences. Thus, attractive residential environments and the importance of different aspects that support quality of life, such as nature, ease of everyday life, safety, low housing costs and the availability of recreational and leisure activities may be emphasized in the locational choices of households. Many shrinking Finnish cities could provide these aspects, as many case cities have invested in outdoor and recreational areas, zoned affordable plots close to nature and built new schools. Also, residents of shrinking cities could benefit from these forces of change, as they would no longer be forced to move away from shrinking cities for study. For instance, online learning creates opportunities to complete university degrees remotely, which could lead to higher income levels. Earlier studies have demonstrated that an increase in skill could increase people's incomes in the context of growing cities (Glaeser and Resseger 2010).

As noted by (Florida, Rodríguez-Pose, and Storper 2021), all cities and regions do not benefit from teleworking, as a limited share of the workforce in intermediate cities, towns and rural areas can do their work remotely. However, our results indicate that shrinking cities could benefit from teleworking, as it enables increasingly flexible ways of working and thus supports multi-local living, as city dwellers can spend more time at their second homes located in the countryside of shrinking cities. In addition, our results indicate that, nowadays, many second homes have a similar level of equipment to permanent homes. This development could lead to people spending time at their second home year round. Although second home ownership has a long tradition in Finland (Pitkänen 2008), second homes have been used mainly during the summer months. On the other hand, it could be possible that, in the future, international multi-local living made possible by location-independent teleworking could also offer new opportunities for shrinking Finnish cities as people are no longer tied to one location. As noted by (Häkkänen, Ilgın, and Karjalainen 2022; Müller 2007), due to globalization, second home ownership has gained new international dimensions. Nevertheless, increasing multi-locality may cause some future challenges, as our results highlight regional differences in value development between real estate located in holiday resort areas and ordinary neighbourhoods and indicate that this may intensify in the future. Such developments may also challenge some city centres to compete with resort areas, as the latter

can provide many recreational facilities, such as spas, hiking trails, skiing and even restaurants, attracting tourists as well as second home residents.

Overall, the findings show that, in the future, shrinking cities may face many challenges related to the polarization of the real estate market. Likewise, many forces of change could lead to increasing amounts of vacant real estate, of which many examples are in danger of drifting into uninhabitable conditions. Many of these could end up being demolished by local authorities. By demolishing their owned vacant buildings, cities may receive savings in maintenance costs. However, publicly funded heavy demolitions also increase the expenditures of local cities and thus may weaken the municipal economy. Thus, in the future, more state funding and subsidies may be allocated to these areas for the demolition of buildings and especially for building renovations. As a part of the European Green Deal, the European Union's goals to increase energy efficiency and decarbonize building stock (European Commission 2022) also increase pressure for the renovation and demolition of buildings in shrinking cities. Thus, in the future, there could be a need for EU-level subsidies aimed at improving the energy efficiency of buildings in shrinking cities.

This research focused on shrinking cities; however, some of the results can be connected to growing cities. Like shrinking cities, growing cities may face the challenge of a weakening attractiveness of the city centre caused by teleworking, e-commerce, online services and concentration of commercial services in shopping centres outside the city core. Consequently, the potential reduced volume of retail customers could cause challenges for local retailers. For this reason, empty retail properties might increase in the city core. This kind of development might create a vicious circle in which vacant retail properties further weaken the attractiveness of the city centre. For instance, as shown by (Kickert et al. 2020), the store-closure risk of retail businesses increases if there are fewer stores located near them.

Although this study focused on future consequences in the context of shrinking Finnish cities, most of the results seem to be consistent with previous studies focusing on urban shrinkage. For instance, by utilizing the urban life-cycle model, (Wolff 2018) discovered that many shrinking European cities are decentralized, and, because of an unfavourable age structure and strong population losses in the hinterlands, the decentralized development turns into centralized decline. In addition, many previous studies have shown that urban shrinkage and policy responses to urban shrinkage have distinct impacts on different areas or neighbourhoods in shrinking cities. For instance, (Hoekstra et al. 2020) discovered that demolitions concentrate in highly urbanized areas and are allocated to inexpensive rental units. Additionally, socioeconomic polarization and inequalities have apparent spatial implications in shrinking cities (Hoekstra et al. 2020).

Even though most of the results are in line with previous studies, there exist some special characteristics that need to be borne in mind in considering the generalisability of this study. In Finland, there is a long tradition of second-home ownership and spending recreational time in sparsely populated areas. In addition, in Finland, digitalization development, including elements such as the electrification of public services and the use of internet services, was common even before the Covid-19 pandemic, but the pandemic accelerated this development even further. For instance, compared to other EU countries, a significantly high proportion of the Finnish workforce started teleworking because of Covid-19 (OECD 2020). According to the Working Life Barometer 2021, a significant proportion of teleworkers wish to continue working remotely after the pandemic (Ministry of Economic Affairs and Employment 2022). Overall, in Finland, the infrastructure supports digitalization-related teleworking and multi-local living, as 4G mobile broadband services cover 59% of the land area and 94% of households (The Finnish Transport and Communications Agency 2022). In addition, the modern and faster 5G mobile network has been expanded at an accelerating pace, and, in the spring of 2021, its coverage was 84% of Finnish households (The Finnish Transport and Communications Agency 2022).

There are also limitations related to the results of this study. First, the results are heavily dependent on the forces of change placed at the centres of the futures wheels. It can be

questioned whether the results would be different if other forces had been placed on the futures wheels. This is certainly possible. However, our study did not aim to capture all possible forces of change but rather to focus on the 24 forces that appeared most strongly in the data. Secondly, in this study, the futures wheels were based on interview data and newspaper articles. It could be questioned whether future consequences can be identified from these data sources. Could some other future consequences have been found by focusing on, for example, planning documents, such as city strategies, or by interviewing, for example, futurists or regional development consultants? On the other hand, previous studies have utilized interviews and newspaper articles as a basis of futures wheels. In addition, our results reveal various development trajectories that lead to a similar outcome. This can be seen to support the reliability of the results. Thirdly, this study focused on eight shrinking Finnish cities, which constitutes a limitation to generalizing our findings. It should be acknowledged that it is possible that another sample of cases might have led to different results.

This article examined the alternative future development trajectories of shrinking cities from the perspective of the real estate markets. Although the research has produced valuable information on the debate concerning consequences related to urban shrinkage, the perspective can be seen as one limitation of the study since urban shrinkage is driven by a complex set of causes that affect the socioeconomic environment of shrinking cities as explained in Chapter 2. Therefore, future studies should also consider economic, social, and political strategies when utilizing the future wheel method, to provide an even more comprehensive understanding of the issue.

The future wheel method has been recognized in previous studies as a valuable approach for enhancing future-oriented thinking and decision-making (Toivonen 2021). Since the method can aid in futures thinking, decision-makers and planners could benefit from its application in real-life planning processes. Moreover, it might also be beneficial to employ the method in participatory planning processes, as it can help in gathering residents' views on possible development trajectories.

7. Conclusions

The present research aimed to identify and analyse the alternative future development trajectories of shrinking cities. By utilizing the futures research method called the futures wheel, we were able to visualize and analyse the possible future consequences of 24 different forces of change and thus further understand future development paths that may result from the forces.

The forces of change and, especially, their consequences will shape shrinking cities and their real estate market environment in the post-pandemic world. Together the results show that the forces of change may lead to many different, even contradictory, development trajectories affecting land use, space use and the urban form. Some of the forces may intensify the current negative effects caused by urban shrinkage. By contrast, some of the forces can radically change the future development from what we previously imagined it would be. For instance, some of the forces can offer shrinking cities opportunities for new types of growth and resilience.

The major contribution of this study is to assist decision-makers and planners in shrinking cities to see and be aware of different alternative possibilities and to draw a rich picture of what could be. This knowledge provides them with an opportunity to make effective policies and planning decisions that can lead towards the desirable or preferable future development, as the future is shaped by decisions and actions that are taken in the present moment. However, it may be questioned what kind of future is preferable. Is it preferable that residential areas spread far from city centres if this creates an opportunity to acquire new residents or second homeowners in shrinking cities? This raises the question of what is preferable for whom. A further study needs to be done to establish what kind of future the local residents, urban planners or decision-makers consider preferable or desirable.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This work was supported by the Academy of Finland [grant number 13339549]

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