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THE RECENT DEVELOPMENT OF URBAN AGRICULTURE IN JAPAN: URBAN
PLANNING AND ALTERNATIVE FOOD MOVEMENTS

JULIA HIGSON
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Reviewed and approved* by the following:

Karl Zimmerer
Professor of Geography
Thesis Supervisor

Roger Downs
Professor of Geography
Honors Adviser

* Signatures are on file in the Schreyer Honors College.

ABSTRACT

Cities in Japan are characterized by a mosaic patchwork of urban and agricultural land use that has developed through the combination of national planning efforts and alternative food movements. Japan has been largely unsuccessful in its attempts to conform to Western planning ideas of zoned land use, and this has created the conditions for mixed land use seen in urban areas today. In addition, while agricultural land use has been a part of Japanese cities for hundreds of years, alternative food movements such as the *teikei* organic movement and the *chisan chisho* local movement have given a new purpose to urban agriculture. These movements began in urban areas before spreading to the rest of Japan, and they are still mainly concentrated in cities today. To many, the inability of the Japanese government to establish a clear distinction between urban and agricultural landscapes has been viewed as a failure. However, small scale agricultural landscapes can in fact benefit Japanese cities by building resilience to natural disasters, promoting food security, providing ecosystem services and revitalizing shrinking and aging cities. This thesis examines the recent development of urban agriculture by considering planning, alternative food movements and the role of agriculture in Japanese cities today. There are key lessons to be learned from Japan's unconventional urban landscapes, and recognizing the potentials of mixed land use can help prepare cities around the world to address and adapt to the environmental and social challenges of the twenty-first century.

TABLE OF CONTENTS

LIST OF FIGURES	iii
ACKNOWLEDGEMENTS	iv
Chapter 1 Introduction	1
Chapter 2 History and Overview of Planning in Japan.....	9
Land Use in Tokyo During the Tokugawa Period (1603 – 1868)	9
Land Use in Tokyo During the Meiji Period (1868 - 1912)	13
New Regulations of the 1919 City Planning Law	16
Implementation of the 1919 City Planning Law	17
Rebuilding the Economy in Post-War Japan	18
Planning in Post-War Japan.....	20
Environment and Politics in Post-War Japan.....	21
New Regulations in the 1968 City Planning Law.....	21
Implementation of the 1968 City Planning Law	22
The Basic Land Law of 1989.....	24
Planning since the 1990s.....	25
Chapter 3 Alternative Food Movements	27
National Modernization of Agriculture	28
Growing Environmental Concerns	29
Food Security	30
The <i>teikei</i> Movement: Blending Organic and CSA Approaches	31
Japan's Local Food Movement: <i>Chisan chisho</i>	36
Chapter 4 Urban Agriculture	40
Urban Agriculture and Food Movements	43
Urban Agriculture as Defense against Natural Disasters.....	46
Food Security and Nutrition.....	48
Ecosystem Services.....	49
Community Building Potentials of Urban Agriculture	51
Potential Limitations of Urban Agriculture	53
Chapter 5 Conclusions	57
BIBLIOGRAPHY	63

LIST OF FIGURES

Figure 1. Map of Japan with major cities	4
Figure 2. Map of Tokyo.....	5
Figure 3. Satellite imagery and boundaries Tokyo (Sioen et al., 2018, p. 4)	6
Figure 4. Simplified layout of a Tokugawa period castle town (Sorensen, 2002, p. 24)	11
Figure 5. Simplified layout of a Meiji period castle town (Sorensen, 2002, p. 80).....	15
Figure 6. A war damage rebuilding plan issued by the Tokyo Metropolitan Government in 1946 (Pernise, 2006, p. 255)	19
Figure 7. Food education and urban agriculture (Yokohari & Bolthouse, 2011, p. 422).....	38
Figure 8. Land use pattern in Tokyo (Sioen et al., 2018, p. 11)	41
Figure 9. Mixed urban and agricultural land use 30 km from the center of Tokyo in Chiba Prefecture (Kogi, Miyamoto, Bolthouse, & Yokohari, 2010, p. 652)	42
Figure 10. Urban agriculture (Yokohari & Bolthouse, 2011, p. 422)	44
Figure 11. Rice farming in Ichikawa, Chiba outside of Tokyo	50

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Chapter 1

Introduction

Japan is a nation characterized by the juxtaposition of contrasts. Neon lights and futuristic technology are neighbored by ancient temples and generations of tradition. This juxtaposition is also evident in the landscape of Japanese cities, where urban areas are interspersed with patches of agricultural land use. This use of urban space for agricultural purposes is present even in Tokyo, Japan's capital and largest city, despite high land values and development pressures. The existing land use patterns in Japan make it an especially interesting place to study the geographic interactions between humans and the environment in urban spaces, because the patchwork of agriculture in urban areas has both social and ecological impacts (Yokohari & Khew, 2017; Yamada, Terada, Tanaka, & Yokohari, 2016).

Cities are too often thought of as being entirely separate from nature, enforcing a duality between humans and the environment (Cronon, 1991; Jonas, McCann, & Thomas, 2013). However, recognizing this division as constructed, rather than absolute, challenges the idea that cities are the antithesis to nature, and suggests that in fact, interactions with the environment shape urban areas just as prominently as social, cultural or economic forces (Braun, 2005; Braun & Castree, 1998). This thesis explores urban agriculture as one particularly distinct manifestation of these human-environment interactions in cities in Japan. Urban agriculture, which is by definition any food production occurring within the city limits (FAO, 1996), brings people in constructed humanized contexts together in direct interaction with the land and natural environment. In a country such as Japan that is small in land area and highly urbanized,

agriculture within cities may seem unlikely to succeed against the pressures of urban development and real estate. This thesis examines how urban agriculture in Japan has developed and the role it plays today.

In order to understand how urban agriculture has been able to develop and continue within Japan, it is important to understand the physical history of the land as well as the social and environmental influences. Land use and the changes in land use patterns throughout time are important components of the development of urban agriculture. Planning efforts, whether successful or not, have long had important impacts on the patterns of land use in Japanese cities. In the context of this thesis, planning refers broadly to the “geographical expression [of] the economic, social, cultural and ecological policies of a society” and an “administrative technique and policy... directed towards a balanced regional development... and the physical organization of space according to an overall strategy” as defined by the European Regional/Spatial Planning Charter (Council of Europe, 1983). In addition to planning, more recent alternative food movements stemming from concerns over the health and environmental impacts of conventional agriculture systems have helped shape the function and use of land as well as the development of urban agriculture as a movement (Nishiyama & Kimura, 2005; Yokohari & Bolthouse, 2011). Environmental changes such as climate change and concerns over natural disasters are also important factors to understand in the recent development of urban agriculture, as urban agriculture can be effective at building resilience to a number of environmental risks (Sioen, Terada, Sekiyama, & Yokohari, 2018). In Japan, urban agriculture also serves an important role by addressing social and demographic change (Yamada, et al., 2016). Japan’s population is declining and aging rapidly. These changes are especially prominent in rural areas and smaller

cities, where the population decline is compounded by young people moving to larger cities like Tokyo and Osaka (Yamada et al., 2016).

This thesis examines the above-mentioned issues to understand how the role of urban agriculture has changed in Japanese cities from the Tokugawa period in the 1600s when the first large urban areas emerged, until today, when Japan is faced by environmental and social challenges such as rising temperatures due to climate change, and an aging and shrinking population. The focus of this thesis is on urban areas, but the themes are relevant throughout the whole of Japan. While the main chapter primarily examines urban agriculture in Tokyo, this thesis also makes an argument for the benefits of urban agriculture for smaller, shrinking cities elsewhere in the country. In addition, many parallels exist between Tokyo and other large cities like Osaka, which are marked in Figure 1 for reference throughout the following chapters.



Figure 1. Map of Japan with major cities

Tokyo is the world's largest city, with a population of 38 million inhabitants (United Nations, 2014). Tokyo's population is projected to begin to decline in 2020, but it will likely remain the world's largest city through 2030 (United Nations, 2014). While it is typically

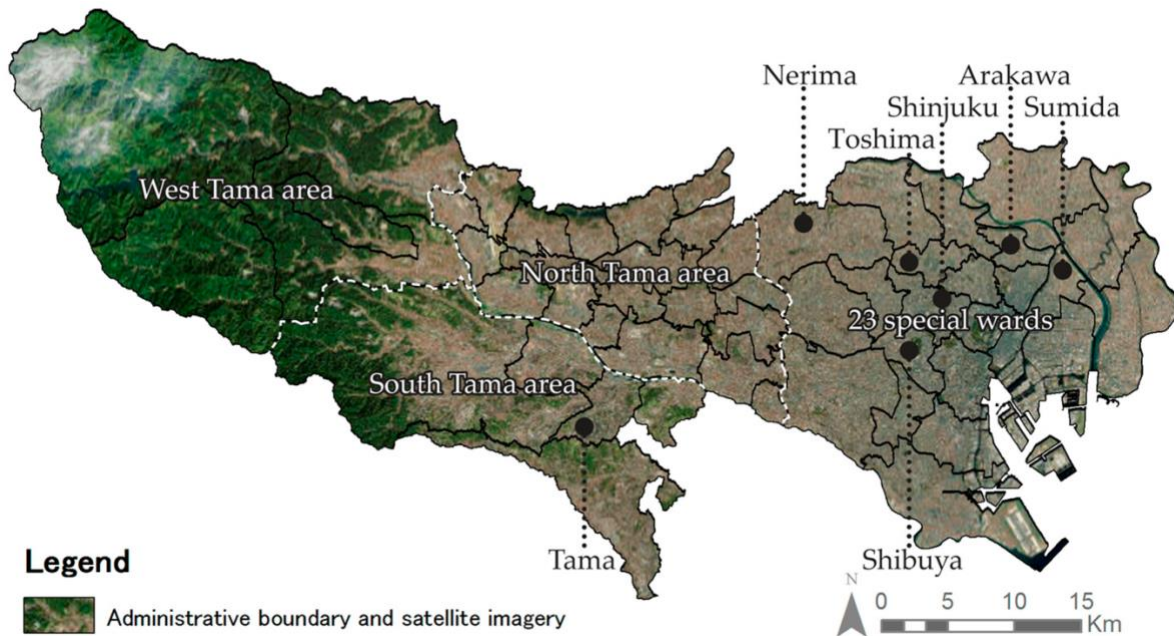


Figure 3. Satellite imagery and boundaries Tokyo (Sioen et al., 2018, p. 4)

In order to understand the context within which contemporary urban agriculture exists, examining the history of planning makes it possible to understand how land use and its spatial patterns have changed throughout history in Japan. The second chapter focuses on the history of planning and land use in Japan beginning from the Tokugawa period in the 1600s, when Japan first entered a period of stability and urbanization, through the rebuilding of Japan following the destruction, both physically and economically, of World War II, and during the decades leading to the present, when threats such as a shrinking population and environmental change are increasingly prominent forces in Japan. As Japan has changed through time, so too has the role of planning in shaping Japanese cities. The intentions of governmental planning bodies and the actual implementation of planning laws have often differed significantly, and this has been an important part of the legacy and image of planning in Japan (Sorensen 2002). This background chapter provides an overview of development in Japanese cities.

The third chapter focuses on alternative food movements, which began to emerge in Japan in the 1960s. The first alternative food movement examined is the *teikei* movement. The *teikei* movement is an organic food movement that began in Japan in the 1960s in response to environmental and health concerns over industrialized agriculture (Kondoh, 2014). The *teikei* movement focuses on direct partnerships between organic farmers and local volunteers (Kondoh, 2014). The second alternative food movement explored is the *chisan chisho* movement, which is a local food movement that emerged in the 1990s in response to fears over contaminated imported food (Nishiyama & Kimura, 2007). Today, the *chisan chisho* movement has been adopted by the national government to promote food education and food security in Japan (Nishiyama & Kimura, 2007).

This chapter also delves into the relationships between localized food movements and larger environmental movements. Alternative food movements are presented as a reaction to both the increasingly modernized and industrialized agricultural system in Japan that developed in the rebuilding of the country following World War II, as well as Japan's decreasing domestic food production and increased reliance on imports. Growing concerns over human and environmental health and the risks such as illness and pollution posed by industrialized agriculture prompted the development of organic and local food movements (Yokohari & Bolthouse, 2011). These movements developed and grew in separate ways, and it is important to recognize their similarities as well as their distinctions in order to understand the larger overall role of alternative food movements in Japan.

In addition to the development of these alternative food movements, this chapter also examines the ways in which these movements have changed over time. While both movements began as small grassroots groups, they have taken on different forms as they have attracted more

interest. These changes are examined both in terms of the size of the movements as well as the type of involvement, from small groups to the national government. Different groups have different motivations and goals in shaping alternative food movements.

The fourth chapter focuses on the recent development and role of urban agriculture in Japan. This chapter draws from the information presented in the previous two chapters to outline the various factors that contributed to the growth of urban agriculture in Japan. In addition, it highlights the importance of urban agriculture in Japan in terms of resilience to natural disasters, food security, ecosystem services and a solution to shrinking cities. In this way, there is an attention to both the past influences behind the development of urban agriculture in Japan as well as laying the groundwork for its role and purpose in the future.

Planning provides a background to the development of land use in Japan and an explanation for the unique patterns of patchwork urban and rural landscapes seen today in Japanese cities. Alternative food movements further build on this to establish the role of social and environmental motivations in creating a new purpose and role for urban agriculture. Finally, examining the current and potential future role of agriculture in Japanese cities establishes the advantages of a mixed landscape of urban and rural functions.

Chapter 2

History and Overview of Planning in Japan

Understanding the history of planning in Japan is vital for the understanding of current land use, policy and the development of urban agriculture. Evidence of historical patterns of urbanization and related agricultural systems is still present in urban areas of modern Japan. Landscapes have retained patchwork qualities that developed with the growth of the first large cities. In addition, Japanese cities have developed urban agriculture from within. Planning laws today have continued to be formulated to meet the same challenges that they were designed to address historically in these fragmented landscapes. These challenges, and the responses to them have shaped values and perceptions of planning and land use in Japan.

Land Use in Tokyo During the Tokugawa Period (1603 – 1868)

The initial rapid urbanization of Japan began in the Tokugawa period. The Tokugawa period was nearly 250 years of peace that followed long periods of internal wars in Japan. Prior to this period, conflicts had prevented unification or large settlements from emerging (Sorensen, 2002). In the Tokugawa period, the country was controlled from Tokyo, then called Edo, by a hereditary military ruler called a *shogun*, while a largely symbolic emperor remained in Kyoto (Hein, 2010). Under the shogun was a feudal system of lords called *daimyo* and warriors called *samurai* (Hein, 2010).

As a result of the newfound peace and stability, the early Tokugawa period ushered in rapid population and economic growth (Sorensen, 2002). This also led to rapid urbanization and an increase in agriculture to meet the needs of a growing nation. Social structure during the Tokugawa period was defined by a strict class system based on Confucianism (Sorensen, 2002). Agriculture was the responsibility of the peasant class, but all land was owned by the emperor and peasants were not allowed to sell or leave the land on which they worked (Hein, 2010). However, while peasants were economically the lowest class, they were regarded as being morally higher than the merchant class due to their role in producing food, especially rice, which was and remains the main staple of the Japanese diet (Sorensen, 2002). Most of the farming during the Tokugawa period occurred in villages outside of castle towns.

Land use and class were intertwined in Tokugawa Japan. In Edo, the division of the city based on social structures resulted in distinct neighborhood communities and cultures (Hein, 2008). As seen in Figure 4, the castle itself was located at the center of the town and was occupied by the lord, or daimyo. This was considered to be the most important feature of a town and was well fortified and often surrounded by a moat. The higher-ranking samurai were located immediately outside the castle wall, and their lodgings formed a second wall to further protect the castle. Beyond this was the commoner area, or *machi*, which was ideally organized into a grid structure based on Chinese systems (Sorensen, 2002). Neighborhoods in Edo were ruled by different governments based on social class. Therefore, local government at the neighborhood level was important in the city, since it lacked an overall controlling central government (Hein, 2008).

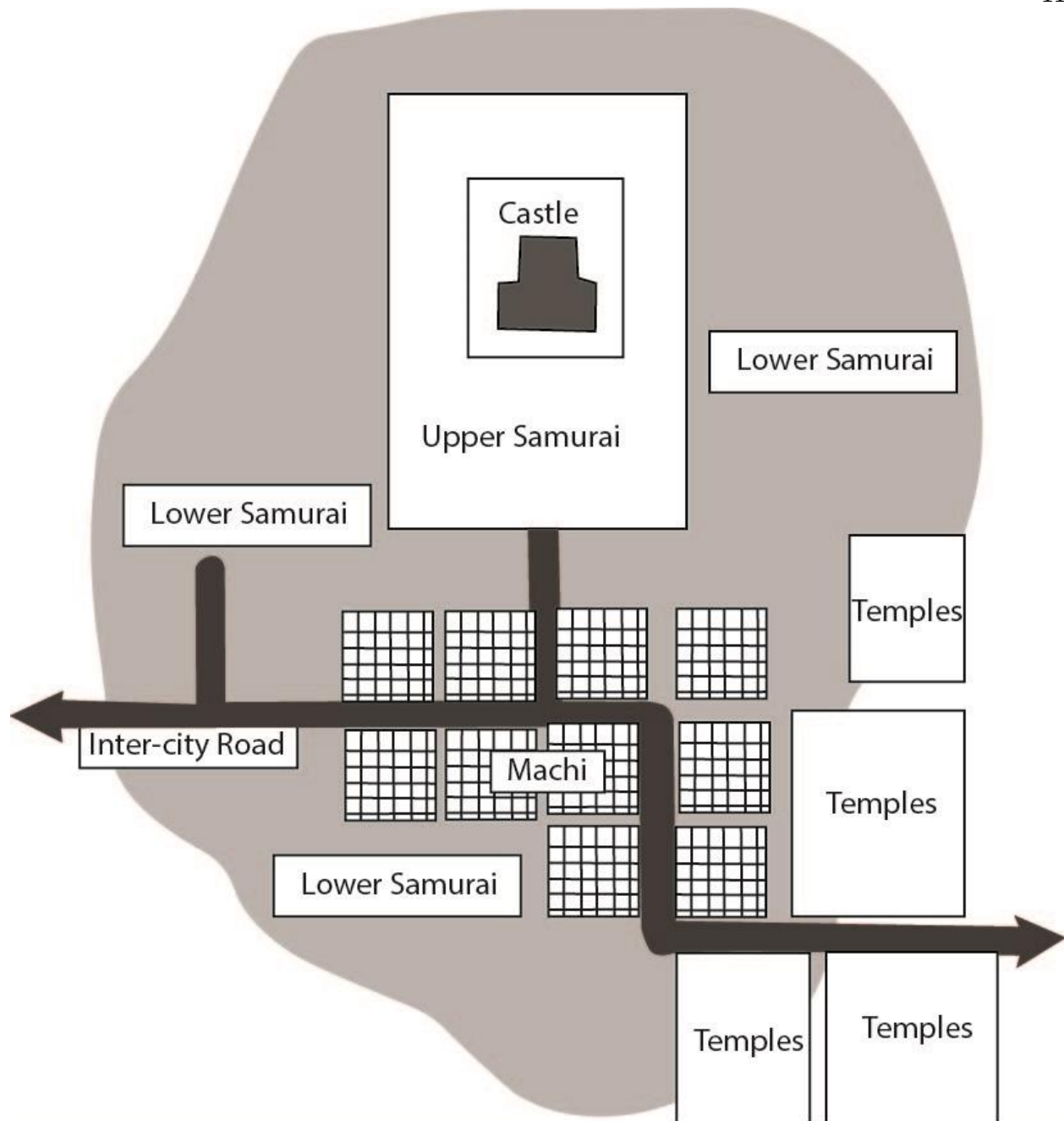


Figure 4. Simplified layout of a Tokugawa period castle town (Sorensen, 2002, p. 24)

Despite this system of class-based land occupation, the actual reality of spatial organization was often less controlled. Rapid growth of cities, especially Edo, meant that organization was more complicated than planned. In addition, the government's control was not

absolute enough to enforce planning, resulting in variation and inconsistencies throughout cities (Sorensen, 2002). This furthered the importance of local governments in neighborhoods.

Another important component of Japanese cities during the Tokugawa period was temples. In Edo especially, a large portion of the city was used for temples. By the end of the Tokugawa period, there were over a thousand temples in Edo, occupying around 15% of the land in the city (Sorensen, 2002). Temples served a variety of purposes. While primarily religious, they also functioned as public open space for markets and entertainment. These areas were also important public green spaces, although they were not managed by the government like Western parks, but rather by private religious groups (Sorensen, 2002).

Edo continued to grow rapidly, and by the end of the Tokugawa period it was already one of the largest cities in the world with a population of over 1 million (Yokohari & Amati, 2005). This rapid growth caused further drifting from the planned grid patterns, and land use within the city became increasingly mixed. Originally planned for villages outside the city boundaries, agriculture began to take on a new role within Edo. It is estimated that by the end of the Tokugawa period, 40% of the land in the city was used for agricultural purposes, and the actual number may even be closer to 50%, as vacant land on daimyo residences were often loaned to neighbors for farming (Yokohari & Amati, 2005).

The integration of agriculture and urban land also likely contributed to the health of the city, creating a relatively hygienic system compared to contemporary European cities. Night soil from the city was used as fertilizer for farming, and fresh agricultural products were easily transported to consumers (Yokohari & Amati, 2005). This process removed waste that could otherwise potentially pose a health risk to water supplies. Agriculture became such an important

part of urban life that even today, some vegetables in Japanese supermarkets are still named by the Edo neighborhoods in which they were grown (Yokohari & Khew, 2017).

Land Use in Tokyo During the Meiji Period (1868 - 1912)

In 1868, the *shogunate* ended and Emperor Meiji restored imperial power and moved his capital from Kyoto to Edo, which was then renamed Tokyo (Hein, 2010). The Meiji Restoration brought about significant changes in all aspects of Japanese society. Land which had previously belonged to the shogun and daimyo was returned to the central imperial government. In addition, the ownership and trade of land was now permitted. This allowed the government to collect a new source of taxes, but also limited the effectiveness of large scale planning efforts (Hein, 2010). The government also lifted regulations on growing specific crops (Sorensen, 2002). As part of establishing new tax systems, the government conducted a complete survey of all agricultural land to determine area, ownership and value (Sorensen, 2002). Despite the changes, the amount of agricultural land remained mostly the same. Farms were still mainly small scattered plots of land and the total area did not grow. Increases in production were due mainly to new farming advancements rather than changes in farmed land area (Sorensen, 2002).

Growth of Tokyo and new systems of land ownership resulted in further fragmented and unorganized land use. Figure 5 shows the changes to land use in the Meiji period, with unplanned growth extending at the city's borders. However, planning was still an important priority of the Meiji government, largely in order to compete with and earn respect from the West (Sorensen, 2002). After Japan was initially opened to the West following its long policy of isolation, Western scholars visiting Japan criticized Japanese cities for the lack of evident,

Westernized planning principles or organization (Hein, 2008). While the Japanese government initially attempted to bring about dramatic changes to emulate European planning, they were unsuccessful. So, instead of enacting dramatic changes, planning in Japan was limited to more pragmatic approaches. One of the main planning methods during the Meiji period was land readjustment (Hein, 2010). This strategy was mostly applied to infrastructure rather than building sites with the aim of reducing fire and disease risks, and resulted in smaller and more irregular building lots (Hein, 2010).

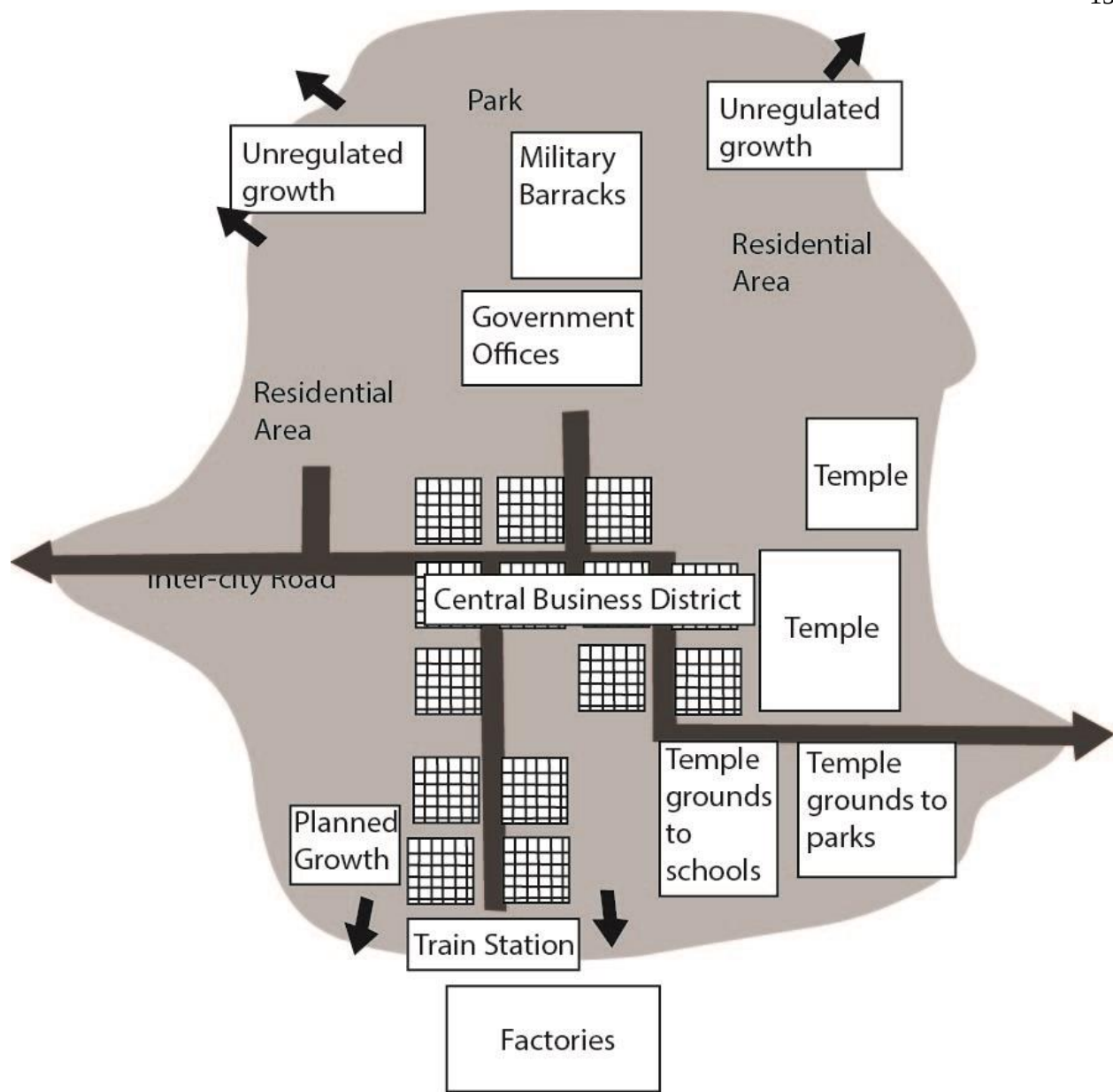


Figure 5. Simplified layout of a Meiji period castle town (Sorensen, 2002, p. 80)

According to Sorensen (2002), the barriers that existed to a Westernized approach to planning during the Meiji period have remained relevant to modern Japan. These include the lack of financial resources for planning, public resistance to change, and most notably the need for direct involvement of the federal government. While Japan struggled with many of the same

problems that faced growing cities in Europe such as increasing development and population density, it lacked the structure of professional associations of architects and engineers as well as advocates and activists for public health and quality of life. As a result, Japanese planning relied on the central government, and was therefore much less efficient and effective as it was unable to engage at a local scale.

New Regulations of the 1919 City Planning Law

Japan was not able to establish a set of planning laws until the end of the Meiji period. In 1919 at the beginning of the Taisho period, the first laws related to planning were created (Hein, 2010). The 1919 City Planning and Urban Building Laws were a response to rapid urban growth and were intended to address planning both on the urban fringe, and in established urban areas (Sorensen, 2002). These laws were applied to Tokyo as well as other urban areas throughout Japan. Once again, Japan turned to the West, and especially England and Germany for inspiration in its planning laws. The 1919 City Planning Law introduced land use zoning, building codes, control of growth in the urban fringe and systems for designating public facilities and land readjustment (Sorensen, 2002). Zoning was applied broadly to either residential, industrial or commercial classifications, and therefore did not enforce strict land separation. Building codes restricted building materials, lot coverage and height, mainly to combat fire risks. Fire Prevention Areas were also defined within zoning and required stricter standards of building materials (Sorensen, 2010).

Growth in the urban fringe was controlled by requiring that construction only occur along roads of a minimum width (Sorensen, 2002). Systems for designating public facilities included

the placement of parks, markets and water treatment. The land readjustment system required land owners to contribute land to public facilities and stated that if two-thirds of landowners in a designated area agree, all remaining must also cooperate (Sorensen, 2002). This shows restraint and reluctance of the government to control development at the expense of land ownership rights (Sorensen, 2010).

Implementation of the 1919 City Planning Law

In effect, the 1919 laws furthered the power of the central government and decreased local involvement in the planning process. In addition, due to the weak civil society in Japan and lack of public awareness or education efforts, the new planning laws created tension and resistance between landowners and the government (Sorensen, 2002). The proposed system of zoning was not entirely successful in its implementation. While the law defined and separated zones, it had little impact on the land use within zones due to lack of regulation and enforcement. Industrial growth continued in residential zones and vice versa (Sorensen, 2010). In effect, the government had little control over the planning and development of land use. These laws, and the obstacles associated with them, remained in effect until 1968 and shaped much of the history of Japan leading up to World War II as the nation continued to grow.

Japan's imperial growth leading up to World War II was also accompanied by the growth of the federal government within the country. The expansion of power of the central Japanese government in the 1930s diminished the country's civil society by decreasing citizen involvement in decision making processes (Sorensen, 2001). The lack of strong civil society and

the centralization of planning power to the federal government has limited the successful implementation of planning processes in Japan (Sorensen, 2001).

Rebuilding the Economy in Post-War Japan

At the end of World War II, poverty and poor quality of life were widespread in Japan. Due to the destruction caused by the war, there was a severe housing shortage across the nation (Sorensen, 2002). In addition, occupation and tight control by the United States prevented organized planning by the Japanese government, so rebuilding was initially carried out privately on small scales, leading to a disorganized pattern of construction based on existing buildings (Pernise, 2006). This made it difficult for Japan to adequately recover and rebuild the economy after the war. It was not until after the outbreak of the Korean War, that Japan's economy began to rebuild. This was initially due in part to the reliance by the United States on Japan as a strategic military point against the spread of communism in Asia (Pernise, 2006).

The 1950s and 60s saw extensive rebuilding and economic growth to restore the country. Organized rebuilding in Japan mainly used land readjustment, as this was the easiest to enforce and the most effective method (Sorensen, 2002). At this time, there were still only four zoning types in Japanese planning from the initial 1919 law: residential, commercial, industrial and quasi-industrial (Sorensen, 2002). Within zoned areas there were few requirements for development of rebuilding projects and construction, despite the opportunity to rebuild in a more effectively planned manner following the destruction. Once again, this lack of organized planning led to cities with patchwork patterns of land use, which can be seen in Figure 6 (Pernise, 2006).

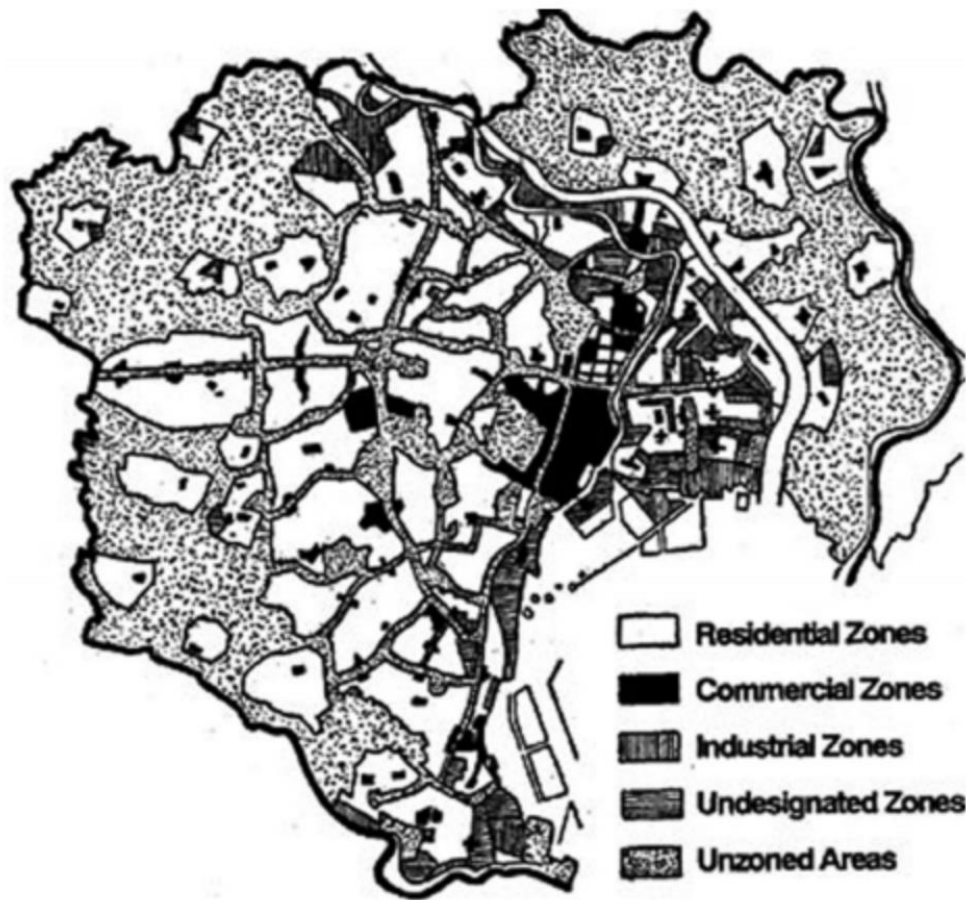


Figure 6. A war damage rebuilding plan issued by the Tokyo Metropolitan Government in 1946 (Pernise, 2006, p. 255)

As Japan began to rebuild itself physically, the economy also began to recover and grow and a new sense of national pride emerged. Japan's economic growth was led by industrial rebuilding, and the government supported corresponding public works and infrastructure development to encourage economic growth (Pernise, 2006). Priorities of the Japanese government can also be seen in the *National Comprehensive Development Plan*. The initial plan in 1962, and its subsequent update in 1969, focused on economic growth in urban areas (Hebbert, 1986). Indeed, most of the economic growth during this period was both industrial and

urban. The majority of government investment projects were focused in the major urban areas of Tokyo, Osaka and Nagoya (Pernise, 2006).

The rapid growth of urban economies was also accompanied by a population shift as people moved away from rural areas towards new industrialized cities. New opportunities in urban areas offered higher salaries and growing job markets that rural areas could not compete with (Pernise, 2006). Once again, however, the population growth in cities was accompanied by further disorganization and complexity, especially in Tokyo. The growth of cities and suburbs led to more demand for public transportation, but the limited available land resulted in further congestion and long commutes (Pernise, 2006).

Planning in Post-War Japan

The government recognized the potential problems, and released reports detailed issues like rising housing prices and disorganized development (Hasegawa, 2014). It was clearly becoming necessary to reform the existing planning process. In 1958, the National Capital Region Development Law was established to limit congestion of industrial plants and residential areas within the Tokyo region (Pernise, 2006). The law sought to decentralize congested areas in Tokyo by promoting separate regions of existing urban, greenbelt and periphery. However, the law did not succeed due to local opposition and lack of enforcement, particularly in the greenbelt region.

Despite its limitations, the attempt to control growth and development by the federal government show the growing concern over rapid urbanization and industrialization. While the government maintained the priority of growth and continued to focus on urban industry, many

professionals and citizens were becoming increasingly alarmed by the condition of Tokyo. According to Pernise (2006), “to the most sensitive Japanese architects of the time, the city appeared to be an ever-growing gigantic mechanical structure of factories and transport arteries, surrounded by the extended and dense urban fabric of compact residential buildings”.

Environment and Politics in Post-War Japan

In addition to urban sprawl that concerned planners and architects, this rapid growth also brought with it a new wave of industrial pollution (Sorensen, 2002). A number of environmental crises prompted the formation of environmental activist groups. These groups of citizens lobbied for changes and elected progressive local governments to call for new control over planning and development (Hasegawa, 2014). These citizen groups as well as local governments largely blamed the then-ruling Liberal Democratic Party (LDP) for failing to regulate development (Sorensen, 2010). As the power of opposition progressive parties grew and the power of the LDP declined, the government attempted to address the problems of development by establishing a new planning system in 1968.

New Regulations in the 1968 City Planning Law

The new planning system created by the 1968 City Planning Law attempted to address some of the barriers causing previous failures in planning. The law shifted the control of planning from the federal government to prefectural and municipal governments, recognizing the need for local knowledge and control in the decision-making process (Hasegawa, 2014). It also

established an urban growth boundary system called *senbiki* or ‘drawing the line’ in Japanese, which divided the urban land into two areas, one for promoting urban growth and one for limiting growth (Hasegawa, 2014). These divisions of urban areas were to be set by prefectural governments (Sorensen, 2010). In urbanization promotion areas, development was encouraged and previous requirements for permissions to convert agricultural land to urban were no longer required. In urbanization control areas, development was restricted in order to prevent sprawl and high land prices (Hasegawa, 2014).

The new law also recognized the importance of public participation and actively encouraged it. Finally, it also increased the number of zones from the 1919 law from four to eight (Sorensen, 2002). One of the main goals of these regulations was to separate residential from industrial land and urban from agricultural land more clearly in order to resemble Western ideas rather than the historically more typical Japanese pattern of mixed land use (Yokohari & Khew, 2017). In addition to new zoning requirements and division of urban areas, the 1968 law also developed a system of development permits. This system gave municipal governments the power to require land contribution for public goods such as roads. In exchange, the government offered permits to develop agricultural land for urban use (Sorensen, 2010). This was the first time such a system of permits was required for land development.

Implementation of the 1968 City Planning Law

Despite the intentions of the new law, the implementation of the new planning guidelines was not entirely successful. The planning system in Japan had long been highly centralized, so there were difficulties in the transition to regional control. In part, this was due to lack of

delegation, caused by doubts about the abilities of regional and local governments (Hasegawa, 2014). These doubts had been central to the debate on establishing a new planning system since the end of World War II (Ishida, 1981). As a result of the perception of incompetency in local governments, municipal governments were required to have plans approved by prefectural governments, counteracting the idea of delegating power and instead maintaining centralized control in the planning system (Ishida, 1981).

In addition to failures in the delegation of powers, the 1968 City Planning Law was not entirely successful in the division of land use. Farmers were reluctant to sell their land in areas intended for urban growth, and urban sprawl continued mostly unrestricted in fringe areas intended for agriculture. Farmers lobbied to reduce taxes on agricultural land and were able to work around the planning laws (Sorensen, 2002). Farming lobbying also resulted in the 1974 and later 1992 Greenland Acts, which protected productive agricultural land in urban areas (Yokohari & Khew, 2017). These were at odds with the ideas in planning laws and represented the deregulation of planning.

Although some changes have been made since the 1968 law, much of this basic framework has continued to shape planning in Japan. Similarly, the country has continued to face the same challenges it did to planning after the 1919 laws. Strong central government compared to weak local government, lack of civil society and lack of financial support have continued to limit planning. As a result, land use in Japanese cities remains mixed and does not conform to zoning. In particular, the inability of planning systems to separate urban and agricultural land uses and the persistence of agriculture within Tokyo has been regarded by Western standards as a failure of planning resulting in a chaotic landscape.

The Basic Land Law of 1989

By the 1980s, the LDP had regained power and began deregulating and privatizing the Japanese economy, including land development. This followed the trends of deregulation set in the US and the UK and it was a response to trade pressures from the US (Sorensen, 2010). As a result of this shift towards deregulation, the Japanese economy went through a bubble of property development. In 1989, the bubble burst, greatly damaging the economy. Due to the role of deregulation in inflating the bubble economy, the government faced backlash and the importance of planning and regulation gained new attention. This resulted in the Basic Land Law of 1989 (Sorensen, 2010).

The 1989 law is somewhat philosophical in its wording and is unlike previous more traditional land development laws. The Basic Land Law states, “In a small country such as Japan, land is a limited resource and a basic necessity of life that is common to all the people, thus the use of land enters the public domain and as such is subject to public restrictions” (Sorensen, 2010). Through this statement, the law lays out four principles of land use and development. First, land use promoting public good and social welfare is prioritized. Second, the law acknowledges that land should be used in accordance with characteristics of an area, including environmental, social, economic and cultural elements. Third, the law attempts to avoid inflation by establishing that speculative development should not be permitted. Finally, the law states that landowners will be taxed based on increases to the socio-economic value of their land (Sorensen, 2010).

While this law was established to counter the deregulation of the 1980s, its provisions and wordings are vague, limiting its success. In addition, Japan’s economy stagnated following the crash in 1989, and the government once again turned to deregulation as a method of

stimulating growth and revival of the property development industry (Sorensen, 2010).

Therefore, it is difficult to tell what, if any, impact the 1989 Basic Land Law had on planning and development.

Planning since the 1990s

The next major Japanese planning law was the 2005 Landscape Law. This law was created following a dispute in the Kunitachi neighborhood of Tokyo over building heights on historic streets (Sorensen, 2010). The dispute involved citizens groups, local government and developers. This law allows municipal governments to regulate development more strictly than existing planning laws by allowing restrictions on private property and by defining landscape development goals (Sorensen, 2010). While this is somewhat minor in influence compared to large-scale planning efforts, the wider involvement of citizen groups shows a shift in Japanese society.

Since the 1990s Japan has seen a reemergence of civil society. Civil society is increasingly being recognized as an important part of the planning process if urban development is to benefit people (Sorensen, 2001). Although lacking a specific definition, civil society encompasses volunteer groups, communities and social movements outside of government control (Sorensen, 2001). Community-building or *machizukuri*, is regarded as a promising new direction for planning in urban areas (Sorensen, 2001). This shift to community involvement in planning could represent a dramatic shift from previous top-down planning practices in Japan (Evans, 2010). However, pre-existing neighborhood characteristics may determine the success of *machizukuri*, and lack of involvement or competent leaders may limit its success (Evans, 2010).

In order to be a successful new component in Japanese planning, *machizukuri* must be integrated with existing planning processes (Hein, 2017).

Despite the introduction of Western planning ideas in Japan, cities have maintained fragmented patchwork landscapes. Underlying culture holds the divided, clustered organization of Japanese urban areas in place. In Tokyo, neighborhoods provide a stronger sense of culture and identity than the city (Hein, 2008). Neighborhoods provide a sense of community, and local customs and festivals maintain this (Hein, 2008).

However, despite initial perception of this as failure, these urban landscapes are now beginning to take on a positive light as fostering community and small-town characteristics within an urban environment (Hein, 2008). *Machizukuri* could represent a way for the fragmentation of Japanese cities to benefit planning processes, and this is increasingly being recognized as a positive potential. No longer is the disorganization considered to be inherently bad planning. Instead, Japanese cities, and Tokyo in particular, have been celebrated as a collection of villages within a larger whole (Hein, 2008). In fact, this model of smaller parts making up a city has been adopted in Western planning in order to create local flexibility within urban areas (Hein, 2008).

Chapter 3

Alternative Food Movements

Since the 1970s, alternative food movements have played an important role in shaping agriculture in Japan. Alternative food movements refer to networks and arrangements linking consumers and producers in new ways, alternative to standard food supply chains (Sage, 2011). Organic food movements initially began as a response to the widespread use of chemicals in industrialized agriculture and concerns by citizens over health and environmental risks. More recently, local food movements have also emerged as a part of agriculture in Japan. Local food movements have also been adopted by the federal government to promote domestic food growth and food security as well as health and a traditional diet. There are key differences between the citizen-run organic food movement and the government-backed local food movement and these gaps have created different benefits and limitations for each system.

In order to understand the rise of alternative food movements, it is also important to understand the context of conventional food systems. Conventional systems may create a response in the form of alternative food movements. Conventional systems often prioritize production and yields. While maintaining and increasing production is important, especially in the context of a growing population, conventional systems may do so with environmental or social costs (Sage, 2011). Alternative food movements with a focus on sustainability aim to meet production needs while also incorporating social justice, resilience and maintenance of the environment and natural resources (Sage, 2011). In the context of the development of Japanese

alternative food movements, the conventional agriculture at the time was an increasingly modernized and industrial system focused on increasing production through the use of chemical fertilizers and increased farm size.

National Modernization of Agriculture

The spread of industrialization in Japan following World War II was also present in the development of a modernized agricultural system. Following the war, Japan began to modernize its agricultural system under the Agricultural Basic Law of 1961 (Kondoh, 2014). The goal of the law was to improve efficiency and productivity of the agricultural system in order to meet the needs of a rapidly growing population and economy. In order to achieve this, the government prioritized the widespread use of chemical fertilizers and industrialization.

Another key strategy to increase efficiency was to increase size of farming operations by merging small farms into large scale modernized farms (Kondoh, 2014). However, this faced pushback from small farmers across the country who were reluctant to give up their land and way of life, and the resistance limited the success of this strategy. The shift towards chemical fertilizers, however, was widely implemented (Rosenberger, 2009). Initially, this too faced pushback from farmers, but visits by government extension officers to rural farms persuaded farmers to switch to the use of pesticides and chemical fertilizers once the effectiveness of these methods at increasing yields were shown (Kondoh, 2014). The government also strived for changes in the economics of agriculture. Following pushes from the federal government, the subsistence level farming that had been dominant in rural Japan, shifted primarily to commercial farming, especially of rice (Kondoh, 2014).

Growing Environmental Concerns

Just as industrialization in urban areas created concern over the environment, so too did industrialization in agriculture. People became especially concerned with the use of chemicals and feared dangers to their health as well as ecology and the environment. Several highly publicized environmental crises at the time further contributed to public concerns about the uses of chemicals in agricultural production.

One prominent example of an environmental crisis that gained public attention is Minamata Disease. Minamata, an industrial town in southern Japan has drawn international focus since the late 1950s for the outbreak of a strange disease, which later turned out to be mercury poisoning due to improper cleanup procedures by a nearby factory that led to pollution of water and fish supplies (George, 2001). This drew awareness to the health risks posed by industrial processes and raised concerns in Japan about food contamination from chemicals.

When the federal government banned a number of pesticides and chemicals such as dichloro-diphenyl-trichloroethane (DDT) and benzene hexachloride (BHC) because of negative health impacts, this led to further concern about the safety of industrialized agriculture. Although less widely publicized than Minamata disease, cases of polychlorinated biphenyl (PCB) residuals found in milk further pushed people to seek alternative sources of food produced without chemicals (Kondoh, 2014).

Food Security

Food security in Japan has increasingly become another important concern. Although the problem was less severe around the emergence of alternative food movements, it has become a major motivator in modern movements. One of the biggest concerns with food security in Japan is the large amount of food that is imported and the limited amount of food produced domestically. In 1960, Japan produced 79% of its food domestically, but by 2003 this number had dropped to 40%, and it has continued to decline since (Nishiyama & Kimura, 2007). Japan's agricultural self-sufficiency level is the lowest among developed nations. This heavy reliance on foreign imports as food sources leads to vulnerability in Japan in several ways.

First, due to the reliance on imported food sources, events in foreign countries have significant impacts on food prices. According to Hisano (2015) there are several ways in which prices can be affected. Increased demand for certain foods around the world can drive up prices. In addition, recent increase in variability of agricultural yields linked to climate change has impacted price variability and uncertainty, which can lead to higher prices. The FAO Food Price Index has tracked the emergence of food price crises over time, and there is an increase in frequency in recent years (Hisano, 2015). Food price crises are sudden price increases in food commodities. Recent examples have occurred in 2007, 2010 and 2011, continuing in some cases against economic trends such as the recession in 2008 (Hisano, 2015). Various triggers such as crop shortages disruptions to shipping networks, and overall increased global demand have led to the recent rise in crisis events.

While these trends are prominent today, similar concerns have existed for decades. For example, in 1981 a medfly contamination in California's lemon crop resulted in sudden and steep increase in lemon prices in Japan, and in many cases no lemons were available at all

(Sears, 1983). As a result of the high dependency on food imports, in many cases Japan has little control over the prices or availability of its food supply. This is a source of vulnerability and threatens food security in Japan.

In addition, Japan's food supply is vulnerable to disruptions in transport and shipping networks. Canal closures or delays at heavy traffic points could restrict the flow of food resources into Japan, resulting in price increases and threats to food security (Sears, 1983). The imports upon which Japan relies are food surpluses in the global market. As a result, any threat to these surpluses is a threat to Japan's food security. Rising temperatures and increased climatic variability threaten to decrease agricultural yields around the world, resulting in a loss of surpluses and a threat to food security for nations with high food import levels (Sears, 1983). Political turmoil abroad and politically motivated embargoes also threaten Japan's food security (Sears, 1983).

Surveys of consumers have consistently indicated a high level of public concern over the issue of food imports and food security (Nishiyama & Kimura, 2007). These concerns, along with concerns over food safety, were important in the formation of alternative food movements. The federal government has also used concern over food security as a motivator for adopting alternative food movements into policy and education to encourage the growth of the domestic agriculture industry and food production.

The *teikei* Movement: Blending Organic and CSA Approaches

The organic food movement was one of the first alternative food movements to emerge and gain a widespread following in Japan. The organic movement was started mostly in a

response to health and environmental concerns over the use of chemicals in agriculture (Moen, 1997). The first organic movement in Japan was the *teikei* system, which began in the late 1960s and early 1970s (Kondoh, 2014). The *teikei* system connects farmers and consumers directly, similar to community supported agriculture systems in other parts of the world such as the US. Consumers help secure farm operations in exchange for produce. The system relies on trust and mutual benefit of farmers and consumers (Rosenberger, 2017).

The official goal of the *teikei* system is to restore agricultural landscapes and protect surrounding ecology. *Teikei* means partnership in Japanese, and one of its main objectives is to eliminate boundaries between producers and consumers and create a system in which the two groups work together (Kondoh, 2014). Although the *teikei* system was one of the first movements to popularize organic farming in Japan, the first organic farms actually emerged earlier, with a few appearing as early as the 1930s and 40s. The first partnerships between farmers and consumers were formed in the 1950s by medical doctors who became concerned with the health impacts of the widespread use of chemicals in increasingly industrialized agriculture (Kondoh, 2014).

Motivated by environmental and health concerns, consumers sought foods produced without chemical fertilizers, and lacking options in most stores, created a system of partnerships with farmers, which eventually became the *teikei* system. Some of these early farms were based locally, while others marketed their products across Japan (Kondoh, 2014). The *teikei* movement mostly began in urban areas with concerned women, especially housewives and mothers, reaching out to farmers for an alternative source of food produced without chemicals (Yokoyama & Sakurai, 2009). One of the oldest formal *teikei* groups was formed in 1972, when a group of housewives in suburban Tokyo formed a study group on food safety (Kondoh, 2014). Lacking

alternative food choices, they contacted farmers directly and set up a partnership in which the consumers agreed to purchase all of the produce, assist with labor and allow the farmers to set prices (Kondoh, 2014). Other groups formed in urban areas in similar ways led by consumers. In other cases, farmers, also concerned about the health risks of chemicals, and noticing the available market, made the switch to organic farming (Kondoh, 2014).

In addition to being concerned with the health and environmental risks of industrial agriculture, the consumers who formed the first *teikei* groups were also concerned with creating a system in which small-scale farmers can continue to exist without other part-time work (Moen, 1997). The grassroots organic food movement and *teikei* groups challenged the existing cultural and social norms in Japan by going against the global economic trends towards consumerism and instead promoting a culture of mutual trust and community (Moen, 1997).

The Japan Organic Agriculture Association was established in 1971 by scientists concerned about the health and environmental risks of chemical use. Although *teikei* had initially started as a consumer-led grassroots movement, following its establishment JOAA took over the lead of the movement (Rosenberger, 2017). JOAA set official guidelines for the *teikei* system, which emphasized the importance of mutual benefits for farmers and consumers, as well as the importance of learning and community (Kondoh, 2014).

The *teikei* movement continued to spread in the 1970s and 80s without any government support and little official acknowledgement or mainstream attention (Kondoh, 2014). Most of the groups formed in the 1970s were in large urban areas, but the 1980s saw *teikei* groups spread to the rest of Japan as well. However, by the late 1980s, *teikei* groups and memberships began to stagnate and then decline (Kondoh, 2014). Despite the trend, this does not suggest a shift away from organic foods. In fact, the organic movement had gained enough popularity and attention

that organic produce became available in stores, and *teikei* groups were no longer the only source (Kondoh, 2014). Due to the continued presence of organic foods in the market, the partnership and community associated with *teikei* has declined since the introduction of produce into stores has removed the connection between farmer and consumer. In this way, the philosophical movement behind *teikei* has diminished though the popularity of organic foods has grown (Rosenberger, 2017).

Social changes also contributed to the decline of *teikei*. Many consumer-led groups were initially formed by housewives who volunteered to support the partnerships. However, as more women began to work, they lacked the time for the volunteering needed to maintain *teikei*. Without a system of volunteers to contribute labor to crop production and distribution, the system of partnerships struggled to continue. In addition, the economic boom of the 1970s and 80s led to a more consumeristic Japan, and this may have decreased interest in community partnerships (Kondoh, 2014).

In 2000, Japan introduced organic certification standards (Rosenberger, 2017). However, certified organic farming still makes up only a small fraction of agriculture in Japan, and many barriers to certification exist, especially for small farmers. The cost of obtaining certification is high, and conflicting values of partnership and consumerism may prevent farmers from pursuing official certification (Kondoh, 2014). In this way, the organic certification standards likely benefit large farms more than small local *teikei* operations (Kondoh, 2014).

Younger organic farmers today differ in some ways from the founders of the *teikei* movement. While the new generation of organic farmers is also concerned with the environmental and health risks of industrial agriculture, they are less likely to reject the established market system to seek an alternative form of direct partnership with consumers

(Rosenberger, 2017). Today's organic farmers combine the values of *teikei* with modern commercial practices despite seemingly contradictory ideas (Rosenberger, 2017). They combine historical Japanese values of community with modern global values of entrepreneurship and individuality.

Unlike the initial founders of *teikei* movements in the 1970s and 80s, young organic farmers today grew up in a time of economic growth and consumerism in Japan (Rosenberger, 2017). While taking part in this economic system, these farmers have also recognized the problems associated with industrial agriculture and have switched to independent organic farming on moral bases. JOAA opposes direct involvement with the government or participation in the market, and despite their role in establishing it, few farmers associated with JOAA even seek organic certification (Kondoh, 2014). JOAA has also pushed for wider policy to promote organic agriculture, but has refused to compromise or even meet with government officials with less strict ideas (Rosenberger, 2017). JOAA and its associated *teikei* groups still encourage the importance of face-to-face meeting between producers and consumers, no use of chemicals, and self-sufficiency (Rosenberger, 2017). Although younger organic farmers are still involved with JOAA to varying degrees, few adhere to the strict standards of formal *teikei* groups (Rosenberger, 2017).

Younger organic farmers are more willing to participate in the market, but they also face more competition than the original *teikei* farms did. Organic and low chemical use products produced abroad are now common in Japanese supermarkets at competitive prices (Rosenberger, 2017). While this creates a challenge for today's organic farmers, the decline of Japanese agriculture, especially in rural villages, has also created an opportunity to purchase land revitalize these areas (Rosenberger, 2017).

The organic movement in Japan has gone through growth and decline and changes since its beginning in the 1970s. The organic movement today has many different parts compared to the relatively straightforward farmer-consumer partnerships established by the original *teikei* groups of concerned citizens. However, despite these changes, the organic movement remains an important alternative food movement.

Japan's Local Food Movement: *Chisan chisho*

The *chisan-chisho* movement began in the late 1990s as a response to the declining agricultural productivity and rural communities (Nishiyama & Kimura, 2007). Rather than focusing on organic foods, the *chisan-chisho* movement focuses on local food production. *Chisan-chisho* movements aim to connect producers and consumers through local food production, although the specifics are not well defined (Yokoyama & Sakurai, 2009). This shows some similar motivations to the *teikei* systems, although the definition and practice is less strict. Rather than small scale partnerships between farmers and consumers, government-supported *chisan-chisho* movements aim to create networks of agricultural production and sale, including a collection of farmers groups, consumers, local and regional governments and businesses (Yokoyama & Sakurai, 2009). Like *teikei* systems, these networks also rely on trust and mutual understanding of values.

The movement initially began with nongovernmental organizations before it was adopted by local and national governments. Today, the government-backed local foods movement is the largest form of *chisan-chisho*. In addition to food security, the Japanese government is also concerned with the rise of diseases such as obesity and diabetes, and the decline in people eating

the traditional Japanese diet (Assmann, 2010). The government's push for local foods refers both to the location of food production and the food culture, emphasizing a push towards traditional Japanese foods and away from increasingly popular Western foods (Assmann, 2010).

One of the underlying values emphasized by *chisan-chisho* groups is that local food is safe because people know where it is coming from and who is producing it, despite the fact that local foods do not necessarily mean face-to-face connections between farmers and consumers (Nishiyama & Kimura, 2007). Another focus of the movement is revitalizing rural agricultural communities. The national government focuses on the restoration of food self-sufficiency and food security in its adoption of *chisan-chisho* movements.

As stated earlier, the most prominent *chisan-chisho* practices are through the national government. However, this is problematic in some ways. The government movements are focused on the increase of domestic food production, and despite claims, may overlook issues like safety and health that are central to the ideas of the original *chisan-chisho* philosophy (Kimura, 2011). In addition, government initiatives may focus on individual responsibility rather than creating real reform in the food systems. These movements also have the tendency to focus on nationalistic ideals and traditional Japanese family values, emphasizing the domestic role of women (Kimura, 2011).

One of the main government implementations of *chisan-chisho* has been in food education. In 2005, Japan became the first country to enact a national law on food education, with the goal of promoting healthy diets, strengthening traditional Japanese food culture, and expanding food security (Yotova, 2016). Figure 7 shows an example of food education engaging with urban agriculture. However, as with other federal government policies, this national food

education has a nationalistic overtone, emphasizing that Japanese food is safer than imported food and that traditional Japanese dishes are better than foreign foods (Yotova, 2016).



Figure 7. Food education and urban agriculture (Yokohari & Bolthouse, 2011, p. 422)

While these education programs promote local foods and the growth of Japan's domestic agricultural production, they do so by enforcing the existing system rather than challenging it or pointing out its flaws. This is also evident in the food education experts. According to Kimura (2011), the majority of local food education experts are women who chose their career not out of a desire to improve the agricultural system in Japan, but to fulfill a traditional female role. This is further demonstration of the government policies that suggest solving agricultural problems in Japan requires individual responsibility and traditional values, rather than systemic change.

The specific narrow focus and the presence of government control may be limiting the success of local food movements in Japan. In comparison to older local foods movements in the US, movements in Japan are less broadly effective (Nishiyama & Kimura, 2005). In the US, local food movements are often associated with a resistance to globalization and multinational companies, as well as tools for promoting other causes such as environmentalism, democracy and social justice (Nishiyama & Kimura, 2005). However, in Japan, these other aspects are not present.

While government policies have failed to capture the full potential of movements like *chisan-chisho*, these movements have still played an important role in changing the public conversation and attitude towards agriculture. Food scandals have continued to shape the local food movement in Japan. Since the 2000s, scandals such as mad cow disease, concerns over imported genetically modified crops and unclear or mislabeled products have contributed to the continued importance of local foods movements (Yokoyama & Sakurai, 2009). Organic co-ops and local food movements that emerged out of concerns over food safety and security have helped create a shift to farming in Japan's cities (Yokohari & Bolthouse, 2011).

Chapter 4

Urban Agriculture

Urban agriculture can be defined as food production that occurs within the city limits. Urban agriculture can include community gardens, commercial gardens, gardens run by institutions or groups and home gardens. Research on urban agriculture around the world shows evidence of benefits including increased fruit and vegetable consumption, higher self-esteem, enjoyment of nature and maintenance of cultural identity and traditions (Colasanti et al., 2012). In the context of Japan, mixed urban and agricultural land use has created a situation for the growth of urban agriculture, and alternative food movements have helped promote it today.

Just as agriculture was an important part of Edo during the Tokugawa period, it is an important part of Tokyo today. Within the central 600 square kilometers of Tokyo's core, a patchwork of more than 900 hectares of land is farmed (Yokohari & Amati, 2005). This land makes up 1.5% of the land area of Tokyo's wards and 0.02% of total agricultural land in Japan. While this is a small amount of land, the produce of farms in Tokyo is not insignificant. 0.3% of vegetables and 0.2% of flowers and ornamental trees in Japan are produced in Tokyo (Yokohari & Amati, 2005). This farmland within Tokyo has survived despite attempts to promote urbanization in the central city since the 1968 City Planning Law. Figure 8 shows the distribution of urban agriculture in the Tokyo area.

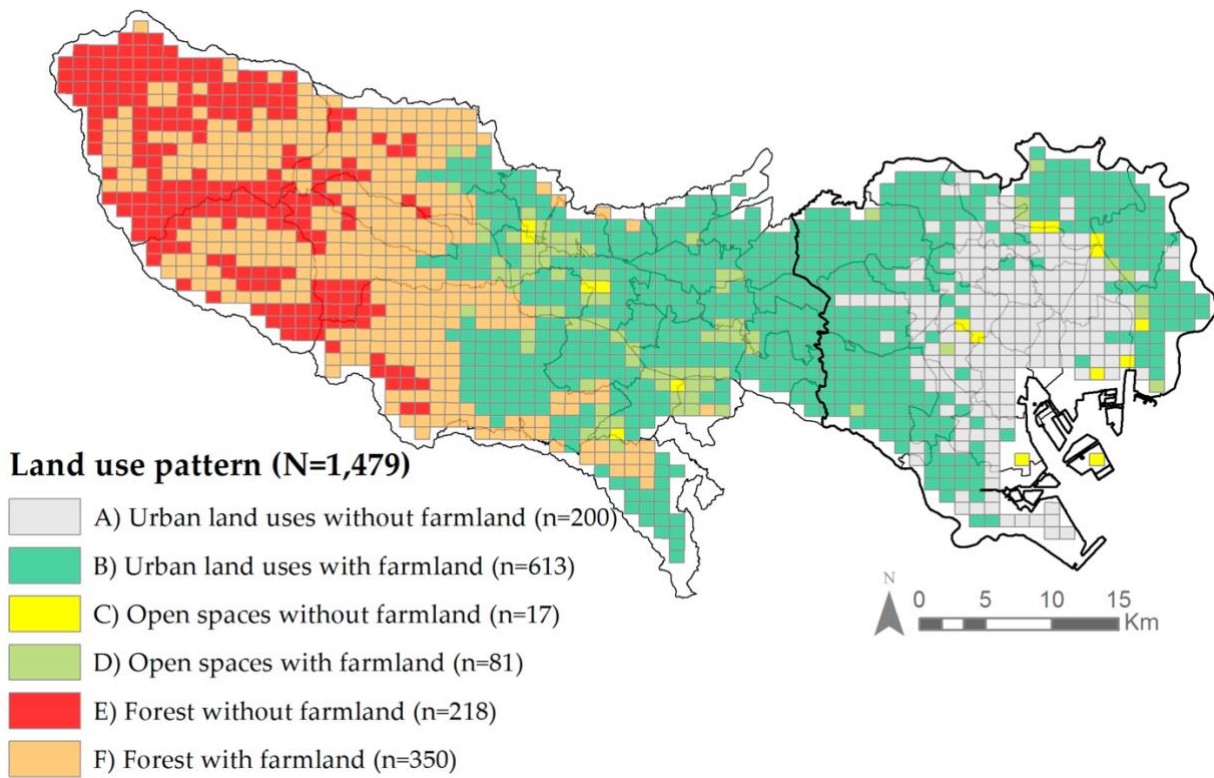


Figure 8. Land use pattern in Tokyo (Sioen et al., 2018, p. 11)

Despite the initial attempts to urbanize this land, the value of agriculture in the city is now recognized and the land is protected and designated as productive green open space (Yokohari & Amati, 2005). While the overall area of agricultural land in Tokyo is small, it is more significant within certain wards. For example, 3% of the land in Setagaya Ward in central Tokyo (see Figure 2) is used for agriculture and it is one of the most agriculturally productive wards in the city (Yokohari & Amati, 2005). Most of the agricultural land in Setagaya Ward is owned by one farmer and segmented into patches. The products from these farms are sold directly to consumers in surrounding areas, and the use of organic practices are encouraged in order to meet demands for safe foods (Yokohari & Amati, 2005). This is consistent with the principles of the *teikei* food movement. The integration of agriculture into urban areas in Japan should be recognized as a way of connecting cities and nature. Figure 9 shows an aerial view of

this integration of urban and agricultural landscapes in Chiba Prefecture, located just outside of Tokyo.

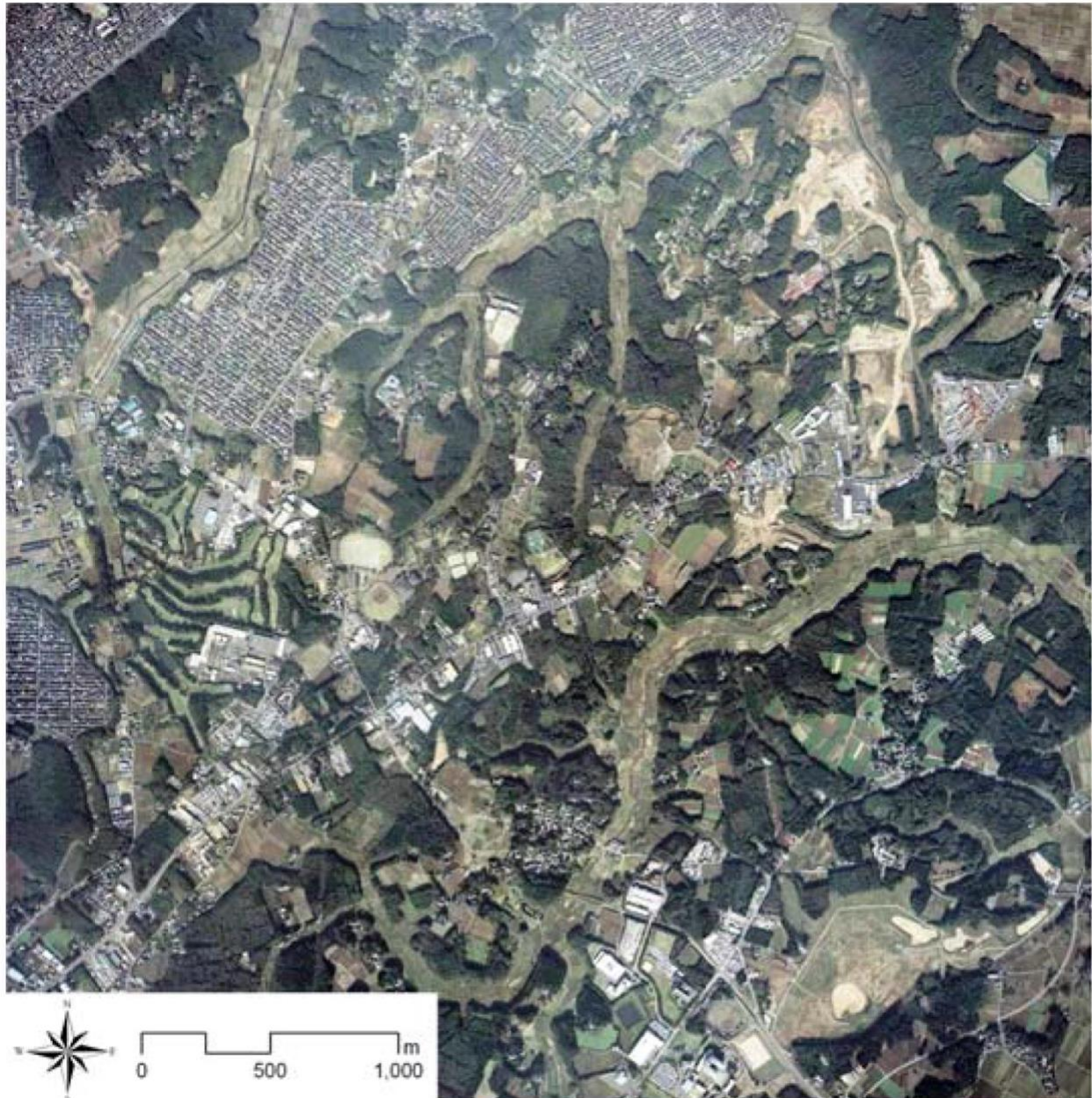


Figure 9. Mixed urban and agricultural land use 30 km from the center of Tokyo in Chiba Prefecture (Kogi, Miyamoto, Bolthouse, & Yokohari, 2010, p. 652)

There are many advantages to urban agriculture, particularly in a Japanese context. Urban agriculture can build resilience to natural disasters, increase food security and agricultural self-

sufficiency and provide ecosystem services. Given Japan's aging and declining population, urban agriculture can serve as an important tool to revitalize shrinking and aging cities by creating new functions for abandoned lots and establishing community cohesion. In this way, the mixed-use landscapes in Japanese cities, once viewed as a planning failure, may actually prove to have many advantages.

Urban Agriculture and Food Movements

Agriculture has been a part of Japanese cities since long before the emergence of movements like *teikei* and *chisan chisho* in the 1970s. However, the modern system of urban agriculture in Japan cannot be understood without connecting it to these movements. As mentioned in the previous chapter, the earliest *teikei* groups formed in urban areas in order to promote organic farming and connections between producers and consumers. While fewer farmers today identify as part of the *teikei* movement, many of these ideas are still prominent in urban agriculture, especially in major cities like Tokyo.

There is a higher demand for organic and low-chemical produce in Tokyo compared to the rest of Japan, and as a result, these farming practices are more common in urban agriculture in Tokyo (Moreno-Peñaranda, 2011). In addition, examining the most popular types of urban agriculture also shows similarities to alternative food movements. Systems which involve direct participation in activities with farmers and consumer as well as allotment gardens are the most popular forms of urban agriculture (Moreno-Peñaranda, 2011). An example of participation between consumers and farmers is shown in Figure 10. This promotion of direct engagement between farmers and consumers is another central part of the *teikei* movement. Despite the fact

that the movement has declined and while urban farmers may not refer to themselves as a part of *teikei*, the philosophy of the movement is still an important objective of urban agriculture today.



Figure 10. Urban agriculture (Yokohari & Bolthouse, 2011, p. 422)

While the *teikei* movement has declined, the *chisan chisho* movement is still a prominent alternative food movement, largely due to its adoption by the government. This is also reflected in urban agriculture. The Japanese government has recognized the benefits of urban agriculture at providing fresh food, and especially organic foods, which are becoming increasingly popular, and has incorporated urban agriculture into policy (Moreno-Peñaranda, 2011). As with other uses of *chisan chisho* by the government, there is a focus on food security and self-sufficiency.

Within Tokyo, the metropolitan government has recognized the importance of urban agriculture

and has focused an effort on maintaining production land in the city since 1994 (Kaoruko, 1995). This effort to protect farming land and promote urban agriculture was largely aimed towards on promoting self-sufficiency within the city. In order to protect urban agriculture, the Tokyo metropolitan government has designated land that should be preserved for farming. However, without incentives for farmers to cultivate the land, preserving it may not be enough to encourage agriculture (Kaoruko, 1995).

The government has also recognized that urban agriculture can encourage engagement between consumers and producers, which can lead to a better understanding of food issues (Moreno-Peñaranda, 2011). This has been another motivator in promoting urban agriculture. Other government programs set in place in the 1990s attempted to encourage participation in urban agriculture. In 1992, the Japanese government started a program called *ona seido*, or ownership system, to provide land for non-farmers to rent and produce food (Mok et al., 2013). This program proved to be very popular, and by 2008, there were 187 *ona seido* programs around Japan. People who engage in *ona seido* programs are typically older people motivated by a desire to connect with nature as well as self-sufficiency, food quality and environmental concerns (Mok et al., 2013). Many of the sites for *ona seido* programs are abandoned farmland and vacant land mainly in the fringes of cities (Mok et al., 2013). While most of the people who engage in *ona seido* programs are not professional farmers, there are others who eventually became semi-professional, cultivating larger areas, usually over 100 square meters and in more central urban areas rather than on the fringes of cities (Mok et al., 2013). Another government-backed program, *shimin noen*, or citizen garden, operates on a similar principle of renting land, but land for these programs was already agricultural and maintained by landowners (Mok et al., 2013). While *shimin noen* became popular, with over 200,000 members nationwide by 1998, the

program may not be as influential due to the fact that average gardens are only 50 square meters in area (Mok et al., 2013).

The *chisan chisho* movement does not specifically call for the development of alternative food systems like urban agriculture, but they share the same goals of promoting safe and healthy local foods, and are therefore often connected. The ideas behind movements like *chisan chisho* and *teikei* are important motivations in the establishment of urban agriculture in Japan today even if they are not directly part of the same movement.

Urban Agriculture as Defense against Natural Disasters

One of the key advantages of urban agriculture in the context of Japan is its ability to reduce vulnerability to natural disasters. Japan is a nation especially vulnerable to natural disasters including typhoons, earthquakes and tsunamis. In order to build resilience to these vulnerabilities, it is important to prepare emergency response systems. Urban agriculture can help with disaster preparation and emergency response by providing a source of nutritional food to survivors and increasing awareness. Urban agriculture can also serve as a buffer to protect residential areas from the worst effects of disasters.

Japan is especially prone to natural disasters, but its cities are densely populated, with narrow roads and complicated planning systems (Sioen et al., 2018). For example, Tokyo is located in the most earthquake prone community in the world. While the overall population of Japan is declining, the population and population density of Tokyo are increasing. This makes the city especially vulnerable to natural disasters. In emergency preparedness simulations by the government, access to and distribution of food has been shown to be an important factor in

effectiveness of preparation and response (Sioen, Sekiyama, Terada, & Yokohari, 2017). The Japanese government has recognized that urban agriculture can play an important role in disaster management by providing an open evacuation space as well as preventing the spread of fires (Moreno-Peñaranda, 2011). In order to achieve better disaster preparedness, the Japanese government asks urban farmers to register their land as disaster prevention cooperation farmland (Sioen et al., 2018). If a farmer agrees to this, the land may be used for evacuations and the construction of temporary food distribution shelters in the event of a disaster.

Urban agriculture can serve as a supplement to emergency food supplies following natural disasters. Typically, post-disaster food supplies are rich in carbohydrates with long shelf lives and a focus on providing energy to survivors (Sioen et al., 2017). These supplies are intended to cover the basic food needs of survivors for short periods of time of up to a few days. However, depending on the scale of the disaster, past events in Japan and elsewhere have shown that survivors actually end up relying on these emergency food supplies for a few weeks to a few months (Sioen et al., 2017). This can have negative health consequences. Emergency food supplies typically lack in nutritional content. Relying on them for longer periods of time can lead to or worsen gastrointestinal symptoms and cardiovascular diseases (Sioen et al., 2017).

While urban agriculture is unlikely to fully replace emergency food supplies following natural disasters, it can provide an important supplement with greater nutritional value to address the health problems (Sioen et al., 2018). Current emergency food sources are focused on providing necessary energy, but urban agriculture can help transition this to provide necessary nutrition as well (Sioen et al., 2018). In addition, easy access to urban agriculture can allow people to be self-sufficient if cut off from other supplies following a disaster. Self-sufficiency can also improve mental health and attitude of survivors of natural disasters (Sioen et al., 2017).

In addition, the presence of urban agriculture in a neighborhood can increase the population's awareness of disaster threats, leading to better preparation (Sioen et al., 2017). In current food systems where urban residents rely on rural agriculture for food sources, populations are more vulnerable (Sioen et al., 2018). Therefore, protecting and promoting urban agriculture is important in building resilience in the core of Tokyo.

Another way urban agriculture can build resilience to natural disasters is by acting as a buffer. The Great East Japan Earthquake and tsunami that followed in 2011 resulted in enormous damage and loss of life. Although dikes were in place along the coastlines, it was not enough to prevent tsunami damages in many cases. Based on past events, one of the best ways to prevent loss of life from tsunamis and flooding is to relocate settlements to higher grounds (Ranghieri & Ishiwatari, 2014). For example, the fishing and farming village of Yoshihama relocated uphill following a previous tsunami and converted their previous settlement land into agriculture. In the 2011 event, the tsunami flooded past the dikes and covered most of the agricultural land, but avoided almost all of the residential area (Ranghieri & Ishiwatari, 2014). In this way, agriculture acted as a buffer to protect the village.

Food Security and Nutrition

Urban agriculture also has nutrition benefits outside of emergency situations. Various studies around the world have shown that consumers participating in urban agriculture eat more vegetables and seasonal foods and have healthier diets overall, and these effects seem to be the most significant in older age groups (Sioen et al., 2017). Urban agriculture is unable to compete with large-scale conventional agriculture, so rather than provide products for the market, urban

farmers sell directly to local people (Sioen et al., 2017). As a result, urban agriculture often produces a wider variety of crops in order to meet the demands of local markets. In addition, urban agriculture typically focuses on fresh, high quality, perishable crops rather than staples. Urban agriculture can contribute to an increased intake of fresh fruits and vegetables, which has been linked to the prevention of cardiovascular disease and cancer (Sioen et al., 2017).

While urban agriculture in Tokyo has focused mainly on diverse fresh crops other than staples, there may also be benefit in incorporating rice production into urban and suburban farming. Urban areas rely on rural agriculture for the production of rice, and transportation can lead to higher costs and environmental damages (Kamoshita, 2007). Increasing rice production closer to urban areas of high demand could also promote resiliency and sustainability in Tokyo.

Ecosystem Services

In addition to building resilience to natural disasters, agriculture reduces pollution and regulates temperature in urban areas. Water contamination is a serious concern in major urban areas. The pollution of water supplies by human or chemical waste is a threat to human health. Water treatment in the urban fringe of Tokyo is often inadequate as a result of unplanned urban sprawl and the inability to connect to the existing systems due to costs (Kogi et al., 2010). This means that water pollution from domestic water use is a major concern and accounts for a large proportion of pollution in Tokyo Bay. 65% of nitrogen in Tokyo Bay and 70% of phosphorus came from domestic wastewater in 2006 (Kogi et al., 2010). Abandoned rice paddies unsuited for agriculture can be used as wetlands to create an alternative method of wastewater treatment (Kogi et al., 2010).

Paddy fields also have an effect on temperatures in suburban areas in Tokyo. According to Yokohari et al. (2001), streets that open onto a paddy field have significantly cooler summertime temperatures up to 150 meters into the neighborhood compared to streets that do not open onto a paddy field. This shows the potential of urban agriculture to reduce urban heat island effect. This could also potentially reduce heat-related health problems, especially among older populations, but further research is needed. Figure 11 shows a paddy field in a suburban neighborhood in Ichikawa, located just outside of Tokyo.



Figure 11. Rice farming in Ichikawa, Chiba outside of Tokyo

Other forms of urban agriculture such as green roofs can also have a positive impact on the environment of a city. According to research conducted by Tanaka et al. (2016) in Osaka, green roofs are effective at mitigating heat during hot summer temperatures. The study demonstrated the effectiveness of a hydroponic rice system at cooling the roof by comparing it to a section of uncovered roof on the same building. This is another method by which urban agriculture can be used to address heat in cities. By reducing urban heat island effect, urban agriculture may also reduce energy use. Urban agriculture also reduces energy use and greenhouse gas emissions by lowering the distance between producer and consumer. Urban agriculture can also benefit the ecosystem by providing habitats and boosting pollination (Moreno-Peñaranda, 2011).

Community Building Potentials of Urban Agriculture

Beyond these ecosystem services, urban agriculture has an important community value. Japan's population is shrinking rapidly, especially in rural areas. Japan has long had strict policies on immigration, and birth rates are declining resulting in overall population loss and making it one of the most rapidly aging societies in the world (Yamada et al., 2016). In addition, there has been a shift in population distribution towards major cities and urban centers. As a result, smaller more isolated cities and urban fringe areas face the biggest impacts of shrinking cities (Yamada et al., 2016). Many farmers in rural areas and small cities are old and lacking successors (Yokohari & Bolthouse, 2011). Urban agriculture in Japan is being led by retired baby boomers, who take up farming as a second career. Semi-professional farmers are also

emerging, and while they participate in agriculture mainly for leisure, their work is sometimes more productive than that of commercial farmers (Yokohari & Bolthouse, 2011). Restoring abandoned lots in Tokyo for agricultural purposes can establish community cohesion and create neighborhood level micro-foodsheds (Kurita, Bolthouse, & Yokohari, 2009). It also has the potential to restore waste and produce cycles that were common during the Edo period between farms and urban populations (Yokohari & Bolthouse, 2011).

Urban agriculture can also address the problem of Japan's shrinking cities. A shrinking city is defined as a densely populated urban area of at least 10,000 residents that has undergone population decline for more than two years and shows evidence of economic or structural changes (Yamada et al., 2016). Patchworks of abandoned lots emerge in shrinking cities, and these patterns are hard to predict or manage. Integrating urban agriculture into these vacant spaces is one promising solution to reconnecting communities both spatially and socially (Yokohari & Bolthouse, 2011). Urban agriculture can convert vacant land to productive spaces, and build community cohesion.

Just as in smaller Japanese cities, in the outer suburbs of Tokyo areas of growth and decline are interspersed (Yamada et al., 2016). Vacant lots are defined as plots of land with no built structures or only minor structures such as storage facilities (Yamada et al., 2016). In Tokyo, as in the rest of Japan, where the population is rapidly aging, old age is a common reason for land abandonment. It is difficult to predict the patterns of vacant lots abandoned due to old age, and as a result the problem often goes unaddressed (Yamada et al., 2016).

Vacant lots can present a number of issues for a city. They may be viewed as unsafe and often result in negative opinions from residents (Yamada et al., 2016). In order to sustain quality of life and attitudes towards a city, the problem of vacant lots must be addressed. Local

conditions varying from site to site will determine how lots should be utilized or maintained in order to benefit the city. Japan's population is urbanizing and aging. High costs and aging populations present problems for local governments around the world trying to preserve public spaces (Sioen et al., 2017). Areas that developed more organically rather than adhering to planning guidelines have a greater number of vacant lots. Urban agriculture presents a potential solution to this problem by providing a way and incentive for people to maintain green spaces within cities. Urban agriculture can be practiced on any size or shape of lot. This makes it especially useful at addressing the issue of abandoned lots, which are often irregular and therefore unsuitable for construction or other purposes (Sioen et al., 2017). According to Sioen et al. (2017), urban agriculture in Tokyo could be increased by 45% if vacant lots were used for farming.

Potential Limitations of Urban Agriculture

While the benefits of urban agriculture in Japan are many, it is also important to recognize possible shortcomings. As with any such movement, there are barriers to the success of urban agriculture in Japan, and there are environmental and social concerns.

According to government surveys, over 85% of Tokyo residents support the development of urban agriculture to promote access to fresh produce (Moreno-Peñaranda, 2011). However, there are many challenges to realizing this goal. Agricultural land use in major cities is declining, as is involvement in farming (Moreno-Peñaranda, 2011). This is due in part to urbanization, land prices and tax laws. One of the barriers to urban farming today is actually what helped create the patchwork landscape that promoted it initially. Inconsistencies in zoning systems between

government agencies and scales of government have struggled to find a definition for urban agriculture and therefore struggled to promote and protect it against urban development (Moreno-Peñaranda, 2011). This means that attempts to protect agricultural land in cities are not always successful.

Rising land prices, especially in major cities like Tokyo, is another barrier to urban farming today. As land in the center of cities becomes more valuable, farmers may be more likely to sell their land or profit from development than continue to farm. There are laws to allow tax exemptions and other incentives for urban farming, but these often have strict and difficult to achieve requirements, such as a long-term commitment to farming the land (Moreno-Peñaranda, 2011). As a result, many farmers are unable or unwilling to comply and once again, may turn to developing their land instead.

In addition, urban agriculture faces some of the same challenges that agriculture in the country overall faces. The farming population is aging in urban areas just as it is in rural areas, and there is uncertainty as to the future of farms without successors (Moreno-Peñaranda, 2011). Many farmers in Tokyo work on family land that has been cultivated for generations (Kaoruko, 1995). Without a younger generation willing to take on the farm, this land may be lost to development. Further development poses other threats to urban agriculture as well. Tokyo has seen an increase in high rise buildings, and this may limit the amount of sunlight that can reach agricultural land (Kaoruko, 1995).

While urban agriculture is linked with alternative food movements like *teikei* and *chisan chisho*, and is often motivated by environmental and health concerns, there are also environmental concerns with urban agriculture. Areas in suburban Tokyo have experienced problems with air quality, even inside buildings, due to pesticide use from nearby agriculture

(Mok et al., 2013). Water contamination due to pesticides and fertilizers has also been an issue in urban and suburban areas (Mok et al., 2013). Industrial pollution can also affect food grown in urban areas, creating health risks. Japan has a long history of industry and mining, and therefore has historically had high levels of harmful contamination incidents (Mok et al., 2013). In particular, cadmium contamination has been known to cause chronic health issues since the early twentieth century. People who ate rice irrigated by cadmium-contaminated water became seriously ill, and although the connection has been known and regulated since the 1970s, cadmium contamination was still occurring at relatively high levels in Japan compared with the rest of East Asia as late as the 1990s (Mok et al., 2013). It is important to acknowledge the possibility of cadmium and other contamination risks in urban or industrial environments where agriculture is occurring.

By examining examples of urban agriculture in other countries, potential social inequalities also arise. Some of the best studied examples of this are in the United States. Although major urban areas like Tokyo and Osaka are growing, smaller cities throughout Japan are shrinking as the population ages and people leave for better opportunities in larger cities. Parallels can be drawn between these cities in Japan and the city of Detroit in the United States, though the urban decay in Detroit is more extreme, with approximately one-third of the city consisting of abandoned land (Colasanti et al., 2012). The amount of vacant land in Detroit has also allowed it to become a leader in urban agriculture. Research in Detroit has shown that while there is often a positive image of urban agriculture, not all residents are accepting of the idea of growing food in the city (Colasanti et al., 2012). Although the cultural divisions in Detroit, a city known for its race tensions, may not be relevant to Japanese cities, the variations in perceptions of urban agriculture are still worth considering.

Interviews with participants in urban agriculture in Detroit also showed that it is viewed as a part of larger social movements related to the environment, poverty and education (Colasanti et al., 2012). As noted in the previous section, lack of these connections across activist movements may limit the success of alternative food movements in Japan, and the same may be true of urban agriculture. Urban agriculture in Detroit is viewed by some as a solution to build a more sustainable future, while others view it as a more temporary necessity in the light of a weak local economy (Colasanti et al., 2012). The example of Detroit shows that if urban agriculture is to be successful, the perspectives of all groups within a city must be carefully considered.

Studies on urban farming in California have shown that low income groups are less likely to participate, and therefore urban agriculture may not be as successful at providing food security and access to all groups (Guthman, Morris, & Alan, 2006). Economic barriers and perceptions about urban agriculture may prevent lower income groups from accessing produce. While food security is often described as an important component of urban agriculture, it may actually be the case that urban agriculture does not provide for those who are in the most need of affordable produce (Guthman et al., 2006). Therefore, urban agriculture serves communities with economic access, while further restricting food security in low-income populations (Guthman et al., 2006).

The socio-economic dynamics of urban agriculture are less well studied and documented in Japan, and it is possible that the issues present in the United States are not defining problems in Japan. However, it is just as important to recognize the potential for these inequalities to arise as it is to consider the potential health concerns of urban agriculture. For urban agriculture to succeed in Japan, its shortcomings and barriers must be understood and overcome.

Chapter 5

Conclusions

Japan's long history of a mixed patchwork pattern of land use in urban areas makes it an interesting place to study urban agriculture in both a historical as well as a modern context.

Urban agriculture has existed in Japan since the earliest periods of urbanization in the Tokugawa period, and it continues to persist in cities today despite significant changes in Japanese society and the economy. These small, integrated agricultural landscapes have remained a characteristic aspect of densely populated urban areas, notwithstanding extensive development and growth.

Two important factors that have contributed to the continued existence of mixed urban and agricultural land uses are planning and alternative food movements. Planning efforts have shaped the growth of Japanese cities, though often not as intended since planning often was not realized due to a lack of local control (Sorensen, 2002). This has allowed the mosaic pattern of land use to continue against the trend of high-density urban development. In addition, the alternative food movements of *teikei* and *chisan chisho* have given these landscapes a new importance by promoting a new purpose for urban agriculture (Kondoh, 2014; Nishiyama & Kimura, 2007).

The combination of historical and modern planning efforts as well as organic and local alternative food movements have shaped the development of agriculture in Japanese cities today. By maintaining a sustained focus on the interactions between planning, alternative food movements and urban agriculture, this thesis connects three important topics, and builds upon existing but separate research on each of these areas.

Understanding the past development of urban agriculture in Japan requires an examination of the history of land use and of efforts to control land use in urban areas. In particular, this can be understood through the history of planning in Japan. Since the formation of the earliest cities in the Tokugawa period in the 1600s, governments at various levels have made attempts to regulate land use and urbanization by establishing rules such as zoning and development codes (Sorensen, 2002). Rapid urbanization and population growth throughout the Tokugawa period initially contributed to the lack of organization in Japanese cities. Early Meiji planning efforts in the late 19th century tried to emulate Western planning ideas, but were unable to effectively establish laws to enforce these ideas. Later, when planning laws were established formally with the 1919 City Planning Law, the authority was given to the central government, limiting local effectiveness (Hein, 2010). While land use zoning was established, it had little actual effect. Later, after the destruction and unorganized rebuilding following World War II, Japan attempted to reconcile the failures of previous planning efforts with the 1968 City Planning Law, in part by shifting some control to local governments. However, despite this intention, much of the actual control remained with the central government, once again limiting planning success (Hasegawa, 2014).

These major limitations to the success of historical planning laws in Japan continue to shape recent efforts. Lack of a strong civil society and the continued centralization of planning powers have consistently proven the limitations of attempts to more rigidly plan and separate Japanese land use. Without public and local involvement in the process, planning efforts have not been successful (Sorensen, 2001). As a result of the inability to implement planning regulations and zoning between urban and agricultural space, mixed land uses have continued to define Japanese cities. For this reason, agricultural spaces have continued to exist within densely

populated cities like Tokyo. Conventionally, this has largely been seen as a failure resulting in a chaotic and unorganized landscape.

The influence of Western planning ideas has shaped the values of planning within Japan. Early Japanese planners attempted to emulate Western practices by following their ideas of separated land uses, and therefore viewed their inability to achieve the same results as a failure. However, by recognizing the importance of mixed land use in the development of urban agriculture, distinctions between planning in Japanese and Western contexts should not be viewed as a failure, but as an opportunity. This mixed urban land use can help build resilience and revitalize cities.

Land use is important in the development of urban agriculture, but even with the spaces available it cannot exist without people to work as farmers or to consume and create demand for the products. This is where alternative food movements come in as an important part of the conversation about urban agriculture in Japan. Alternative food movements that developed in response to increasingly industrialized national agriculture systems helped pave the way for urban agriculture as it exists today in Japanese cities (Yokohari and Bolthouse, 2011).

One of the earliest established alternative food movements in Japan was the organic-focused *teikei* movement, which began in response to industrial agriculture and a desire for food produced without chemicals (Kondoh, 2014). This took the form of direct partnerships between consumers and producers in urban areas, and encouraged the participation of people without farming backgrounds in urban agriculture. The *teikei* movement began in Tokyo before spreading to other cities and eventually rural areas throughout Japan. The main influence of the movement, however, remained largely in urban areas (Kondoh, 2014). While this movement has declined with the rise of other options in organic foods, similar ideas and partnerships remain in

place in urban agriculture today. There is a higher demand for organic or low-chemical food in urban areas such as Tokyo than in the rest of the country, and urban agriculture helps fill this market demand (Moreno-Peñaranda, 2011).

The *chisan chisho* movement for local foods is also connected to urban agriculture. Though the movement has been mainly adopted by the federal government and used for educational and, some would argue, nationalistic agendas, it still shares many ties to urban agriculture and the role of urban agriculture can promote the goals of the *chisan chisho* movement as well (Nishiyama & Kimura, 2007). Urban agriculture promotes connections between local producers and consumers, and the federal government supports this as part of its adoption of the *chisan chisho* movement. The government has also used *chisan chisho* to promote urban agriculture as a method of increasing self-sufficiency and food security. Due to the connections with the *chisan chisho* movement and its goals, the government has recently supported the protection of agricultural land within Japanese cities (Moreno-Peñaranda, 2011). This preservation of agricultural land uses in urban areas promotes the continued development of urban agriculture.

Neither the *teikei* nor the *chisan chisho* movements are solely focused on urban agriculture. Both movements were established to promote broader goals of access to organic and local foods. Yet, both movements played important roles in establishing the recent development of urban agriculture. The *teikei* movement promoted partnerships and an interest in organic food, which remain important characteristics of urban agriculture today (Rosenberger, 2017). The *chisan chisho* movement, in part through its government support, has helped establish urban agriculture as a method of achieving self-sufficiency and food security through local food (Moreno-Peñaranda, 2011).

Urban agriculture has developed throughout Japanese history and changing land use, and has evolved to play different roles today. Now and looking toward the future, there are a number of important roles for urban agriculture, especially in the context of environmental and social change. Urban agriculture can offer solutions to natural disasters by building resilience both in terms of disaster preparation through more nutritional emergency food supplies and awareness (Sioen et al., 2018). It can also act as a buffer to prevent the worst effects of disaster and protect vulnerable areas (Ranghieri & Ishiwatari, 2014).

In addition, urban agriculture can play an important role in food security, which is increasingly important in Japan, where food supplies are heavily reliant on foreign countries. Promoting food security at a local, regional and national scale can help reduce Japan's vulnerability to a number of threats such as food price crises and disruptions in global transport and shipping networks (Hisano, 2015; Sears, 1983). While urban agriculture alone is not the solution to Japan's food security concerns, it promotes local self-sufficiency and nutrition, which can build towards greater food security.

In the light of climate change, another increasingly important role of urban agriculture is the ability to provide important ecosystem services. In particular, urban agriculture in many forms such as green roofs or rice paddies, can help reduce urban heat island effect (Tanaka et al., 2016; Yokohari et al., 2001). Mitigating high temperatures may have important health benefits by reducing risk of heat-related problems, especially in older people. Agricultural landscapes can also mitigate pollution and prevent water contamination, which could otherwise have negative effects on human health (Kogi et al., 2010).

Finally, Japan is a nation with a rapidly shrinking population. While major cities like Tokyo continue to grow, smaller cities in Japan are shrinking as the population ages and moves

to larger cities for increased opportunities (Yamada et al., 2016; United Nations, 2014). In these contexts, urban agriculture can provide a potential solution by occupying vacant lots, which may otherwise become hazards or be difficult to maintain. In addition, urban agriculture can build community cohesion, which is important in maintaining and rebuilding shrinking cities (Yamada et al., 2016; Yokohari & Bolthouse, 2011).

Urban agriculture in Japan has been shaped by a number of factors including the history of land use and the limitations of planning attempts, as well as the influence of organic and local alternative food movements. While the contexts creating opportunities in the landscape for urban agriculture have often been viewed as failures, many advantages of mixed use landscapes can be seen in the development of urban agriculture. Rather than viewing patchwork landscapes in Japan as a failure of planning, they should be viewed as a distinctive means of connecting people and nature in what can be productive relationships, both environmentally and socially. Perhaps we should recognize the success of urban agriculture in Japan and view Japan as a role model for urban areas around the world facing environmental and social change.

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ACADEMIC VITA

Academic Vita of Julia Higson

jmh673@psu.edu

Education

Majors: Geography and Anthropology

Minors: Japanese and GIS

Honors: Geography

Thesis Title: The Recent Development of Urban Agriculture in Japan: Urban Planning and Alternative Food Movements

Thesis Supervisor: Karl Zimmerer

Work Experience: Research Assistant

Date: January 2017 – December 2017

Description: Data collection and GIS analysis

Institution/Company (including location): Human Environmental Dynamics Lab, Penn State University Department of Anthropology

Supervisors' Names: Douglas Bird and Rebecca Bliege Bird

Grants Received: Foreign Language Area Studies Fellowship

Awards: EMSAGE Laureate, Geography Alumni Scholars Undergraduate Student Award, E. Willard Miller Undergraduate Paper Award, Anthropology Day 2018 Undergraduate Poster Award

Presentations: Penn State – Pittsburgh Undergraduate Research Symposium, Penn State Anthropology Day 2018

Community Service Involvement: Outdoor School, Penn State Eco-Action, PSU Fossil Free

International Education: Tanzania Parks and People, IES Tokyo Language and Culture

Language Proficiency: Japanese, French