Public-Private partnerships and their limiting factors for a sustainable public sewerage industry: A comparative analysis of three municipal cases in Japan

CIRIEC-UNED 2021-092-083 DOI: 10.22458/rna.v12i2.3771

Asociaciones público-privadas y sus factores limitantes para una industria de alcantarillado público sostenible: un análisis comparativo de tres casos municipales en Japón

Naoki Fujiwara, Professor
Otemon Gakuin University, Faculty of Regional Development Studies, Ibaraki, Osaka, Japan,
n-fujiwara@otemon.ac.jp
https://orcid.org/0000-0002-5062-6138

Received: April 09, 2021 Accepted: September 13, 2021

ABSTRACT:
This study focuses on the conditions for the implementation of the APP, in the form of a concession for the management of the sewerage business. Three uncertainties were identified as limiting factors for PPPs; a) level of service to ensure sustainability, aging of machinery and equipment; b) public spending on rain and the national government subsidy system; c) residents' perception of the water business and the provision of equitable services. The methodology includes case studies (cities of Hamamatsu, Osaka and Nara in Japan). It consists of two parts: a) analysis of relevant published materials and b) application of surveys and semi-structured interviews with municipal officials and, in the case of Osaka, an affiliated company established to operate the sewer business.

RÉSUMÉ :
Cette étude se concentre sur les conditions de mise en œuvre du PPP, sous la forme d'une concession pour la gestion de l'entreprise d'assainissement. Trois incertitudes ont été identifiées comme des facteurs limitatifs pour les PPP ; a) niveau de service pour assurer la durabilité, détérioration des machines et des équipements ; b) dépenses publiques en pluie et système de subventions du gouvernement national ; c) perception par les résidents du commerce de l'eau et de la fourniture de services équitables. La méthodologie comprend des études de cas (villes de Hamamatsu, Osaka et Nara au Japon). Il se compose de deux parties : a) l'analyse des documents publiés pertinents et b) l'application d'enquêtes et d'entretiens semi-structurés avec des fonctionnaires municipaux et, dans le cas d'Osaka, une société affiliée établie pour gérer l'entreprise d'assainissement.

RESUMEN:
Este estudio se centra en las condiciones para la implementación de la APP, en forma de concesión para la gestión del negocio de alcantarillado. Se identificaron tres incertidumbres como factores limitantes para las APP; a) nivel de servicio para asegurar la sostenibilidad, deterioro de maquinaria y equipo; b) gasto público en lluvia y sistema de subsidios del gobierno nacional; c) percepción de los residentes sobre el negocio del agua y la provisión de servicios equitativos. La metodología incluye estudios de casos (ciudades de Hamamatsu, Osaka y Nara en Japón). Consta de dos partes: a) análisis de materiales publicados relevantes y b) aplicación de encuestas y entrevistas semiestructuradas con funcionarios municipales y, en el caso de Osaka, una empresa afiliada establecida para operar el negocio de alcantarillado.

RESUMO:
Este estudo tem como foco as condições de implantação da APP, na forma de concessão para a gestão do negócio de esgotamento sanitário. Três incertezas foram identificadas como fatores limitantes para as PPPs; a) nível de serviço para garantir a sustentabilidade, deterioração de máquinas e equipamentos; b) gastos públicos em chuva e sistema de subsídios do governo nacional; c) A percepção dos residentes sobre o negócio da água e a prestação de serviços equitativos. A metodologia inclui estudos de caso (cidades de Hamamatsu, Osaka e Nara no Japão). Consiste em duas partes: a) análise de materiais publicados relevantes e b) aplicação de enquetes e entrevistas semiestruturadas com funcionários municipais e, no caso de Osaka, uma empresa afiliada estabelecida para operar o negócio da rede de esgotamento sanitário.

KEYWORDS:
PUBLIC–PRIVATE PARTNERSHIPS, CONCESSION, PUBLICLY OWNED ENTERPRISES

PALABRAS CLAVE:
ASOCIACIONES PÚBLICO-PRIVADAS, CONCESIÓN, EMPRESAS DE PROPIEDAD PÚBLICA.

MOTS-CLÉS :
PARTENARIATS PUBLIC-PRIVÉ, CONCESSION, ENTREPRISES PUBLIQUES.

PALAVRAS-CHAVE:
PARCERIAS PÚBLICO-PRIVADAS, CONCESSÃO, EMPRESAS IMÓVEIS PÚBLICAS.

INTRODUCTION

Water is an indispensable resource for humans, and water services need to be developed by prioritizing the public interest from a long-term perspective (Koppenjan & Enserink, 2009). Historical experience shows that there are at least three models of water provision in practice: public, private, and community models. The public model is dominant in water services, but privatization and public-private partnerships (PPPs) have been introduced to increase efficiency.

Since the mid-1980s, liberalization has led to numerous water industry reforms, allowing for more privatized and commercialized services, thereby initiating the economic globalization process (Bakker, 2003, 2007; Swyngedouw *et al*., 2002). Municipalities are compelled to make trade-offs between environmental and social sustainability and economic sustainability. Thus, utilities may circumvent contradictions by finding creative solutions to operate within regulations, service delivery models, and municipalities (Furlong, 2012; Furlong & Bakker, 2010).

Monopolistic tendencies are the principal concern in privatization, as these may limit water access for low-income citizens and result in a lack of investment for improving water quality (Cesar, 2019). Some countries, such as the United Kingdom and France, find there are benefits of market competition over public monopoly. In other countries, such as Germany, municipalities create hybrid public/private firms that benefit from both market engagement and economies of scale available under monopoly production. Differences in national traditions of public intervention, institutional arrangements, and public service markets make local public services an area of great diversity (Warner & Bel, 2008).

In Japan, the public water business has been managed in the form of a "local public enterprise". It is a part of the local government but corporate accounting has been introduced to ensure management efficiency, and it has been financed by issuing corporate bonds. Despite these reforms, a decrease in population and deterioration of existing facilities and equipment has increased the momentum for further public water administrative reform. From the classification for the resource management reforms in the water sector discussed by Bakker (2007), the public water business reform in Japan continues to exhibit the organizational reform of corporatization under asset management via private sector partnership for more efficient management (Fujiwara, 2020). However, there is little research on private sector participation in the public sewerage business or analysis of a management and governance model for a sustainable sewerage industry. This study aims to fill these gaps in the research by analyzing reforms of the public sewerage businesses of three Japanese cities based on textual analysis and interview surveys.

METHODS

The research methods included scrutinizing preliminary research and conducting comparative case studies of three municipal sewerage business reforms in Hamamatsu, Osaka, and Nara cities of Japan. These three cities are the most advanced municipalities in Japan's public sewerage business in terms of reforming their businesses through PPPs. This study consisted of two parts. First, we performed a textual analysis of relevant materials published by the national and municipal governments and the proceedings of local councils. Second, we conducted semi-structured interview surveys with officers of the municipalities and, in the case of Osaka, an affiliated company established to operate the sewerage business. These interviews were conducted during four periods from 2018 to 2021, with a total of 10 executives and other staff members.

RESEARCH RESULTS

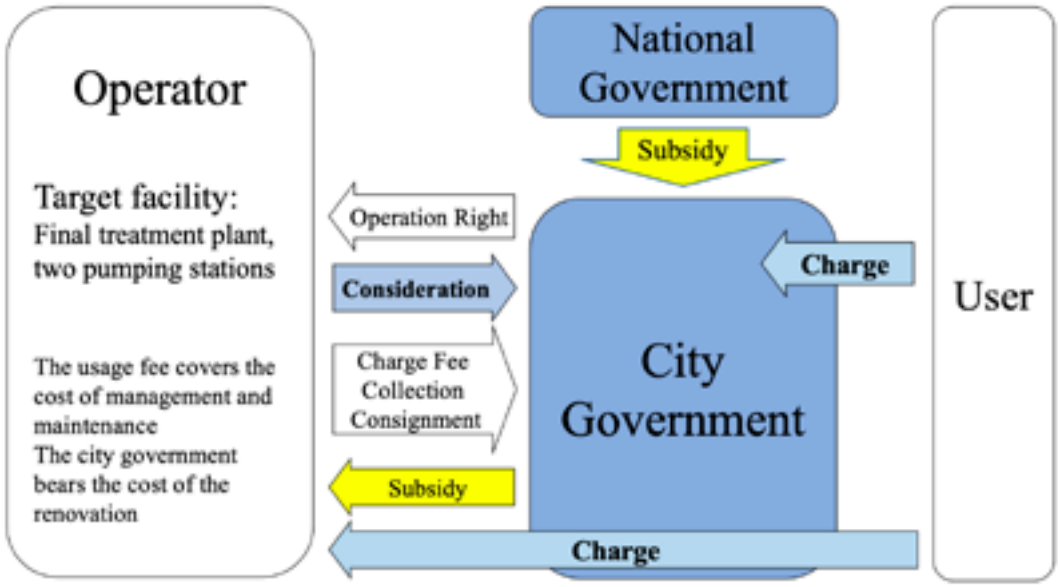
Case study 1: Hamamatsu City Government

The city of Hamamatsu has an area of 1,558.04 km^2 and a population of approximately 800,000. It is located between Tokyo and Osaka, both of which are the most densely populated areas of Japan. Hamamatsu is a transportation hub that connects the east and west of Honshu island through high-speed trains and highways. It is an industrial city where the three major industries of textiles, musical instruments, and motorcycles have developed. Hamamatsu City Government (HCG) was the first city in Japan to begin operating sewerage facilities by the concession method from April 2018. A huge expansion of the sewerage treatment area in Hamamatsu city owing to a 2005 merger of cities and towns triggered the business reform. The newly transferred Seien area was the largest treatment area in the city, accounting for approximately 50-70 % of the entire city by both area and sewage treatment amount.

Up to then, about 70 people had operated these facilities, of which 50 were outsourced to the private sector for maintenance, and the remaining 20 people were prefectural government staff and public corporation employees in charge of the construction design, operation management supervision, and budget and contract work.[1]

The HCG decided to introduce the concession method for the management of the terminal treatment plant and the pumping station, based on the cost reduction effect and the advantages of restricting an increase in staff. Except for the renovation of facilities (90 % of the cost is borne by the city), the management of the target facilities is entirely entrusted to the owner of the operating right (Figure 1).

Figure 1. Scheme of sewerage business concession for Hamamatsu city



Source: Adapted by the author from Hamamatsu City Government (2017, p. 10).

After announcing the concession, the HCG started an open call for proposals in May 2016, and selected a consortium of five companies, Veolia, JFE Engineering, ORIX, Tokyu Construction, and Suyama Construction Group, in March 2017. In October 2017, the HCG signed a 20-year concession contract with the joint venture established by the consortium, Hamamatsu Water Symphony Co., Ltd. The concession was estimated to reduce the project cost by 14.4 % (8.66 billion yen) by converting the total planned project cost of the direct management and concession method over the project period into present value. In addition, the HCG expected to earn 2.5 billion yen from the company in compensation for the operating right. There are five expected advantages of introducing this concession: reduction of electricity costs by long-term procurement and introduction of new technology; reduction of utility costs, such as chemical costs by global procurement; reduction of repair and inspection costs by in-house production and specification changes; education and training by skilled technical staff; and an increase in regular employees.[2]

1 Hamamatsu City Government, Nihonhatsu Hamamatsu-shi no Gesuido Uneiitakuhoshiki no Genjyo nitsuite [The Current Situation of Japan's First Sewerage Operation Consignment Method in Hamamatsu City] (2020). https://www.mlit.go.jp/mizukokudo/sewerage/content/001377290.pdf (Accessed May 31, 2021)

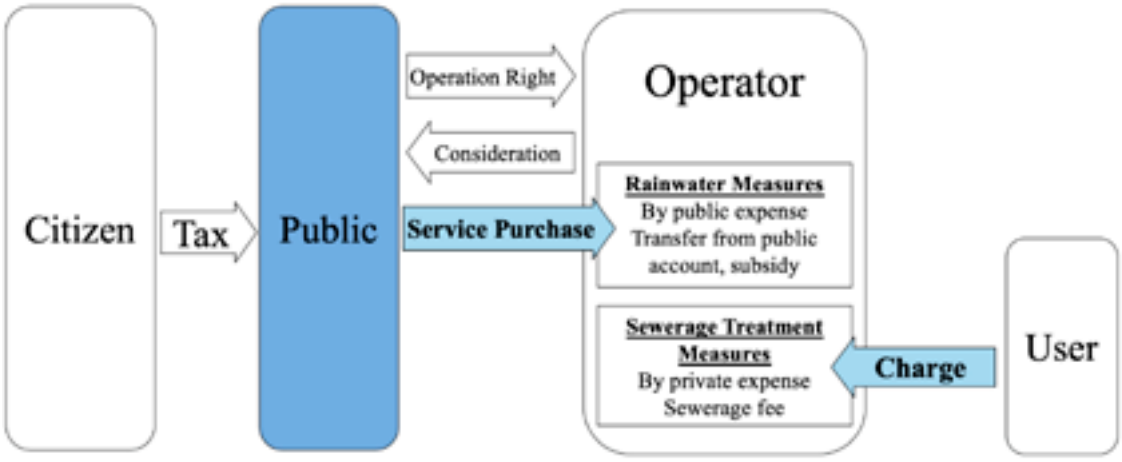
2 Nara City Government, *Nara-shi niokeru Kanminrenkeijigyo no Torikumijyokyo nitsuite* [The Status of Public–Private Partnership Projects in Nara City] (2018). https://www.mlit.go.jp/common/001259218.pdf (Accessed May 31, 2021).

Case study 2: Osaka City Government

Osaka is the central city of the Kansai region in western Japan, which is the second most populous area after Tokyo. Approximately 2.75 million people live in an area of 225 km^2 of Osaka. The purpose of the organizational reform of Osaka's sewerage business consists of the following six points: First, the reform aims to maintain high-level citizen services, securing high-quality technology, accumulating new know-how, and acquiring the skills and know-how of the staff engaged in the sewerage business. Second, the reform seeks to implement project and business development through joint ventures with the private sector, which is difficult for public bodies. Third, the reform aims to implement water drainage and improve the combined sewer system at considerable time and cost to secure citizens' safety. Fourth, the reform seeks to improve the efficiency of the business under an increasingly severe operating environment owing to the huge required renewal of treatment and sewerage facilities, despite the decreasing trend of water consumption and revenue. Fifth, the reform aims to review the number of maintenance department staff, as they comprise a larger proportion than in other cities. Sixth, the reform is a response to the demand for sewer engineers and technicians. In other cities, proper sewerage business management has become challenging owing to the lack of workers trained in these jobs.

The Osaka City Government (OCG) aims to introduce a "mixed operation rights system" as the final organizational form of the sewerage business. This system is a vertical separation system in which local governments own facilities and private companies carry out business operations as well as a part of capital investment, such as renewal of facilities financed by private companies' finances. For facilities throughout the city area, the sewerage business is entrusted to outside organizations except for new construction, such as large-scale remodeling and reinvention, which requires policy approval. The contract period is assumed to be 20-30 years. As Figure 2 shows, the owner of the operation right implements its business with the service purchase compensation (public expense) paid from the public sector and charges from service users (private expense).

Figure 2. Model of a mixed operation rights system for Osaka city



Source: Adapted by the author from Osaka City Government (2015, p. 57).

For the expected schedule of this organizational transformation, three steps are assumed for the transition of organizational reform (Table 1). Phase 1 involves comprehensive outsourcing, carried out on the operation and maintenance of sewerage facilities by the Urban Technology Center, an affiliated association of the OCG. In phase 2, the current stage, in addition to the comprehensive outsourcing of operations and maintenance, small, simple renewals will be implemented by the newly established city-owned enterprise. Finally, in phase 3, a mixed operation rights system will be introduced, and a range of facility renewals and refurbishments necessary for operation will be implemented.

Table 1. Steps for management reform of Osaka's public sewerage business

Business Area	Phase 1	Phase 2	Phase 3
Business Area A Public Administrative Specific Works	**Public:** Organized work related to comprehensive business development Operations involving the exercise of public authority based on the sewerage law		
Business Area B Construction	**Public:** New construction for anti-flood, combined sewerage improvement Large-scale update and renovation works		
Business Area C Operation and Maintenance	**Private:** Comprehensive outsourcing	**Private:** Comprehensive outsourcing Small simple renewal works	**Private:** **Mixed operation right system** Contract term 20–30 years
Expected Effects of Business operations	Reduction of maintenance costs	Revenue growth from domestic and overseas business development	Reduced construction costs
Contracted Party	Affiliated general incorporated association	• New entity (stock company) • 100% owned by city government	• Stock company • A part of the share is owned by private company

Source: Osaka City Government (2015, p. 67), modified by the author.

Table 2. Conditions of Osaka City Council for the sewerage business organizational reform budget

Maintain current service level	For outsourcing the sewerage business operation to a newly established company, the city must sufficiently supervise the company not only to make the management more efficient but also to acquire the knowledge and technology of the present staff.
Secure a crisis management response system	The city must ensure that the safety and security of the citizens are maintained, fully considering crisis management, including disasters.
Reduce costs by private management method	With the establishment of a stock company, it is necessary to consider the introduction of a more effective performance procurement system and take measures to reduce the burden on citizens.
Accountability and information disclosure	It is necessary to report the business plan to the City Council immediately after the establishment of the corporation.
Thorough consideration of and accountability in promoting reform	The operating power system must be carefully examined, providing polite and sufficient explanations to Parliament.

Source: By author sourced from Osaka City Council. *Gian Dai 130 Go Heisei 28 Nen Osakashi Gesuido Gigyo Kaikei Yosan nitaisuru Futai Ketsugi* [Incidental resolution for Bill 130, 2016 Osaka City Sewerage Business account budget]. Retrieved from https://www.city.osaka.lg.jp/shikai/page/0000349891.html (Accessed May 17, 2021).

In the Osaka city sewerage business budget in March 2016, the Osaka City Council stated that the city was responsible for the sewerage business, supervising it to protect citizens' safety, and ensuring that it would be more efficient and sustainable for the future. Moreover, the council announced five resolutions on budget execution concerning the sewerage business organizational reform (Table 2). Thereafter, the Clearwater OSAKA Corporation was established on July 1, 2016, and operations started on April 1, 2017.

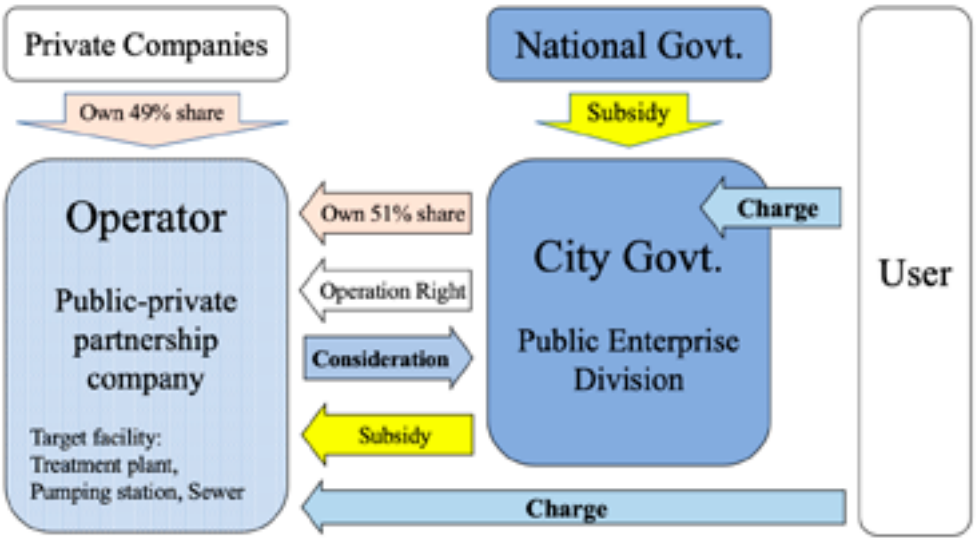
Case study 3: Nara City Government

Nara city is located 30 km east of Osaka city, covering an area of 276.94 km^2 and with a population of approximately 360,000. It is an historical region, with Nara being the capital of ancient Japan 1,300 years ago. The Nara City Government (NCG) identified the following four problems with the city's water and sewerage business. First, there is an increased need for renewal due to aging facilities; second, revenue has decreased owing to the declining population, especially in the eastern region; and third, there is a shortage of professional technical staff and difficulty recruiting new and mid-career staff (Tsujii, 2017).

The NCG considered introducing a concession system that is not a pure business consignment but instead chose to promote facility renovation and flexibly encourage the vitality of the private sector, yet guaranteeing publicity and accessibility rather than completely leaving it to the private sector. In this scheme, a PPP company is established as a concession-type trustee; the city invests 51 % and seeks investment for the rest by private companies. The NCG controls the management of the new company and secures technology succession both by dispatching staff from the NCG Public Enterprise Division and by utilizing the technology of the private partners.[3]

3 Nara City Government, Kanmin Renkei Konsesshon no Torikumi [Public-Private Partnership Concession Initiatives] (2018). https://www.mhlw.go.jp/file/06-Seisakujouhou-10900000-Kenkoukyoku/0000194563.pdf (Accessed May 31, 2021).

Figure 3. Scheme of Sewerage Business Concession for Nara city



Source: Adapted by the author from Nara City Government (2017, p. 13).

The concession scheme for the NCG is shown in Figure 3. The contract period is expected to be 15 years, and only the operating right will be held by the private sector, while the facility will be owned by the NCG. About half of the PPP companies' staff are expected to be dispatched from the NCG. New investments in business operations will be implemented by the company.

In this way, the NCG has been preparing to introduce a concession, although the draft ordinance for introducing it was rejected by the city council in March 2016. The city council criticized the draft as follows.

Water and sewerage are important infrastructure facilities in daily life and should be treated equally in a city-wide plan. There are still many issues to be solved, such as the fact that only a part of Nara city is the target area, and that the proposal is too sudden, and that understanding has not yet spread (Liberal Democratic Party).

The area plays the role of the city's water source pond. Local residents have made efforts to protect water sources, and complained that privatization is turning their backs on this effort and letting the city abandon the area (Communist Party).

This privatization is a sudden proposal, and there is a lack of explanation for the relevant areas, so it cannot be said that the residents have fully understood it. A polite explanation of the relevant areas and the overall picture of the plan should be given, and the ordinance should be proposed only after the understanding and cooperation of the residents (Nara Mirai no Kai [Nara Future Association])

After the rejection of the draft concession ordinance, the NCG introduced a comprehensive business consignment for the water and sewerage business for 2.5 years from October 1, 2018. The NCG is examining whether to grant a concession to the joint company that has been entrusted with the consignment, Nara City Sewerage Service, which consists of six private companies. The contents of the comprehensive consignment work are general management of water and sewerage; terminal treatment plant operation management; planned maintenance work, such as patrol/inspection, resident/accident response, sewer inspection/cleaning, emergency/disaster response, sewerage treatment plant and pumping station renovation design and construction, and minor maintenance work. the envisaged cost is about 555 million yen.[4]

4 Nara City Government, Kanmin Renkei Konsesshon no Torikumi [Public-Private Partnership Concession Initiatives](2018). https://www.mhlw.go.jp/file/06-Seisakujouhou-10900000-Kenkoukyoku/0000194563.pdf (Accessed May 31, 2021).

DISCUSSION

This section compares the cases of sewerage business reforms in the three local governments based on the interview survey, and examines the conditions under which PPPs for sewerage business reforms can create a sustainable sewerage industry. As shown in Table 3, the balance sheets of all three municipalities discussed in this study are expected to deteriorate in the future owing to their declining populations and aging facilities, and the momentum for improving management efficiency has increased. The reforms in Hamamatsu and Nara cities were triggered by the 2005 merger of cities, towns, and villages, but in the case of Osaka city, there is a more positive reason, namely, awareness of the business opportunities for wide-area expansion of public sewerage projects. Osaka and Nara city governments have tried to introduce a concession, but have not yet obtained the consensus of the local government council.

Table 3. Comparison of three local governments' sewerage business reform

Municipality	Hamamatsu city	Osaka city (phase 2)	Nara city (after the concession ordinance was rejected)
Motivation for reform	Area expansion due to merger of cities, towns, and villages Need for new personnel and efficiency	Wide-area business opportunity	Deterioration of future income and expenditure Lack of staff
Entrusted business content	Narrow (treatment plant/pumping station operation management)	Wide (treatment plant/pumping station operation management)	Wide (treatment plant/pumping station operation management, sewerage maintenance)
Target area	Partial areas (50-60 %)	All city areas	Partial areas (3 %)
Contract period	20 years	5 years	2.5 years
Entrusted organization	5 private companies form a joint venture	Municipally owned enterprise	Municipal and private joint company (city owns 51 %)
Effect amount (within contract period)	8.6 billion yen	5.5 billion yen	n.d.
Degree of aging facilities	Medium	High	High
Stormwater and sewage classification	Clarified	Unclear (combined sewerage)	Clarified
Predictability of renovation and renewal costs	High (relatively clear amount of renovation and renewal required in the future)	Low (aging facilities/heavy rain countermeasure costs)	Medium (aging facilities)
Future prospect	Concession verification	Concession introduction	Concession introduction

Source: By author.

The following four factors are obtained from the comparative analysis as reasons for Hamamatsu being the only city to introduce a concession. First, the scope of work targeted for the Hamamatsu concession was limited to the treatment plant and pumping station. Second, there are few aging facilities in areas where concessions were introduced, and it was easy to calculate the long-term estimate of the cost of future renovations and renewals subsidized by taxes. Third, the Hamamatsu city management did not implement reform of the water supply business, since users have a stricter perspective on privatizing drinking water. Reform of only sewerage management is more likely to be acceptable to users than its reform with water supply. Fourth, the Hamamatsu concession was introduced in the newly merged area, which had been operated by a wide-area public administrative body until then, and thus, did not have a sense of community with the rest of Hamamatsu city.

Based on these considerations, the limiting factors of Japan's reform of its public sewerage business management can be summarized by the following five points, as shown in Table 4.

Table 4. Limiting factors in the reform of public sewerage business management

Ensuring redundancy	Uncertainty in heavy rain and earthquake countermeasures Larger risk of facility operation and maintenance compared to Europe and the United States Sewerage business environment
Aging machinery and equipment	Uncertainty in repair amounts and related expenses Operation based on the experience of skilled staff Facilities that are aging and have exceeded their duration
Compensation from taxes	Uncertainty in the amount and period of subsidies from the national government Rain water treatment by public water, especially in urban combined sewers National subsidy for facility development for heavy rain countermeasures
Integration with water business reform	The impact of greater resistance to water business reform Refusal to privatize drinking water
Equal service and accessibility	A sense of inequality between areas where public–private partnerships have been introduced and areas where they have not

Source: By author.

The first factor limiting reform of the sewerage business is the uncertainty of the investment required for heavy rain and earthquake countermeasures. A characteristic of Japan's climate is that it is required to respond to earthquakes and heavy rains that exceed mechanical equipment capacity in peacetime more than Western countries are. When considering reforms of Japan's public sewerage business, water and sewerage facilities need to be resilient, and redundancy is required to withstand natural disasters. Moreover, due to growing interest in environmental changes caused by global warming, severe weather events, such as typhoons and heavy rains, have attracted greater attention from the public. New capital investment is required to strengthen the capacity of sewerage systems, especially in densely populated urban areas.

In addition, in the event of an emergency, the local government, which is the facility owner, can mobilize the maximum amount of resources (Hart, 2003). There is also criticism that know-how will be lost if significant outsourcing is undertaken. With the growing awareness of disaster prevention and mitigation, municipalities are expected to mobilize maximum resources in an emergency.

A second limiting factor is the aging of machinery and equipment, the degree of which varies by device. Many municipalities operate machinery and equipment beyond the endurance year based on the know-how of veteran staff. This is a risk that even operating municipalities cannot estimate. At the introduction of a concession, the contracted company is more sensitive to this risk to the local government and has high motivation for to undertake regular planned maintenance with updates after a certain period, instead of fixing simply when a problem occurs. This raises the costs of construction investment spending.

Third, in Japan, under the principle that rainwater treatment is a public expense, local government taxes are used as a source of funds, and about half of the construction cost of sewerage facilities for rainwater is subsidized by the central government. This is a customary, yet unstable fiscal policy. It acts as a hindrance to long-term PPP contracts

of more than 10 years. Fourth, there is deep opposition, including emotional opposition, to integration of water supply business reform with sewerage business reform, including the introduction of PPPs as privatization of the water supply business. Fifth, from the perspective of providing equal services and accessibility, citizens may oppose the introduction of PPPs in only a part of city areas.

CONCLUSION

We derive the following policy implications related to further administrative changes in the public sewerage business in the future. In this study, we focused on the conditions for introducing a PPP approach, especially in the form of a concession to manage the sewerage business. We identified three uncertainties as limiting factors for PPPs. The first is uncertainty over the service level for ensuring sustainability and the aging of machinery and equipment; the second is uncertainty over the principle of rainwater public expenditure and the national government's subsidy system; and the third is uncertainty by residents about the relevance of the water business and the provision of equal services.

In Asia, the prevalence of managing publicly owned enterprises with capital participation by private companies is increasing (Jensen, 2017). Furthermore, aggressive corporate development of publicly owned enterprises and their expansion outside their regions are increasing with the advancement of urban entrepreneurialism (Tremml, 2019). In Japan, where disaster risk is higher than in Western countries, sewerage projects are required to have higher redundancy, and higher public commitment is required than in other countries.

Although significant private consignment and privatization are difficult in Japan, it is realistic to provide services by public or publicly owned enterprises. Further improvement in management efficiency is expected through competition among publicly owned enterprises to expand their jurisdictions. The national government is required to support the establishment of such publicly owned enterprises and to develop a transparent and stable subsidy system over the long term. As future research, we would like to undertake a comparative analysis of the governance of sewerage business management by publicly owned enterprises in Japan with overseas cases.

REFERENCES

Bakker, K. (2003). Archipelagos and Networks: Urbanization and Water Privatization in the South. *Geographical Journal*, *169*(4), 328-341.

Bakker, K. (2007). The 'Commons' versus the 'Commodity': Alter-globalization, Anti-privatization and the Human Right to Water in the Global South. *Antipode*, *39*(3), 430-455.

Cesar, S. (2019). Privatization of Water: Evaluating Its Performance in the Developing World. *Annals of Public and Cooperative Economics*, *90*(1), 5-23.

Fujiwara, N. (2020). Administrative Reform for Sustainable Public Water Services in Japan: A Case Study of Sewerage Management Reform. *Asian Review of Public Administration*, *30*(1-2), 54-70.

Furlong, K. (2012). Good Water Governance Without Good Urban Governance? Regulation, Service Delivery Models, and Local Government. *Environment and Planning A*, *44*(11), 2721-2741.

Furlong, K. & Bakker, K. (2010). The Contradictions in 'Alternative' Service Delivery: Governance, Business Models, and Sustainability in Municipal Water Supply. *Environment and Planning C: Government and Policy*, *28*(2), 349-368.

Hamamatsu City Government. (2017). *Hamamatsu-shi niokeru Gesuido Jigyo Heno Konseshon Hoshiki Donyu nitsuie* [The Introduction of Concession System to Sewerage Business in Hamamatsu City].

Hart, O. (2003). Incomplete Contracts and Public Ownership: Remarks, and an Application to Public-Private Partnerships. *The Economic Journal*, *113*(486), C69-C76.

Jensen, O. (2017). Public-Private Partnerships for Water in Asia: A Review of Two Decades of Experience. *International Journal of Water Resources Development*, *33*(1), 4-30.

Koppenjan, J.F.M. & Enserink, B. (2009). Public-Private Partnerships in Urban Infrastructures: Reconciling Private Sector Participation and Sustainability. *Public Administration Review*, *69*(2), 284-296.

Nara City Government. (2017). *Nara-shi Shokibo Jyogesuidoshisetsu niokeru Kanminrenkeijigyo no Torikumi* [The Efforts of PublicPrivate Partnership Projects in Small-scale Water and Sewerage Facilities in Nara City].

Osaka City Government. (2002). *Osaka-shi Gesuido Jigyo Keieikeitai Minaoshi Kihon Hoshin* [Osaka City Sewerage Business Management Form Review Basic Policy].

Swyngedouw, E., Kaika, M. & Castro, J.E. (2002). Urban Water: A Political-Ecology Perspective. *Built Environment*, *28*(2), 124-137.

Tremml, T. (2019). Linking Two Worlds? Entrepreneurial Orientation in Public Enterprises: A Systematic Review and Research Agenda. *Annals of Public and Cooperative Economics*, *90*(1), 25-51.

Tsujii, M. (2017). Nara-shi Jhogesuido niokeru Konseshon no Torikumi nituite [Concession Initiatives in Nara City Water and Sewerage]. *Shintoshi*, *71*(12), 21-25.

Warner, M. E. & Bel, G. (2008). Competition or Monopoly? Comparing Privatization of Local Public Services in the US and Spain. *Public Administration*, *86*(3), 723-735.