

Wide-Area Business Operation in the Tama Area

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Summary

Waterworks business in the Tama area of Tokyo Metropolis is a large-scale business to supply water for approximately 3.9 million people. Due to the historical background that city and town water services were integrated into metropolitan waterworks and due to challenges arising from Tama's diverse geographical feature that it contains mountainous areas to city areas, we are still unable to fully exert the scale merit as wide-area waterworks. In order to fulfill our fundamental mission of stably supplying safe and delicious high quality water, we actively undertake measures such as reorganization of water distribution areas, unification of business processes with the wards area, and contribution to domestic water business entities. Through these efforts, we aim to further evolve into a strong and reliable wide-area water supply system.

Keywords

Efficient operation, restructuring water facilities, cooperation with cities and towns, wide-area water supply, disparity in Tama area

Challenges of Waterworks in Tama

Bureau of Waterworks, Tokyo Metropolitan Government operates its business covering almost the entire administrative area of Tokyo Metropolis except island area and some cities, and its coverage area is largely divided into the wards area in the east and the Tama area in the west. Among them in the wards area, water service has been operated in an integrated manner since the beginning of the service in 1898, whereas in the Tama area, each cities and towns operated service individually. The oldest founding year is 1926, while in many cities and towns services started after 1950, and the main source of water was groundwater. However, based on requests from cities and towns that had problems such as lack of water resources due to sudden population increase, we have integrated them gradually into the waterworks run by the Metropolis since 1973. In this way, the Tama area has its own historical background, different from the wards area.

In addition, geographically, the wards area is highly urbanized as an area with the capital function of Japan, whereas the Tama area has its characteristic as mixture of areas with various features as it contains mountainous areas with less population and flatland where urban areas are formed like the wards area.

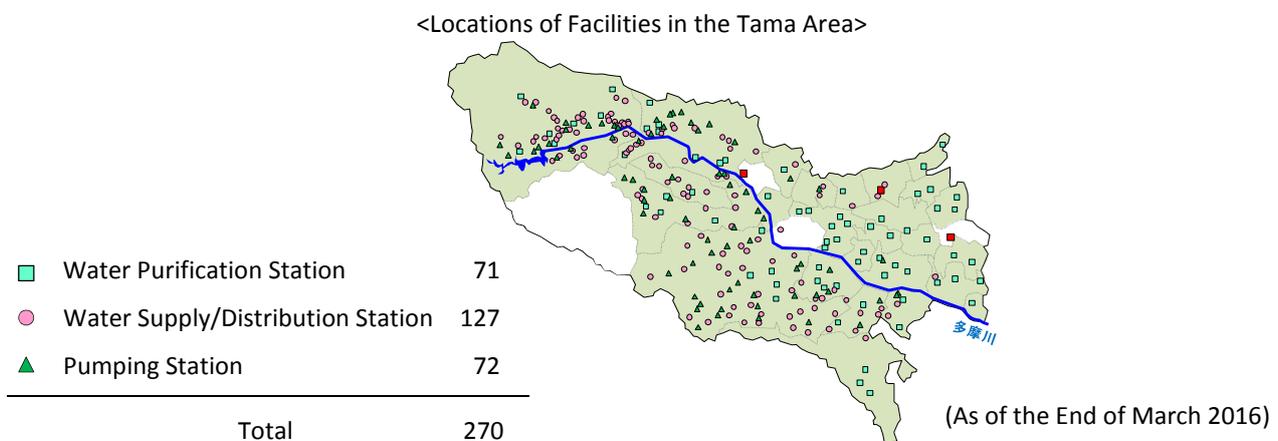
As of 2017, the metropolitan water supply in the Tama area covers 26 cities and towns with population of approximately 3.9 million people and around 10,000 km of total length of distribution pipes, a scale comparable to that of Yokohama City, Japan's second largest water business entity. In the Tama area, Tokyo Waterworks has been making its efforts in securing stable water supply and

improving its service as appropriate as wide area water service through centralized management of facilities and by establishing Tama Customers Center to respond to customers' requests such as discontinuation and commencement of service or inquiries. However, many problems still remain due to the Tama area's own historical background and geographical features. Based on these circumstances, Tokyo Waterworks has formulated the "Tama Waterworks Operation Plan 2017: Toward a strong and reliable wide-area water supply system" for the period from April 2017 to March 2021 to restructure the wide area water supply system from various aspects such as facility management and water charge collection.

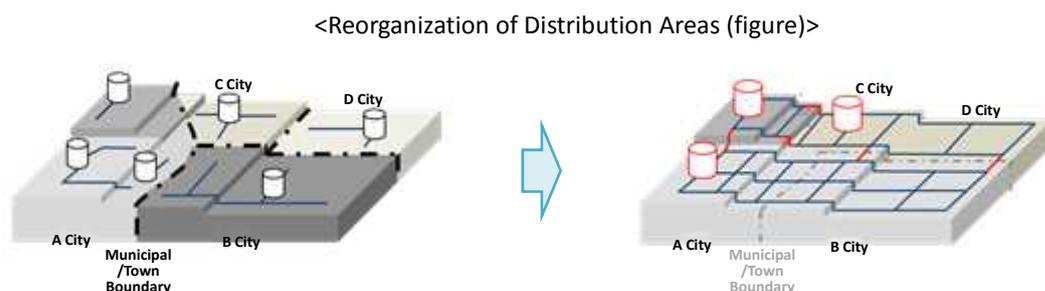
Efforts of Tama Waterworks

Efforts to Maintain/Improve Facilities

Due to the history that city and town water services were integrated to the metropolitan waterworks, the distribution areas in the Tama area are set within individual city and town areas, and in many cases they are small in scale without considering the height difference of ground. In addition, the facilities of water purification plants, water supply stations, water distribution plants and pumping stations are also small in scale, and there are as many as 270 facilities dotted in the water supply area of approximately 612 km² (as of the end of March 2016). Because of this, the facility management is inefficient, and the scale merit as a wide-area water supply has not been fully exerted.

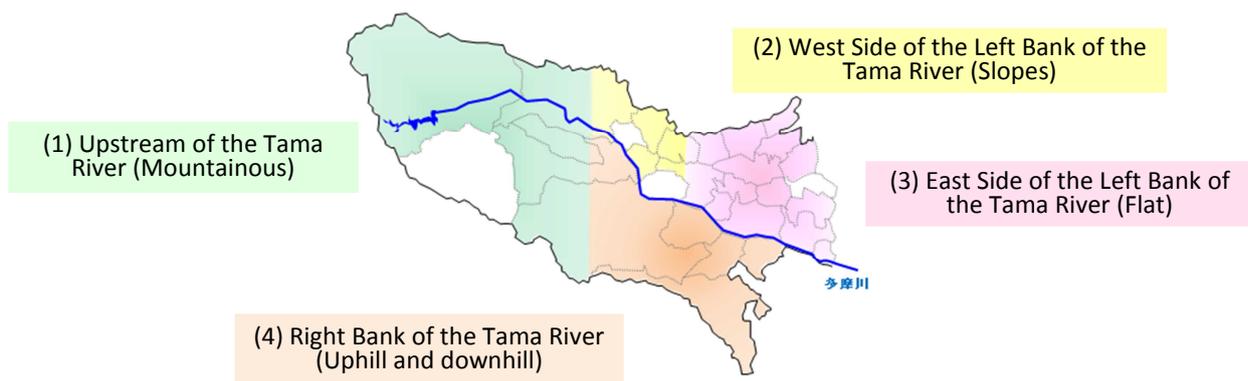


Therefore, we will enable more efficient facility management by reorganizing the water distribution areas and merging/abolishing existing facilities.



In promoting such reorganization, we must consider the geographical features of the diverse Tama area. Therefore, based on regional characteristics such as water sources, topography, height difference of ground and number of service connections in the Tama area, we divided the area into four areas; (1) Upstream of the Tama River, (2) West Side of the left bank of the Tama River, (3) East Side of the left bank of the Tama River and (4) Right bank of the Tama River. Then, we will promote establishment of reasonable and appropriate water distribution areas that are not limited by city and town boundaries in each of four areas and development of water purification plants and water supply stations as the bases of each water distribution area.

<Four Areas in Accordance with Regional Characteristics (Image)>



Firstly, (1) Upstream of the Tama River has regional characteristics that it includes mountainous areas and the number of service connections is small and dispersed over a wide area. Since the height difference of ground and the undulation are very large, we will expand the water distribution areas as much as possible in spite of smaller than other areas, while equalizing the water distribution pressure. As the main efforts for the time being, we will change to an appropriate water purification treatment system by introducing membrane filtration facilities that can improve the maintenance controllability of the water purification facilities and stabilize the purification treatment. Additionally, we will install pipes with the adjacent water distribution areas to strengthen backup.

Secondly, (2) West Side of the left bank of the Tama River is an urban area with slopes and it has regional characteristics that the number of service connections is moderate, and there are intensifying pressure and depressurizing areas. Therefore, while resolving intensifying pressure and depressurizing areas in accordance with the sloping terrain in one direction, we will expand the water distribution areas as much as possible into medium scale. As the efforts for the time being, similar to the area (1), we will change to an appropriate water purification treatment system by introducing membrane filtration facilities as well as develop water purification plants and water supply stations as the bases of water distribution areas.

(3) East Side of the left bank of the Tama River is an urban area with the flat land and the number of service connections is relatively large, which shows the regional characteristics are close to those of the wards area. Thus, we will reorganize distribution area into large-scale ones as large as those of the wards area according to the flat terrain. For the time being, we will develop water purification plants and water supply stations as the bases of water distribution areas by constructing new water supply stations and expansion of distribution reservoirs.

Lastly, (4) Right bank of the Tama River has its regional characteristics that it is a undulating hilly

terrain, the number of service connections is moderate with intensifying pressure and depressurizing areas. Therefore, we will reorganize water distribution areas into medium scale ones while resolving intensifying pressure and depressurizing areas in accordance with the undulating terrain. At the moment, we will strengthen the functions of purification plants and water supply stations as the bases of water distribution areas by seismic reinforcement of distribution reservoir.

In this way, we will improve the efficiency of facility management and water supply stability in each of the four areas in accordance with its regional characteristics.

Efforts such as integration of water charge collection system

Along with integration into the Metropolitan Waterworks, as considering the convenience of customers, we have been also unifying the operation management, which used to be different for each city and town, into the method of Tokyo Metropolitan Government. However, there were some tasks which were difficult to change. The Tama Water Charge Network System (so-called "TAMA") used in Tama water service was introduced in January 2005. However, as it was necessary to deal with different business processes for each city and town, it is operated separately from the System of Water Charge Network (so-called "SWAN") which has been used in the wards area since January 2002.

For this reason, when customers who live in the Tama Area make payment or inquiries at branch offices in the wards area, we need to confirm with service stations in the Tama area and make customers wait until the confirmation is completed.

Therefore, we will unify business processes which are different between the Tama area and the wards area, and integrate the system related to charge collection.

The dissolution of business differences is being implemented in stages to reduce risk. While previously invoices were mailed, due to the introduction of issuance of bills on the spots, starting April 2017, payment can be made from the day of meter reading in Tama area as with the wards area, which improves customer convenience. It also improves efficiency of work as it reduces mailing costs.

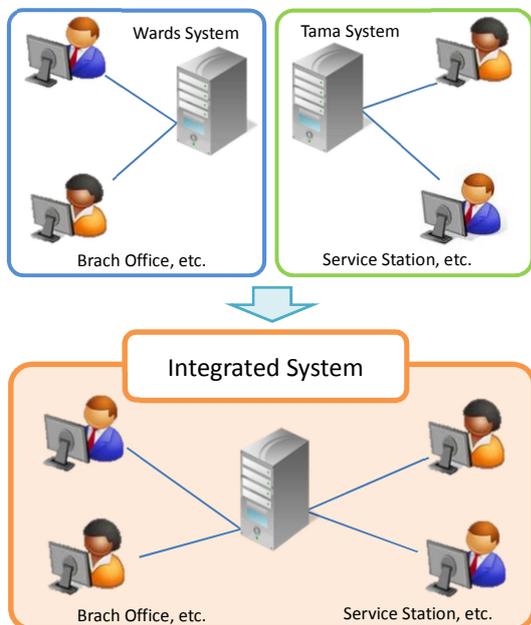
In addition, Tokyo Waterworks set comprehensive reception centers that centralize reception services such as commencement/discontinuation of water service and responses to various inquiries. However, the Customer Center (opened in January 2005) for the wards area and Tama Customer Center which covers the Tama area (opened in November 2006) are operated separately.

As a result, if all the operators of Tama Customer Center are in the process of accepting calls, even if there are operators available at the Customer Center for the wards area, we cannot transfer calls from customers and thus, we have to make them to wait. Furthermore, since the number of operators at Tama Customer Center is less than that of the center for wards area, there is also a problem in difficulties backing up with Tama Customer Center when the Customer Center for the wards area goes down due to the earthquake and others.

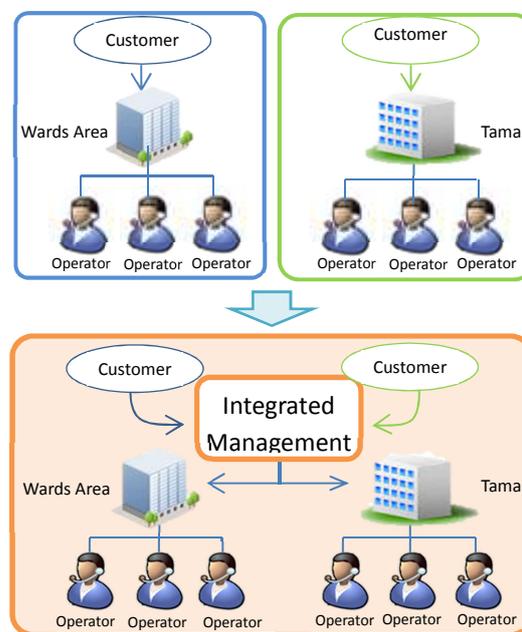
Therefore, we will manage the calls from customers in a centralized manner, distribute them to the center for the wards area and the center in Tama and distribute operators to an appropriate scale to strengthen the backup.

In this way, we will further improve customer's convenience and work efficiency by integrating our charge collection system and centralized management of the customer centers.

<Integration of Charge Collection System (figure)>



<Integrated Management of Customer Centers (figure)>



Efforts in Public Relations

In the Tama area, until March 2012, the operation of the water supply business was entrusted to cities and towns even in the water supply area of the Metropolitan Waterworks. Today, such entrustment of operation was abolished, and the water service is run by the Metropolis both in name and substance. However, since cities and towns had operated the water supply business for many years, the awareness of the efforts of wide-area waterworks by Tokyo Waterworks is low. In the survey of FY2014, the acknowledgment of customers living in the Tama area was 50.6% to the fact that the Tokyo Metropolitan Government is operating the water service in the Tama area. And in the survey of FY2015, the acknowledgment of customers living in the Tama area about our efforts of wide area waterworks operation of the Tama area was 20.2%.

Therefore, we will enhance our public relations activities by utilizing various media and opportunities.

In implementation of public relations activities, "understanding" "trust" and "familiarity" were set as the basic concepts. "Understanding" aims to improve customer awareness about various project developments to exert the merit as wide area waterworks, "trust" aims to improve customers' trust in Tama water supply by informing our efforts such as stable water supply, and "familiarity" aims to let customers notice the importance of tap water and feel familiar with the Tama Waterworks service.

< Table : Residents' Acknowledgment of Tama Waterworks >

Acknowledgment	FY2014		FY2015	
	Customer Satisfaction Survey (13/06/2014-29/06/2014)		Customer Needs Survey (29/07/2015-09/08/2015)	
	The fact that the Tokyo Waterworks is operating the water service in the Tama area		Efforts of wide area waterworks operation of the Tama area	
I know	28.3 %	Total 50.6 %	4.6 %	Total 20.2 %
I have heard	22.3 %		15.6 %	
I do not know	45.6 %		77.9 %	
No answer, and others.	3.8 %		1.9 %	

As a concrete effort based on these concepts, we first opened Tama Waterworks Twitter account in April 2017, and started to transmit information related to Tama Waterworks from time to time as needed by linking with events. We also reviewed regional publicity papers that we have been publishing and increased the frequency of publication and number of copies. We are also trying to make more effective and community-based PR papers by taking balance between articles that are unified for the entire Tama area and those that provide regional features. Furthermore, in order to enhance understanding and trust in our measures, we are also trying to expand experiencing-type communication and face-to-face communication and considering for implementation of walking tours on water supply facilities in the Tama area and open lectures on waterworks.

In this way, by disseminating information specialized in the Tama area, such as facility development, water quality management, disaster prevention measures, history of Tama water service, and construction information, we aim to let customers understand our efforts of project development as wide-area waterworks and build trust and familiarity.

Other Efforts

In Japan, according to the provisions of Article 6 of the Water Supply Act, waterworks business is in principle operated by cities, towns and villages and thus, there are so many small water business entities. According to the "Local Public Enterprise Yearbook FY2015" of the Ministry of Internal Affairs and Communications, Ministry of Internal Affairs and Communications, among 1,273 water supply business entities, there are 1,039 business entities supplying water for population of less than 100,000 (81.6%).

Many of these entities are facing with problems such as decrease in water demand due to declining population, facility aging and shortage of personnel, and as it is difficult to deal with these problems by a single entity alone, the necessity of widening the area of business is under discussion. For example, at the national level, an Amendment Bill of the Water Supply Act was submitted to the 193rd Diet in March 2017 in order to respond to the challenges faced by waterworks as mentioned above and strengthen the water supply base (the session was ended on June 18, 2017 and the bill is under review during adjournment at the House of Representatives). Besides, "JWWA Vision (draft)," drafted by the Japan Water Works Association in August 2016, also urges to establish a new support system for widening the area of business and public-private partnership as a countermeasure to more

severe situation in the future.

Under such situations, Tama Waterworks has a track record of integrating water services run by cities and towns into the Metropolitan Waterworks ahead of the whole country, and has knowledge about area widening accumulated in the process. Thus, it is required to make use of such knowledge effectively.

We will promote information provision, technical cooperation, and others based on the needs of other entities accordingly.

In order to promote such efforts, three business entities of Tokyo, Yokohama City, and Kawasaki City entered into a "Memorandum of Understanding on Projects for Supporting Domestic Water Business Entities" in February 2017. In this MoU, three water business entities express to implement supports based on requests from water utilities within metropolitan region by utilizing know-how and technical cooperation of the three business entities. Tokyo Metropolitan Government has experiences of integrating the water businesses in the Tama area into the Metropolitan Waterworks, the city of Yokohama has redeveloped water purification plants utilizing PFI, and the city of Kawasaki has achieved downsizing of water purification plants according to the future water demand. Based on this MoU, we established the "Domestic Contribution Platform," which accepts requests for support, shares information about the support's implementation, and discusses and examines for the brush up of the content of support. The support project is scheduled to begin after October 2017. After implementation of the support project, we are considering to disseminate information not only to the metropolitan area but also to water business entities throughout the country as appropriate in cooperation with JWWA.

In addition, as we are aware of the importance of technical support, and others based on local needs not only for water business entities that are members of JWWA but also for water business entities in the island area of Tokyo Metropolis. We will work on support not limited to assistance in emergencies such as drought but even during normal times in cooperation with the departments concerned at the Metropolitan Government.

By actively utilizing technology and know-how that we have cultivated up to the present and sharing them with other business entities, we will cooperate in human resource development and business operation of domestic water business entities. And at the same time, we will also seek for improvement of the capabilities of Tokyo Waterworks.

Conclusion

In Tama Waterworks, based on the "Basic Plan for Integrating Tama Water Supply into Metropolitan Waterworks," established in December 1971, we have been promoting integration of water services run by cities and towns into the Metropolitan Waterworks. However, there are still remaining problems such as insufficient exertion of the scale merit, and true efforts aimed at wide-area waterworks are still underway. In the future, we will continue to promote systematic and steady efforts, but some initiatives require constant long-term efforts, such as restructuring of water distribution areas. Therefore, envisioning changes in social conditions and from a long-term perspective, we will strive to achieve further evolution to a strong and reliable wide-area water supply system.