What are the Keys for Sustainable Cities in Japanese Case?

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Introduction

Recently, the national government and local municipalities in Japan have realized the need for implementable agendas on regional revitalization. In Japanese regional policymaking, the concept of *sustainable development* is the most significant as it addresses current Japanese social issues, such as municipal consolidations, rapid population decline, a rapidly aging society, and finite natural resources.

In this context, the concepts of Sustainable Development Goals (SDGs) have a tremendous impact on Japanese society and administration because related SDG policies are aligned with the government's regional policies. Sustainable development requires municipalities to develop new and alternative strategies for the effective enforcement of sustainable development policies. The question is, what are these key strategies? While the SDGs cover a lot of ground, this study focuses on Goal 11: Sustainable Cities and Communities, and, in particular, the strategic keys for sustainable cities in Japan. This consideration of these keys will contribute to the discussion of the policies aligned with SDGs.

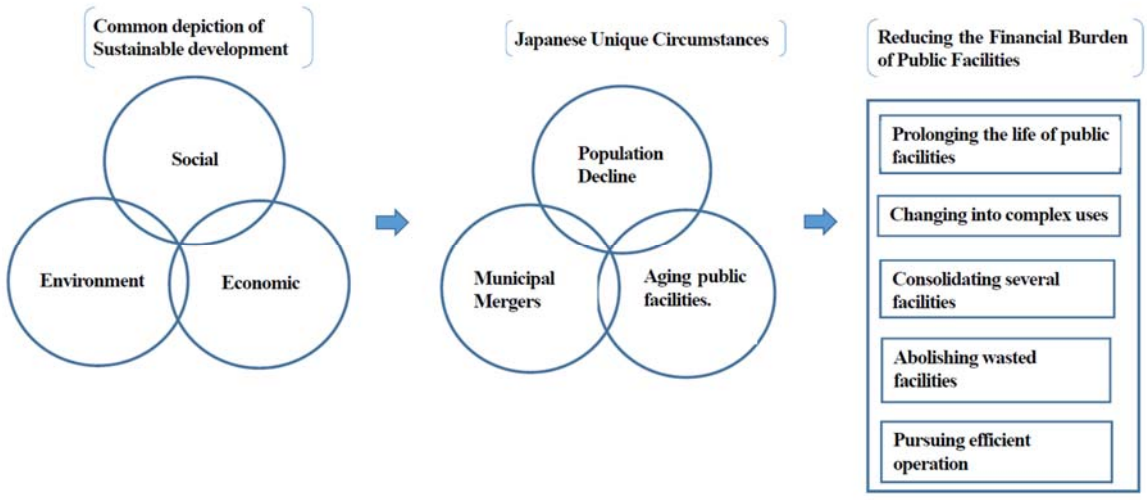
Ⅰ. Outline

Komeily (2017)[1] states that the concept of sustainable development must encompass "environmental," "social," and "economic" dimensions. Whereas environmental sustainability relates to making decisions with the intent of protecting the natural environment, social sustainability is about actively supporting the capacity of current and future generations to create healthy and livable community by promoting equity, diversity, livability, democracy and so on. Economic sustainability refers to using resources wisely, efficiently, and responsibly for long term benefits.

This is commonly how sustainable development is described. However, when examining sustainable city policies in Japan, three unique circumstances should be taken into consideration; population decline, municipal mergers, and the aging public facilities.

Based on these considerations, Japanese municipalities are currently planning and implementing policies that reduce the financial burden of public facilities by prolonging their service life, changing into complex uses, consolidating several ones, abolishing wasted ones, and pursuing efficient operation of them. See Figure 1.

Figure 1. Structure of Japan's Sustainable Cities



The Figure is created by the author.

[1] Source: Komeily A, Srinivasan R. *Sustainability in Smart Cities: Balancing Social, Economic, Environmental, and Institutional Aspects of Urban Life. Smart Cities*: Wiley; 2017. pp.504-505.

Ⅱ. Background

First, this study examines the structures of sustainable development policies in Japan, and then looks to the future management of public facilities.

A. Concept of Sustainable Development

Komeily (2017)[2] states that the contentious topic of sustainable development culminated with the publication of the Brundtland Report: Our Common Future (1987). The report defines sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Three decades later, this report has been widely embraced by the public and private sectors, and the interpretations of sustainable development have evolved. There is broad consensus that sustainable development must encompass social, environmental, and economic dimensions, and policies have been implemented that promote this interaction. These three pillars support the current concept of sustainable development.

B. Japan's Unique Circumstances

When examining Japanese sustainable city policies based on the current basic concept of sustainable development, three circumstances unique to Japan must be considered; municipal consolidation, population decline, and the service life of public facilities.

1. Municipal Mergers

The national government initiated the consolidation of municipalities, or local governments[3].

Table 1 shows the variation in the numbers of municipalities over time. The number of prefectures has remained at 47 since 1888. However, municipalities decreased from 71,314 in 1888 to 1,718 in 2014[4]. This large decrease is attributable to the municipal mergers that occurred particularly during three large merger movements.

The first of these merger movements were the great Meiji mergers of 1888–1889, when the number of municipalities declined to about one fifth of the original size, from 71,314 to 15,859. Between 1953 and 1961, the great Shōwa mergers were conducted, resulting in a further decrease of about two thirds, from 9,868 to 3,472. Finally, the great Heisei mergers were implemented between 1999 and 2010, which decreased the number of municipalities by about one half, from 3,229 to 1,771.

Table 1.

Changes in the Number of Municipalities

	City	Town	Village	Total	Events
1888	--	--	--	71,314	
					Big Amalgamation of Meiji Standard minimum size 300-500 households ・To properly execute such functions as elementary school, taxation, family register, etc.
1889	39	15,820		15,859	Municipal Government Act (1889.4)
1945. 10	205	1,797	8,518	10,520	
1947. 8	210	1,784	8,511	10,505	Local Autonomy Law (1947. 5)
1953. 10	286	1,966	7,616	9,868	Towns and Villages Amalgamation Promotion Law (1953. 10 Expired in 1956. 9)
					Big Amalgamation of Showa Standard minimum size 8,000 in population ・To effectively manage at least one junior high school.
1956. 4	495	1,870	2,303	4,668	New Municipality Construction Law (1956. 6 Expired in 1961. 6)
1956. 9	498	1,903	1,574	3,975	
1961. 6	556	1,935	981	3,472	
1965. 4	560	2,005	827	3,392	Law concerning Special Measures for Municipal Amalgamations (1965. 3 Effective for 10 years)
1995. 4	663	1,994	577	3,234	3rd Extension of the above Law (1995. 3 Expired in 2005. 3)
1999.4	671	1,990	568	3,229	Big Amalgamation of Heisei
2002. 4	675	1,981	562	3,218	
2005. 3	732	1,423	366	2,521	
2005. 4	739	1,317	339	2,395	Law concerning Special Measures, etc. for Municipal Amalgamations (2005. 4 Will expire in 2010. 3) → reduction of special financial measures (LAT, special loans)
2006. 4	779	844	197	1,820	
2007. 4	782	827	195	1,804	
2008. 4	783	812	193	1,788	
2009.4	783	802	192	1,777	
2010.2	783	799	189	1,771	
2014.4	790	745	183	1,718	

Source: Created by the author.

[2] Komeily. *op. cit*. pp.504.

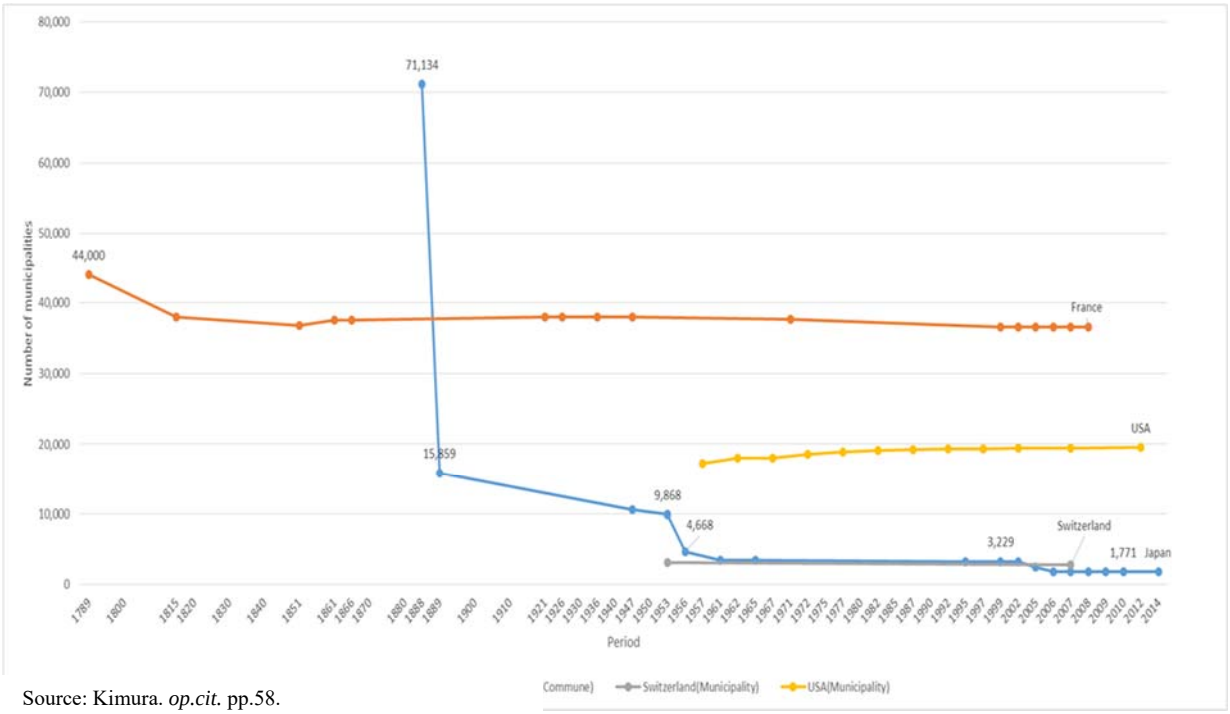
[3] Japan has had three great consolidation movements: the Meiji, Shōwa, and Heisei consolidations. They were not mandated by law, but it is probable that the Meiji consolidations came very close to being mandatory and the implementation of the Shōwa consolidations was strongly pressured by the national government. Yokomichi K. *The Development of Municipal Mergers in Japan*: The National Graduate Institute for Policy Studies; 2007. pp.3-4.

[4] The number of municipalities is 1,724 in June 2019.

The great Heisei mergers, in particular, were implemented within a unique context. Among other things, the mergers were a necessary response to the ongoing process of decentralization[5] and the financial deterioration of municipalities. These conditions strengthened the influence of consolidated municipalities over administrative management, reinforced the municipalities' financial foundations, and resulted in more efficient municipal public services.

Consequently, the number of Japanese municipalities has decreased by about one fortieth in 120 years, as opposed to the stable trend in numbers of municipalities of France and the US. See Figure 2.

Figure 2. Variations in Numbers of Municipalities



Source: Kimura. *op.cit.* pp.58.

Municipal mergers in Japan have had great regional impact through the economy of scale, the establishment of new regional identities, etc. But they also have created new problems, one of which is the overlap of public facilities in the new consolidated districts. For example, if two cities consolidate, each with a library, the new city has two libraries. The overlapping of public facilities became a contentious issue between municipalities from 2010, and urgent action to mitigate this has been required.

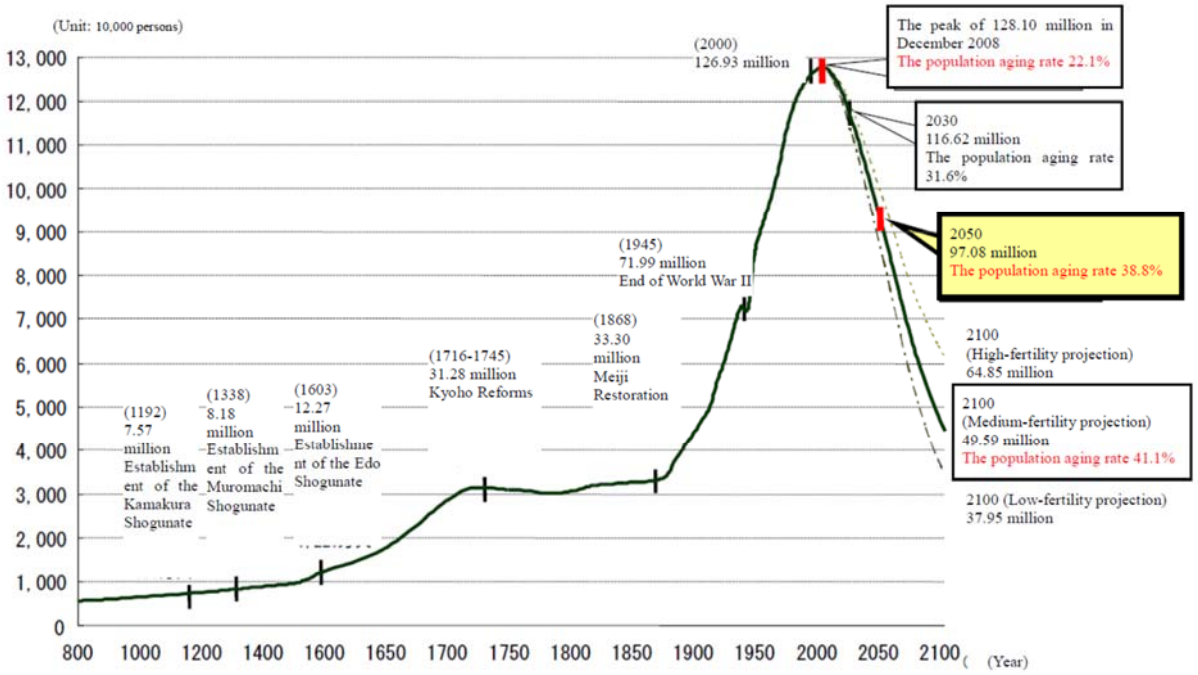
2. Population Decline

Japan's population grew steadily through the 1940's post-war baby boom and the 1970's baby boom. However, since its peak at 128.08 million in 2008, it has been experiencing a sharp decline. According to *Population Projections for Japan* by the National Institute of Population and Social Security Research (the IPSS), the medium fertility projection variant, assuming the total fertility rate (TFR) is

[5] With the enactment of the Uniform Decentralization Law in April 2000, municipalities as delegated functional systems that reinforced centralization were abolished. Municipalities were expected to conduct all of their administrative business independently under the principle of autonomous decision making. The reform was controversial and it was argued that municipal consolidation, and the related increased competencies, were requisite for the transference of numerous administrative duties. In that context, the great Heisei consolidations were powerfully advanced. Kimura S. *Regional Administration in Japan Departure from Uniformity*: Routledge; 2017. pp.62-63.

approximately 1.35, indicates that the Japanese population will fall below 100 million by 2050 and decline further, dipping to under 50 million by 2100. See Figure 3.

Figure 3. Population Projections for Japan



Source: The Interim Summary of the "Long-Term Vision for National Land" (February 21, 2011, Long-Term Forecast Study Group, Policy Subcommittee, National Land Council).

The national government has begun taking measures to counteract this shrinking society, thus determining the following long-term goals.

a. The creation of three hundred thousand jobs for the younger generation by 2020.
b. Attaining equilibrium between the influx and outflux of people from the National Capital Region.
c. The development of conditions for younger generations that encourage marriage.
d. The advancement of intercommunal cooperation.

Under the policies that drive this vision, municipalities set various comprehensive strategies for regional revitalization, which include policies for city sustainability. These policies have been necessary since the sharp decline in the Japanese population since 2010, and the countermeasures are implemented as a part of regional rejuvenation.

3. Service Life of Public Facilities

The management of public facilities has recently become crucial. The latter half of the 1950s was the start of the Japanese economy's high-growth period, and so-called "bedroom communities" were created in many parts of Japan. Infrastructure for public facilities was constructed and developed, including bridges, tunnels, schools, waterworks facilities, community centers, waste processing facilities, public housing, etc.

At present, in the 2010s, more than 50 years have passed since the completion of most public facilities. Nationwide measures are now required to rebuild aging infrastructure. In order to realize the most efficient strategy to ease the strain on the next generation while still maintaining facility safety, municipalities across the nation have been drawing up a "Comprehensive Management Plan of Public Facilities" and have been conducting thorough facility management. The management of aging facilities is the third most important point on the agenda for municipal sustainable development.

Ⅲ. Structure of Japanese Sustainable Development Policies

A. Outline

In the situations where sustainable city policies have been planned and executed, they are composed of four measures: (1) public facility management, (2) location optimization, (3) urban traffic networks, and (4) information and communications technology (ICT)[6].

In order to ascertain the relation between subnational governance and sustainable development, this study focuses on *(1) Public Facility Management* as municipalities are responsible for these policy undertakings.

B. Facility Management and Fiscal Challenges

The management of public facilities is key to effective public administration. Looking to Japan, the question is what the keys are for future facility management. This section examines this by outlining the fiscal challenges and measures related to public facility management in light of the future social landscape.

1. Public Facility Management and Public Facility Reform

Public Facility Management, including the efficient use of public assets, is now regarded as key to the reform of those facilities, which local authorities pursue as part of their fiscal management activities. See Table 2.

Table 2. Structure of Reform of Public Facility Management

	Types			
Pubic Facilities Reform	Effective Construction and Operation		Construction	PFI, etc.
			Operation	Designated Administrator, etc.
	Public Facility Management	Basic Policies for Fiscal Management	Appropriate Projection	Population of each age, etc.
			Revenue and Cost Estimation	Approaches for securing funds
				Cost estimation
				Accurate understanding of the *peak* of fiscal demands
			Dissemination of factual information	Cost Information and Stock Information per Public Facility
				White Paper on Public Facilities, etc.
			Enhancement of the Added-value of Public Facilities	Securing revenues from advertising fees
				Naming rights sponsorship, etc.
		Approaches for reducing financial burden	Prolonging the life of public facilities	
			Quantitative reduction of public facilities in total	Complex
				Consolidation
				Abolishment
				Diversion
				Efficient operation and management

Source: Created by author.

[6] The policies of (B), (C) and (D) above are generally referred to as Smart City Policies.

It is important for municipalities to gain an overall perspective of public assets while moving towards comprehensive facility management, with the objective of passing on the use of these public assets to future generations. Public facility management is composed of two groups; the first constitutes the basic policies for the fiscal management of public facilities, and the second constitutes approaches to reduce their financial burden.

Ⅳ. Basic Policies for Fiscal Management of Public Facilities

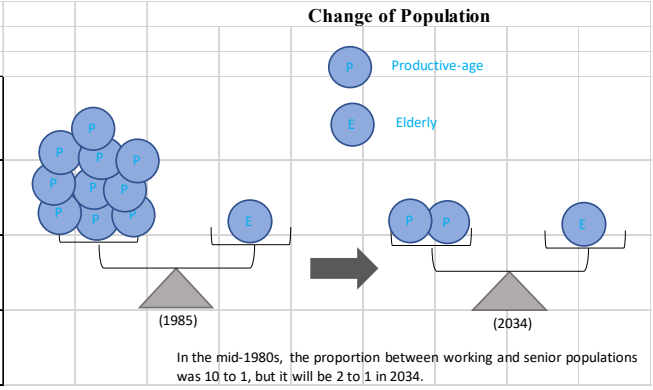
The basic policies for the fiscal management of public facilities are composed of accurate population projections, revenue/cost estimations for facility management, the dissemination of factual information to municipal residents, and the marketing of the facilities' added value.

A. Appropriate Projection of Population for Each Age Group

In Hadano City, Kanagawa prefecture, the local population is predicted to total approximately 160,000 in 2034 (10,000 down from 2013) and the working age population will be 96,000 (20,000 down from 2013), as a result of an aging and declining population. See Figure 4.

Figure 4. Hadano City Population Projection

Population / Year	Gross population (people)	Productive-age population (people)	Elderly population (people)	Floor areas of "Hakomono" (㎡)
S60 (1985)	142,000	96,000	9,000	210,000
H21 (2009)	170,000	116,000	33,000	310,000
H46 (2034)	160,000	96,000	49,000	?



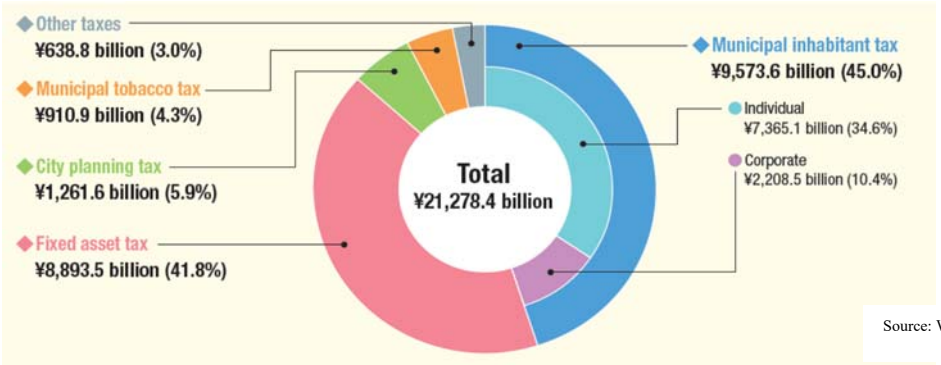
Source: Created by author based on Hadano City's public facility white papers.

B. Revenue/Cost Estimation

1. Approaches for Securing Funds

Municipal inhabitant tax, levied on each individual and corporate income, accounted for 45.0% of the total municipal tax revenue in the fiscal year 2016, second to property tax. See Figure 5.

Figure 5. Municipal Tax (FY 2016 settlement)



Source: White Paper of Local Finance: MIC; 2018

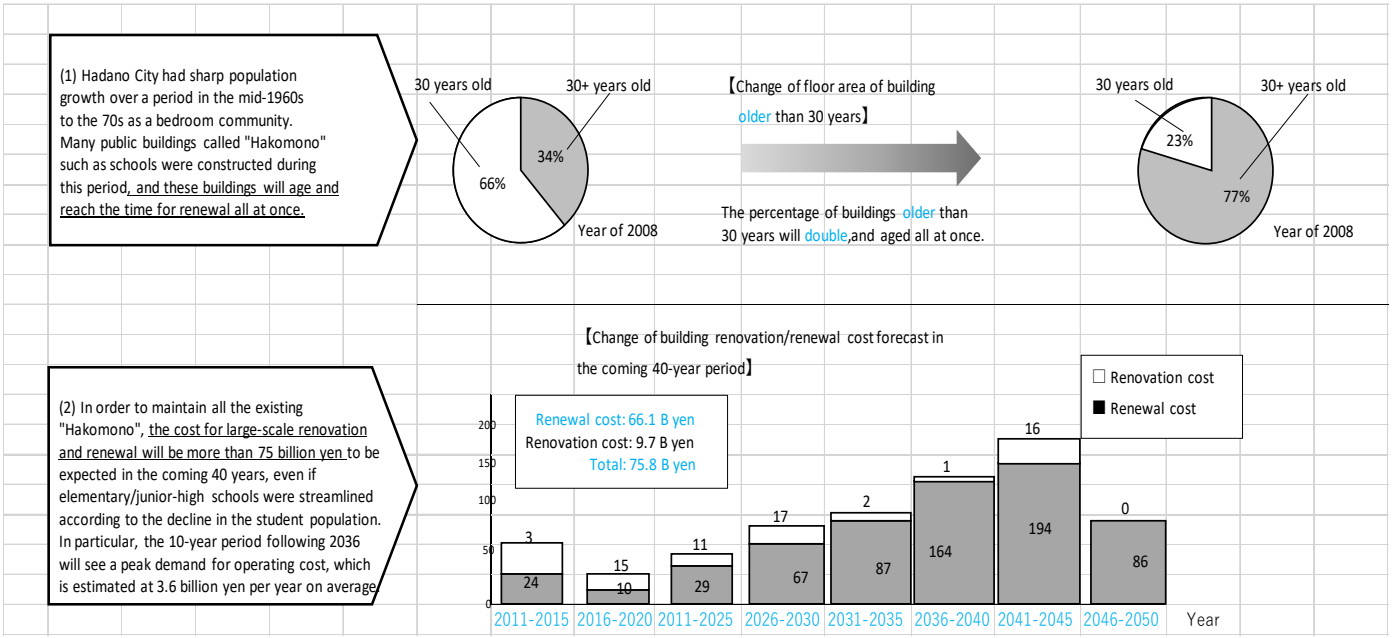
This indicates that local tax revenue significantly relies on the number of taxpayers residing in the municipality. A comparison between Hadano City's working age population in 1985 and its projected population in 2034 reveals that the decrease in the working age population will be greater than the decline of the total population, pointing to the possible decline of future tax revenues.

This shows the importance of accurate tax revenue projection and well-balanced public facilities in the management of the total city.

2. Cost Estimation

The Hadano City municipality, after comparing the states of its public facilities between 2008 and 2018, estimates a cost of 75 billion yen for large-scale renovations over the next 40 years for the maintenance of all public facilities. See Figure 6.

Figure 6. Cost Estimation for Hadano City



Source: "Fujisawa City Public Facilities Management White Papers in Fujisawa City," Fujisawa City municipalities

The projection of the future working population in the future is closely associated with future tax revenues of a local government. Therefore, in this demographic forecast, the shift of the productive-age population must be paid attention to, together with those of the elderly and youth.

3. Accurate Understanding of the "Peak" of Fiscal Demands

Municipalities must accurately calculate their expenditure based on their policies for updating and renovating public facilities, and predict exactly what will be required most at the "peaks." Each municipality has experienced a different period of rapid public facility construction, which is considered its first "peak." Some pursued mass construction in the 1970s and 1980s, when Japan saw a population boost, while others may have experienced a boost in construction in the early 1990s. The municipal mergers around 2008 also stirred up a construction rush. Those buildings that were constructed intensively during these specific periods will come to need updating in their entirety, and this will be the municipality's second "peak." The most difficult task at that time will be to secure the funds for conducting the work. Municipalities must have taken measures in advance to appropriately handle the fiscal needs, which will grow sharply during those periods of facility updates.

In principle, the following measures are required: (1) securing a reserve fund through cost-cutting in the local administration; (2) postponing the "peak" by extending the service life of facilities; (3) adjusting the timing for renovation work through the extension of facility service life to mitigate the spending demand; (4) the quantitative reduction of existing facilities; and (5) general cost-cutting measures (the reduction of expenses). Whichever means are taken, municipalities need to carefully plan their fiscal management.

C. Dissemination of Information

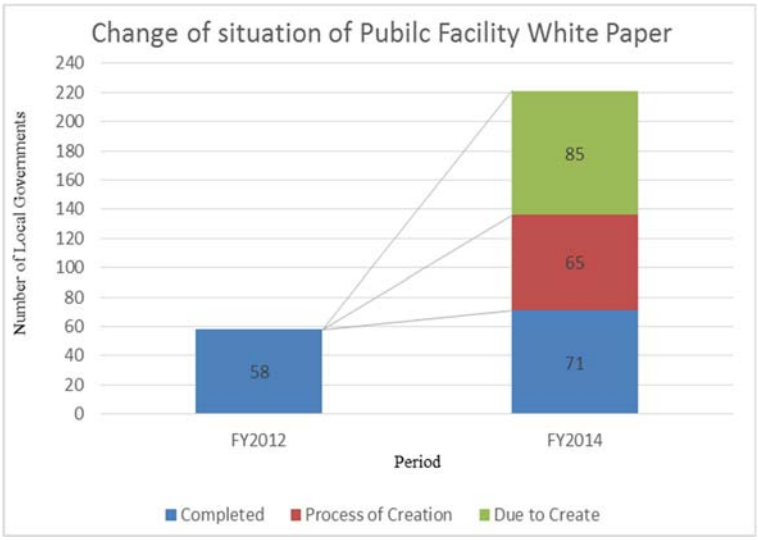
Currently, the primary method to disseminate information is through the public facility white papers, or "the papers". The papers report the consolidation, abolishment, spatial arrangement planning, and cost estimations for the repair, renewal and maintenance of a particular municipality's public facilities. From

2010, advanced municipalities began publishing these reports to kept residents up to date with the status of their public facilities.

1. Trend of the Papers

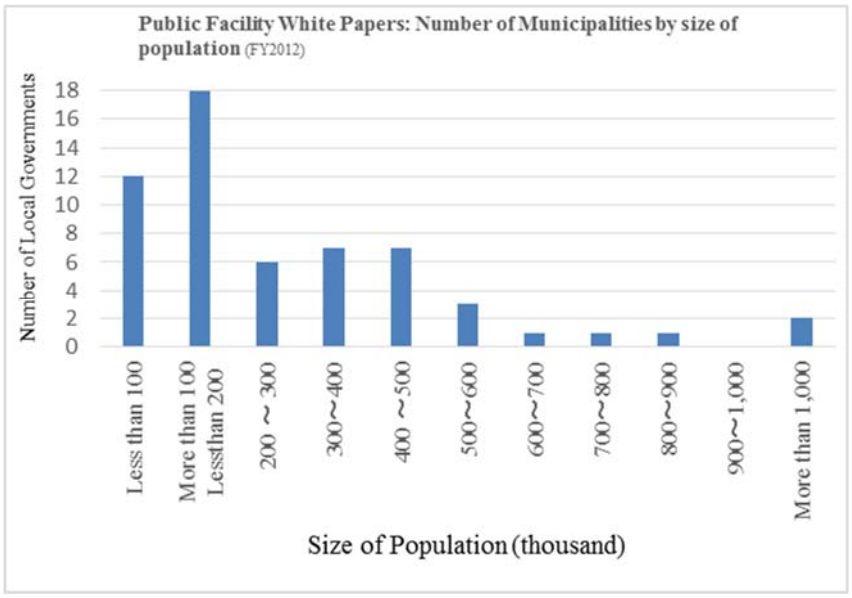
The number of municipalities that published their papers increased from fiscal years 2012 to 2014, and the numbers of municipalities in the process of creation, or due to create their papers, also remarkably increased. See Figure 7.

Figure 7.



The number of municipalities that have published their papers, by the scale of population, is shown in Figure 8. This shows that among municipalities with populations of less than five hundred thousand, a relatively large number of municipalities have established their white papers.

Figure 8.



The following three points should be kept in consideration;

(i) The publication of the papers is not mandatory; the national government did not suggest nor recommend producing them. However, the papers became common among municipalities from the bottom-upward. This phenomenon shows urgency of the demand for establishing proper public facility management policies among the municipalities.

(ii) The publication of the papers has become widespread among municipalities, which is evidence that many municipalities acknowledge the necessity of disseminating information to residents about the management of their public facilities.

(iii) Smaller municipalities work aggressively on their papers; evidence that the compact municipalities are acutely realizing the prerequisite of winning the support of their residents to execute public facility management policies.

2. Functions of the Papers

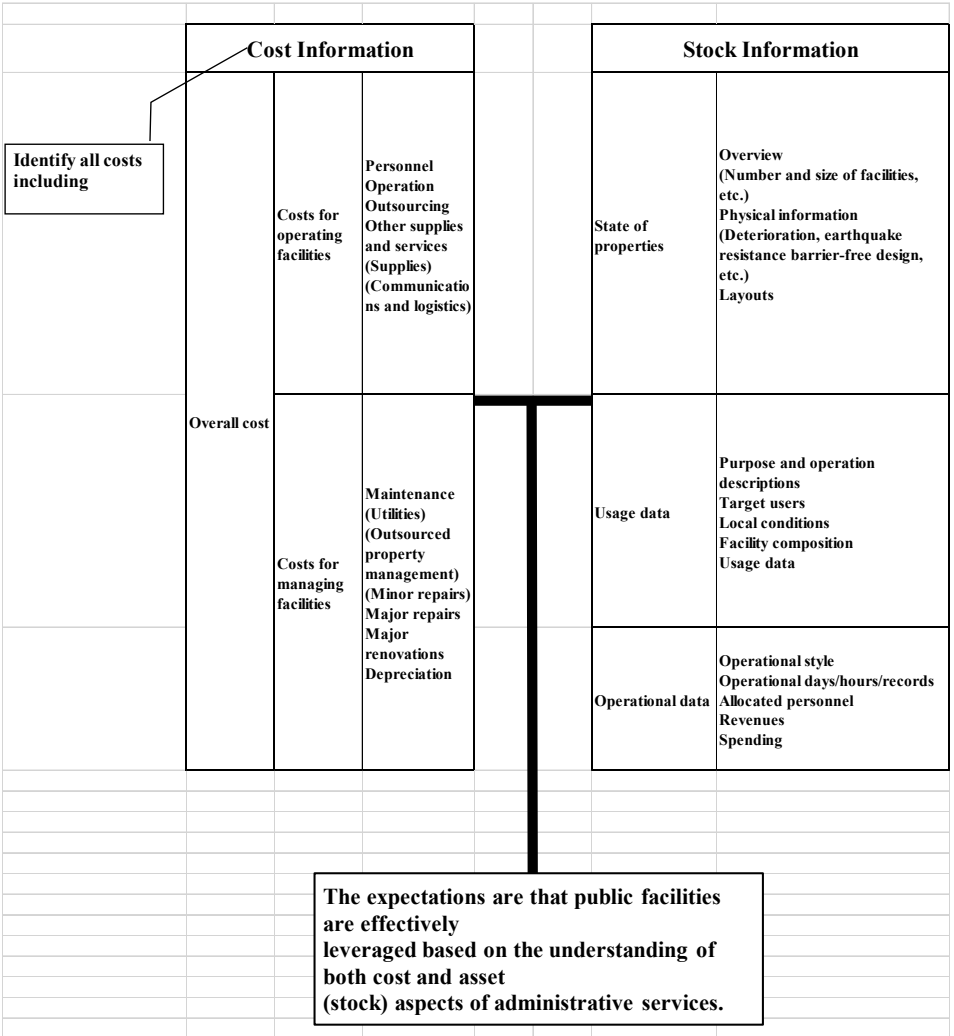
The papers generally have several objectives in disseminating information, two of which are worthy of attention; the Cost/Stock Information and the Message to the Residents.

a. The Cost/Stock Information: Fujisawa City

In order to facilitate quantitative measures for the reduction/life-extension of public facilities, residents must be informed, with empirical data, on the actual costs and future prospects of these facilities, rather than be informed through an abstract or theoretical explanation. A good example of this is the publication of a municipality's public facility white papers, which will list the operational status and cost information of each facility to show their comparative cost-performance. Municipalities must earnestly convey the seriousness of facility updates and maintenance to its citizens; the taxpayers.

For example, the Fujisawa City municipality, Kanagawa Prefecture, investigates and analyzes each of its public facilities in terms of both their cost and stock information. See Figure 9.

Figure 9. Fujisawa City: Cost/Stock Information per Public Facility



Source; Created by author based on Public Facility White Paper of the Fujisawa City

The cost information is calculated from the municipality's administrative account statements and other relevant information. It conveys the total expenditure for the overall management of a public building, including the provision of administrative services, and the related expenses of staff fees and other operational costs. The stock information relates to the physical state of buildings and land, such as the status of their use and operation, and their aging status. Understanding the state of public facilities and the accompanying administrative services required, from the perspectives of both cost and stock information, casts light on the problems with the current administrative functions.

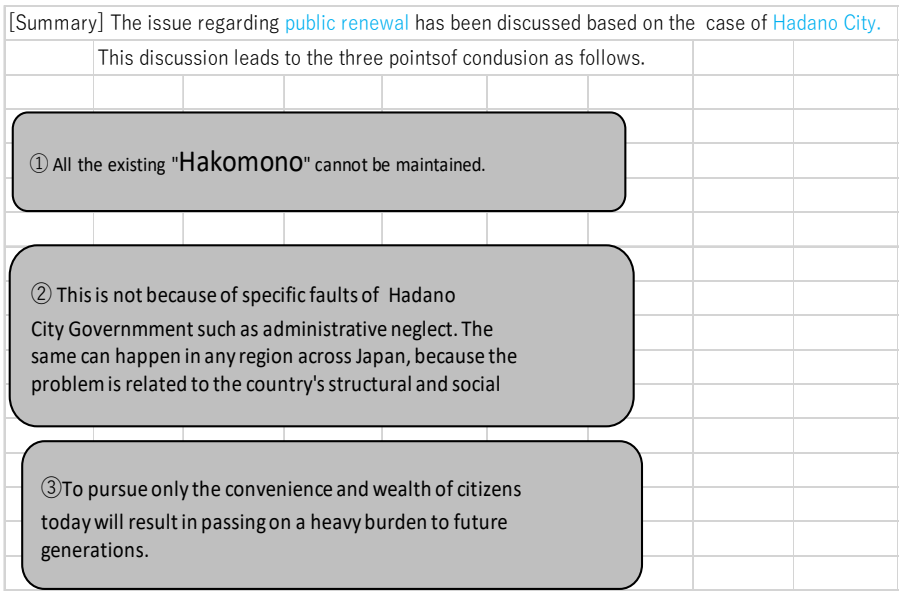
The Fujisawa City public facilities white paper states, "Based on a cross-sectional identification and analysis of the cost of providing administrative services in public facilities, accounting for 60% of total spend, and the stock conditions of land and properties and the accompanying services required, it will be a fundamental necessity to employ new perspectives on facility management for future administration," and, "It will also be important to elucidate and analyze the current conditions of the facilities, and prepare and disclose the information to citizens in the form of public facility white papers, to ensure the participation of the local population in considering measures for improvement."

b. Message to the Residents: Hadano City

After comparing the 2008 state of its public facilities to their state in 2018, the Hadano City municipality estimates a cost of 75 billion yen for large-scale renovations, and the subsequent maintenance, of all of its public facilities. In addition, aligned to the trend of an aging and declining population, the total local population is predicted to total approximately 160,000 in 2034 (10,000 down from 2013). The working age population will be 96,000 (20,000 down from 2013).

By contrasting the huge expense estimated for large-scale facility renovations with the decline in working-age taxpayers, the Hadano City municipality concludes in its public facilities white paper that, "Soon, it will be impossible to maintain all of this city's existing public buildings (*hakomono*)." This constitutes a clear communication for the local citizens and others. This example is evidence of the importance of disseminating information and stance that are fact-based and unambiguous. See Figure 10.

Figure 10. The Hadano City Public Facility White Papers



Source; Created by author based on Public Facility White Paper of the Hadano City

This is one example of a policy for the dissemination of information regarding public facility management. The Hadano municipality sends information to its residents in a straightforward manner, and the feedback is positive that this enables a new level of understanding for the residents of Hodano.

The number of municipalities drafting white papers is expected to grow, and municipalities are responsible to their citizens for administrative policies that cater for a declining society.

D**. Adding Value to Public Facilities**

Adding value to existing public facilities is one mechanism for their fiscal management, however, the primary means are through the revenue generated from advertising fees, and the sponsorship fees for naming rights.

1. Securing Revenues from Advertising Fees

Facility management involves not only large-scale, macro level measures, such as the quantitative reduction of facilities in total; it involves micro level measures that leverage the additional value offered by public facilities. A typical example of a micro level initiative is the procurement of advertising fees from public properties. A recent such approach includes placing advertisements on large projection screens in government office buildings; placing floor mats in the entrance halls, and benches in the reception areas. Another approach is to let the space of public properties, such as for beverage vending machines. Nagareyama City also takes a micro approach to facility management by tendering proposals for the commercial packaging of facilities' assets. The proposal that best maximizes the available space of the public facilities is planned and executed.

2. **Naming Rights Sponsorship**

It is now common to leverage the added value of public facilities by the tendering of naming rights. Naming rights are the rights to name specific facilities; a contractual claim that includes incidental rights. A municipality can grant the right to a corporate entity ("partner") to name a facility. The partner pays for the privilege, based on a contract. The conventional contractual practice is to regard the name given by the partner as a trade name, while retaining the facility's official/legal name. Naming rights sponsorship introduced by municipalities has been a common revenue source since 2003. See Table 3.

Table 3. Naming Rights (Primary Cases)

Name	Proprietor	Initial Period				Recent Years				Naming rights partner (industry)
		Starting year	Cotract Value (B yen) Nick name	Cotract term (Year)	Per-anuum contract value (Byen/year)	Starting year	Cotract Value (Byen) Nick Name	Cotract term	Per-anuum contract Value (Byen/year)	
Tokyo Stadium	Tokyo Metropolitan Government	2003	1.2 Ajinomoto Stadium	5	0.24	2008	1.2 Ajinomoto Stadium	6	0.22	Ajinomoto (food)
Kobe sports park	City of Kobe	2003	0.2 Green Stadium Kobe	2	0.1	2011	0.14Byen Hotto Motto Field Kobe	4	0.035	Hotto Motto (food)
International Stadium Yokohama	City of Yokohama	2004	2.35 Nissan Stadium	5	0.47	2013	0.45Byen Nissan Stadium	3	0.15	Nissan Motor (transportation equipment)
Miyagi Baseball Stadium	Miyagi Prefecture	2005	0.6 Fullcast Stadium Miyagi	3	0.2	2008	0.75Byen Kleenex Stadium Miyagi	3	0.25	Nippon Paper Group (paper making)
Shibuya Public Hall	Special Ward of Shibuya	2006	0.42 SHIBUYA C.C.Lemon Hall	5	0.084	-	-	-	-	Initial partner : Suntory(beverage)

Source: Prepared by the author based on the information taken from related local government websites.

There are increases (the Miyagi Baseball Stadium) and decreases (the Tokyo Stadium) in the values between the initial contracts and the current contracts for the above public facilities. The balance of supply and demand is expected to change in the future depending on the benefits available to partners; such as the nature of the facility, its ability to attract customers, the frequency of mass-media exposure, and the opportunities for localized brand communication.

Apart from the approach whereby municipalities specify the facilities that can be sponsored, there have recently been various other approaches to contractual naming rights, one of which allows for the partner to choose a facility to put their chosen name on (facility sponsorship proposal), as is the case in Yokohama City, Kanagawa Prefecture. See Table 4.

Table 4. Naming Rights Sponsorship: The Achievements in Yokohama City from the Proposal Model.

Matano Park and Yokohama University of Pharmacy Stadium (*The first case in Yokohama.)	**Counterpart:Tsuzuki Integrated Educational Institution/Yokohama University of Phamacy Contract term Contract term; 10 years, Aug.1,2009-Jul. 31, 2019 Contravt value (annual):10M yen**
Bay Quarter Walk	**Counterpart: Mitsubishi Logistics Corporation Contract term; 5 years, Dec. 1, 2009- Nov. 30, 2014 Contract value (annual): 8 M yen**
Do Amenity-Shin-Yokohama Station square restroom-Kawaya-Do of Toilet Diagnosis Expert	**Counterpart: Amenity Contract term; 3 years, Oct. 20, 2011 -Oct. 19, 2014 Consideration: provision of public toilets maintenance services to improve user comfort and proper maintenance (equivalent to 5.6 M yen for 3 years)**
Cup Noodle Museum Par	**Counterpart: Nissin Foods Holdings Co, Ltd Contract term; 10 years,Aug, 1, 2012 -Jul. 31, 2022 Contract value (annual): 5 M yen**

Source: "List of Naming Rights Sponsored Facilities." Yokohama City Government web page

The public facilities chosen by partners for naming include a baseball pitch in a park, a pedestrian deck, public toilets and a lawn, thus illustrating that the potential for valuable sponsorship may be found in the facilities close to partner locations that are likely to be overlooked by municipalities. This might constitute a process for municipalities to explore the leveragability of their local assets, making it an important potential revenue stream for the future.

Ⅴ. Approaches for Reducing the Financial Burden of Public Facilities

This section examines the approaches for reducing the financial burden of public facilities. Municipalities have started compiling their approaches in the form of public facility comprehensive management plans (“comprehensive plans”), with the support of the national government.

A. Outline of Management Styles: Contents of the Comprehensive Plans

In 2014, Japan’s Ministry of Internal Affairs and Communications published guidelines for local governments’ comprehensive plans. The ratio between the numbers of local governments with established comprehensive plans is shown in Table 5., with the prefectures at 100%, the designated cities at 100%, and the municipalities at 99.6%.

Table 5. The Status of the Comprehensive Plans (FY2019)

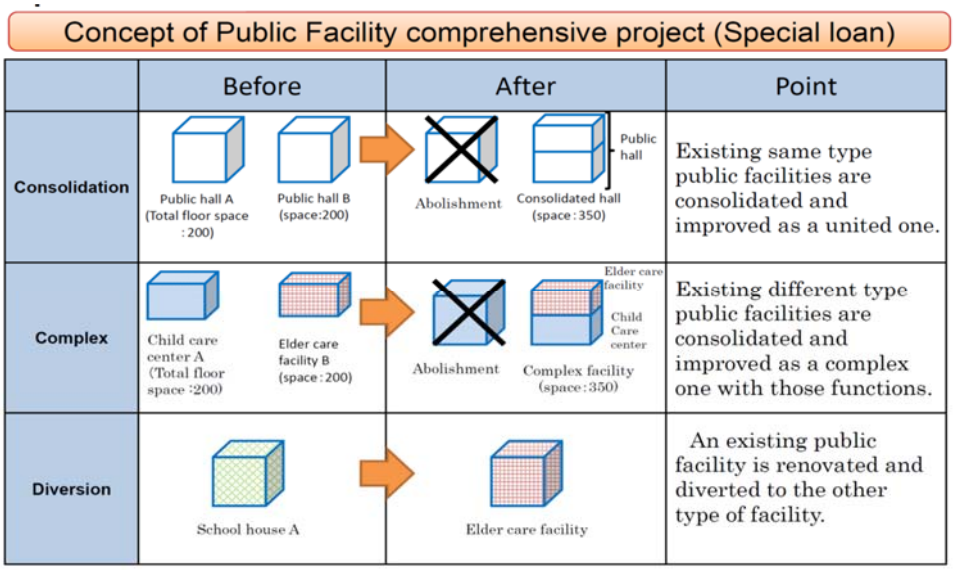
Classification			Prefecture		Designated City		Municipality		Total	
			Bodies	Share	Bodies	Share	Bodies	Share	Bodies	Share
Response bodies			47	100.0%	20	100.0%	1,721	100.0%	1,788	100.0%
Plan to formulate			47	100.0%	20	100.0%	1,721	100.0%	1,788	100.0%
Breakdown	Established		47	100.0%	20	100.0%	1,714	99.6%	1,781	99.6%
	Unestablished		0	0.0%	0	0.0%	7	0.4%	7	0.4%
	Planned Time	FY2018	0	0.0%	0	0.0%	4	0.2%	4	0.2%
		FY2019 and after	0	0.0%	0	0.0%	3	0.2%	3	0.2%
No Plan			0	0.0%	0	0.0%	0	0.0%	0	0.0%

Source: Created by author, based on materials by the MIC.

Local governments can implement plans swiftly but, because they are immersed in the unique circumstances of Japan's population decline, municipal consolidation, and aging public facilities, their need to reduce the financial burden of their public facilities is urgent. See Figure 1.

Local governments plan projects to use the most effective methods for the renovation and maintenance of their public facilities, and accordingly adopt the management style applicable for each public facility within their comprehensive plans. The main styles are consolidation management, complex management and diversion management. See Figure 11. Additionally, the abolishment/extension of public facilities' service lives are primary management styles.

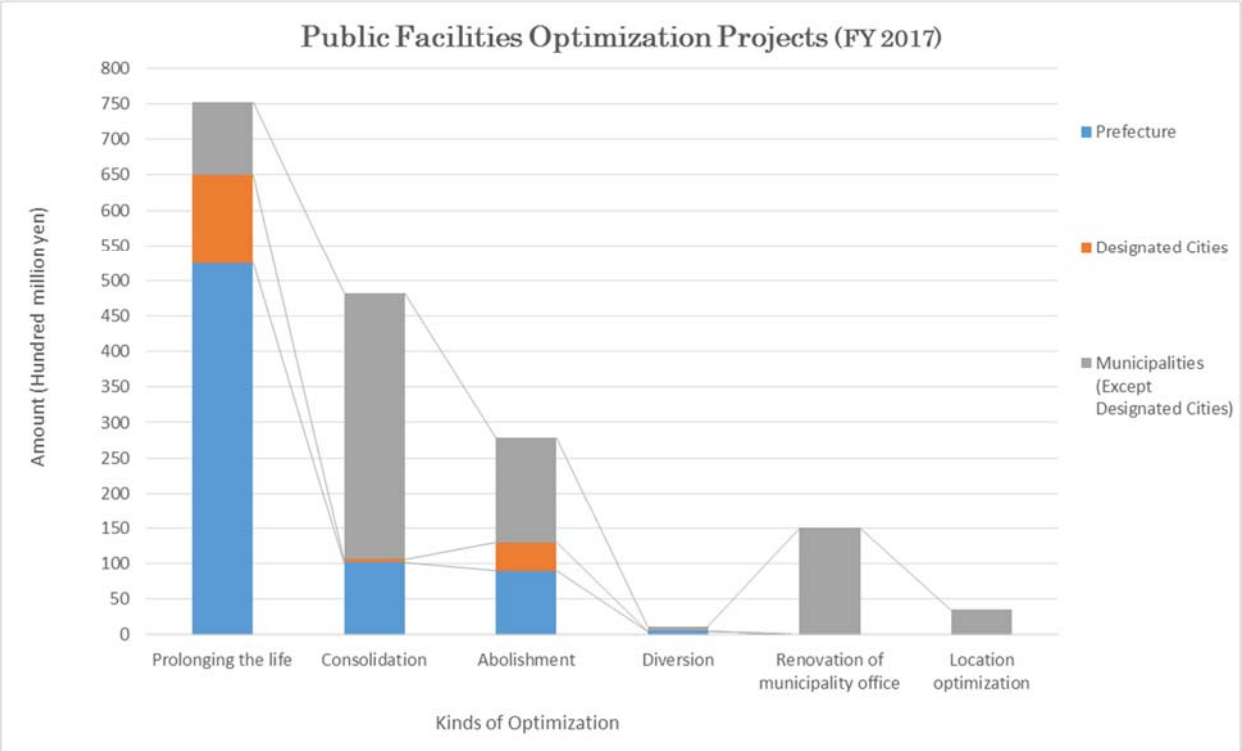
Figure 11.



Source: Material by MIC

The management style projects which are included in the comprehensive plans are financially supported by national government. See Figure 12.

Figure 12.



Source; Created by author.

The following points are noteworthy.

(ⅰ) Prolonging the life of public facilities is in the most required coping style, particularly for prefectures. Prefectural public facilities are generally large, and this coping style is thought to be the most effective and practical.

(ⅱ) Consolidation is the second most required coping style, particularly for municipalities. Many municipalities have experienced the mergers and this coping style addresses the overlap of public facilities.

B. Management Style Details

1. Prolonging the Service Life of Public Facilities

a. Outline

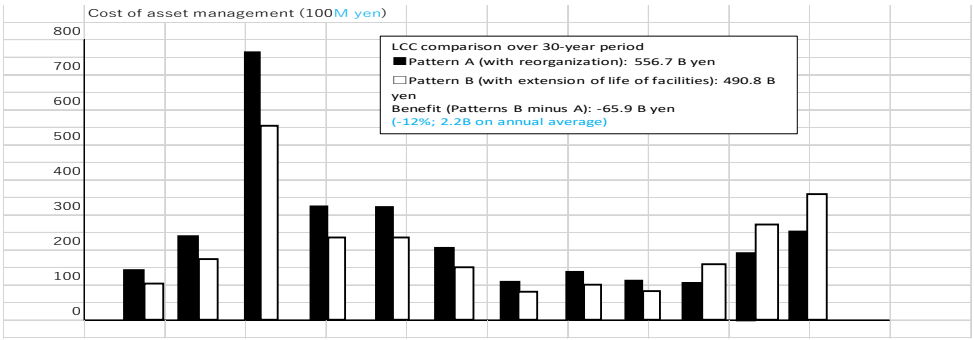
As previously stated, some municipalities pursued mass construction in the 1970s and 1980s, when the country experienced a population boom, while others may have experienced their first "peak" during Japan's period of economic growth in the early 1990s. The facilities built during these specific periods will require complete renovation, forming their second "peak." The greatest challenge is then to secure funding to conduct the construction. In order to appropriately handle their fiscal requirements, municipalities must take measures in advance.

On average, architectural structures require rebuilding every 30 to 40 years, but the actual lifespan of the structural frames is longer. However, despite structural stability, public facilities were conventionally rebuilt to accommodate changing social needs and/or material deterioration. Maintaining facilities for a longer period contributes to a cost reduction as long as the structural frame is stable. Thus, prolonging the service life of facilities through refurbishment, to ensure continually safe and comfortable use, is an effective coping style, which also costs less than total reconstruction. There are instances of combining this method with the total quantitative reduction of public facilities, etc.

b. Example: Aomori Prefecture

Aomori Prefecture estimates the timing for renovating facilities (e.g. school houses) and the reduction of facility service-life costs, by combining the reorganization of public facilities, their life extension, and other cost-cutting measures. See Figure 13.

Figure 13. Aomori Prefecture: Comparison of LCC Estimates under the Life-extension Measures



2. Quantitative Reduction of Public Facilities

The reorganization of existing facilities involves having clear criteria to determine which facilities should be kept, which should be consolidated, and which should be terminated. Some municipalities conduct awareness surveys to gather public opinion; others utilize an objective score-based evaluation scheme.

For example, the Hadano City municipality sets targets for the rearrangement of public facilities in its policy; "Over the next 40 years, primary/junior-high schools and other facilities will be reduced by 26% and 43% respectively. This is a total reduction of 31%, which is equivalent to 72,400m^2 of floor space. This will achieve a saving of 34.7 billion yen in facility renewal and operational cost, and contribute towards solving the funding shortage."

Where municipal mergers have resulted in a surplus of public facilities, there may be redundant administrative services. These municipalities must conduct a post-merger investigation to plan the optimal distribution of facilities.

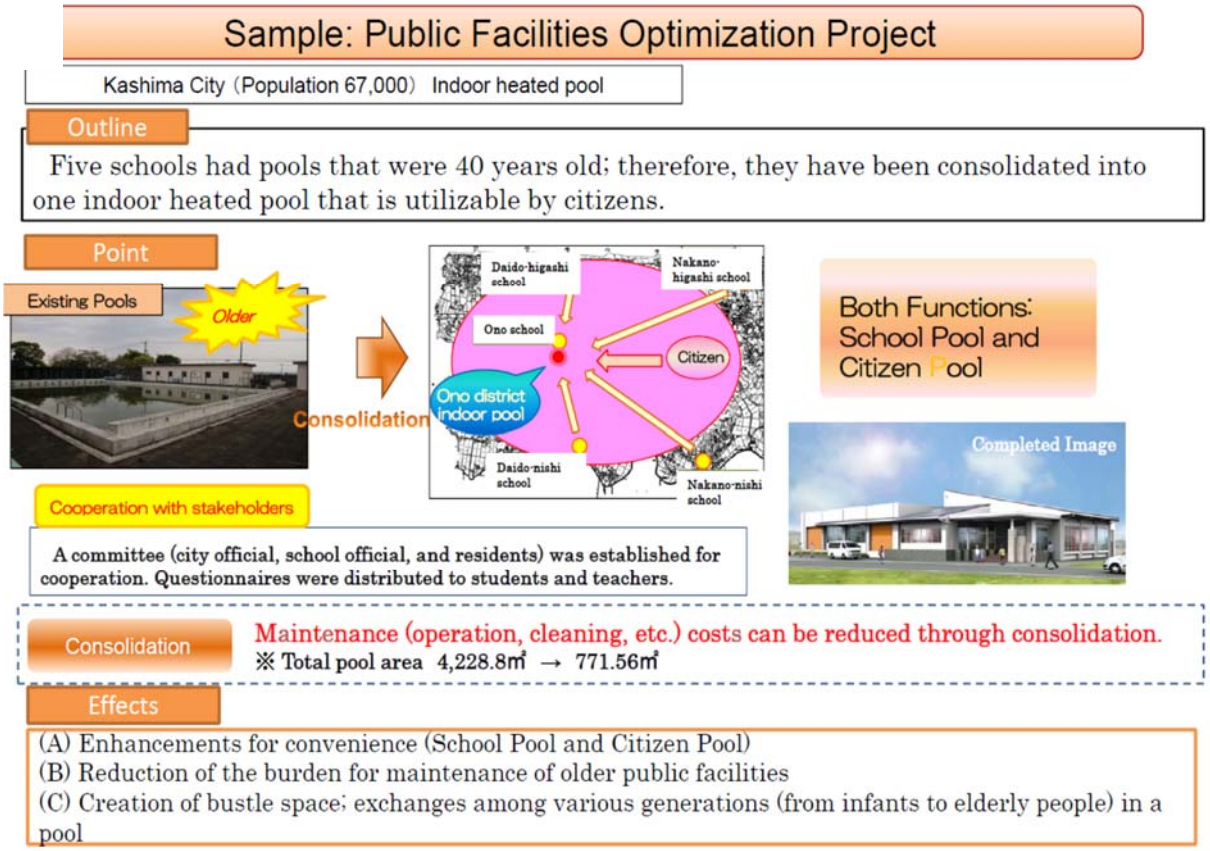
The public facilities reorganization plan in Misato Town, Akita Prefecture, sorts 147 facilities into the categories of "merger," "partial merger," "management review," or "status unchanged". Establishing clear targets drives internal consensus regarding the plans for public facilities, ensures accountability to citizens, and assists with fiscal management plans.

Consolidation, complex, and/or diversion have been the primary public facility coping styles for municipalities.

a. Consolidation Management Style

Consolidation is a management style whereby the same types of existing facilities are pieced together to form a single, improved facility. Public hall A, with a floor area of 200m^2, and public hall B, with a floor area of 200m^2, merge into a new public hall, with a floor area of 350m^2; two facilities consolidated and, on this occasion, the total floor area is reduced according to demand. For example, Kashima City in Ibaraki Prefecture had five schools with pools that were 40 years old, and consolidated them into one indoor heated pool. Consolidation projects aim to provide an adequate amount of facilities with a higher quality of public service. See Figure 14.

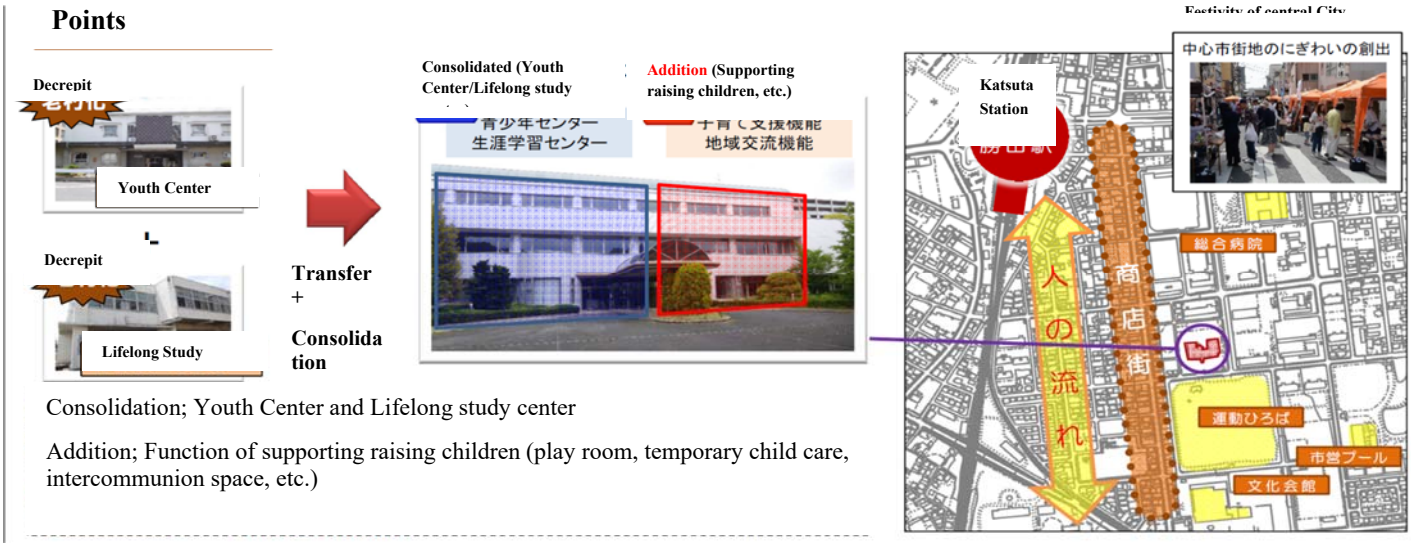
Figure 14.



b. Complex Management Style

Complex is a management style that consolidates different types of public facilities, evolving them into one unified complex facility with many functions. For example, Gojo City in Nara Prefecture merged a decrepit youth center with an aging study center, and created a communal area with the addition of child care support services; play room, temporary child care space, intercommunion space, and such. Complex management style projects merge two or more facilities and develop new functions for them. See Figure 15.

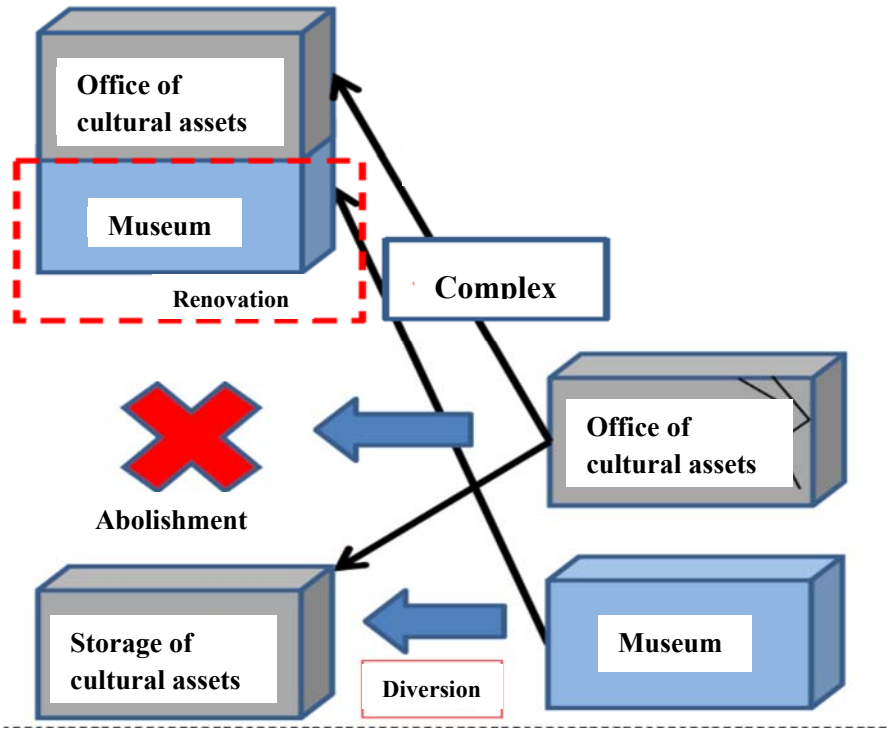
Figure 15. Gojo City



c. Diversion Management Style

Diversion is a management style whereby an existing public facility is renovated and functionally transformed into another type of facility. For example, Tanba City in Hyogo Prefecture had an aging museum. The museum building was diverted to the function of being a cultural asset while the function of museum within the building was transferred to another facility. See Figure 16.

Figure 16. Tanba City



These examples show how Japanese municipalities have been devising combinations of these coping styles.

d. Efficient Operation and Management of Public Facilities

Public facility management usually involves the cooperation of various administrative divisions, but there

are some municipalities that manage public facilities efficiently by outsourcing their maintenance and inspection to a single agent, thereby cutting maintenance costs and gaining some inclusive services (such as a breakage repair service).

For example, Nagareyama City in Chiba Prefecture allowed each public facility, such as a government building or a school, to commission their own separate maintenance work for elevators, electric systems, and air conditioning systems accordingly. However, this system did not provide municipalities with a comprehensive overview of the projects or the costs involved in facility maintenance. Therefore, they switched to inclusive facility management outsourcing[7], centralizing the delegation of the maintenance and inspection work. As a result, they achieved a significant reduction in administrative work relating to facility management, as well as a saving of 11 million yen.

C. Combination of Several Management Styles

There are a variety of methods for facility management, as shown in Table 1. However, facility management is not necessarily limited to one method. For effective management, a combination of methods may be required, such as the extension of service lives for some facilities, together with a total quantitative reduction in the number of facilities. This leads to the control of the overall life-cycle costs of public facilities.

Ⅵ. Conclusion

From Japan's perspective, ascertaining the keys for future public facility management requires that it be considered in the context of local administrative management and community development.

What has been revealed is that public facility management fundamentally affects regional urban policies. As stated in the introduction, Japan has three unique circumstances; municipal consolidation, the population decline, and aging public facilities. This has led the country to find ways to accommodate concentrated urban structures through the strategic management of public facilities. Japan's experience in facility management highlights the following:

A. Stakeholders and the Provision of Information

The first challenge is to involve residents and local businesses, as key stakeholders, in the management of their public facilities. Sachs (2015)[8] suggests that sustainable cities are economically productive, socially (and politically) inclusive, and environmentally sustainable. Urban planning is key to enabling cities for social inclusion; cultivating social stability, trust, and harmony into society[9].

Facilities are not only functional entities for the public; they are also *safe places for citizens to dwell*. In other words, municipal residents are *multiple stakeholders* in public facilities; they are the *users* of facilities, such as water supply and sewage; the *visitors* to facilities, such as parks, libraries, and community centers; the *parents*, whose children go to local schools; and the *donators* of public facilities, such as memorial houses. Each of these citizens has their own opinion on the effectiveness of their public facilities, including its continuing contribution to society, and the urgency of its reform.

Therefore, municipal policy makers should take these multiple relationships between citizens and their facilities into consideration, and seek to gain public support for their policies, or they risk the management of their facilities. The consensus of the public as multiple stakeholders is key to managing public facilities as safe places to dwell; these strategies create public facilities that encourage social inclusion in sustainable cities.

In addition, strategies for adding value to public facilities, such as the marketing of naming rights, encourages the involvement of the local businesses in community upliftment. Public facility management is closely linked to an increase in residential value, and congruity between facility policies and local

[7] The 51 commissions derived from 34 facilities (a total commission of approx. 57 million yen) were integrated into a single commission.
[8] Sachs JD. *The age of sustainable development*: Columbia; 2015. pp.366.
[9] The author sums up *op.cit.*, pp.367.

business activities is imperative for sustainable city development. Consequently both citizens and local businesses are becoming increasingly important stakeholders in sustainable development.

The involvement of the stakeholders with the provision of information is effective in these contexts. In Hadano City, public facility white papers show the significance of a direct message from the local government to its citizens; the local government's effective transmission of information has led to the congruous involvement of all stakeholders.

B. Breaking the Stereotypes

The three circumstance unique to Japan - population decline, municipal consolidation and aging public facilities - are changing perceptions toward urban policies and breaking the stereotypes. These are the following stereotypes that are being broken:

1. "The number of taxpayers sharing the tax burden will not change/decrease."

The principle of sharing a tax burden is that municipalities relieve the burden of tax, in exchange for the development of social capital, in the form of public services. Previously, the concept of sharing a tax burden assumed that the taxpayer bracket would not fluctuate. But, since 2008, Japan has had a rapidly declining society, and the tax-paying, working age population, has decreased by approximately 40%. Therefore, a precondition to the facility of sharing the tax burden has drastically changed. Under circumstances where the cost of social capital is too high despite citizens bearing the tax burden, it has become difficult to understand the individual situations in cities, even if we may understand them from a macro perspective. For example, the increasing elderly population will place the public infrastructure for senior citizens as high priorities for maintenance, while a declining population reduces the need for schools and other facilities aimed at young people.

Therefore, some municipalities are drafting public facility white papers as a way of gaining citizen support, by demonstrating the impact of a declining working age population, as well as communicating the process of reallocating public facilities accordingly.

2. "Downsizing leads to a decrease in quality."

When considering the sustainable development of a local community with a declining population, a reduction in the quality of public service is not a necessary result of downsizing the public facilities. Instead, public facilities need to be "right-sized" in communities for the following generations, by finding the appropriate purposes for specific facilities. Ascertaining the scale of downsizing infrastructure systems and projects, such as the conversion from agricultural community sewerage to joint domestic septic tanks, has just begun. An example is the complex coping style of combining a kindergarten, a nursery school, and a child care support center, utilizing a closed elementary school. Therefore, knowledge of the infrastructure and downsizing requirements of individual communities is required.

3. "Infrastructure must be single purpose."

Most public facilities are the equivalent of administrative assets under public law. Therefore, the use of such infrastructure beyond its originally intended use is prohibited, unless strict requirements are met, such as no administrative problems, nor violations of the public interest. This legal system has disseminated the idea that public facilities should be only used for the purposes of its original intent. However, a declining society has to break away from such fixed idea and take the initiative of using infrastructure for multiple purposes, based on the decreasing requirements for singular services, and the shrinking financial resources of municipalities as service providers. For example, the school building floor area per child is increasing due to the recent decline in the number of children, accordingly creating vacant classrooms. Therefore, the multipurpose use of these buildings, involving nursery schools and social welfare facilities, has been initiated. Currently, various methods for increasing the multipurpose use of buildings is under way, such as establishing fixed term leases for grounds under elevated roads, which are administrative assets. It is also vital to seek multiple revenues from the multipurpose use of infrastructure,. and create secondary values for administrative assets.

The U.N. is predicting that 60% of the world's countries will experience population decline. In light of this, key strategies for the effective enforcement of the sustainable development policies are considered burning issues. I consider the administrative experiences of Japan as able of imparting practical direction for sustainable city policies.

<Bibliography>

Owens J, Clark G, Smith GT. *City Limits: Perspectives on the Historical European City*: MQUP; 2010.

Coletta C, Evans L, Heaphy L, Kitchin R. *Creating Smart Cities*: Taylor & Francis; 2018.

Kimura S. *Regional Administration in Japan: Departure from uniformity*: Taylor & Francis; 2016.

Song H, Srinivasan R, Sookoor T, Jeschke S. *Smart Cities: Foundations, Principles, and Applications*: Wiley; 2017.

Lu Y. *Public Asset Management – Empirical Evidence from the State Governments in the United States*: Lambert; 2012.

Lo F, Marcotullio P. *Globalization and the Sustainability of Cities in the Asia Pacific Region*: United Nations University Press; 2001

Manning J. *More Light, More Power – Reimaging public asset management*: NLGN; 2012.

Hakusho CZ. *White Paper on Local Public Finance – Illustrated, 2018*: MIC; 2018. http://www.soumu.go.jp/iken/zaisei/30data/chihouzaisei_2018_en.pdf

Ngwira M, Manase D. *Public Sector Property Asset Management*: Wiley; 2016.

Shinichi O. *Public, Reform, Policy Change, and New Public Management*: EROPA Local Government Center; 2004.

Rajaram, Anand et al. The Power of Public Investment Management – Transforming Resources into Assets for Growth: World Bank; 2014.

Sachs JD, Ban K. *The Age of Sustainable Development*: Columbia University Press; 2015.

Shah A. *Local Governance in Industrial Countries*: World Bank; 2006.

Song H, Srinivasan R, Sookoor T, Jeschke S. *Smart Cities: Foundations, Principles, and Applications*: Wiley; 2017.

Steiner K. *Local Government in Japan*: Stanford University Press; 1965.

Tamagawa H. *Sustainable Cities: Japanese Perspectives on Physical and Social Structures*: United Nations University Press; 2006.

Uddin W, Hudson WR, Haas RCG. *Public Infrastructure Asset Management, Second Edition*: McGraw-Hill Education; 2013.