

# JICA Global Agenda for No. 19 Sustainable Water Resources Management and Water Supply

## Cluster Strategy for Supporting the Growth of Water Utilities



Japan International Cooperation Agency (JICA) works toward the achievement of the Sustainable Development Goals (SDGs).



2022.9

# 1. Purpose

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## 1.1 Purpose of the “Cluster<sup>1</sup> Strategy”

This cluster "Supporting the Growth of Water Utilities" belongs to the JICA Global Agenda "Sustainable Water Resources Management and Water Supply"<sup>2</sup> and aims to increase the number of "Growing Water Utilities" that can raise funds for expansion and improvement of their water services to realize the vision of "universal and equitable access to safe and affordable drinking water for all".

The realization of the purpose and vision of this cluster will contribute to the achievement of SDG Target 6.1: "Universal and equitable access to safe and affordable drinking water for all".

## 1.2 Overview

In many water utilities in developing countries, citizen dissatisfaction due to the low service levels, lack of trust in water utilities, inefficient business operations, and insufficient funds are often observed in vicious cycle. The goal is to improve the operation and management of water utilities to put them on a growth trajectory by turning the vicious cycle into a virtuous cycle of improved service, more efficient operations, securing tariff income, and securing investment. The creation of such self-sustaining and growing water utilities is the key to achieving the SDGs, and it is important to increase the number of water utilities with sound management to mobilize private sector funds. To achieve this goal, JICA will adopt an approach that starts from the expansion of the tariff revenue base and improvement of services through facility development and an approach that starts from the increase of revenue and profit and improvement of services through the reduction of non-revenue water.<sup>3</sup>

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<sup>1</sup> “Cluster” denotes a group of development cooperation projects and activities that share a common purpose and development scenario. JICA facilitates the formation of clusters among partner countries and organizations, based on JICA Global Agenda, with a view to vitalizing global collaboration.

<sup>2</sup> The Global Agenda "Sustainable Water Resources Management and Water Supply" sets two cluster strategies: "Practical Integrated Water Resources Management to Resolve Water-related Issues in the Field" dealing with water resources management and " Supporting the Growth of Water Utilities" dealing with water supply.

<sup>3</sup> The percentage of water volume that was not subject to billing due to leakage, theft, meter

## 2. Current Situation and Development Approaches

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### (1) Needs for Development Cooperation

#### <Importance as a development issue>

Access to water is essential for human survival, as well as for supporting economic activity, and the United Nations has declared access to drinking water to be a human right. Water-borne diseases kill more than 500,000 people a year, mainly infants, and 50% of cases of underweight and malnutrition are related to water, sanitation and hygiene problems (World Health Organization (WHO)). Water fetching labor, which is mainly carried out by women and children, is also a major burden, affecting education as children are unable to go to school.

Water supply and the establishment of hygienic practices such as hand washing are also essential for the prevention of infectious diseases such as the new coronavirus disease COVID-19, but the lack of water supply, toilets, and hand washing facilities in schools and health facilities is also an issue. This is an important development that is directly related to ensuring public health and human security through universal health coverage (UHC).

In addition, climate change effects such as rainfall extremes and sea level rise have revealed problems such as water supply restrictions due to drought and salinization of coastal water sources, which are expected to worsen in the future. Sustainable water supply by securing water resources is also important as a climate change adaptation measure.

#### <Population growth and stalled water access rate>

As mentioned above, ensuring access to water is an important development issue, but as the population of developing countries continues to grow, the rate of access to safe water has not increased, especially in urban areas. There is an urgent need to develop water systems that can provide a safe and efficient water supply. According to the United Nations, the urban population, which was 30% of the world's population in 1950, is expected to reach 68% by 2050, and number of cities with a population of more than one (1) million in developing countries, excluding China, are projected to

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failure, etc., in relation to the volume of water distributed.

reach 397 by 2030.

According to WHO and UNICEF, two (2) billion people lack access to "Safe Water"<sup>4</sup> in 2020 out of which 610 million are living in urban areas. While access to safe water in rural areas has steadily increased from 53% in 2015 to 60% in 2020 (about 270 million more people have access), in urban areas the rate has only slightly increased from 85% to 86% (360 million more people have access), and investments in facilities to accommodate the growing population have not been made. As a result, urban water supply coverage in Africa, Central and South Asia, and the Pacific has consistently declined since 2000.

### **<Funding gap>**

The reason for the lack of improvement in access rates to safe water is the lack of funding for the construction of water supply facilities. According to the World Bank, an investment of 37.6 billion dollars per year is needed to achieve SDG target 6.1. In contrast, the total amount of aid in 2019 for water supply and sewerage systems is \$7.2 billion (Japan is the largest bilateral donor with \$900 million; OECD Development Assistance Committee (DAC)), which is a large funding gap compared to the amount of investment needed.

Therefore, expectations for private investment are increasing, and in line with the Addis Ababa Action Agenda, the mobilization of diverse sources of funding, including private funds, and the use of Official Development Assistance (ODA) as a catalyst for such mobilization, are becoming more important. However, water supply and sewerage systems together account for only US\$4 billion, or 4% (World Bank) of the total for all infrastructure sectors, including transportation and energy. The reasons for this are that water utilities are in poor financial and business conditions that do not allow private companies to invest in them, and that water rates are politically kept low, making it difficult to formulate profitable projects.

### **<Review of past development approaches and necessary efforts in the future >**

International development approaches have emphasized the construction of water supply facilities to improve the rate of access to safe water. However, as mentioned above, there is a lack of funds required for investment in facilities, and private capital has not been introduced. Water supply development is financed by the "3Ts": tariffs,

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<sup>4</sup> Drinking water supply services that are from an improved source (tap, deep well, protected shallow well, spring, rainwater), on premise, available when needed (at least 12 hours per day), and not contaminated with fecal indicators or high priority chemical indicators (arsenic, fluoride). In addition, 785 million people do not have access to water supply services defined as "Basic Drinking Water Supply Services," which are defined as drinking water from an improved source, provided collection time is not more than 30 minutes for a round trip.

taxes, and transfers. To solve the problem of insufficient funds, it is important to change the dependence on subsidies and aid, and to develop water utilities that can raise funds from their own resources (retained earnings), bond issues, and borrowings, based on the highly predictable revenues from water tariff revenues.<sup>5</sup> To this end, it is necessary to link facility improvement with management improvement, to increase customer and water tariff revenues by improving water service, and to reduce loss, as typified by non-revenue water, so that water utilities can generate funds that can be used for investment and grow on their own.

### **<Position in Japanese policy>**

Access to drinking water is listed in Target 6.1 of SDG Goal 6 and is essential for "Human Security" promoted by the Japanese government. At the 4th Asia-Pacific Water Summit held in Kumamoto City in April 2022, Prime Minister Kishida announced the "Water Initiative for Water" to accelerate global water-related efforts by providing approximately 500 billion yen over the next five years.

There are also expectations for the water business as part of an infrastructure export strategy. However, because this field involves many basic technologies and civil engineering works, making it difficult for Japanese companies to take advantage of their technological superiority, and because, in principle, water services are publicly operated in Japan and the accumulation of know-how in the private sector is less advanced than in other countries, Japanese companies' global share (water supply and sewage, industrial water, and Desalination) is stagnant at 0.5% (in FY2019, Ministry of Economy, Trade and Industry). The Japanese government aims to increase its track record by strengthening its understanding of local needs, enhancing its ability to propose packages from the upstream planning stage, raising awareness about "Quality Infrastructure," and promoting collaboration with overseas and local partners. Since local governments are responsible for domestic water supply services, the overseas activities of local governments is also expected to facilitate the overseas expansion of Japanese companies.

## **(2) Management resources**

Japan has been the top donor in international cooperation in the water and sanitation sector from 2007 to 2017, and from 2018 to 19 it remains the second largest donor after the World Bank (in terms of disbursements). In this field, which requires both infrastructure and operational and management capacity, JICA's strength lies in its

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<sup>5</sup> In arid and semi-arid areas where the cost of developing water resources is so high that recovering the cost through water tariff revenues alone would exceed what citizens can afford to pay, subsidies are also necessary.

ability to utilize financial and technical cooperation in an integrated manner, and it has a proven track record in improving facilities, services and management such as non-revenue water measures. The financial cooperation provided safe water to approximately 30 million people over the 10-year period from 2011 to 2020, and the technical cooperation contributed to the development of approximately 100,000 human resources over the same period. As of the end of 2021, about 100 projects are underway in more than 40 countries. For example, cooperation with Phnom Penh, the capital of Cambodia, has yielded remarkable results, which led to the spread of potable 24-hour water supply to 90% of the population within a decade of the devastation following the civil war, and has been called "The Miracle of Phnom Penh".

In addition, Japan boasts a water supply coverage rate of over 98% and has realized a high-quality water supply system that enables all citizens to obtain safe water from their faucets 24 hours a day, and in the process, various domestic actors, including local governments and private companies, have accumulated know-how. In this way, Japan has the know-how and resources necessary for international cooperation in the field of water supply, and has a track record of implementing world-class cooperation. In addition, as seen in the "Kumamoto Initiative for Water" mentioned above, the government policy also emphasizes international cooperation in the water sector. Therefore, JICA needs to focus its efforts in this area.

Other development partners include financial institutions which have strengths in facility investment, and collaboration for scaling up through co-financing would be effective. With regard to capacity development, some organizations have strengths in supporting sector reforms, such as strengthening regulation and developing the legal framework for such reforms, while JICA has a wealth of experience in supporting water utilities. Therefore, they can complement each other. In terms of mobilizing private-sector funds, OECD and Convergence function as knowledge hubs, and IFC has strengths in transaction advisory services, while JICA has extensive experience in forming projects for investment and financing through technical cooperation and in supporting management improvement. This is a mutually complementary relationship.

# 3. Development Scenario and Key Concepts

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## 3.1 Development Scenario

The standard social change process and the activities and outputs (solutions) to inspire and promote change until "Equitable Access to Safe Water for All" (objective/vision) is achieved in each country through each bilateral cooperation implemented under this cluster are as follows

### **[Process of social change]**

In countries with low or slow growing water access rates, water utilities are often unable to expand and improve water services to accommodate population growth. This is largely due to a situation in which water utilities find themselves in a vicious cycle of "low service standards, citizen dissatisfaction, lack of trust in water utilities, low citizen willingness to pay, low water tariff levels, inefficient operations, insufficient funds, and inadequate investment".

Although the situation varies according to the target country, depending on the different stages of development,<sup>6</sup> the main issues can be categorized as follows.

- ① Water supply facilities have been destroyed due to conflict or other reasons, and there is no or severe lack of water services.
- ② Basic water services exist, but the level of service (coverage, water supply hours, water quality, water pressure, etc.) is extremely low, management is inefficient, and customers' satisfaction and willingness to pay are low.
- ③ Although it has reached a certain level of service, in terms of management, the net profit is small, making it difficult to raise funds and to expand in accordance with the expansion of the urban area and the economy.
- ④ Although model good water utilities have been established in the country, they have not been able to spread nationwide due to challenges in sector governance, local conditions, and other factors.

Based on the recognition of the above issues, the cluster assumes the following process of social change.

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<sup>6</sup> Quantitative indicators for the different stages of development are presented in "5.2 Monitoring Framework".

- ① Basic water service delivery will be restored in areas which were affected by conflict and other factors.  
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- ② Water services are implemented by water utilities that have improved and reached a certain level of service.  
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- ③ Based on the satisfaction and trust of customers and stakeholders in water services, water tariffs will be collected, and the management of water utilities will become sound. A "Growing Water Utility" that can independently raise funds to improve and expand water services will be developed.<sup>7</sup>  
↓
- ④ The model "Growing Water Utility" will be disseminated and expanded to other regions of the country. In addition, governance of the water sector will be strengthened to make this dissemination feasible.  
↓
- ⑤ Improvement and expansion of self-sustaining water services by "Growing Water Utilities" throughout the country.

### **【Approach to solution】**

Based on the key concepts described in 3.2, the cluster will implement four cooperative approaches according to the stage of development of the water utilities.

- **(a) Human security-oriented type:** This is a stage where destruction of facilities, significant shortages, and extremely low capacity of water utilities due to conflict, refugee influx, etc. are challenges. The focus is on responding to needs in an agile manner, and the goal is to restore basic service delivery by providing support for restoration of service delivery and formulating reconstruction plans. After the implementation of cooperation, once the restored water supply facilities are properly maintained and managed, the water utility will move on to the next social condition. Cooperation in this phase is important as a contribution to regional stabilization and support for refugees.
- **(b) Basic service improvement support type:** This is a stage where basic service delivery exists, but extremely low service standards (limited water supply coverage, short water supply hours, near-untreated water quality, low water

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<sup>7</sup> "Independently raise funds" means that the water utility is expected to raise funds through borrowing or private investment based on the revenues from water tariffs. However, there may be cases where subsidies from the general account are required, such as when the scale of the water utility is small, or when geographical or natural conditions force the cost of water supply to be high and cost recovery based on water tariffs alone is difficult considering the affordability of the people.



pressure, etc.) and inefficient management (non-revenue water ratio exceeding 50%, large net losses) are issues. The goal is to reach a certain level of service by emphasizing facility improvement to improve the level of service, as well as by implementing measures such as strengthening the basic operation and maintenance capacity of water utilities. Improvement of water supply services will not only improve people's living environment but also contribute to economic development. After the implementation of the cooperation, if the service level and citizens' satisfaction are improved and the number of customers and water tariff revenues are increased, the water utility will move to the next social condition.

- **(c) Water utility growth support type:** This is a stage where the water utility has reached a certain level of service, but the issue is the small net profit so that it is difficult to raise funds and expand the water supply services in accordance with the expansion of the residential area and the economy. The target water utility aims to become a "Growing Water Utility" that can independently raise funds by focusing on management improvement and implementing capacity development and facility improvement that will lead to management improvement (non-revenue water reduction, improvement of water distribution networks, customer expansion, etc.). After the implementation of the cooperation, if the water utility's business operations become more efficient and the increased net profit enables it to mobilize funds for investment in the expansion and improvement of water services, it will move to the next social condition.
- **(d) Sector governance support type:** This is a stage where a model "Growing Water Utility" has been established in the country, but issues remain in sector governance and rural area. The water utility aims to expand the model nationwide and strengthen water sector governance by scaling up model cases, supporting sector governance, and mobilizing private funds. In this stage, the focus of the cooperation moves to the institutional development in the whole country, and it is considered that water utilities that are positioned in the "Basic Service Improvement Support Type" and "Water Utility Growth Support Type", which is described above, are mixed in the country. After the implementation of the cooperation, once the model cases are rolled out throughout the country and the monitoring and guidance of water utilities are continued, and the legal system and financing mechanism are in place, the country will move to a condition where water service improvement and expansion by "Growing Water Utilities" are implemented throughout the country.

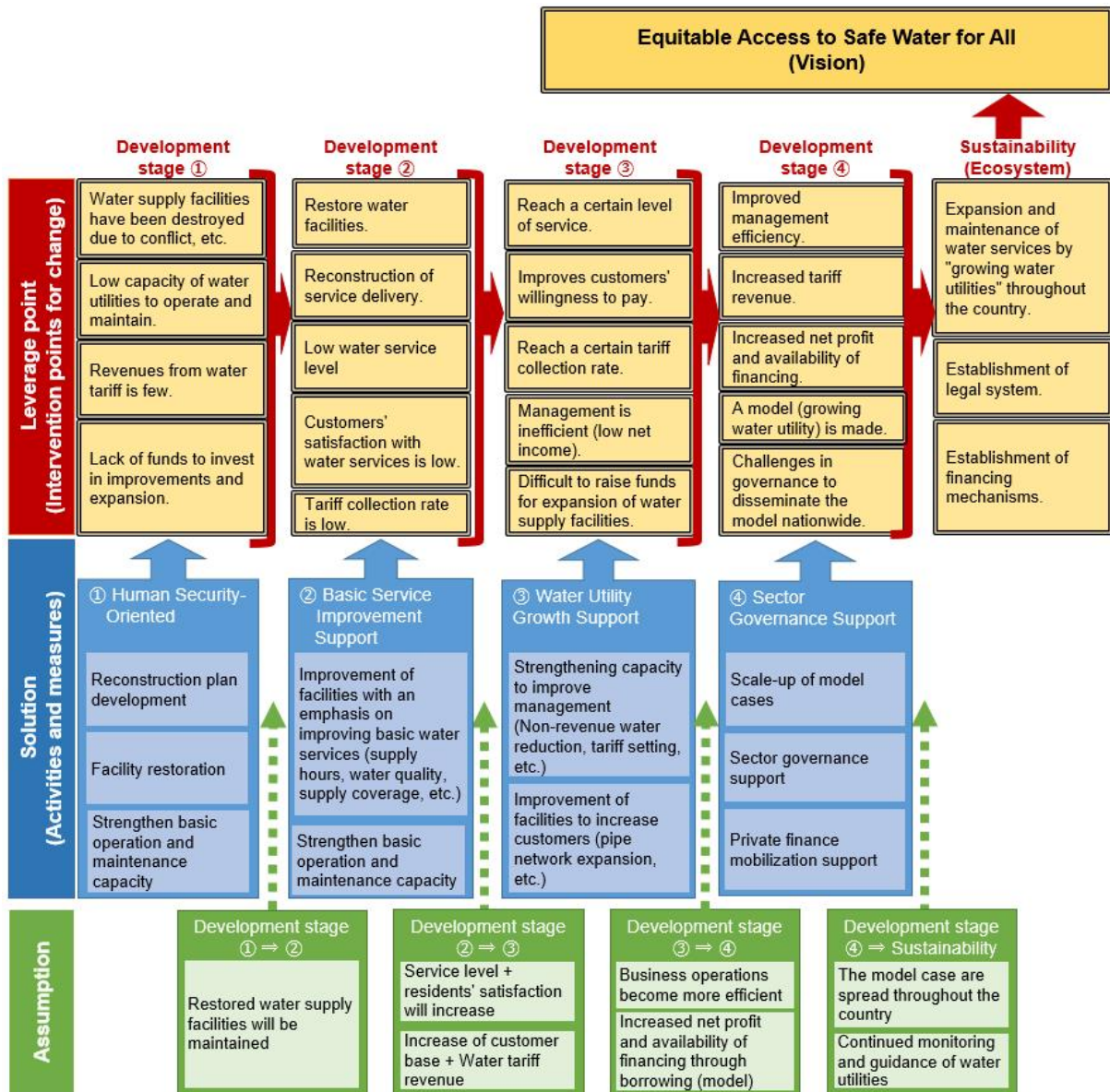


Figure 1 Conceptual diagram of a development scenario

### 3.2 Key Concepts of Development Scenario

Each bilateral cooperation comprising this cluster will be based on a "Growth Spiral" of water utilities. The model constitutes the key concept, which gives a rationale for the effectiveness of the solution in the standard scenario described above.

#### (1) Growth spiral of water utility

Water utilities that are having difficulty in growing independently are in a vicious cycle of low service levels, citizen dissatisfaction, lack of trust in the water utilities due to this dissatisfaction, the resulting low tariff collection rate and opposition from citizens and politicians to tariff increases, inefficient operations as typified by high non-revenue

water rates, and insufficient funds. In order to transition to a self-sustaining "Growing Water Utility," such a vicious cycle must be turned into virtuous cycle: "(1) Improve water service level ⇒ (2) Improve customers' satisfaction and trust, and increase the number of customers ⇒ (3) Improve management and finance, and create investment capacity by increasing tariff revenue, improving operational efficiency, and revising tariff levels ⇒ (4) Expand water facilities through investment activities ⇒ (1) ⇒ (2) ⇒ (3) ⇒ (4) ...", and a growth spiral must be activated (Figure 2: Helping water utilities get into a growth spiral).

During Japan's period of rapid economic growth, the water supply coverage rate increased rapidly from about 30% in 1955 to about 80% in 1975. This rapid development of waterworks in such a short period of time was made possible by (a) the Waterworks Law and regulations that stipulate the level of service, which should be provided to the customers (water quality, water pressure, 24-hour water supply, etc.), and responsibilities of water utilities, as well as by the implementation of financially disciplined waterworks management based on independent accounting and public enterprise accounting under the Local Public Enterprise Law, (b) development of the facilities using debt financing through the issuance of long-term, low-interest public enterprise bonds, backed by the creditworthiness of the local government and sound waterworks business management, and (c) financial management that under the medium- to long-term planning and financial outlook, including investment in facility expansion and renewal, water tariffs were revised and the water supply system was expanded to increase revenue and repay the principal and interest of the bonds issued.<sup>8</sup>

In JICA's cooperation, there have been cases in Cambodia, Samoa, Tajikistan, and other countries where the improvement of water supply services has led to remarkable improvements in water utility management. In Phnom Penh and Siem Reap in Cambodia, water supply facilities after the civil war were reconstructed and expanded with grant assistance, and as a result of improved water supply services through capacity development with technical cooperation, the tariff collection rate became almost 100% and the non-revenue water was significantly reduced. As a result, they were in a financial position to significantly expand their facilities by borrowing yen loans, and the Phnom Penh Water Supply Authority was also listed on the stock market. In Apia, the capital of Samoa, the construction of water purification plants and water transmission and distribution facilities through grant assistance and technical cooperation were carried out in parallel, and water that meets water quality standards

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<sup>8</sup> The educational material prepared and published by JICA, "[Japan's Experiences on Water Supply Development](#)" (2017), provides more details.

can now be supplied 24 hours a day, and water pressure has stabilized. This increased citizen satisfaction and trust in the water supply system, and led to an increase in the tariff collection based on a volumetric tariff system using water meters. The financial situation, which had been in the deficit, turned into a surplus.<sup>9</sup> In Hamadoni, a regional city in Tajikistan, where the water supply was unstable and a flat rate system was used to collect tariffs, stable water supply became possible due to the improvement of facilities through grant assistance and technical cooperation to strengthen the capacity of water distribution management and leakage prevention. As a result, a survey of residents' satisfaction with their water supply showed that they were 100% satisfied, and the transition to a metered rate was made without any major opposition. This drastically reduced excessive water use by some residents and increased water tariff revenues. In the future, JICA will further clarify the rationale of the development scenario by organizing quantitative evidence and case studies.

## **(2) Targeted approaches to put water utilities on a growth spiral**

Effective cooperative approaches to put water utilities on a growth spiral can be broadly classified into two approaches: those starting from the expansion of the tariff revenue base and service improvement through facility improvement, and those starting from the improvement of revenue and expenditure and service improvement through non-revenue water reduction. For water utilities with a low level of service, the first focus should be on service improvement, without which it is difficult to gain the trust of citizens and policy makers in the water utility, and it is difficult to improve the tariff collection rate and to promote the appropriate level of tariffs. Water utilities that are able to ensure a certain level of service level should focus on improving management efficiency and fund mobilization capacity, and should improve their financial soundness so that they can secure a level of net profit that can be used for facility investment and fund mobilization.

In this cluster, the development stages of water utilities are classified into four patterns based on the status of issues related to operation, maintenance, and management, and effective cooperative approaches are proposed for each of them.<sup>10</sup> Note that since the economic level and challenges of water utilities vary from country to country, they cannot necessarily be clearly classified into the above four categories, and it is assumed that some situations may span multiple categories. The stage of development of a water utility is judged based on its status related to operation and

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<sup>9</sup> Ryuji Ogata, et. al. (2022) [Sustainable management of water utility in Samoa through services improvement with Okinawa Water Bureaus](#), Waterlines, Waterlines, 41:2, 96-106

<sup>10</sup> Please refer to “4.1 Partnership with Partner Countries”.

maintenance and management, as shown in Figure 3.

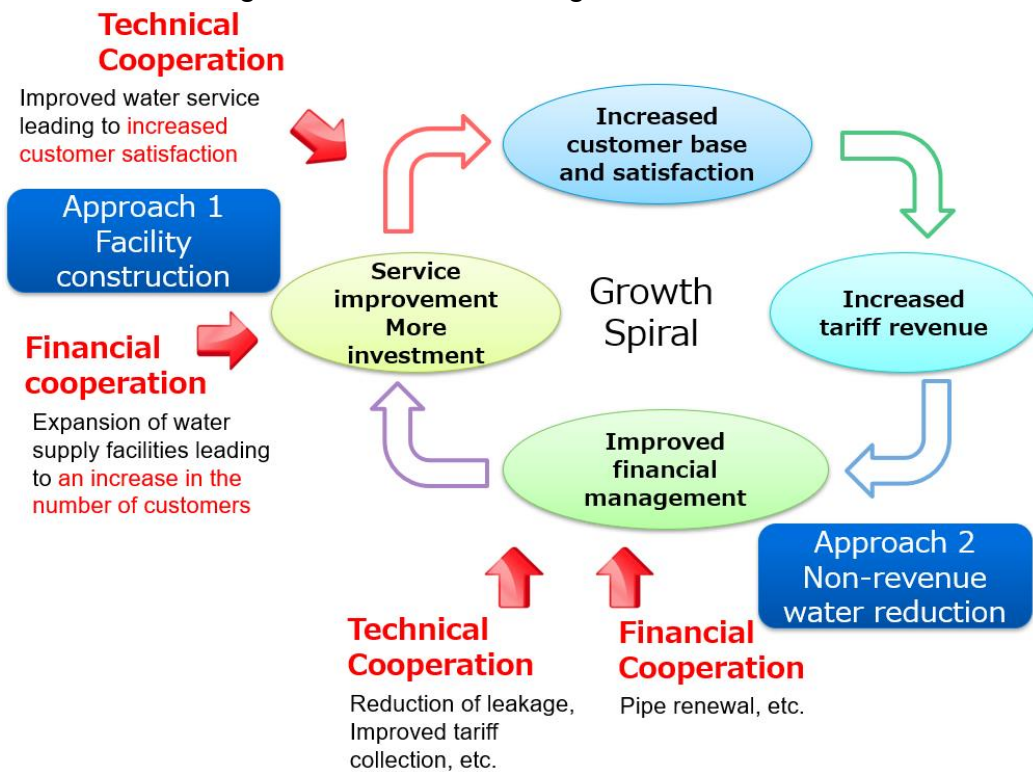


Figure 2: Helping water utilities get into a growth spiral

|  |   |   |   |   |
|--|---|---|---|---|
| <b>Economic level</b>                      | Less developed <span style="float: right;">→</span> Developed |   |   |   |
| <b>Priority Development agenda</b>         | Securing public health (Basic Human Needs, Human Security)    |   | Urban infrastructure (service coverage, service level)  |   |
| <b>Issues of utilities (Service level)</b> | Lack of basic service delivery and O&M capacity               | Limited service coverage, intermittent supply, low water quality  | Difficult to expand coverage, inequitable distribution, deteriorated water quality in the network | There are examples of good utility management, but regulatory framework and performance monitoring are insufficient |
| <b>Issues of utilities (Management)</b>    | Very low tariff collection, Lack of service delivery          | Inefficient management, low tariff collection, low tariff setting | Difficulty in mobilizing finance and revising tariff  | There are examples of good utility management, but regulatory framework and finance mechanism are insufficient      |
|  |   | <b>Large net loss</b><br>NRW 40% over                             | <b>Small net profit</b><br>NRW 25-40%   | <b>Large net profit</b><br>NRW 10-25%   |
| <b>Cooperation approaches</b>              | Ensuring service delivery and planning for reconstruction     | Constructing facilities and enhancing basic O&M capacity          | Improving management and profitability (NRW reduction, etc.)                                      | Improving sector governance, dissemination of good practices  |
| <b>Type</b>                                | ① <b>Human Security type</b>                                  | ② <b>Basic service improvement type</b>                           | ③ <b>Cooperation for growth type</b>  | ④ <b>Cooperation for sector governance type</b>   |

Figure 3: Criteria for determining the stage of development of water utilities operation and maintenance, management issues)

## 4. Implementation Direction

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The cluster will be based on deployment through cooperative approaches (solutions) according to the four stages of development of water utilities, aiming to collaborate with other development partners for each cooperative approach. In addition, activities related to the deepening of the cluster strategy (increasing effectiveness) and the dissemination of the cluster strategy (to other actors<sup>11</sup>) will be carried out using the platform budget. In particular, the latter will inspire cooperation and learning among other actors that contribute to the cluster objectives, as well as the formation of a transnational network to promote the independent growth of water utilities. The goal is to achieve Indirect Targets through collective impact and create an ecosystem that promotes the independent growth of water utilities (Figure 4: Conceptual diagram of cluster strategy).

### 4.1 Partnership with Partner Countries

The policy and anticipated scale of resource commitment for deployment for each cooperative approach is as follows

#### **(1) Targeted approaches according to the four stages of development of water utilities**

JICA aims to deploy its cluster strategy to more than 40 water utilities by 2030. Target countries will be selected in accordance with the following policy, and attention will be paid to resource allocation. A distinction will be made between countries that will continue to receive medium to long term support and make large investments, and countries that will make small-scale investments such as training programs and knowledge sharing.

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<sup>11</sup> The term "other actors" refers to other water utilities, development partners, domestic municipalities, private companies, etc.

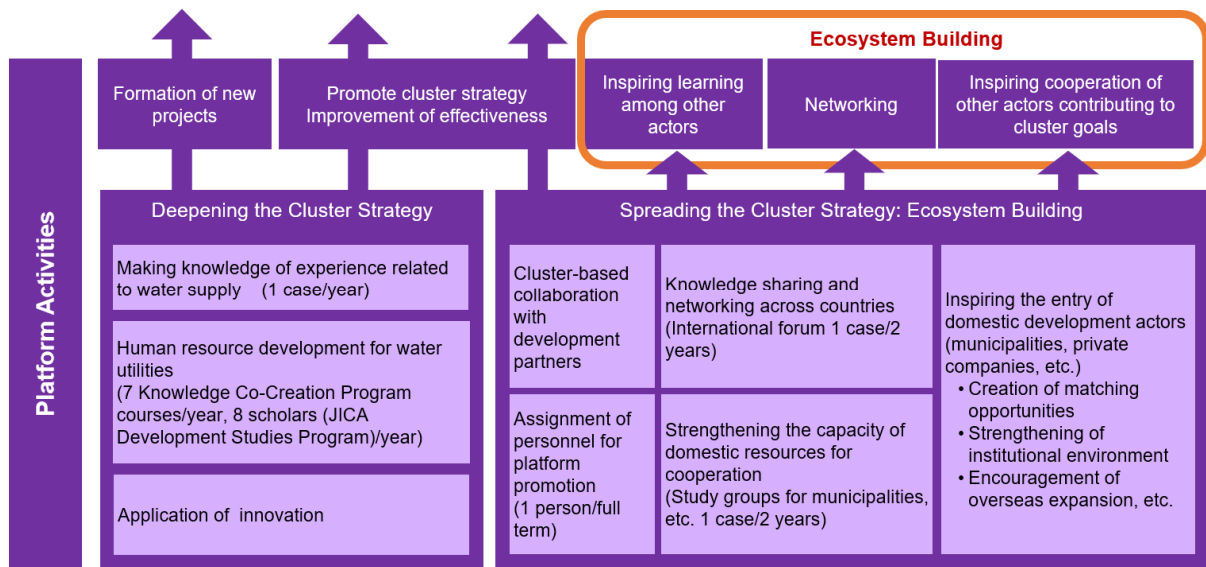
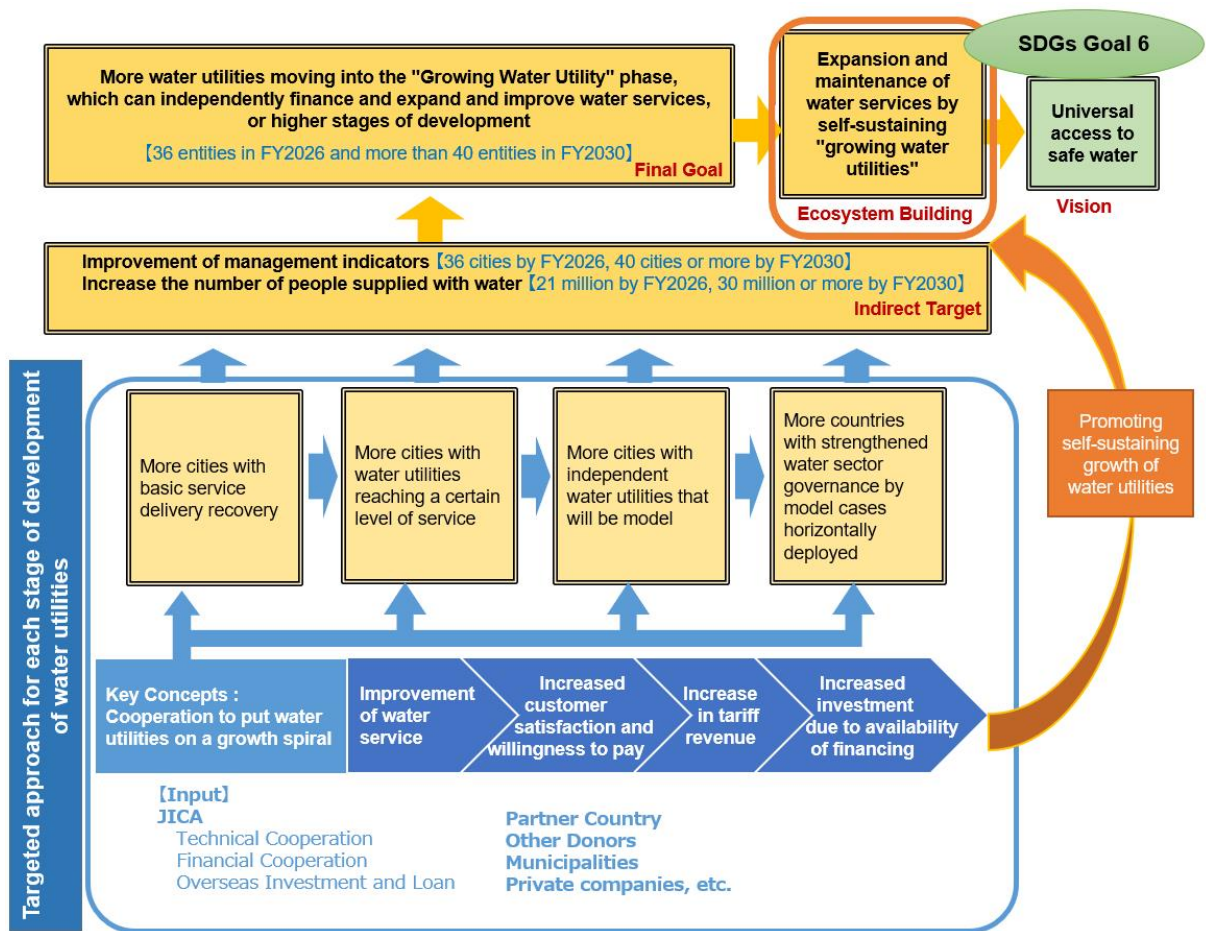


Figure 4 Conceptual diagram of cluster strategy

**Table 1: Key targeted countries and regions for targeted approaches**

| Type                                  | Main target countries/regions   | Resources distribution <sup>12</sup> |
|---------------------------------------|---|--------------------------------------|
| (a) Human security-oriented           | Sudan, South Sudan, Iraq (reconstruction from conflict)<br>Palestine, Jordan (refugee generation and influx)  | 10%                                  |
| (b) Basic service improvement support | Kathmandu, Pokhara (Nepal),<br>Faisalabad (Pakistan)<br>Kigali (Rwanda), Zanzibar (Tanzania)  | 30%                                  |
| (c) Water utility growth support      | Apia (Samoa)<br>Managua (Nicaragua), Paraguay<br>Lilongwe (Malawi), Abuja (Nigeria)<br>Addis Ababa (Ethiopia)   | 40%.                                 |
| (d) Sector governance support         | Cambodia (nationwide development modeled on Phnom Penh, development of water supply law, supervision and training of private operators)<br>Laos (nationwide development based on the model of the three preceding regions, development of standards, and development of financing mechanisms) | 20%.                                 |

- **(a) Human security-oriented type:** JICA will respond flexibly to urgent needs by utilizing fast-track procurement process and other methods. Collaboration with international organizations and the use of local resources will also be promoted. The allocation of resources to this category will depend on the occurrence of needs for reconstruction assistance, etc., and is expected to be approximately 10% of the total based on past experience. Other development partners often provide support to water utilities in this type, so collaboration will be important.
- **(b) Basic service improvement support type and (c) Water utility growth support type:** JICA will mainly cooperate with water utilities categorized in these two types (volume zone). JICA will focus on capital cities and major cities that have a large number of beneficiaries and will serve as basis for horizontal development, in countries where the access rate to safe water is low or where many people do not have access to safe water, and to achieve the results of the cooperation, the water utilities targeted for the cooperation must have a certain level of governance. In stage (b), water services will be improved and expanded to achieve development goals such as ensuring public health, while increasing the satisfaction of the customers and their willingness to pay. In developing countries, it is often the case that service levels vary from district to district within a city, but it is necessary to ensure that basic service levels are achieved fairly for the entire

<sup>12</sup> Resource allocation is an image of allocating inputs (effort), including human resources, work time, and preparatory studies. It is not an allocation of cooperation amounts.



water supply service area. In stage (c), JICA will create a "Growing Utility" that can expand services independently by setting tariffs at a level that allows for cost recovery, improving management efficiency, and expanding the revenue base. In stages (b) and (c), emphasis will be placed on facility improvement and reduction of non-revenue water as the starting point for the growth of the water utility. In stage (b), facility development will focus on investments that lead to improved water services, such as water supply hours, water pressure, service coverage rate, and water quality, while in stage (c), investments that contribute to management efficiency and improvement, such as increasing the number of customers, reducing non-revenue water, installing water meters, and improving energy efficiency, will be emphasized so that the water utility can expand its water services on a self-sustaining basis. In addition, since it is important to strengthen operation and maintenance and management capacities, the know-how of domestic local governments will be utilized. For local governments in Japan, training their own staff and supporting the overseas expansion of local companies are major reasons to get involved in international cooperation, and while continuing knowledge sharing and study sessions for local governments, JICA will strengthen partnerships with domestic local governments that are particularly proactive. Since local governments have capacity constraints, JICA will also work to expand domestic resources, including development consultants, private companies funded or established by local governments, domestic water supply operating companies, and other private companies that are active in overseas development. Since these types fall under the most central part of the scenario envisioned by this cluster strategy, from improvement of water supply services to improvement of water supply management, and since most of the water utilities in developing countries belong to these types, 70% of resources are expected to be allocated to these types. In particular, in the "(b) Basic Service Improvement Support type", facility development is particularly important and requires a large amount of investment funds, so active collaboration with other development partners will be promoted.

- **(d) Sector governance support type:** JICA will target countries that can advanced support by utilizing existing cooperation assets. For the policy system, JICA will collaborate with organizations such as the Ministry of Health, Labor and Welfare and the Japan Water Works Association. To support mobilization of private capital, JICA will aim to expand new partnerships with development partners, private companies such as trading companies, financial institutions, and investors. This type of cooperation has been insufficient in the past, but JICA will envision increasing efforts with a focus on countries where model water utilities have been developed and where cooperation in mobilizing private investment is possible, with

20% of resources to be allocated.

## (2) Financing for the development of targeted approaches

JICA will cooperate to improve water services and increase tariff revenues through facility development. JICA will also provide assistance to strengthen the management capacity of water utilities in an integrated manner. The choice of ODA loan or grant aid is based on (1) whether or not the country is eligible for ODA loans, (2) the creditworthiness of the water utility, and (3) whether or not the government will sub-loan the borrowed funds to the water utility.

PPPs and blended financing will be actively supported for those cases that meet the following two criteria: (1) creditworthiness of the utility, and (2) capacity of the public to mobilize private capital (legal system, procurement, and contract management capacity), or will be supported in parallel with the strengthening of these capacities. The use of Private Sector Investment Finance will also be actively considered.

**Table 2: Financing criteria**

| ODA loan and grant aid | Criteria ①<br>Countries eligible for ODA loans? | Criteria ②<br>Is the water utility eligible for financing? | Criteria ③<br>Is the government subleasing to the water utility? | Finance                   |
|------------------------|---|--|--|---------------------------|
|                        | No  | —  | —  | Grant aid                 |
|                        | Yes   | Yes  | —  | ODA loan                  |
|                        |   | No   | Yes  | Grant aid                 |
|                        |   |  | No   | ODA loan (also grant aid) |

| Mobilization of private funds | Criteria ①<br>Financial condition of water utilities (Creditworthiness)  | Criteria ②<br>Capacity on the part of the public sector for mobilizing private-sector funds   | Finance                |
|-------------------------------|--|---|------------------------|
|                               | <ul style="list-style-type: none"> <li>Level of tariff at which bankable projects can be structured</li> <li>Stable net profit</li> <li>Governance capable of identifying political and financial risks</li> </ul> | <ul style="list-style-type: none"> <li>Environmental improvement in terms of policies, legislation, guidelines, etc.</li> <li>Develop reliable underlying data to enable appropriate risk sharing</li> <li>Transparent procurement system</li> <li>Human resources with knowledge and experience in mobilizing private-sector funds, and the ability to formulate projects, procure funds, and supervise contracts</li> </ul> | PPP<br>Blended Finance |

In technical cooperation, JICA will actively work on management improvement such as non-revenue water reduction, and the development of financing mechanisms such as blended finance and the establishment of a water supply improvement fund.

(a) ODA loans

Since the number of approved projects has decreased by less than half from 5.7 projects/year in 2011-13 to 2.4 projects/year in 2014-18, the formation of projects will be strengthened. To this end, target countries and regions will be selected based on the Cluster Strategy and in coordination with technical cooperation.

(a) Blended finance

JICA will collaborate with leading development partners who have accumulated knowledge. JICA will promote the use of blended finance by improving management of water utilities, forming bankable projects, and promoting sector coordination through technical cooperation.

(c) PPP

PPPs are essential for mobilizing funds to achieve the SDGs and for improving water services. On the other hand, there are not a few cases where problems have arisen, such as slow progress in PPP project formation, opposition by citizens, and inappropriate contracts and contract supervision, mainly due to the characteristics of fixed investment as a public utility, the difficulty of securing profitability, the lack of capacity on the part of the public sector in PPP project formation, procurement, contract supervision, etc., and the political risk surrounding water tariffs. Against this backdrop, many water utilities, including those in developed countries, are still publicly operated, and there are also cases where water supply services have been re-publicized after promoting the use of the private sector, and so, the world is not necessarily in a situation where more and more water utilities are being operated by the private sector.

In accordance with the basics of the drinking water supply service as a public utility, the basic principles are (1) safety, (2) equity, (3) affordability, (4) sustainability, and (5) transparency,<sup>13</sup> and JICA will strengthen the capacity of the public side and promote support for the private side (private sector partnership such as Private Sector Investment Finance), and maximize the development effect by mobilizing the private

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<sup>13</sup> If this basic principle is followed, there would be no need to question whether public or private management. However, in developing countries, most water utilities are publicly owned and operated, and there are only a few small-scale water systems in rural areas that are fully privately owned, including ownership of facilities.

sector as well. Bearing in mind that there are many cases where government subsidies, such as VGF, are required to ensure profitability, support will also be provided for the establishment and operation of systems to control risks.

Since there are still few cases of PPP in the water supply sector in Japan, and JICA's cooperation is also rather limited, JICA will promote staff training and collaboration with development partners such as IFC. JICA will promote collaboration with trading companies that are active players in overseas PPPs and participate in waterworks business operations through M&A of overseas waterworks operating companies.

(d) Use of Private Sector Investment Finance

In order to utilize Private Sector Investment Finance, the following four initiatives will be undertaken. (1) Develop legal systems and make policy proposals to improve the investment environment, (2) Support the improvement of the management of water utilities, (3) Actively disseminate the results of these efforts to corporations, and (4) Formulation of projects that are relatively low-risk and considered easy to commercialize.

Above financing criteria are applied to the different stages of development of water utilities as follows.

| Development stages \ Finance        | Grant Aid                                   | ODA loan | Mobilization of private funds |
|-------------------------------------|---|----------|-------------------------------|
| ① Human Security-Oriented           | Recovery of service delivery                |          |                               |
| ② Basic Service Improvement Support | Improvement of basic service                |          | Challenge area                |
| ③ Water Utility Growth Support      | Improvement of management and profitability |          |                               |
| ④ Sector Governance Support         | Scale-up of model cases                     |          |                               |
|                                     | volume zone                                 |          |                               |

Figure 5: Strategy according to development stages and finance

### **(3) Securing water resources and climate change measures**

Securing water sources is essential as a prerequisite for improving and expanding water supply services. However, due to climate change effects such as extreme rainfall and sea level rise, problems such as water supply restrictions due to drought and salinization of water sources in coastal areas have become apparent and are expected to worsen in the future. Sustainable water supply through securing water resources will contribute to SDG target 6.4 "By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity." This is important as a climate change adaptation measure as well.

The non-revenue water management that this Cluster Strategy is focusing on to improve water service and management are expected to have the effect of creating an effectively available water resource by reducing leakage, which is one of the causes of non-revenue water. In addition, the appropriate collection of water tariff based on the amount of water used will not only contribute to improved management but will also encourage water conservation by customers. Furthermore, for the expansion of water supply, water sources must be secured and developed in a planned manner from a medium to long term perspective. With these points in mind, in implementing the Cluster Strategy, sufficient attention should be paid to securing water sources, improving their sustainability, and promoting climate change adaptation measures.

The Global Agenda "Sustainable Water Resources Management and Water Supply" also addresses the Cluster Strategy "Practical Integrated Water Resources Management to Resolve Water-related Issues in the Field" with respect to water resources management, with the goal of increasing the number of entities responsible for water resources management and multi-stakeholder partnerships as consultative mechanisms to build consensus among stakeholders. In regions where water supply and demand are under pressure or where there are concerns about water resource degradation such as water pollution and declining groundwater levels, JICA will also take into account the concept and initiatives of the above-mentioned Cluster Strategy of integrated water resources management, keeping in mind that comprehensive coordination with other sectors based on the concept of integrated water resources management.

## **4.2 Activities for Maximizing Development Impacts**

### **(1) Deepen the Cluster Strategy**

**(a) Creating knowledge of experience related to water supply**

- Promotion of Knowledge Management: JICA will develop knowledge of good practices and lessons learned in Japanese water utilities and JICA's cooperation, and apply them to human resource development and projects related to water supply. To date, a textbook, "[Japan's Experiences on Water Supply Development](#)" has been published and is widely used. The text was prepared by mobilizing JICA's networks with universities, domestic local governments, the Japan Water Works Association, and other organizations. It touches on issues facing Japan's waterworks industry today, such as the need to renew large numbers of facilities, to cope with a declining population, and to anticipate and flexibly respond to changes in economic and social trends, and also shares with developing countries the problems Japan has experienced and the measures it has taken to deal with them. In addition, the "[Research on Private Sector Participation in Water Supply Services](#)" analyzed PPP trends and discussed cooperation policies. With regard to non-revenue water measures, which play a major role in improving management, the project research "[Key Points on Non-Revenue Water Reduction Projects](#)" was conducted to organize effective approaches for cooperation. JICA will conduct research and analysis on methods of analyzing the management status of water utilities, on how to classify them into four development stages, the means of financing and how to promote it, and external funds availability for scale-up and their utilization.
- Promote "Mainstreaming of Disaster Risk Reduction": JICA will consider flood and inundation countermeasures for water intake facilities and water treatment plants.
- Promotion of multi-sectoral efforts: Since the water sector is also closely related to health, nutrition, education, gender, and other sectors, and synergistic effects between these sectors can be expected, collaboration with these closely related sectors should be promoted.

**(b) Human resource development of water utilities**

- Conduct Knowledge Co-Creation Program, which is one of the technical cooperation that JICA carries out in Japan, and JICA Development Studies Program (scholarship program) utilizing Japanese experience, aiming to develop executive candidates, engineers, and practical personnel of water utilities. JICA Development Studies Program "Water Engineering and Utility Management for Future Leaders" accepts 8 participants per year at the University of Tokyo and Toyo University. JICA will strengthen cooperation with Japan's top-class academic experts in other projects as well.

**(c) Utilization of innovation**

- Actively consider the use of innovations such as open source software, GIS, leak detection using ICT, assessment of pipeline damage risk using AI, and tariff collection using prepaid meters, smart meters, and electronic money, as well as compile and share knowledge on the applicability and considerations for developing countries.

**(2) Dissemination of the Cluster Strategy**

**(a) Promote collaboration with development partners**

- In supporting blended finance and PPPs or capacity building related to them, JICA will collaborate with development partners that have accumulated knowledge and experience upfront. In addition, emphasis will be placed on coordination for scaling up (from good practice to nationwide, from water utilities strengthening to institutional development, and from public funds to public funds + private funds), and collaboration with development partners that complement each other and the use of resources of other organizations will be promoted. In the human security-oriented type, collaboration with humanitarian agencies will be pursued. The following table shows strengths of other development partners and the image of mutual complementarity that leverages JICA's strengths.

**Table 3: Cooperation with development partners**

|   |                      | Strengths of Other Development Partners   | JICA's Strengths   |
|---|----------------------|---|--|
| Mobilization of private funds (PPP, Blended Finance)                              |                      | <ul style="list-style-type: none"> <li>• Knowledge Hub</li> <li>• Leading case study</li> <li>• Transaction Advisory</li> </ul> | <ul style="list-style-type: none"> <li>• Policy and institutional development, support for bankable project formulation, and management improvement support through technical cooperation</li> <li>• Fund mobilization (especially in Asia)</li> </ul> |
| Scale-up  | Facility Investment  | <ul style="list-style-type: none"> <li>• Co-financing</li> </ul>  | <ul style="list-style-type: none"> <li>• Formulation of a model case</li> <li>• Formulation of long-term basic plans (master plans)</li> <li>• Launching the growth process through Grant Aid</li> <li>• Scaling up through ODA loans</li> </ul>       |
|   | Capacity Enhancement | <ul style="list-style-type: none"> <li>• Sector reform</li> </ul>   | <ul style="list-style-type: none"> <li>• Strengths in supporting water utilities</li> </ul>  |
| Human Security-Oriented (fragile states, conflict-affected states, refugee, etc.) |                      | <ul style="list-style-type: none"> <li>• Humanitarian aid</li> <li>• Emergency service delivery</li> </ul>                      | <ul style="list-style-type: none"> <li>• Shift from humanitarian assistance to development cooperation, capacity building on the public side, and reconstruction planning</li> </ul>   |

**(b) Cross-country sharing of knowledge and experience and networking**

- Knowledge/experience sharing and networking: JICA aims to share experiences, raise awareness, and increase motivation across countries, by, for example, regularly holding "Executive Forum for Enhancing Sustainability on Urban Water Service in Asian Region", "Executive Forum for Enhancing Sustainability on Urban Water Service in Sub-Saharan Africa Region", and "Benchmarking Workshop on Non-revenue Water Measures" by three African countries (Kenya, Rwanda, Malawi). Japanese local governments, consultants, and other players will also be involved to share development scenarios, case studies, and knowledge of the Cluster Strategy. In addition, by forming a cross-national network, JICA aims to inspire mutual learning and cooperation outside of JICA's cooperation.
- Implementation of training by developed water utilities: JICA will support water utilities that have increased their capacity through JICA's cooperation to provide training and other cooperation to other water utilities in their own countries and neighboring countries. As a leading example, JICA's technical cooperation projects currently being implemented in other countries are using the Phnom Penh Water Supply Authority in Cambodia, which is famous for its remarkable transformation of water supply service and organization, for training. This has also led to cases where water utilities in other countries have visited Phnom Penh with their own budgets, and Phnom Penh Water Supply Authority personnel trained with JICA's cooperation have served as lecturers, customizing the training content to suit the actual situation in the partner country.

**(c) Strengthening the capacity of domestic cooperative human resources**

- In JICA's technical cooperation, Japanese local government officials and consultants are dispatched to partner countries as Japanese experts. Therefore, it is important to develop these human resources. JICA will provide capacity-building training for prospective experts and others from Japanese local governments, as well as hold regular study sessions for local governments and consultants. JICA has held study sessions for about 25 Japanese local governments, business venture financed jointly by the public and private sectors, the Japan Water Works Association, and other organizations, as well as JICA staff, totaling about 100 people. This will promote understanding of the Cluster Strategy and stimulate cooperation that contributes to the goals of the strategy, as well as create a network of municipalities interested in international cooperation in the water supply sector and stimulate mutual learning among them.



**(d) Inspiring the participation of domestic development actors (municipalities, private companies, etc.)**

- JICA will promote the participation of Japanese companies in the operation and maintenance of water utilities, disseminate the concept of "High Quality Infrastructure," improve the institutional environment, create matching opportunities through training programs, utilize promising technologies in technical cooperation, support the international cooperation by local governments, encourage the participation of the business venture financed by local governments, encourage private companies involved in the operation and maintenance of water utilities in Japan to develop their business overseas, and disseminate information on the needs of developing countries. Since some local governments and private companies have formed public-private councils, JICA will also consider using these existing platforms.
- Private sector participation can take many forms, including not only infrastructure investment through PPPs, etc., but also technological innovation in individual products and services, and CSR initiatives, etc. Therefore, approaches will be tailored to each industry and business category.

**(e) Platform promotion system**

- Establish a team of JICA staff to conduct knowledge work. Secure staff to support information collection, organization, and dissemination.

**(3) Platform activities**

- Knowledge Co-Creation Program (Training in Japan): 7 courses/year
  - JICA is implementing Knowledge Co-Creation Program (Training in Japan) through the partnerships with Japanese water utilities, Japan Water Works Association (JWWA), and Japan International Corporation of Welfare Services (JICWELS). JICA will share the concept of the Cluster Strategy with these partners. The concept of the cluster strategy and good practices will be summarized in online educational materials, which will be made available for reference to participants in the training programs. In this way, the number of water utilities promoting initiatives in line with the concept of the Cluster Strategy will be increased.
- JICA Development Studies Program (scholarship program): 8 students/year / JICA Chair
  - JICA Development Studies Program (JICA-DSP) invites future leaders from partner countries to Japan, and offers them the opportunity to learn about

Japan's modernization and development experiences and its wisdom as a country that provided cooperation toward the progress of developing countries after World War II. In order to expand the opportunities of such Japanese studies in partner countries as well, JICA started the "JICA Chair (JICA Program for Japanese studies)" in collaboration with leading universities in partner countries.

- "Water Engineering and Utility Management for Future Leaders" is one of the JICA-DSP courses, accepting about 8 participants per year at the University of Tokyo and Toyo University. JICA will support the participants to develop their problem-solving skills and become future leaders, as well as to create a network among them. In addition, JICA will support the participants to play an active role as a core member of JICA counterparts, water utilities, and competent authorities after they return to their home countries.
  - JICA utilizes a video lecture on Japanese water supply development for JICA Chair by the supervisor of the JICA-DSP.
- South-south cooperation and knowledge-sharing meetings: 2 per year
    - JICA will raise awareness and inspire other water utilities to take action through hands-on observation of good examples of "Growing Water Utilities" and sharing of the process. In this way, the number of water utilities that promote initiatives in line with the concept of the Cluster Strategy will be increased.
  - Invitations and international forums: 1 per year
    - By sharing good practices and examples of initiatives toward "Growing Water Utilities," JICA will raise awareness and inspire other water utilities to take action. Executive forums will be held in Asia and Sub-Saharan Africa, respectively. This will increase the number of water utilities that promote initiatives in line with the concept of the Cluster Strategy.
  - Project research and knowledge management activities: 1 project/year
    - JICA will collect evidence on hypotheses and development scenarios for the Cluster Strategy, improve cooperative approaches, review results and identify lessons learned, collect and analyze information on new cooperative approaches, and disseminate the results widely.
  - Capacity building training for the candidates of JICA experts: 1 case/year
    - This program will be conducted mainly for candidates of JICA experts and operation staff of international cooperation in Japanese local governments to

share ideas and good practices of the Cluster Strategy.

- Local government study groups, consultant study groups: 4 workshops/year
  - Share the concept of the Cluster Strategies and good practices with Japanese local government officials and consultants, who are the main players in JICA's cooperation.
- Support staff: Continuous assignment during the term
  - The personnel will be assigned to the platform activities as described above.

## 5. Goal, Targets, and Indicators

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### 5.1 Goal/Targets and Indicators

The following is envisioned as the logical path (logic) for the realization of the objectives and vision of this Cluster Strategy. The implementation of the cooperation based on the Cluster Strategy will strengthen water production capacity (water sources and water treatment plants), reduce the non-revenue water ratio in pilot areas, and develop the capacity of water utility staff and strengthen organizational capacity (Direct Outcomes). The number of people supplied with drinking water in the target countries will increase and the management of water utilities will improve (Intermediate Outcomes). The increase in the service population and improved management of the water utility will repeat the growth spiral of the water utility, and more water utilities will move into the "Growing Water Utility" stage, where they can independently raise funds to expand and improve water services, or higher development stages (Final Outcomes). Thereby universal and equitable access to safe drinking water will be realized (Vision).

Specific Vision, Final Goal, Indirect Targets, and Direct Targets are as follows

#### <Vision>

- "Universal and equitable access to safe drinking water"  
(included in SDG Target 6.1 "Achieve universal and equitable access to safe and affordable drinking water for all")

#### <Final Goal>

- By 2030, more than 40 water utilities will move to the "Growing Water Utility" stage, where they can independently finance and improve and expand water services, or the higher of the four stages of development (Note: target number

of utilities by the end of FY2026 is 36)

Indicators: Indicators according to the four stages of development are under consideration.

#### < Indirect Targets >

- More than 40 water utilities will have improved management indicators by 2030  
(Note: Target number of entities by the end of FY2026 is 36)

Indicators: Indicators according to the four stages of development are under consideration.

- Service population will increase by more than 30 million by 2030  
(Note: The target water supply population by the end of FY2026 is 21 million)

Indicator: Service population increased by JICA's cooperation

#### < Direct Targets >

- By 2030, the organizational capacity of 40 utilities will be strengthened  
(Note: Target number of utilities by FY2026 is 36)

[State of overall organizational capacity of water utilities/Indicator: Number of utilities with improved organizational capacity indicators]

- Capacity of 100,000 utility employees to be developed by 2030  
(Note: The target number of employees by FY2026 is 50,000)

[State of organizational capacity (staff behavior) of water utilities/Indicator: Number of staff with improved capacity]

- Non-revenue water rates in pilot areas of 40 utilities will be reduced by 2030  
(Note: Target number of utilities by FY2026 is 36)

[State of organizational capacity (function) of water utilities/Indicator: Number of utilities with decreased non-revenue water rate].

- By 2030, 40 utilities will have enhanced water production capacity (water sources and water treatment plants)  
(Note: The target number of utilities by FY2026 is 36)

[State of organizational capacity (facility and equipment) of water utilities/Indicator: Number of utilities with improved water production capacity].

The target level of 40 utilities is set based on the volume of projects underway and planned for implementation, and will lead to a transition to the higher stages along the four development stages by working with other development partners. Emphasis will be placed on the development of water utilities that can not only simply increase the number of people they serve, but can also independently finance and expand their operations to accommodate population growth.

As indicators to judge the development stage and improvement status, the following indicators are considered: water supply coverage rate, water supply hours, and water

quality standards compliance rate for purified water, etc. as indicators of service level, and current account balance, non-revenue water rate, tariff collection rate, and tariff level, etc. as indicators of management status.

## **5.2 Monitoring Framework**

Monitoring shall be conducted using the following "Monitoring Table".

**[Cluster-wide Goal/Targets and Indicator]:** Subject of performance evaluation

|                                    |   |
|------------------------------------|---|
| <b>Goal/Targets and Indicators</b> | <p><b>(1) Final Goal</b></p> <ul style="list-style-type: none"> <li>• More water utilities will move to the "Growing Water Utility" stage or higher development stages, where they can independently raise funds to expand and improve water services [36 utilities by FY2026, 40 utilities or more by FY2030]</li> </ul>   |
|                                    | <p><b>(2) Indirect Target</b></p> <ul style="list-style-type: none"> <li>• Improvement of management indicators [36 utilities by FY2026, 40 utilities or more by FY2030]</li> <li>• Increase population served [21 million by FY2026, 30 million by FY2030]</li> </ul>  |
|                                    | <p><b>(3) Direct Target</b></p> <ul style="list-style-type: none"> <li>• By 2030, Organizational capacity of 40 utilities will be strengthened (Note: Target number of utilities by FY2026 is 36)</li> </ul> <p>[Status of overall organizational capacity of water utilities/Indicator: Number of utilities with improved organizational capacity indicators]</p> <ul style="list-style-type: none"> <li>• Capacity of 100,000 utility employees to be developed by 2030 (Note: The target number of employees by FY2026 is 50,000)</li> </ul> <p>[Status of organizational capacity (staff behavior) of water utilities/Indicator: Number of staff with improved capacity]</p> <ul style="list-style-type: none"> <li>• Non-revenue water rates in pilot areas of 40 utilities will be reduced by 2030 (Note: Note: Target number of utilities by FY2026 is 36)</li> </ul> <p>[Status of organizational capacity (function) of water utilities/Indicator: Number of utilities with decreased non-revenue water rate]</p> <ul style="list-style-type: none"> <li>• By 2030, 40 utilities will have enhanced water production capacity (water sources and water treatment plants) (Note: The target number of utilities by FY2026 is 36)</li> </ul> |

|  |  |
|--|--|
|  | [Status of organizational capacity (facility and equipment) of water utilities/Indicator: Number of utilities with improved water production capacity] |
|--|--|

**【Monitoring Indicators】:** The following indicators are applied to monitor the outcomes of respective projects and the overall progress of the strategy.

|                                  | <b>【1<sup>st</sup> development stage】</b>  | <b>【2<sup>nd</sup> development stage】</b>  | <b>【3<sup>rd</sup> development stage】</b>   | <b>【4<sup>th</sup> development stage】</b>   |
|----------------------------------|--|--|---|---|
| <b>(4) Intermediate Outcomes</b> | <p><b>Human security-oriented type</b></p> <ul style="list-style-type: none"> <li>•Service delivery is restored.</li> <li>•Service level is still inadequate.</li> <li>•The operation and management capacity of the water utility is low.</li> <li>•Tariff revenues are low.</li> </ul> | <p><b>Basic service improvement support type</b></p> <ul style="list-style-type: none"> <li>•Reach a certain level of service.</li> <li>•Satisfaction and willingness to pay for services of customers improved.</li> <li>•Reach a certain level of tariff collection rate.</li> <li>•Management is still inefficient and net profit is low.</li> <li>•It is still difficult to raise funds for expansion of water supply facilities.</li> </ul> | <p><b>Water utility growth support type</b></p> <ul style="list-style-type: none"> <li>•Management efficiency improved.</li> <li>•Tariff revenues increased.</li> <li>•Net profit increased, and financing for facility investment became possible.</li> <li>•A model of a "Growing Water Utility" created.</li> <li>•There is a model, but it is still not nationwide. There are governance issues that need to be addressed.</li> </ul> | <p><b>Sector governance support type</b></p> <ul style="list-style-type: none"> <li>•Model cases spread throughout the country.</li> <li>•Private sector funds are also included in the financing.</li> </ul> |

|  |                         |  |                         |  |   |  |
|--|-------------------------|--|-------------------------|--|---|--|
| <b>(5) Monitoring indicators of intermediate outcomes<sup>14</sup></b> | Water Service           | (a) Service population (number of customers) |                         |  |   | <ul style="list-style-type: none"> <li>• Increase in the number of service population throughout the country</li> <li>• Increase in water supply coverage nationwide</li> <li>• Improvement of the development stages of water utilities nationwide</li> </ul> |
|  |                         | (b) Water supply coverage rate               | Less than 50%           | 50% to 80%   | 80% or more                               |  |
|  |                         | (c) Water production capacity                |                         |  |   |  |
|  |                         | (d) Water supply time                        | Less than 12 hours/day  | 12-24 hours/day                                      | 24 hours/day                              |  |
|  |                         | (e) Water quality                            | Untreated, turbid water | Water quality standard compliance rate less than 80% | Compliance with water quality standards   |  |
|  |                         | (f) Customer Satisfaction                    |                         |  |   |  |
|  |                         | (g) Water supply pressure                    | low water pressure      | instability  | Stable and within standard values         |  |
|  | Water Supply Management | (h) Accounting system                        |                         |  | Aiming for Public Company Accounting      |  |
|  | (i) Tariff level        |  |                         |  | Aim for a level of sustainable investment |  |

<sup>14</sup> The indicator values for each development stage are only a guide, and the development stages will be examined by comprehensively considering the characteristics of individual water utilities, and the indicator value guidelines themselves will be reviewed based on the results of monitoring data collection.



|  |   |             |            |                         |  |
|--|---|-------------|------------|-------------------------|--|
|  | (j) Tariff collection rate                |             |            | Aim for 100%.           |  |
|  | (k) Non-revenue water rate                | 40% or more | 25% to 40% | Less than 25%           |  |
|  | (l) Meter installation rate               |             |            | Aim for 100%.           |  |
|  | (m) Leakage rate                          |             |            |                         |  |
|  | (n) Net sales                             |             |            |                         |  |
|  | (o) Net profit                            |             |            |                         |  |
|  | (p) EBITDA                                |             |            |                         |  |
|  | (q) EBITDA Margin                         |             |            | Aim for 40% or more     |  |
|  | (r) Return on assets                      |             |            |                         |  |
|  | (s) Ordinary profit ratio                 |             |            | Aim for more than 10%.  |  |
|  | (t) Capital adequacy ratio                |             |            | Aim for 40% or more     |  |
|  | (u) Fixed assets to fixed liability ratio |             |            | Aim for less than 100%. |  |

|  |   |  |  |  |
|--|---|--|--|--|
| <p><b>(6) Immediate outcomes</b></p>                       | <ul style="list-style-type: none"> <li>•Water facilities are restored.</li> <li>•Staff with rudimentary operation and maintenance capabilities are in place.</li> </ul> | <ul style="list-style-type: none"> <li>•Facilities necessary for service improvement are established.</li> <li>•Standard Operating Procedures (SOPs) are in place.</li> <li>•Customer service is in place.</li> <li>•Performance monitoring is in place.</li> <li>•Basic non-revenue water control measures are in place.</li> <li>•Tariff collection system is in place.</li> </ul> | <ul style="list-style-type: none"> <li>•The management plan is formulated and the PDCA cycle is implemented.</li> <li>•Facilities are upgraded to improve tariff revenue and management efficiency.</li> <li>•Advanced non-revenue water control are in place.</li> <li>•The utility is taking steps to improve its financial and managerial performance, such as corporate accounting, volumetric tariff collection, and setting tariff levels that take cost recovery into account.</li> </ul> | <ul style="list-style-type: none"> <li>•The governance and regulatory system is in place to improve the level of water services throughout the country.</li> <li>•A very long-term, low-interest financing system is in place.</li> <li>•Long-term facility development plans are in place.</li> </ul> |
| <p><b>(7) Monitoring indicators of direct outcomes</b></p> | <ul style="list-style-type: none"> <li>•Status of facilities needed to restore service delivery (water supply capacity, etc.)</li> </ul>                                | <ul style="list-style-type: none"> <li>•Status of facilities improvement for service improvement (block division of pipe network, improvement of</li> </ul>  | <ul style="list-style-type: none"> <li>•Status of facilities to improve tariff revenue and management efficiency (expansion of pipe network, pipe</li> </ul>   | <ul style="list-style-type: none"> <li>•Status of legal systems, training, etc. based on the experience of model water utilities</li> </ul>  |

|  |  |   |  |   |
|--|--|---|--|---|
|  | <ul style="list-style-type: none"> <li>• Number of staff with increased capacity for rudimentary facility operation and maintenance</li> </ul>   | <ul style="list-style-type: none"> <li>service reservoirs and water treatment plants, expansion of pipe network, etc.)</li> <li>• Number of staff with improved capacity to improve services</li> </ul>   | <ul style="list-style-type: none"> <li>renewal, energy efficiency, installation of water meters, etc.)</li> <li>• Number of staff with improved capacity to improve management</li> </ul>  | <ul style="list-style-type: none"> <li>• Status of institutional development for fund mobilization and number of fund mobilization</li> </ul>   |
| <p><b>(8) Solution</b><br/><b>(Output of activities)</b></p> | <p><b>(a) Human security-oriented type</b></p> <ul style="list-style-type: none"> <li>• Reconstruction planning</li> <li>• Recovery of facilities</li> <li>• Fostering rudimentary operation and maintenance skills</li> </ul> | <p><b>(b) Basic service improvement support type</b></p> <ul style="list-style-type: none"> <li>• Improvement of facilities to improve basic water supply services (water supply hours, water quality, water supply coverage, etc.)</li> <li>• Improvement of operation and maintenance capabilities to improve basic water supply services</li> <li>• Improvement of basic management skills such as customer service and tariff collection</li> </ul> | <p><b>(c) Water utility growth support type</b></p> <ul style="list-style-type: none"> <li>• Improvement of capacity leading to improved management (non-revenue water reduction, tariff collection, etc.)</li> <li>• Facility improvements leading to customer expansion and management efficiency (pipe network expansion, pipe line renewal, pump renewal, meter installation, etc.)</li> </ul> | <p><b>(d) Sector governance support type</b></p> <ul style="list-style-type: none"> <li>• Scaling up model cases</li> <li>• Sector governance support</li> <li>• Fund mobilization support</li> </ul> |

The method and frequency of indicator collection are shown in the table below.

| category                  |  | Indicator   | Collection method/frequency, collection system, etc.  |
|---------------------------|--|---|---|
| Output-outcome monitoring | Performance evaluation<br>(Mid-term target)            | <p><b>【Qualitative Indicators】</b><br/>Proactive and sustainable water resources management will be strengthened and the operation and management of water utilities will be improved.</p> <p><b>【Quantitative Indicators】</b><br/>Number of human resources trained in water supply and the increased number of service population.<br/>(Number of trained personnel: 100,000 by 2030; Water supply population: more than 30 million by 2030)<br/>(Corresponds to indicator 6.1.1 "Proportion of population using safely managed drinking water services" of SDG target 6.1)</p> | <p><b>【Qualitative Indicators】</b><br/>Once a year (assumed to be at the end of the fiscal year), indicators related to water service and management will be extracted and analyzed from the progress reports and other documents of each cooperation.</p> <p><b>【Quantitative Indicators】</b><br/>The number of human resource development is counted as mainly the total number of participants in technical cooperation counterparts, training programs, seminars, etc. The increase in the service population, mainly due to financial cooperation, is counted at the time the cooperation is committed. The frequency of collection will be once a year (end of the fiscal year is assumed).</p> |
|                           | Cluster evaluation<br>(Achieved with JICA's resources) | <p><b>【Final Outcome】</b><br/>Number of water utilities that have reached the "growing water utility" stage or have moved to the higher of the four development stages.<br/>(more than 40 by 2030)</p> <p><b>【Interim Outcome】</b><br/>Number of water utilities with improved management indicators<br/>(more than 40 by 2030)</p>   | <p><b>【Final Outcome】</b><br/>Once a year (assumed to be at the end of the fiscal year), indicators related to water service and management will be extracted and analyzed from the progress reports and other documents of each cooperation.</p> <p><b>【Interim Outcome】</b><br/>Once a year (assuming the end of the fiscal year), management indicators such as net profit, non-revenue</p>  |

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|-----------------|---|--|---|
|                 |   | <p><b>【Direct Outcome】</b><br/> Strengthening of organizational capacity in water utilities, improvement of water production capacity including securing water sources, reduction of non-revenue water, improvement of customer satisfaction, etc.<br/> (More than 40 by 2030)</p>   | <p>water rate, etc. will be extracted and analyzed from the progress reports and other documents of each cooperation.</p> <p><b>【Direct outcome】</b><br/> Once a year (end of the fiscal year is assumed), analysis will be made from the progress reports and other documents of each cooperation, etc.</p>          |
|                 | <p>Scoring element<br/> (Achieved by mobilizing external resources)</p> | <p>Number of water utilities that have reached the "Growing Water Utility" stage or have moved into the higher of the four development stages.<br/> (Mobilize external resources to accelerate achievement and increase the degree of improvement)</p> <p>Increased service population<br/> (Aim for a larger service population by mobilizing external resources)</p> | <p>Once a year (assumed to be at the end of the fiscal year), analysis will be made from the progress reports and other documents of each cooperation.</p> <p>Once a year (assumed to be at the end of the fiscal year), analysis will be made from the progress reports and other documents of each cooperation.</p> |
| <b>Evidence</b> |   | <p>R. Ogata, S. Segawa, S. Rashidc and H. Nakayama (2021): Revenue augmentation through improved water supply services: a case study of the SMART-WASA team of Faisalabad, Pakistan, Journal of Water, Sanitation and Hygiene</p>  | <p>The effectiveness of the development scenarios in each collaboration and the evidence for the key concepts will be reviewed by selecting regions with high potential for meaningful findings and conducting case studies.</p> <p>Evidence will also be</p>   |

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|  | <p>for Development (2021) 11 (6): 1097-1101.<br/> <a href="https://doi.org/10.2166/washdev.2021.064">https://doi.org/10.2166/washdev.2021.064</a></p> <p>R. Ogata, S. Matsumoto, M. Takara, L. Semi Lesa, K. Ujike: Sustainable Management of a Water Supply Utility in Samoa islands through Water Services Improvement and in Cooperation with Okinawa Water Supply Bureau (Waterlines Vol. 41, No. 2, pp. 96-106)<br/> Other JICA cooperation results for Cambodia, Tajikistan, etc.</p> | <p>accumulated through literature reviews (including preparation of review articles) and impact evaluations.</p> <p>Through these, the development scenarios and key concepts will be reviewed and revised as necessary.</p> <p>Based on the results of the monitoring, the progress of the Cluster Strategy in each country, the status of platform activities, and the collection of evidence on development scenarios and key concepts will also be compiled and reported.</p> |
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