

# Challenges in enabling aging-in-place initiatives in aging and shrinking Japanese cities: a case of the Gifu suburbs

Retos en la implementación de iniciativas de envejecimiento en ciudades  
japonesas envejecidas y en declive: el caso de los suburbios de Gifu

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## Abstract

This study first reviewed previous literature on 1) the residential environments and everyday lives of older adults to examine universal factors enabling aging-in-place initiatives, and 2) the

generation and outcomes of aging and shrinking suburbs in the Japanese context, via comparisons with case studies in Western cities. A case study was then conducted in the suburbs of Gifu to provide a clear impression of older adults' daily lives and their perceived barriers in aging and shrinking suburbs in Japan. Finally, we discussed challenges involved in enabling aging-in-place initiatives whose major goal is to provide residential environments in which older adults can maintain continuous residency in their attached homes and neighborhoods in Japanese cities. The case study revealed that many older adults wished to continue living in their homes and neighborhoods. Diversification of accessible support in families and modification of interrelationships among family, housing, and welfare can contribute to adjustments in later life. Systems to support mobility after ceasing driving should be examined in more detail, because older adults were not satisfied with bus service quality, resulting in individuals postponing the decision to cease driving. To enable aging-in-place initiatives in Japan, cooperation among different ministries in national government and divisions at the municipal level is necessary.

**Key words:** aging and shrinking cities; aging-in-place; post-growth society; Japanese cities.

## **Resumen**

Este trabajo revisa, en primer lugar, la literatura existente sobre: 1) los entornos residenciales y de la vida cotidiana de las personas mayores, con la intención de examinar los factores universales que favorecen la puesta en marcha de iniciativas de lucha contra el envejecimiento, y 2) las generación de suburbios envejecidos y en declive en el contexto japonés, y sus consecuencias, comparándolos con estudios de casos en ciudades occidentales. Posteriormente se analizaron los suburbios de Gifu, para mostrar cómo es la vida cotidiana de las personas mayores, y las barreras que perciben en los suburbios envejecidos y en declive de Japón. Por último, se analizaron los desafíos a las que deben responder las iniciativas de envejecimiento, cuyo principal objetivo es proporcionar entornos residenciales donde las personas mayores puedan residir de forma permanente en sus viviendas y barrios en las ciudades japonesas. El estudio de caso reveló que muchos mayores deseaban seguir viviendo en sus hogares y barrios. Las diversas fuentes de apoyo a las familias y los cambios en las interrelaciones entre la familia, la vivienda y la asistencia social pueden mejorar los últimos años de vida. Los sistemas de apoyo a la movilidad después de dejar de conducir deberían examinarse con más detalle, porque los mayores no estaban satisfechos con la calidad del servicio de autobuses, lo que hacía que las personas aplazaran la decisión de dejar de conducir. Para favorecer las iniciativas dirigidas a

mitigar los efectos del envejecimiento en Japón, es necesaria la cooperación entre los diferentes ministerios del gobierno nacional y los departamentos a escala municipal.

**Palabras clave:** ciudades envejecidas y en declive; envejecimiento; sociedad post-crecimiento; ciudades japonesas.

## 1 Introduction

Japanese cities have faced several challenges typical of post-growth societies over the past few decades (Hino & Tsutsumi, 2015; Hirayama & Izuhara, 2018). Among the most crucial issues are demographic changes including population aging, depopulation, and low fertility. These changes have generated aging and shrinking cities in Japan, and an increase in housing vacancies, a lack of daily transportation services, and a reduction in perceived quality of life among older residents have drained vitality from Japanese cities (Kubo & Yui, 2019). For example, the Tokyo metropolitan area has rapidly divided into a growing city center and shrinking suburbs since the second decade of the 21<sup>st</sup> century (Kubo, 2020). This change reflects the government's intention to increase Tokyo's competitiveness, which has increased urban developments in central Tokyo (Hirayama, 2005; Jacobs, 2005; Kubo, 2015). In contrast, less investment in the aging suburbs has accelerated shrinkage in Tokyo's outer suburbs since the beginning of the 21<sup>st</sup> century (Kubo, 2015; Kubo & Yui, 2019). An especially serious problem is seen in middle-sized cities, such as Gifu city, which have often experienced aging-driven shrinkage not only in the suburbs but also in city centers.

This study examines the generation of aging and shrinking cities in Japan, as well as the challenges presented by these contexts, to identify countermeasures to resolve the problems of the post-growth period in urban Japan. In this context, the study focused on "aging-in-place" initiatives, which aim to increase residents' quality of life and establish an age-friendly urban environment (Cutchin, 2003; WHO, 2007). These initiatives are examples of shrinkage-accepting governance in shrinking cities (Hospers, 2014). Through a case study in the middle-sized city of Gifu, the article discusses challenges in implementing ageing-in-place initiatives in aging and shrinking Japanese cities.

The current study consisted of four sections. In Section 1, we review literature on the relationship between older adults and their residential environments to guide the research framework. Section 2 examines the generation and outcomes of aging and shrinking suburbs in the Japanese context via a comparison with case studies in Western cities. In Section 3, a case study in the suburbs of

Gifu provides a clear impression of older adults' daily lives and their perceived barriers in aging and shrinking suburbs in Japan. To analyze older adults' residential environments, we focused on three analytical scales; body and house, neighborhood, and wider areas, and the interrelationships among these scales. Finally, we discuss challenges involved in enabling aging-in-place initiatives whose major goal is to provide residential environments in which older adults can maintain their continuous residency in their attached home and neighborhood in Japan.

### **1.1 Literature review: the relationship between older adults and residential environments**

In this section, we review discussions about older adults' residential environments and everyday lives to examine the criteria for enabling aging-in-place initiatives. Aging-in-place initiatives have been discussed by international institutions such as the World Health Organization (WHO); academic disciplines such as gerontology, urban, population and welfare geography, planning, and demography; and the state and municipal governments of countries facing population aging (Andrews et al., 2007; Skinner et al., 2015).

To examine residential environments that enable continuous residency in the attached homes and neighborhoods, three analytical scales are considered important: 1) a human scale, such as older adults' bodies and homes, which reflect individuals' changeability over time (Johansson et al., 2008); 2) a community/neighborhood scale that determines individuals' perceptions of the interrelationships among individuals, homes, and residential areas (Chaudhury et al., 2016; Elliott et al., 2014); and 3) the wider residential area that determines older adults' perceived well-being and dignity, and evaluation of the "livability" of their residential areas (Schwanen & Ziegler, 2011). These three scales are interrelated and form the daily life of older adults. Therefore, our surveys covered both the criteria in each scale and the interrelationships among the three scales. A review of related studies informed the criteria analyzed in each scale in this study.

To enable aging-in-place in urban environments, older adults' changeability should be considered. Older adults face changes in their bodies and environments in different time periods, such as on a daily basis as well as long-term. For example, on a daily scale, their mood and health condition can change based on weather condition, whereas in the long-term, their physical condition may gradually or rapidly decline. In addition, the need to move to relatives' houses, hospitals, or care-facilities may also change older adults' physical and mental conditions (Johansson et al., 2008). When older adults perceive changes in their relationships with their residential environment, they try to adjust to this new interrelationship with their environment

(Peace et al., 2011). During this adjustment, decisions are made that prioritize the option that maintains their identity, rather than an option based on objective criteria; these decisions are the result of interrelationships among social, physical, and psychological environments (Peace et al., 2011). Although older adults face negative changes in their body or surrounding environment, their body has capability to adjust and negotiate their residential environments (Rowles, 1978).

In the United States, the post-war baby boomers who drove suburbanization have reached older age, and the corresponding increased demand for providing care in their neighborhoods stimulated discussion on older adults' home environment (Williams, 2002). As people age, they tend to stay home longer than when they were younger. Housing conditions can therefore strongly affect older adults' perception of short- and long-term changes. For example, when a person has lived in the same house for a long period, they tend to form place attachment to their residential environment, including their home (Coleman et al., 2016; Tanner et al., 2008). Johansson et al. (2008) stressed the importance of adjusting housing conditions to fit later life by reducing various barriers in the home and living environments; such housing adjustment is a useful tool in enabling aging-in-place initiatives. Maintaining a house and garden tends to be regarded as a heavy duty for older adults, requiring both financial and human support. In reality, older adults perceive strong stress when they fail to negotiate with people to gain support, resulting in a rise in feelings such as solitude and uneasiness (Coleman et al., 2016).

We focused on older adults' perceptions of their neighborhood environments and the roles that maintain their continuous residency in their community. Although satisfaction with the residential environment in their community has less impact on older adults' decisions about moving than life events and age (Clark & Lisowski, 2017), "push" factors such as a decline in safety and urban shrinkage can trigger motivation to move (Duque-Calvache et al., 2018). In contrast, strong bonds with the local community and the presence of friends nearby increase older adults' motivation to engage in community-based activities, feeling of place attachment, and their level of perceived well-being (Chaudhury et al., 2016; Elliott et al., 2014). Place attachment to home and neighborhood is expected to increase older adults' perceptions of happiness and quality of life, and contribute to maintaining their health condition. Older adults' place attachment is generated through the formation of physical, social, and autobiographical "insideness" as they have lived in their residential environments for a long time (Rowles, 1983).

We examined older adults' daily lives in wider areas. Access to fresh food and independent mobility are crucial factors that maintain quality of life for older adults in the context of aging and

shrinking neighborhoods (Morland et al., 2002). In Japan, many suburban neighborhoods that were developed in the 1970s and 1980s have experienced an increase in vacant real estate. Shops, offices, and other facilities in shrinking neighborhoods cannot maintain their business and become vacant; sometimes they are used as day-care facilities for older adults (Yui et al., 2017). Older adults living in such shrinking suburban neighborhoods often experience reduced access to fresh food within walkable distance. The lack of independent mobility can further reduce access to fresh food, resulting in a poor dietary condition, as reported in late 1990s England (Wringley et al., 2002). Access to fresh food is determined by complex interrelationships between an individual's socioeconomic status, degree of social engagement, and health condition. Discussions about "food deserts" have tried to understand these mutual relationships between individuals' conditions and their built environment (Iwama, 2017). According to Iwama (2017), food deserts are typically problems in areas with: 1) high concentrations of older adults, the impoverished, and other socially vulnerable populations, and 2) declines in level of access to fresh food, communication with family members or the local community. In Japan, reducing levels of investment, along with the aging of existing residents and out-migration of young people are major causal factors for aging and shrinking neighborhoods, resulting in high possibility of an area becoming a food desert.

The availability of independent mobility can determine older adults' well-being and perceived quality of life (Davey, 2007; Musselwhite, 2015; WHO, 2015). A built environment that permits older adults' mobility affects the determinants of well-being, such as their physical and mental health and social activities in their home and neighborhood (Musselwhite, 2015; WHO, 2015). The relationship between mobility and well-being is contextual and determined by complex interrelationships among the time-space characteristics of the residential environment and individuals' life course stage and capability (Nordbakke & Schwanen, 2014; Schwanen & Ziegler, 2011). Independent mobility is achieved when individuals can maintain freedom and physical capability to move in physical space at their own discretion, enabling outdoor activities that maintain older adults' identity and social engagement, as well as access to technology that supports a weakening body (Schwanen, Banister et al., 2012). Older adults accumulate conditions to maintain independent mobility by planning outdoor behavior in advance so they can safely complete their moves to/at their destination. This may involve modifying their needs and destination to fit their changeable condition, and using techniques to support their weakening body, such as devices to aid walking and private cars (Bailey et al., 2011; Nordbakke, 2013; Siren & Hakamies-Blomqvist, 2009).

Finally, the relationships among individuals, availability of private cars, and accessibility to public transportation systems such as buses should be discussed. Although many older adults tend to prefer walking and driving a private car rather than riding a bus (Li et al., 2012; Schmocker et al., 2008), this tendency is less marked among women and those without access to private cars. Over the past few decades, more women started driving cars, and older adults' activities outside the home have increased (Hjorthol et al., 2010).

In addition to the previous study examined in the previous section, several aging-led problems that have gathered social attention throughout the first two decades of the 21st century should be analyzed in Japan. First, lack of opportunities to socialize or communicate with others may result in people remaining in their houses alone. This can lead to a "solitary death" or "dying alone," which refers to a body that has not been found by others for several days after a person has passed away in their home, and is now regarded as a social problem in Japan (Matsumiya, 2013). Second, an increase in housing vacancies can cause disorder at a block-level or in a neighborhood as a whole and can even reduce residents' life satisfaction (Accordino & Johnson, 2000; Benediktsson, 2014; Kubo & Yui, 2019; Yui et al., 2017). Therefore, we also considered social bonds (e.g., engagement with the local community and communication with adult children) and residents' perceptions of an increase in vacant housing in the community.

## **1.2 Methodology**

As part of the case study, we conducted interviews and questionnaire surveys in a study neighborhood in Gifu city, which is the capital of Gifu prefecture and part of the commuter belt of central Nagoya, with 9.3% of the working population commuting to Nagoya city. The population of Gifu city is 406,735, 27.2 % of whom are older adults (Statistical Bureau of Japan, 2015). A large proportion of Gifu's suburban housing estates were developed in the 1970s and 1980s by the public and private sectors to accommodate a growing young population seeking job opportunities in Gifu and the Nagoya metropolitan area (Kubo et al., 2020). Like suburbs in Tokyo, many housing estates largely occupied by owner-occupied detached houses and public/social housing suffer from problems related to the rapid aging and long-term shrinking trends in the second decade of the 21<sup>st</sup> century, when the original residents reached their 70s and 80s (Kubo, 2020; Kubo et al., 2020). We selected a typical suburban neighborhood in this context for our case study.

The study neighborhood is in an area containing communities that share a decline in residential environments and have an aging rate of 35.1% which exceeds Japan's average as well as the

average of Gifu city. We conducted a field survey of older adults' body conditions and houses, neighborhoods, and wider areas where older adults conduct their daily activities, housing vacancies, topographic conditions in both macro (within the neighborhood) and micro (block to block, or inclination around houses) levels, and activities in local communities. We asked local community organizations (residents' associations and senior residents' associations in both detached houses and public housing areas) to take part in our surveys and distribute information and questionnaires to their members via community networks. In Japan, most residents living in owner-occupied detached houses and public housing join local communities, and owner-occupied condominiums organize home-owners' associations to maintain their common properties. Residents in private rental apartments tend not to join such communities. In detached house neighborhoods, local communities tend to distribute information from municipal governments, organize community-based activities (e.g., community festivals, evacuation drills, or street cleaning), run community centers, and play roles in bridging local authorities (e.g., local welfare systems) and residents (Kubo et al., 2010; Kubo et al., 2013; Kubo, 2020). Thus, gaining agreement to join the survey from the board of the local community is an important requirement for conducting successful field surveys and increasing residents' level of engagement. We conducted interview surveys with most of the board members of local communities as preliminary research to clarify the outline of the study neighborhood and seek support for the survey. The content of the questionnaires and semi-structured interviews were drafted based on previous findings in the literature and determined by these preliminary interviews.

Questionnaires were distributed to all households in the study neighborhood between September 2015 and March 2016; a total of 591 questionnaires (336 households in detached house area and 255 households in the public housing area) were distributed, and 245 responses were collected (178 responses from the detached house area and 67 responses in the public housing area; in total, 41.5% of households in the study neighborhood joined this survey). Among these respondents, eight older adults, who were recommended by local communities or volunteers) participated in semi-structured vis-à-vis interview surveys. These interviewees were selected to represent older adults living in the study neighborhood. Questionnaire results were analyzed as descriptive statistics, supplementing the contents of semi-structured interview surveys and the whole picture of aging and shrinking Japanese cities.

In the analysis of body and home, we analyzed the health condition (food ingestion) of older adults, perceived barriers in the home and community, and the distribution and residents' perceptions of vacant housing in the case neighborhood. For analysis on the neighborhood scale,



we investigated participation in community activities and communication with family and other locals. In the context of the wider area, we considered access to fresh food, availability of private cars, and use of public bus services. We also focused on interrelationships among different criteria; between food ingestion and engagement in community-based activities, between the quality of bus services and individuals' evaluations, and between individuals' concerns and their residential environments.

Kubo et al. (2020) also dealt with a part of this survey, but a wide range of the survey content of the whole study could not be fully analyzed in Kubo et al. (2020). Therefore, we used data that were not used in Kubo et al. (2020).

### 1.3 Study area

The Nagoya metropolitan area is the third largest metropolitan area in Japan, forming the Tokaido megalopolis with Tokyo and Osaka metropolitan areas (Figure 1, also see Figure 2). The area's diversified manufacturing industry, represented by the automobile industry (e.g., Toyota) has supported the growth of the economy, population, and culture. Compared with Tokyo, which expanded its metropolitan boundary to 100 km at the peak of suburbanization in the 1980s, the Nagoya metropolitan area is compact; a 10 km commuter belt represents the inner suburbs and a 30 km commuter belt the outer suburbs (Kubo and Otsuka, 2019). Kozoji New Town in the 10 km commuter belt was one of the largest housing estates in the 1970s and 1980s, welcoming immigration of young families from non-metropolitan areas (Tani, 1997).<sup>1</sup> However, there are many aging and shrinking suburban neighborhoods in the Nagoya metropolitan area, one of which is the Gifu suburbs (explained later in this section).

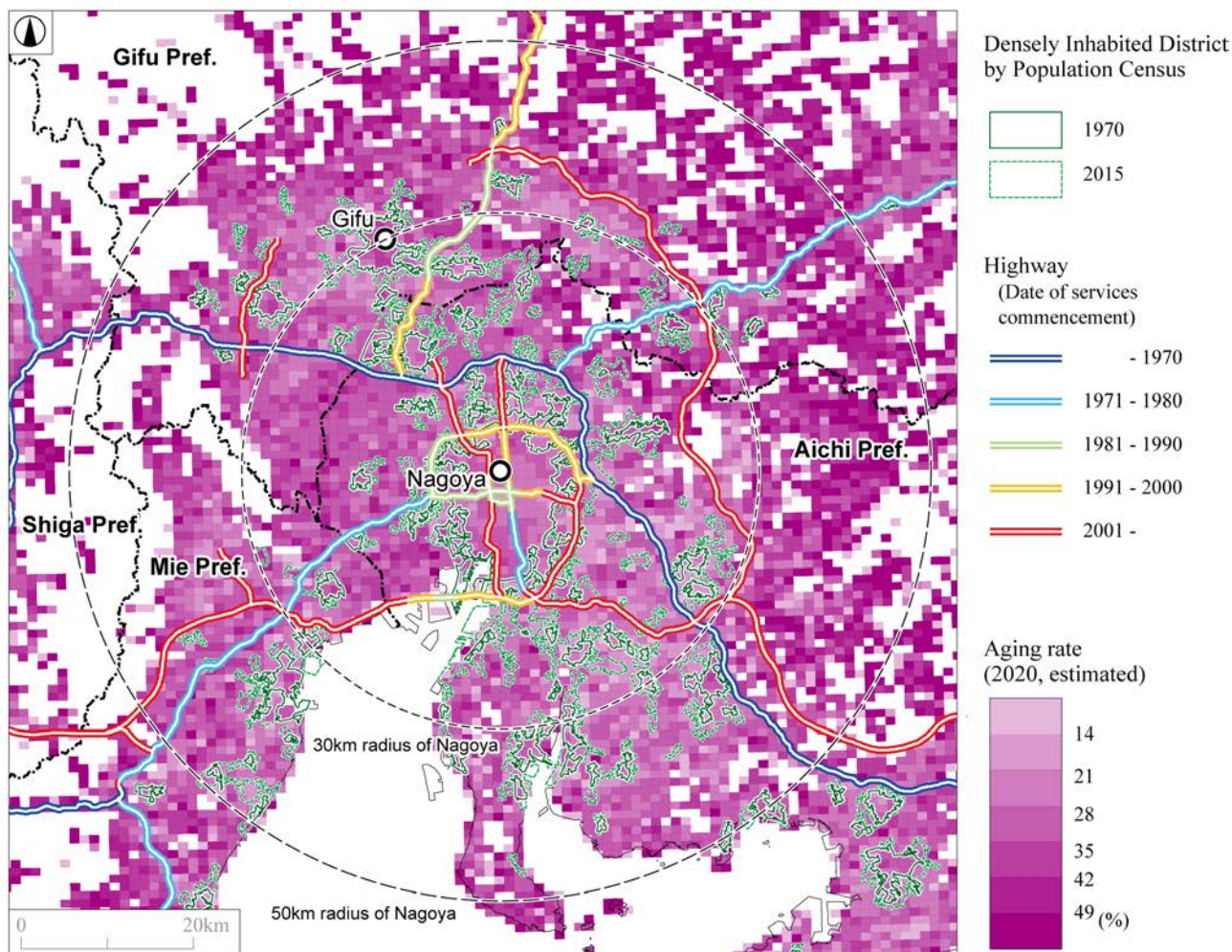
Major highway and train networks connecting the city center and the suburbs were developed in the 1970s and 1980s (Figure 1). In the first two decades of the 21st century, disparities in continuous investment among the outer suburbs became marked. For example, the north-east and east sectors gained more investment for highway construction; however, in the north-west and west sectors, where Gifu city is located, new highways were not constructed. The aging rate is high in areas close to the prefectural borders and in the 30–50 km belt of the metropolitan area.

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1 Of the housing stock in Kozoji New Town, public rental apartments have the highest vacancy rates because the proximity to central Nagoya means young families continue to move into detached houses in the town. Even in the 30 km commuter belt, some suburban housing estates experienced a continuous inflow of young families whose parents had purchased homes in nearby housing estates (Kubo & Otsuka, 2019).

Gifu city is on the 30 km line from central Nagoya and has a high aging rate in both the city center and suburbs.

Figure 1. Distribution of population and major urban investment in the Nagoya metropolitan area (1970–2015)

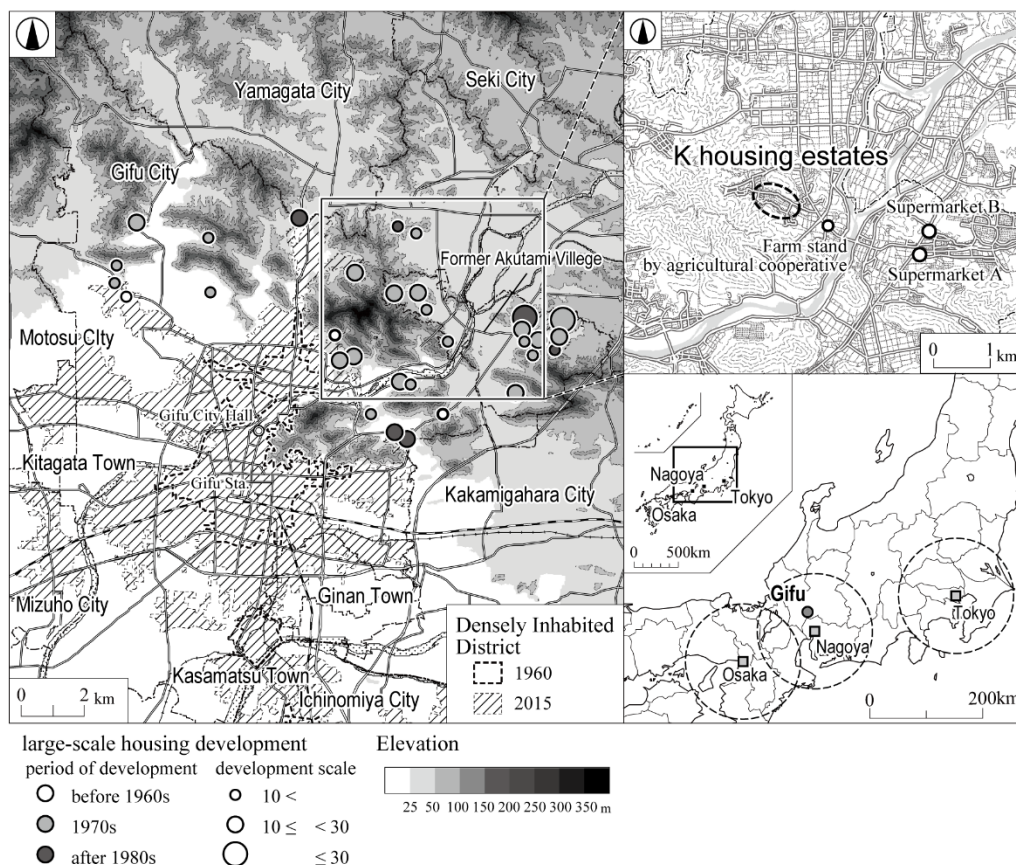


Source: Statistics Bureau of Japan (1970–2015) Population Census of Japan, Statistics Bureau of Japan, Tokyo

An intensive field survey was conducted in a suburban housing estate in the suburbs of Gifu city (Figure 2). A diversity of local industries, such as the textile industry in Gifu city, and *washi* paper manufacturing and blade manufacturing in neighboring areas has required young workers since the 1950s. As in the commuter belt of Nagoya city, there was a sufficient inflow of young people in the 1970s and 1980s. Many teenagers of that time, mostly post-war baby boomers, moved to major metropolitan areas from rural areas in search of better occupational opportunities. To accommodate the increasing young population, both public and private sectors invested in

transportation systems, housing development, and other social and educational facilities. In Gifu city, the municipal governments (Gifu city and Gifu Prefecture) developed 193.5 ha of land to supply housing estates from the mid-1950s to the 1970s. Private developers also sold housing and industrial land. Figure 2 shows the distribution of major housing estates in Gifu city. In contrast to the central business district of the city on the plain, most large-scale housing developments in the 1970s and 1980s were built on poor land surrounded by mountains. The inclination of this land with less light because of the surrounding mountains, and the disaster-prone condition of the area typify the housing development of the time. In short, because of soaring housing demand and pressure for new urban developments, inferior land (e.g., sites of heavy industry, mountainous areas, slopes on hillsides, or disaster-prone areas) were targeted for housing developments. Hill-side housing estates provide daily barriers for older adults, and resilience after natural disaster tends to be weak.

Figure 2. Sites of the case study



**Note:** Study neighborhood is K housing estates in the right top figure. This figure is a revision of Figure 1 in Kubo et al. (2020).

Source: Statistics Bureau of Japan (1970–2015) Population Census of Japan, Statistics Bureau of Japan, Tokyo. Governmental documents provided by Gifu city and Gifu Prefecture

The study neighborhood typifies this type of Japanese housing development in the 1970s and 1980s. A total of 12.9 ha of land was sold by the city government between 1965 and 1969 in the case neighborhood (including 62 public/social housing units, 40 single-detached houses, and 334 residential lots). In 1971, the prefectural government also provided 7.2 ha of residential land in this area including 480 public/social housing units and 69 residential lots. Smaller development in the case neighborhood showed there was limited diversity in land use in the neighborhood; mostly owner-occupied detached houses, succeeded by public/social housing units. Residents usually travel to the nearest shopping center in their own cars. This center is approximately 4 km from the neighborhood, connected by a community-based bus service with seven pick-ups on weekdays and six pick-ups on weekends at the local bus stop (as of the 2018 schedule).

## **2 Institutional backgrounds of Japanese aging and shrinking cities**

In this section, we summarize discussions on aging-led shrinking cities and the Japanese institutional background. Shrinking-city debates occur in three types of city contexts (Kubo, 2020). The first type of context is found in areas of economic decline where there is an additional trigger for out-migration, such as older industrial cities in northern England (Couch & Cocks, 2013; Keenan et al., 1999) and the Rust Belt of the United States (Hollander, 2018; Immergluch, 2011; Sadler & Lafreniere, 2017). European cities with massive out-migration during the post-socialist transformation in the 1990s are a second context for urban shrinkage (Batunover & Gunko, 2018; Nelle et al., 2017; Rink et al., 2012). Japanese cities are a third category, where longevity-led urban shrinkage results from demographic changes in terms of aging, low fertility, the out-migration of younger generations from aging neighborhoods, and depopulation as long-term societal trends (Kubo & Yui, 2019; Nordvik & Gulbrandsen, 2009; Yui et al., 2017). Similar to Japan's experience with population aging, low fertility, and depopulation as semi-permanent phenomena, Eastern and Northern European cities have experienced demographic changes such as the aging of existing residents and the out-migration of young people (Galjaard et al., 2012; Turok & Mykhnenko, 2007).

### **2.1 Causes of Urban shrinkage in Japanese context**

Urban shrinkage is a complex phenomenon in which many factors and causes mutually affect each other (Fol, 2012; Haase et al., 2014). In Japan, demographic changes play significant roles in the emergence of shrinking cities. In the following sections, we summarize the international and domestic bodies of literature on urban shrinkage on two inter-related analytical scales

(neighborhood and national) to compare and examine the background of urban shrinkage in the Japanese context.

*a) Neighborhood scale*

Neighborhood life-cycle theory has frequently been discussed to explain urban shrinkage in previous studies (Hollander, 2018). This theory describes how neighborhood conditions change over time through the five stages of development, transition, downgrading, shrinkage, and renewal (Hoover & Vernon, 1959). Similarly, the theory posits that cities will follow the life-cycle stages of urbanization, suburbanization, counter-urbanization, and re-urbanization. In these models, the city or neighborhood is viewed as destined to fall into decline in later stages. Building on previous studies, Alves et al. (2016) examined Portuguese cities' shrinkage processes, finding that shrinkage tends to emerge through the urban life-cycle and/or through regional, political, and social background characteristics beyond the natural urban life-cycle.

The process of urban shrinkage can be accelerated by 1) the spill-over effects of the attributes of a neighborhood on the surrounding neighborhoods (Mockel, 2014) and 2) some neighborhood attributes (Hackworth, 2016; Immergluck, 2016). In detail of the spill-over effect, Morckel (2014) studied the effects of the surrounding neighborhoods' characteristics on an increase in vacant housing. If a neighborhood is surrounded by good neighborhoods where few housing units are abandoned, there is a lower probability that the amount of vacant housing will increase in the neighborhood. An exception is neighborhoods that are surrounded by inferior neighborhoods that have a high rate of vacant housing. For these neighborhoods, the possibility of an increase in vacant housing is low if they have a high demand for housing and a very high residential standard. Moreover, some neighborhood attributes, such as a high concentration of poverty, vacant housing, and ethnic minority populations can trigger shrinkage at the neighborhood level, resulting in an increase in the crime rate, a rise in vacant housing or vacant lots, and a decline in the quality of the neighborhood environment (Sadler & Lafrenier, 2017).

In the Japanese context, Kubo et al. (2013, 2015) examined the local response to urban shrinkage in Tokyo's outer suburban municipalities and found different attitudes regarding the increase in vacant housing associated with the increasing age of existing residents. Much of the vacant housing in Tokyo's inner suburbs was transitional, and there was sufficient demand for houses and land because of the proximity of these areas to central Tokyo. Potential homeowners in their 30s or 40s regarded the inner suburbs, which are within 20–40-km commuter belt of Tokyo, as commutable areas. In contrast, the outer suburbs were popular among homeowners in the 1970s



and the 1980s, when land prices in Japan rose dramatically because of the extremely high urbanization pressure in the Tokyo metropolitan area and the growth of the economy. During the first two decades of the 21<sup>st</sup> century, national and municipal policies have stimulated urban developments in city centers, resulting in sufficient supply of relatively affordable super high-rise condominium developments (Kubo, 2020). Potential homeowners in these decades preferred city-center living, which allow them to maintain their double-income status by reducing commuting time, facilitating the balance of home and office responsibilities (Koizumi et al., 2011). In these years, the appeal of living in the outer suburbs declined dramatically, accelerating the out-migration of young people, who moved to city centers upon reaching major life events to gain better educational, occupational, and lifestyle possibilities. As the decades have passed since the 1970s and 1980s, the original residents of the outer suburbs have grown older, and many outer-suburban neighborhoods have experienced both a rise in population aging and an increase in vacant housing (Kubo, 2020; Kubo & Yui, 2019).

As a result of above-mentioned neighborhood changes over time, an increase in aged houses typifies the reality of shrinking neighborhoods in Japanese cities. These aged houses and shrinking neighborhoods tend not to fulfill requirements of older adults' continuous residency. Aged houses require renovation or maintenance works to offer livability and walkability for older adults within/near their houses, however less availability of public support in this field and unwillingness of older adults to ask support to their adult children prevent renovation work in their later life (Kubo et al., 2020). Shrinking neighborhoods typically experience less investment to neighborhood infrastructure, a decline in community services, and an increase in vacant real estate property (Yui et al., 2017).

#### *b) National scale*

National and municipal urban policies strongly affect the local housing market, economic developments, and interrelationships between the family, housing and welfare (Ronald & Lennarts, 2018). In the following paragraphs, we examine the changes in Japanese urban policies from the 1950s onwards, as well as the subsequent socioeconomic and spatial transformations.

Since the 1950s, the Japanese government has stimulated homeownership, reaching a 60% homeownership rate in the 1960s (Ronald, 2008). Under a governmental scheme, tax reductions for housing loans for home buyers, the deregulation of private housing mortgage systems, and reductions and exemptions for municipal property tax were implemented (Kubo & Mashita, 2019). Purchasing a newly built house is the best option in terms of receiving these tax reduction

and mortgage benefits, which has resulted in a strong preference for newly built houses. Moreover, large reduction rates in municipal property tax are given for residential lands than for agricultural or unused lands, and owners often choose to retain vacant/abandoned houses to maintain residential land status, rather than demolishing these buildings.

In the 1970s and the 1980s, the Japanese government launched acts and plans to enable suburban investment in the areas, such as transportation systems, large-scale housing developments built by both private- and public-sector entities, and relocation projects moving of urban functions to the suburbs. Under the horizontal expansion of Japanese metropolitan areas, middle-class workers could afford housing in Tokyo's outer suburbs in the 50–70-km commuter belt (Kubo, 2020).

Beginning in the late 1990s, however, the Japanese government changed their policy to stimulate city-center redevelopments throughout Japan. The Urban Renaissance Special Measure Law of 2002 and related laws allowed deregulation in urban planning, building standards, and the housing and mortgage markets. Central Tokyo was targeted to be the epicenter for stimulating the Japanese economy, and redevelopment projects were encouraged in the central wards of Tokyo, the Tokyo Bay area, and vacant plots along rivers or on reclaimed land (Koizumi et al., 2011; Kubo & Yui, 2011). Another aim of the Japanese government and municipal governments was to win competitions among global cities (Jacobs, 2005). The result was a “divided Tokyo,” with a sharp contrast between the growing city center and the shrinking suburbs; less investment in the outer suburbs and the aging of existing residents caused disparities in living condition within the Tokyo metropolitan area (Kubo, 2020). Similarly, other major Japanese metropolitan areas, such as Osaka and Nagoya, experienced an urban divide during this period (Kubo & Otsuka, 2019).

In the first decade of the 21st century, transportation systems were deregulated, resulting in the emergence of “compact city” initiatives and the divergence of public transportation at the municipal level. Revisions of Japan's Road Transportation Law in February 2002 and October 2006 expanded the definition of public transportation, and small vehicles and demand-responsive bus services were added. Although the bus services were controlled by the national government under the Road Transportation Law until the 1990s, revision of this law in 2002 enabled municipal governments to take charge of local bus services. This resulted in the emergence of community-based bus services, which tended to be run by municipalities, private companies, local NPOs, or local communities. The enforcement of the Act on Revitalization and Rehabilitation of Local Public Transportation Systems in 2007 further stimulated the diversification

of local public transportation systems and encouraged civic engagement during decision-making processes regarding designating detailed local transportation plans. Diversified agents in public transportation systems stimulated the restructuring of local transportation systems. In rural or depopulated areas, major bus services were replaced by community-based and demand-responsive bus services (Tanaka, 2014). In addition, the revision of Railway Business Act in March 2000 affected the expansion of a new urban form characterized by intensified networks between strong urban hubs (i.e., “compact-city” initiatives). Transit-oriented developments strengthened the urban functions of major train stations and other transportation hubs (Kubo, 2020), whereas local train systems in less populated areas were abolished or replaced by new transportation systems (e.g., demand-responsive bus services). The deregulation in transportation system legislation in the first decade of the 21st century dramatically increased accessibility to major urban facilities in city centers; however, accessibility and livability in the suburbs declined.

## **2.2 Aging and shrinking suburbs as a result of urban shrinkage**

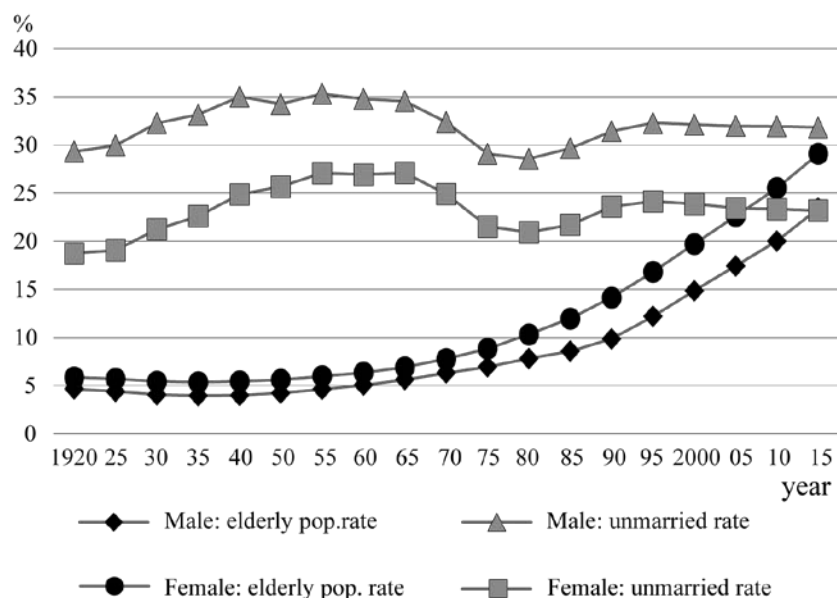
As a result of the institutional backgrounds, aging and the succeeding rise in vacant housing in the suburbs were the specific outcomes of urban shrinkage in Japan (Kubo & Yui, 2019; Yui et al., 2017). In contrast to Japanese cities, previous studies based on Western cities have revealed that shrinking cities tend to experience increases in crime and poverty rates; the out-migration of younger and skilled residents, which causes older adult, unskilled, and impoverished populations to increase; and vacant housing (Cui & Walsh, 2015; Fol, 2012; Immergulch, 2016; Kubo & Yui, 2019; Jones & Pridemore, 2016; Roderick & Pridemore, 2016; Whitaker & Fitzpatrick, 2013). As a byproduct of these increases, declines in housing prices, residential conditions, and population size are commonly found (e.g., Kubo, 2020).

Japanese society has been rapidly aging in recent decades, with older adults making up to more than 25% of the population for both men and women (Figure 3). The percentage of the population who were unmarried dropped from the 1970s to the 1980s, when many of the post-war baby boomers got married and rushed into homeownership in the suburbs (Figure 3), but the percentage unmarried then rose again beginning in the 1990s along with the bursting of Japan’s bubble economy and the growth of unstable job opportunities for young people. As marriage and fertility have been strongly connected in Japan in terms of social norms and legal background, the rise in the unmarried population rate has been synonymous with a decline in the fertility rate. Population aging and low fertility have progressed over the past few decades,



transforming the demographic composition and urban structure of Japan, along with the change in housing demand.

Figure 3. Changes in the percentage of older adults and unmarried individuals in the population of Japan (1920–2015)



Source: Statistics Bureau of Japan (1920–2015).

Population Census of Japan, Statistics Bureau of Japan, Tokyo

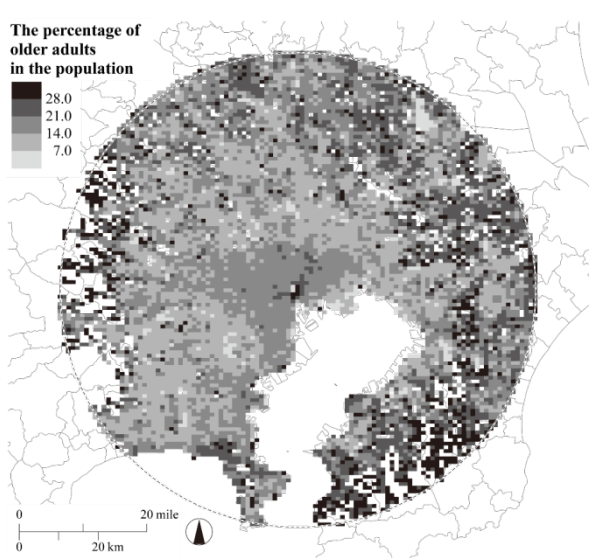
Figure 4 presents the changing distribution of the older adult population in the Tokyo and Nagoya metropolitan areas. Both metropolitan areas have shown rapid population aging in the first two decades of the 21st century. Until 2010, central Tokyo showed a higher aging rate compared with that of the suburbs because of 1) the aging of existing residents and the concentration of older adults in public and rental housing (Kagawa, 1987; Yui, 1996, 1998) and 2) the out-migration of young families either along with major life events such as marriage and the birth or growth of their children (Tani, 1997) or when the younger generation transformed their real estate property in the city centers from residences into small offices (Naganuma, 2005).

Regarding the rise in aging population rate in Japanese social housing, there's a clear spatial disparity between the city center and the suburbs: the concentration of the older adult population was more obvious in central Tokyo rather than in the suburbs (Yui, 1996; 1998). This situation was largely caused by institutional factors. For example, the Japanese government originally developed public/social housing for young married couples in the 1950s and the 1960s, but the state gradually reduced the allowable income of potential residents over the following decades, resulting in a high concentration of older adults, single-parent families, and impoverished families

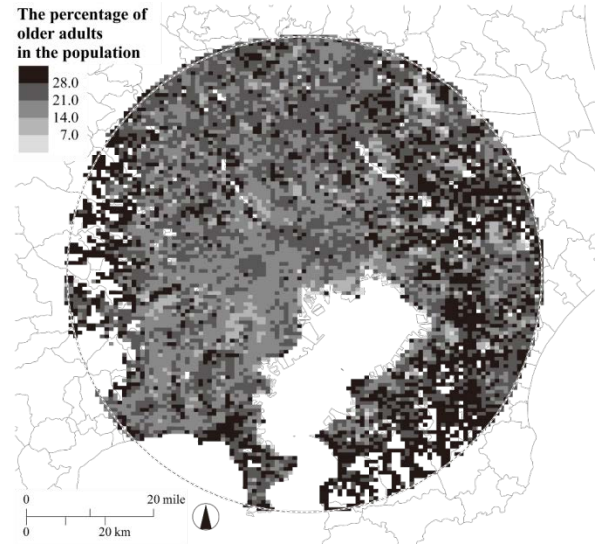
with many children living in the social housing (Hayakawa, 1997; Kubo, 2012; Kubo et al., 2011). These housing units have thus changed in nature from public housing to social housing along with the transformation of housing policies from a welfare-state orientation to a neo-liberal orientation.

Figure 4. Changes in the percentage of older adults in the population of the Tokyo and Nagoya metropolitan areas (2000–2010)

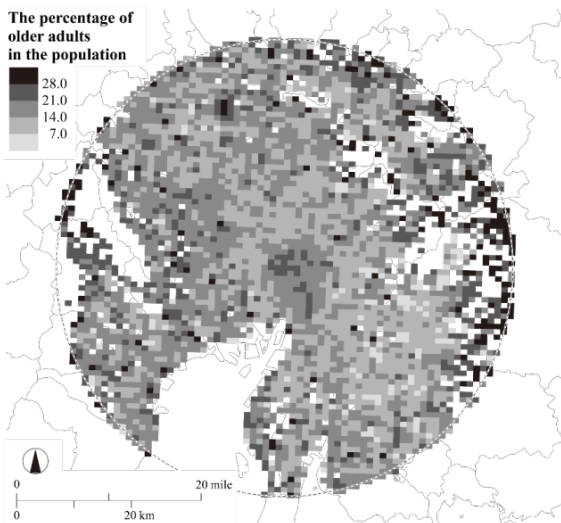
a) Tokyo metropolitan area in 2000



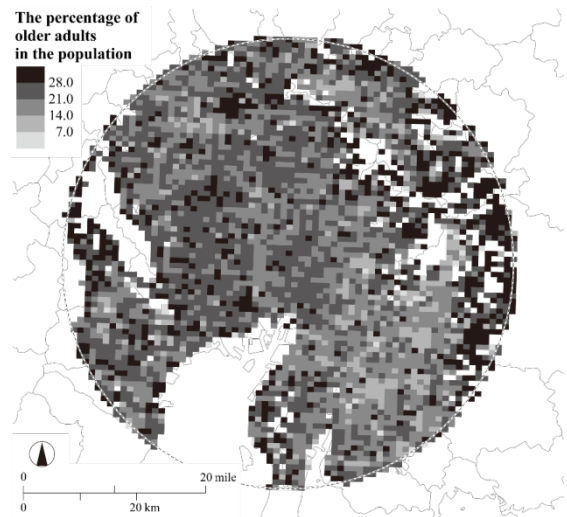
b) Tokyo metropolitan area in 2010



c) Nagoya metropolitan area in 2000



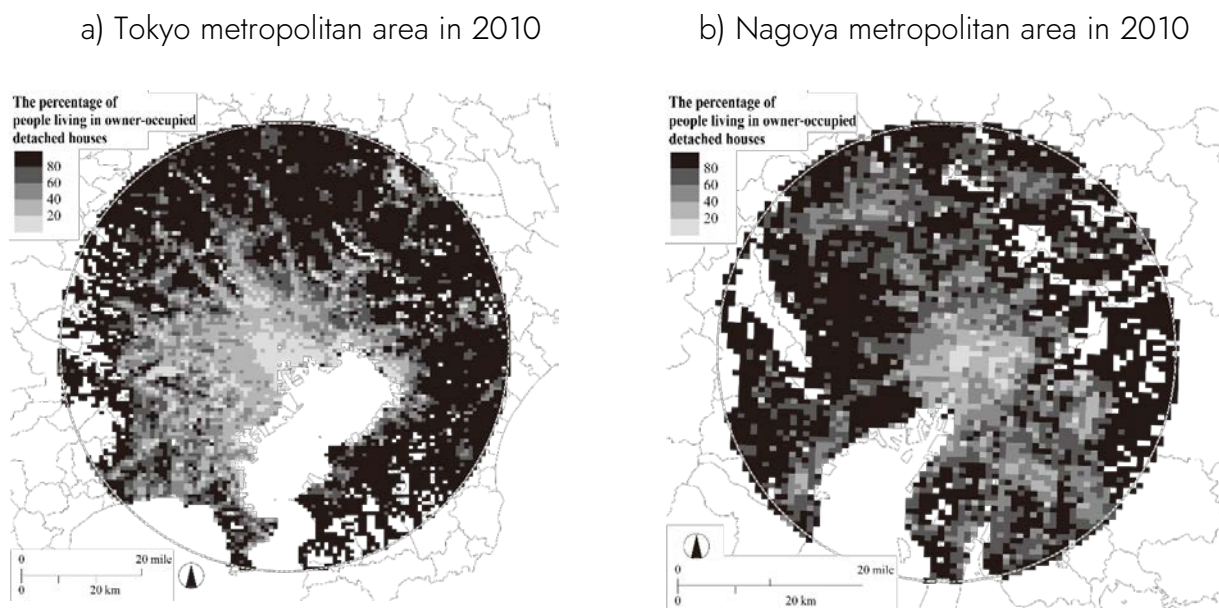
d) Nagoya metropolitan area in 2010



Source: Statistics Bureau of Japan (2000–2010)

Population Census of Japan, Statistics Bureau of Japan, Tokyo

Figure 5. The percentage of people living in owner-occupied detached houses in the Tokyo and Nagoya metropolitan areas (2010)



Source: Statistics Bureau of Japan (2000–2010)

Population Census of Japan, Statistics Bureau of Japan, Tokyo

Second, soaring land prices in the 1980s stimulated property owners' decision making regarding the utilization of city-center property as rental offices rather than as their own residences, resulting in the out-migration of young people to the suburbs and less inflow of people seeking to live in city centers (Naganuma, 2005).

Figure 5 explains the distribution of detached houses in the metropolitan suburbs. In old suburban housing estates, aging became more obvious as existing residents aged, and there was a massive out-migration of younger generations seeking better educational, job, and homeownership opportunities in re-developed city centers (Yui et al., 2016, 2017). The aging mechanism also reflects Japanese housing tradition, which is characterized by the following elements: 1) a strong preference for newly built housing as a result of the rapid decline of housing prices after residency (especially for detached houses); 2) a dramatic decline in mobility after homeownership in Japan because many homeowners live in the same house for their entire lives; 3) the fragility of the existing-housing market in Japan as a whole and the nature of generational transfer of real estate property because of the two factors above; and 4) most of the housing of many suburban housing estates developed in the 1970s and the 1980s being sold during this same time period, welcoming potential homeowners with similar life-stage, economic, and household-size status (Yui, 1999). Thus, aging in the outer suburbs has progressed over

time, becoming more obvious after 2010, when many housing estates celebrated anniversaries in their 30s or 40s and their residents reached older age.

### **3 Older adults' everyday lives in the Gifu suburbs**

In this chapter, we report a field survey in a case neighborhood in the suburbs of Gifu city to examine daily lives of older adults living in aging and shrinking suburbs. Here, we focused on older adults' daily behavior and perceived challenges using three analytical scales (body and house, neighborhood, and wider areas) and explored the interrelationships among these scales.

#### **3.1 Overview of surveyed residents**

More than 45 years have passed since the first residents moved to the case neighborhood; 60.1% of survey respondents were aged 70 years and over, and 21.3% were in their 60s. Older-adult-only households accounted for more than 60% of the respondents. Many respondents had lived in the same house for more than 40 years; 14.9% in public housing and 64.0% in owner-occupied single detached houses. In terms of the occupations of household heads, 35.5% were retired or not employed, 24.5% were company employees, 3.3% were public servants, 11.8% were self-employed, 5.7% were part-time workers, and 6.9% were in other job categories. Table 1 shows the reasons why respondents moved to the case neighborhood. Residents living in detached houses moved for home ownership (106 of 178 respondents) and other life events, such as marriage and growing families. Public house residents moved because of rent affordability, marriage, spouse's death, or separation.

Table 2 shows respondents' characteristics. In the following sections, we explore respondents' narratives to explain the results of the questionnaire survey in detail. Older adult residents tended to live with a spouse (ID 2, 7) and adult children (ID 1, 4, 6), or to live alone after the death of their spouse (ID 3, 5, 8). Those living with their spouse or adult children received daily support from family members. Our survey showed that 66.9% of respondents' oldest children and 53.1% of their second children lived in nearby areas (Gifu or Aichi Prefectures). Respondents whose adult children lived far away communicated by phone and supplemented this lack of support with visits from other older adults (Urry, 2007).

Table 1. Respondents' reasons for moving to their current residences

| Reasons for moving to current residence | Public housing residents | Detached house residents | Total | Percentage of respondents |
|---|--------------------------|--------------------------|-------|---------------------------|
| Home ownership                          | -                        | 106                      | 106   | 43.3                      |
| Marriage                                | 15                       | 55                       | 70    | 28.6                      |
| Rent affordability                      | 34                       | -                        | 34    | 13.9                      |
| Birth/growth of children                | 7                        | 21                       | 28    | 11.4                      |
| Job transfer                            | 7                        | 6                        | 13    | 5.3                       |
| Spouse's death/separation               | 12                       | 0                        | 12    | 4.9                       |
| Evicted                                 | 9                        | 0                        | 9     | 3.7                       |
| To live with parents                    | 0                        | 3                        | 3     | 1.2                       |
| Retirement                              | 3                        | 1                        | 4     | 1.6                       |
| Others                                  | 9                        | 14                       | 23    | 9.4                       |

**Legend:** Multiple answers. Total number of responses was 245; 67 respondents lived in public housing and 178 in detached houses in the case neighborhood. There were 18 respondents who originally lived in this area or were landowners in this area.

Source: authors' questionnaire survey

Table 2. Interview respondents' household structure and daily lives

| Household                              | ID 1                            | ID 2                           | ID 3          | ID 4                             | ID 5            | ID 6                            | ID 7                    | ID 8                   |
|--|---------------------------------|--------------------------------|---------------|----------------------------------|-----------------|---------------------------------|-------------------------|------------------------|
| Age, years (sex)<br><b>Interviewee</b> | 60s (m), <b>63 (f)</b> , 39 (m) | 76 (m), <b>66 (f)</b>          | <b>68 (f)</b> | <b>75 (m)</b> , 70s (f), 50s (-) | <b>78 (f)</b>   | <b>82 (m)</b> , 56 (m), 50s (f) | <b>84 (f)</b> , 86 (m)  | <b>87 (f)</b>          |
| Years of residency                     | 30+ years                       | 45+ years                      | 30+ years     | 40+ years                        | 40+ years       | 40+ years                       | 30+ years               | 45+ years              |
| Dietary conditions                     | Allergy to marine products      | Well-balanced, less vegetables | Well-balanced | Well-balanced                    | Well-balanced   | Care of blood glucose level     | Well-balanced           | Well-balanced          |
| Walking                                | Tired on slopes, bridge         | No problem                     | -             | No problem                       | Tired on slopes | No problem                      | Tired on slopes, stairs | Less walk, weak ankles |

Table 2. Continuation

|                                       |                              |  |  |  |                                |  |                       |                                       |
|---------------------------------------|------------------------------|--|--|--|--------------------------------|--|-----------------------|---------------------------------------|
| Friendship, communication with locals | Less visiting with locals    | Weekly visits with friends outside the community | Bi-weekly cafe visits with local friends | Weekly cafe visits with locals and other friends | Daily cafe visits with friends | Strong bonds with locals and other friends | Greetings with locals | Friends at hobby, day-care and locals |
| Community membership, events joined   | Senior club, yearly cleaning | Less time to engage, yearly cleaning             | Board member, local events               | Board member, local events                       | Board member, local events     | Senior club, board member, local events    | Yearly cleaning       | Yearly cleaning, local events         |
| Driving license                       | Family has car license       | Family has car license                           | Car and automobile license               | Car and automobile license                       | None                           | Car and automobile license                 | None                  | Car license                           |
| Frequency of driving                  | Family drives daily          | None, no car at home                             | Drive daily                              | Drive daily                                      | None                           | Drive daily                                | Ride with daughter    | Drive daily                           |
| Bus service                           | Less chance to ride          | Twice a month, costly                            | Less chance, costly                      | No chance to ride                                | Once a week                    | Almost no chance                           | Almost no chance      | Once in 2,3 month                     |
| Visits to city center                 | No chance                    | No chance  | Once in a while                          | Monthly visit                                    | Weekly visit                   | No chance                                  | No chance             | Weekly visit                          |
| Birthplace of couples                 | Gifu Pref.                   | Gifu Pref.                                       | Gifu and Toyama Pref.                    | Gifu Pref.                                       | Gifu city                      | Gifu Pref.                                 | Kansai region         | Gifu Pref.                            |

Source: authors' interview surveys

### 3.2 Health condition, community engagement, and access to fresh food

We started with the analysis of health condition (body scale) and asked if respondents had eaten the 10 recommended foods<sup>2</sup> every day in the week before this study. If individuals ate all food categories, they were awarded 10 points. Low-scoring older adults (3 points or fewer) were considered to have a relatively high risk for declining social and intellectual activities (Kumagai et al., 2003). We analyzed the relationship between the food ingestion score and degree of community engagement.

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<sup>2</sup> According to Kumagai et al. (2003), 10 required foods include green and yellow vegetables; meat; seafood; eggs and egg products; milk and dairy products; soybeans and processed soy products; seaweed; potatoes; fruits; and oils and fats.

Score distribution among age groups clearly showed that older adults paid more attention to food ingestion than younger people. Low-scoring respondents accounted for 37.5% of those in their 30s (n=8; average score 4.63), 38.9% of those in their 40s (n=18; 4.28), 32.1% of those in their 50s (n=28; 5.21), 51.6% of those in their 60s (n=64; 5.48), 19.5% of those in their 70s (n=87; 6.05), and 13.9% of those in their 80s and over (n=36; 6.81). More than 80% of respondents aged older than 70 years were classified in the high-score category (4 points and more).

Table 3 shows the relationship between the food ingestion and community engagement. High-scoring respondents tended to join more than two community-based activities. The more individuals participated in community-based activities, the more likely they were classified in the high-scoring category. Respondents explained that residents have to pay an amount of money if they did not participate in yearly street cleaning, which was the reason for the high participation level in this activity. Older adults aged 80 years and over are excluded from being community potential board members (e.g., ID 8 in Table 2); some female residents were also excluded from this role because of their duties in taking care of their spouse (IDs 2 and 7). Evacuation drills were held in the nearby school garden; many older adult respondents felt that this site was not accessible by walking because of the slopes in the neighborhood.

ID 8 experienced a decline in food variety after the death of her spouse, but tried to fulfill food ingestion in daily life, increasing her quality of life. Because she could drive and had good communication skills, she joined community-based activities (mostly street cleaning) and hobby activities, which were held in the central area of Gifu city. She made many friends by joining these activities. However, others expressed concern about the sustainability of the community because of aging and community shrinkage.

- Some have started not joining local activities or taking roles as a board member in our community because they are too old to do it. How can we maintain our community?  
(Interviewee ID 3)

Table 3. Number of community-based activities in which respondents participated

| Food Ingestion score        | Number of activities: 0 | 1    | 2    | 3    | 4    | 5    | 6    | Total |
|-----------------------------|-------------------------|------|------|------|------|------|------|-------|
| Three points or fewer (LOW) | 6                       | 15   | 15   | 10   | 11   | 3    | 3    | 63    |
| Four points and more (HIGH) | 4                       | 31   | 40   | 29   | 54   | 12   | 4    | 174   |
| Total                       | 10                      | 46   | 55   | 39   | 65   | 15   | 7    | 237   |
| % of LOW category           | 60.0                    | 32.6 | 27.3 | 25.6 | 16.9 | 20.2 | 42.9 | 26.6  |
| % of HIGH category          | 40.0                    | 67.4 | 72.7 | 74.4 | 83.1 | 80.0 | 57.1 | 73.4  |

**Legend:** Community-based activities included: yearly street cleaning (n=227, 92.7% of respondents participated), becoming a community board member (n=151, 61.6%), yearly evacuation drills (n=122, 49.8%), joining community-based senior clubs (n=31, 12.7%) (an additional two community groups for older adults were listed).

Source: authors' questionnaire survey

Although many older adults engaged in community-based cleaning and took on roles as community board members, they did not always enjoy communicating with locals of the same age, resulting in less participation in senior clubs.

- It's a very closed community, cul-de-sac and limited shops or cafés within my neighborhood. Neighbors love gossip. I hate it. (Interviewee ID 2)
- I have friends going to café together. Every morning we meet at the café nearby and chat for several hours. I don't join formal senior clubs that my local community holds in the community center. (Interviewee ID 5)

Access to fresh food is also affected by mobility. According our survey, approximately 80% of households went shopping by themselves, and others asked for support from adult children, relatives, friends, or housekeepers. Most (89.5%) respondents used their private cars for fresh food shopping; 7.2% took a bus, 6.8% walked, and 3.6% used bicycles. The destinations were mostly concentrated in three shops within a 4 km distance from the neighborhood. The most common frequency of travel for fresh food shopping was 1–2 times a week (54.6%, n=131), followed by every 2–3 days (30.0%; n=72), every day (12.5%; n=30), and less than once a



month (2.9%; n=7). Because of the slopes and bridge between the neighborhood and major shopping sites, those who did not drive a car tended to reduce the frequency of shopping or use other services, such as food delivery, route sales trucks, or housekeepers.

ID 2 used a home-delivery service from a private company that delivered dinner boxes; this respondent was satisfied with the nutritional balance and taste of the food, enabling a high-score status for food ingestion. Others bought foods from a route sales truck (22.4% of respondents). In addition to ordinary shopping at a supermarket outside the community, residents supplemented fresh foods by using the route sales truck. Therefore, these respondents were mostly classified in the high-score category.

### **3.3 Home maintenance, housing vacancies, and neighborhood quality**

Under the Japanese housing systems, developers' main targets were young families who purchased newly built houses; this resulted in limited options for rebuilding, repair, or improvement of existing housing, thereby preventing older adults and those needing wheel-chairs from continuing to live in their attached house by adjusting the conditions (Hayakawa, 1997). Therefore, we asked if respondents had rebuilt, improved, or repaired their housing (Table 4). We found that 15.7% of respondents had done no repairs/improvements to their house, and 50.6% had previously built an extension to increase living space for family members. Although 32.0% of respondents had tried in-house repairs, such as replacing old wallpaper or wooden floors/ceilings, only 20.2% had modified their home to an age-friendly condition by reducing steps or slopes in/around the house or adding handrails along in-house steps or in bathrooms. In the interview survey, only ID 7 had obtained support from adult children for housing maintenance.

Table 4. Maintenance, repair, and improvement of residences

| Maintenance, repair, and improvement of residence | Respondents living in public housing | Respondents living in detached houses | Percentage of respondent |
|---|--------------------------------------|---------------------------------------|--------------------------|
| Nothing   | 42                                   | 28                                    | 15.7                     |
| Building an extension                             | -                                    | 90                                    | 50.6                     |
| Barrier-free construction, adding handrails       | 1                                    | 36                                    | 20.2                     |
| Rebuilding  | -                                    | 25                                    | 14.0                     |
| Other in-house repairs                            | 17                                   | 57                                    | 32.0                     |

**Legend:** Multiple answers were collected. In addition, earthquake strengthening was done by 11 respondents (6.2%) Source: authors' questionnaire survey

Table 5 shows the actors who were expected to be responsible for maintaining respondents' current residences when they could no longer live there. Most respondents expected their spouse or adult children to take care of housing, and only one respondent said they would use a professional maintenance company or agent. Four respondents expected to sell or rent their homes (2.2% of respondents). There were several reasons for this: 1) in the fragile second-hand housing market, owners of detached houses cannot expect demand for their houses (Kubo & Yui, 2019) and 2) the strong interrelationships among family, housing, and welfare in Japan have prevented entry of non-family actors to these fields (Izuhara, 2000). This resulted in a rise in vacant housing in neighborhoods that are mostly occupied by owner-occupied detached houses (Kubo & Yui, 2019).

The distribution of vacant housing in the case neighborhood is illustrated in Figure 6. A total of 37 vacant houses were identified during the authors' field survey. Because of the slight inclination north to south and west to east throughout the neighborhood, many vacant houses had more than five steps between the road and home entrance. According to the interviews with local community members, many of the original residents were older adult singles or couples who could no longer live in a house and neighborhood with slopes and steps. Poor lighting in the neighborhood caused by the cul-de-sac surrounded by mountains also affected residents' perceptions of livability. One respondent explained the unlivable residential environment of the neighborhood.

- Terrible slopes in my neighborhood! I bought a power assisted bicycle. No private car. Buses? Only when I go to see my doctor. (Interviewee ID 1)

**Table 5. Expected future actors of maintenance of residences  
(after current owners vacate because of hospitalization, moving out, or death)**

| Expected housing maintenance actors       | Number of respondents in detached house residents | Percentage of respondents |
|---|---|---------------------------|
| No one applicable                         | 7   | 3.9                       |
| Spouse                                    | 74  | 41.6                      |
| Adult children                            | 110   | 61.8                      |
| Relatives                                 | 24  | 13.5                      |
| Neighbors                                 | 22  | 12.4                      |
| Private companies for housing maintenance | 1   | 0.6                       |
| Sell or rent out                          | 4   | 2.2                       |
| No idea                                   | 9   | 5.1                       |

**Legend:** Multiple answers were collected.

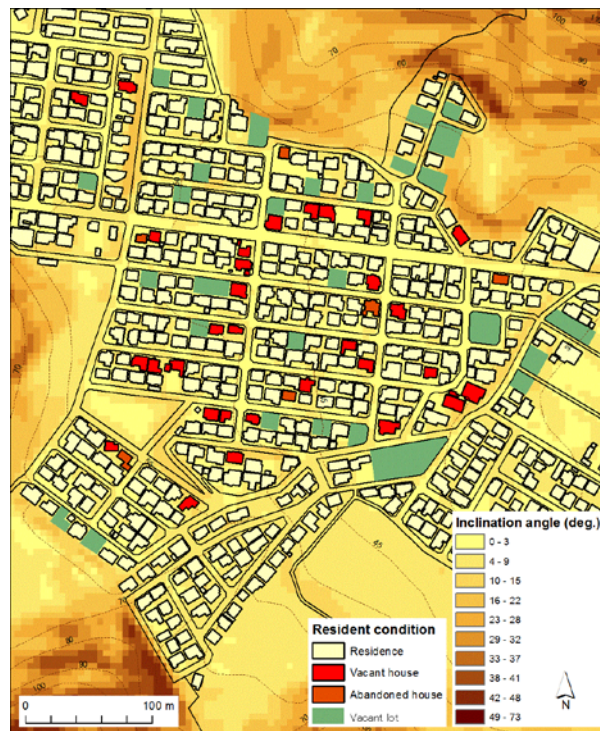
Source: authors' questionnaire survey

The authors' questionnaire survey used a five-point evaluation (no/relatively no/intermediate/relatively yes/yes) for residents living in detached houses: 84.4% wanted to live in their current home as long as possible (relatively yes/yes) and 20.0% felt uneasy about the increased vacant housing nearby (53.8% did not care and 26.3% were intermediate). For most residents, the increase in vacant housing was a symbol of the aging and shrinking neighborhood, but they did not mind if vacant houses were located in different blocks. Residents whose neighboring houses were vacant felt uneasy because of security concerns.

Kubo et al. (2017) noted that older adults cared about an increase in vacant housing in their neighborhood and understood that the houses were vacated because of the aging of the original owners. Some houses were abandoned because of the difficulty of continuous and frequent visits of adult children to take care of the vacant property. Older adults believed that their adult children would need to spend enough time taking care of their home after their deaths in the near future, and therefore had not discussed such matters with their adult children. Often, their

adult children lived in different prefectures and found it difficult to take this responsibility. The function of family-oriented housing and welfare systems has rapidly faded under the expansion of neo-liberalism and social changes that emerged over the past few decades (Ronald & Lennarts, 2018). However, older adult individuals may not believe that such changes affect their lives. These gaps between generations underlie the increased numbers of vacant houses in aging and shrinking neighborhoods (Kubo & Yui, 2019).

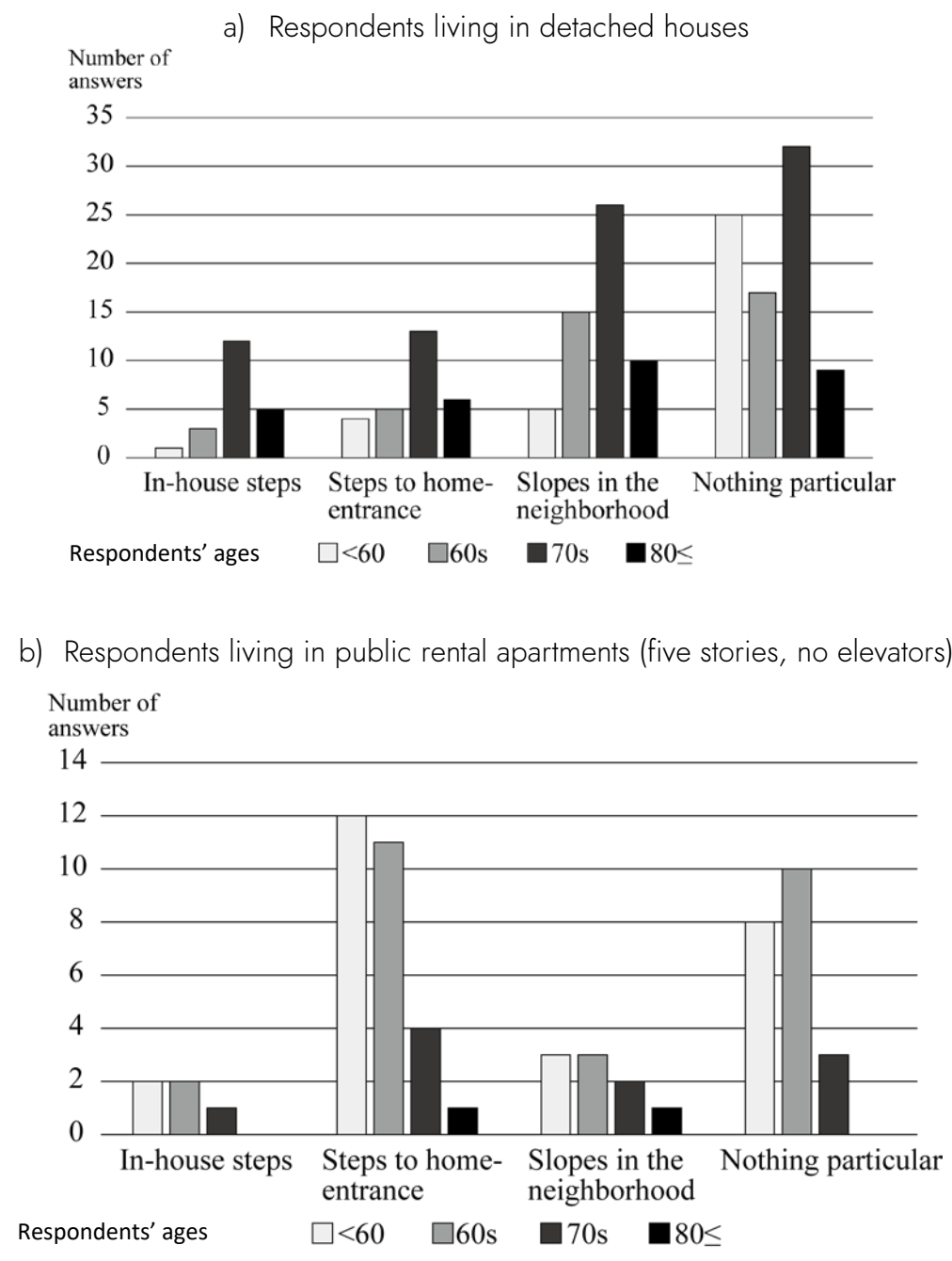
Figure 6. Distribution of vacant housing and vacant lots in the case neighborhood (2016)



Fuente: authors' field surveys

Figure 7 explains respondents' perceived barriers in their homes and neighborhoods. Respondents living in detached houses tended to identify the slopes in the neighborhood as barriers, with this trend more marked in those in their 60s and over. Because public housing (rental apartments) was in five-story buildings without elevators, respondents of all ages found the steps between the road and their home entrance were barriers. Respondents in detached houses perceived more in-house barriers compared with those in public housing.

Figure 7. Respondents' perceived barriers in homes and neighborhoods



Fuente: authors' questionnaire surveys

### 3.4 Independent mobility

Figure 8 shows respondents' driving ability. Even among those in their 70s and 80s, male respondents were less likely to report trouble driving. However, female respondents were more likely to feel uneasy about driving. A number of individuals did not have a driver's license or private car. Interview respondents confirmed weakening sight and a decline in concentration during driving, but many felt that driving was necessary to continue living in the neighborhood.

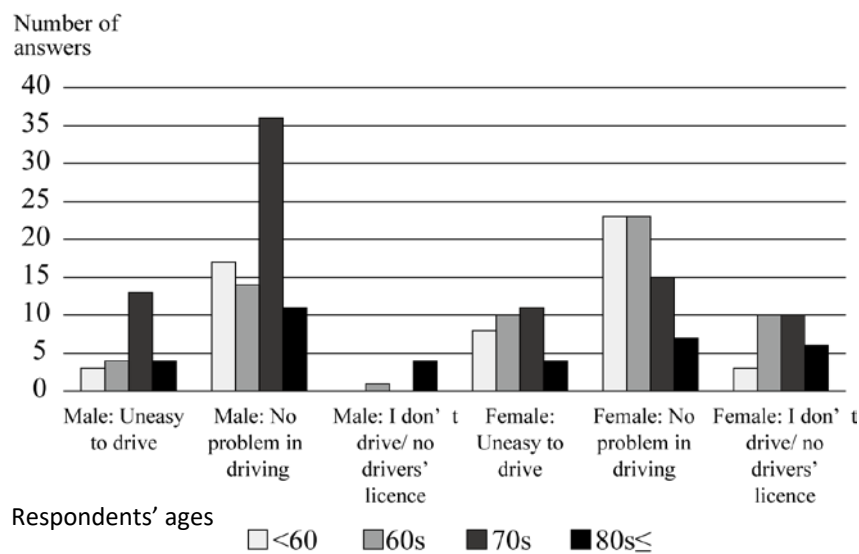
- I have to drive my car to maintain my life here. Indeed, it is an inconvenient location, but we needed to buy a house before retirement when we were asked to leave company housing. (Interviewee ID 8)

Bus services supplemented independent mobility of non-drivers, but they did not meet the demand of older adults in the case neighborhoods because of the cost and usability.

- I've never tried a bus ride here. It costs 1,200 yen for a round-trip to the main station. I drive my car or walk if I need to. (Interviewee ID 5)

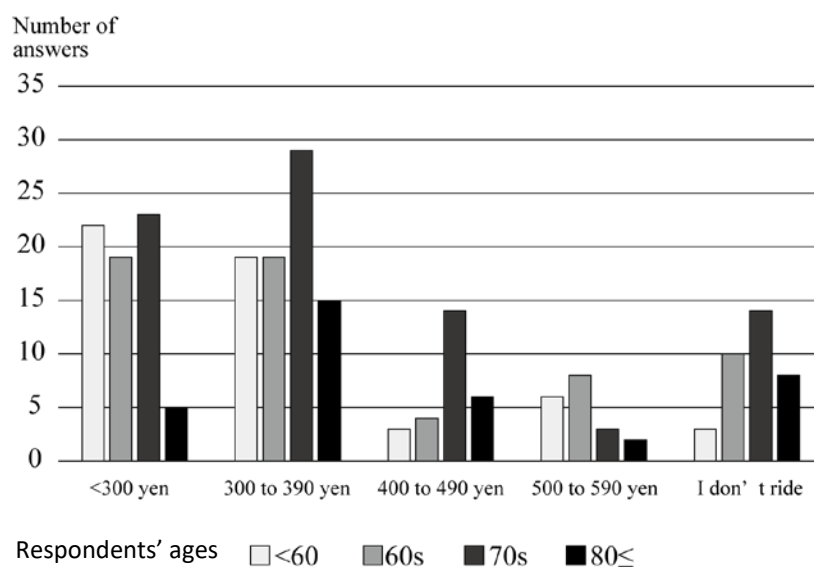
Willingness to pay for a bus ride to the central areas of the city (Figure 9) showed that there was a huge gap between the actual price (560 yen) and the price respondents were willing to pay. Most respondents thought 400 yen should be the maximum price for a bus ride to the city center. Although the Gifu city government offers a pre-deposited bus card for individuals aged over 70 years (including a 3000 yen fee and 20% discount for bus rides), individuals with driving ability and private cars do not feel that it is necessary to make an application.

Figure 8. Respondents' driving ability



Fuente: authors' questionnaire survey

Figure 9. Willingness to pay for a bus ride to the central area of the city



Legend: Price for a bus ride to the Gifu station is 560 yen (50-minute ride).

Fuente: authors' questionnaire survey

#### 4 Challenges to aging-in-place in aging and shrinking Japanese suburbs

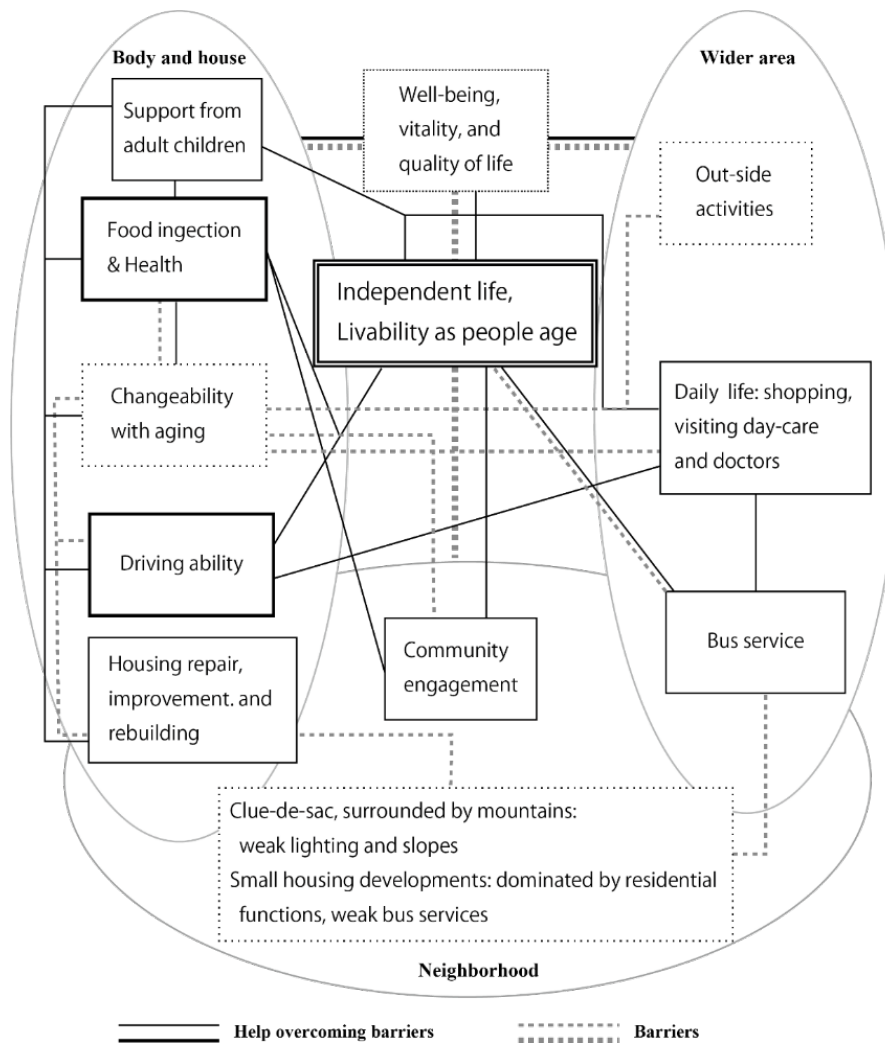
Figure 10 summarizes the case study findings. In the three analytical scales (body and house, neighborhood, and wider areas; elements in each scale are circled), each element (in boxes) and their interrelationships (in lines) generated livable/unlivable environments for older adults and increased or decreased their perceived well-being, vitality, and quality of life.

The case neighborhood was developed on cul-de-sac land, surrounded by mountains. Poor lighting and slopes in the neighborhood decreased the walkability for older adult residents. Small-scale development prevented diversity in land use in the neighborhood, which is mostly occupied by residences. Residents need to shop 4 km from the neighborhood; individuals that can drive can maintain their lives, but those who relied on walking, bicycles, or bus services were disadvantaged in terms of access to fresh food. Some felt uneasy about their driving ability, but the residential environment did not allow them to cease driving. Driving ability was central to maintaining their daily activities, such as shopping, visiting day-care or hospitals, and hobby activities.

Given the changeability of older adults in both the short- and long-term, they need to adjust to their surrounding environment, way of engaging in community, relationships with adult children, and other many aspects of their daily lives. The family-oriented housing custom and Japanese housing system prevented their decisions on housing adjustment. Fluidity in the existing housing

market and diversity in housing-related services (e.g., maintenance, repair, and rebuilding professionals) that are accessible for older adults are required. We found that older adults modified their lifestyles, asked for support from friends or adult children, and used new services to fulfill their changing needs as they aged. By accumulating enabling conditions, they maintained their dignity, well-being, and quality of life.

**Figure 10. Barriers and enablers in older adults' daily lives in aging and shrinking suburbs: a summary of case study in the Gifu suburbs**



**Legend:** Lines become wider when the effect of an element becomes stronger.

Source: authors' field survey

As this study showed, many older adults want to continue their life in their home and neighborhood. Diversification in accessible support for family and private matters that have been dissolved within the family contribute to adjusting to later life. Systems to support mobility after



ceasing driving should be examined because older adults were not satisfied with bus service quality, which resulted in them postponing their decision to cease driving.

In addition to the specific challenges mentioned above, the most crucial challenges to enabling aging-in-place in Japan are bureaucracy, division between ministries, hierarchical political decision-making systems, and reduced civic power to change systems in Japan. To enable aging-in-place initiatives in Japan, cooperation among different ministries in national government and divisions at municipal levels (e.g., welfare, housing, urban development, and transportation systems) is necessary. However, many studies have pointed out that the divisions between ministries do not enable efficient small-scale political decision making in Japan (e.g., Kubo 2020; Kubo & Yui 2019). The divisions between ministries have been reported to prevent the resolution of comprehensive regional phenomena, such as the rise in vacant housing, which have emerged along with rapid aging and urban shrinkage in Japanese cities (Kubo & Mashita, 2019).

Debates about the shrinking-city phenomenon have revealed that many government agencies express that shrinkage-accepting governance is needed to resolve urban shrinkage, but, in reality, their content tends to be growth-oriented (Hospers, 2014). It is not easy to accept urban shrinkage and change existing systems so they can fit into an age of post-growth and shrinking. In contrast to shrinking suburbs and middle- and small-sized cities in Japan, Tokyo is still growing and national government and Tokyo metropolitan government prefer growth-oriented policies to succeed in global competition among cities, resulting in substantial spill-over of growth-oriented governance at the municipal level throughout Japan (Kubo, 2020).

This situation requires decentralization in political decision-making, which leads to weakening of the existing hierarchical political decision-making system of Japan. The process enables municipal government and residents to determine policies that meet their regional needs in the post-growth period. The main goals of “shrinkage-accepting” initiatives, which include ageing-in-place initiatives, are “mitigating the negative effects of shrinkage by demolishing existing houses revitalizing neighborhoods and coordinating policies with neighboring cities (Hospers, 2014, pp.1513, l.36-38).” Under current systems in Japan, demolishing existing houses is not easy due to the huge budget required (1 to 2 million yen), and the lack of understanding of these requirements among homeowners in a housing market dominated by newly-built housing (Kubo, 2020; Kubo & Yui, 2019). The key to enabling such initiatives, “coordinating policies with neighboring cities”, seems more feasible, but requires decentralization in the political decision-making system to give more power to determine region-specific policies at the municipal level.

At the same time, civic engagement is thought to be one of the most important requirements in enabling smart decline, which is closely related to shrinkage-accepting governance (Hollander & Nemeth, 2011). This idea has gradually expanded in Japan since the late 1990s (Kubo, 2020). Compared with Western cities, such cities in North America (Hollander & Nemeth, 2011) in which many agents at the community level stimulate civic engagement, and Northern European cities in which society and individuals view urban shrinkage as a chance to make more sustainable and livable societies (Hospers, 2014), areas in which civic engagement can practically work and communities' power in political decision-making are still limited in Japan.

Challenges to enabling aging-in-place have been described for a range of areas, levels, and scales. All of these elements are interrelated. Therefore, comprehensive countermeasures should be established in Japan.

## 5 Conclusions

This study aimed to examine the generation of aging and shrinking cities in Japan, as well as the challenges in enabling aging-in-place initiatives in Japan. Through a case study based on the suburbs of Gifu city in the Nagoya metropolitan area, we examined barriers to the actualization of aging-in-place initiatives in the context of shrinking and aging suburban neighborhoods by analyzing older adults' everyday lives and the physical and social environments of suburban neighborhoods. Based on previous studies, we established three analytical scales for the present study: 1) body and house; 2) residential area; and 3) wider areas. Elements forming the daily life of older adults in these analytical scales were separately and comprehensively analyzed.

Although most older adults were eager to continue an independent life, they identified notable physical and social barriers in their residential environments. Older adults adapted to their conditions to allow continuous residence by modifying their environments and preparing for changes over time. To implement aging-in-place initiatives in Japanese cities, it is necessary to understand the socio-geographical differentiation of older adults, adopt urban governance to deal with aging and urban shrinkage, fulfill care environment requirements, and improve institutional background (e.g., welfare systems, division between ministries, and reduced civic engagement).

This study was not able to overcome the following limitations. First, although we communicated with local communities and residents in the study neighborhood in depth, producing highly descriptive and detailed data on older adults' lives in aging and shrinking neighborhoods, the

number of collected questionnaires was limited. Second, this case study supplemented the lack of the third category of urban shrinkage, but because of the unique institutional background of Japan, the findings cannot be fully applied to the Western context. As the WHO (2007) has pointed out, aging of cities is a global trend requiring many actors to engage in the problems emerging in aging cities. The experience and findings of Japanese cities thus require re-evaluation. Third, the results of the current study were obtained through descriptive analysis. Statistical analysis utilizing a large number of questionnaires could be valuable for supplementing the findings of our study.

Based on the findings and limitations of the current study, several topics should be examined in future studies. First, more detailed statistical analysis is required to understand the complex phenomenon of everyday life of older adults in aging and shrinking neighborhoods. Second, older adults' behavior in the home could be analyzed by utilizing high-quality GPS or in-depth observation/interview techniques. Although we paid attention to changeability among older adults, more timely and detailed methodologies should be applied for further analysis. We plan to address the above-mentioned limitations and suggestions in our future research.

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