

The installation of Emergency Water supply Taps passed through the Great East Japan Earthquake

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ABSTRACT

The Great East Japan Earthquake (3.11) caused the suspension of water supply to 500,000 customers, equal to half the population of Sendai City. In our response activities to this widespread suspension of service, there was **a shortage of human resources** due to enormous works to be done, such as restoration of damaged facilities, emergency water supply, and answering telephone inquiries from customers. We gave priority to restoration of facilities, as a result, we could allocate only a limited number of staff members for emergency water supply activities. As a solution from this shortage of human resources, we are undertaking a project to install **"Emergency Water supply taps (ground type) (EW taps)"** at every municipal elementary school, and also, tackling **educational activities** to allow citizens to actively participate in emergency water supply as key players.

Preparations and Evaluation

Emergency water supply facilities

Previously, we had established the following **emergency water supply facilities (3types,65 locations)** in preparation for "the Miyagi-oki Earthquake" in 37-year cycles. Any facility was designed supposing Water Works Bureau staff members to set up and operate.



Figure1 - Emergency drinking water storage tank

(21 locations)

Water storage tanks with a capacity of 100m3 are installed underground in schools or parks.



Figure2 - Emergency water supply taps [main pipe type] (24 locations)

They are constructed in earthquake-resistant distribution mains laid under the road.



Figure3 - Water reservoir with Emergency stop valves

(20 locations)

Emergency stop valves are automatically shut when a disaster strikes.

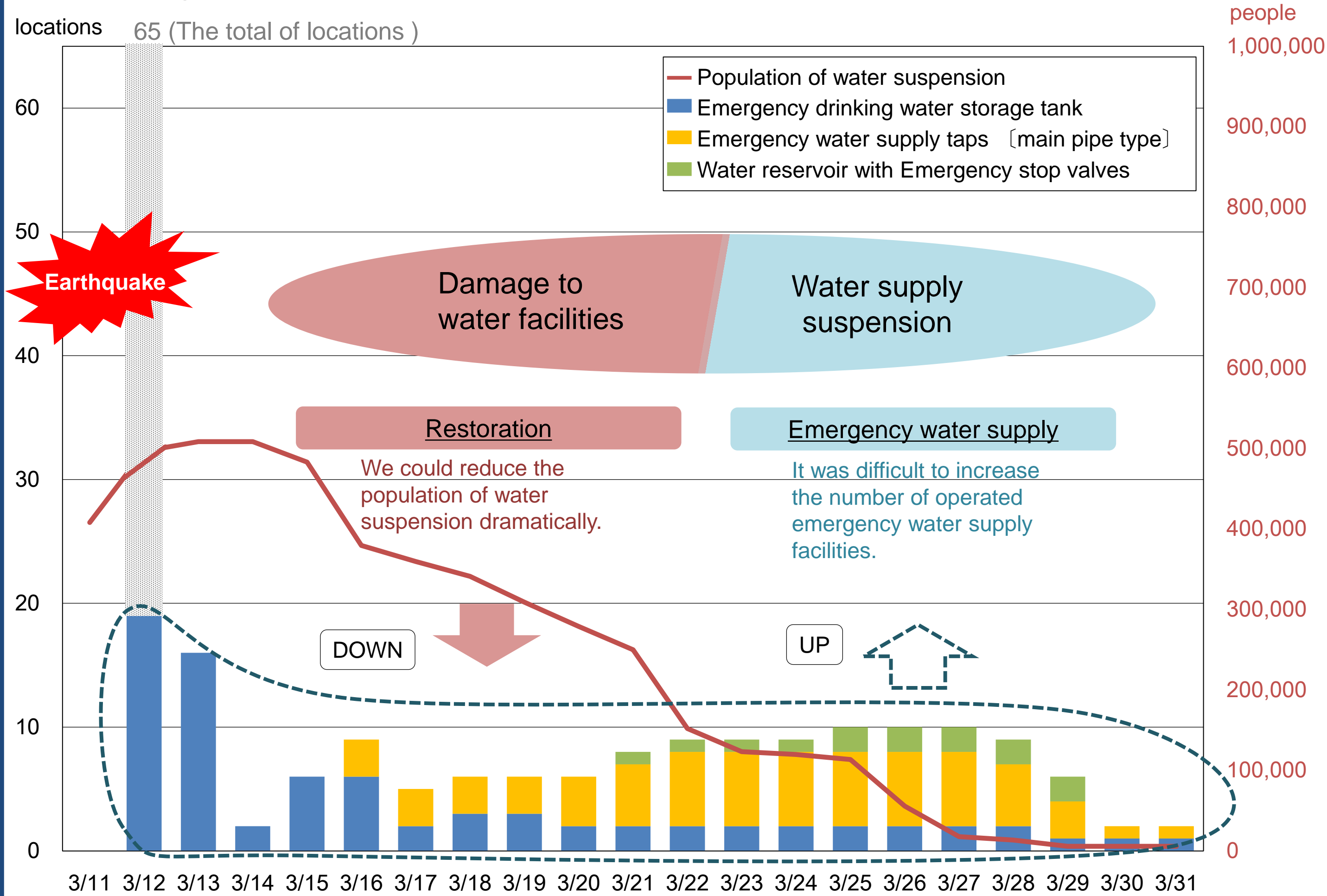


Figure4 - The timeline of Population of water suspension and Operated emergency water supply facilities

A long line is snaking its way to the emergency water supply facilities.

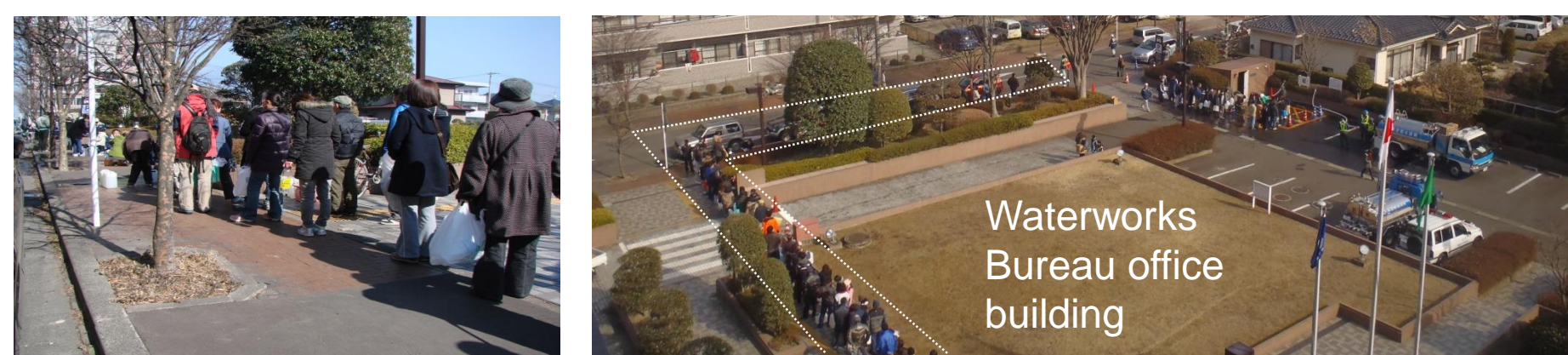


Figure5 - Citizens waiting for water supply

Analysis and Solution

Previous System

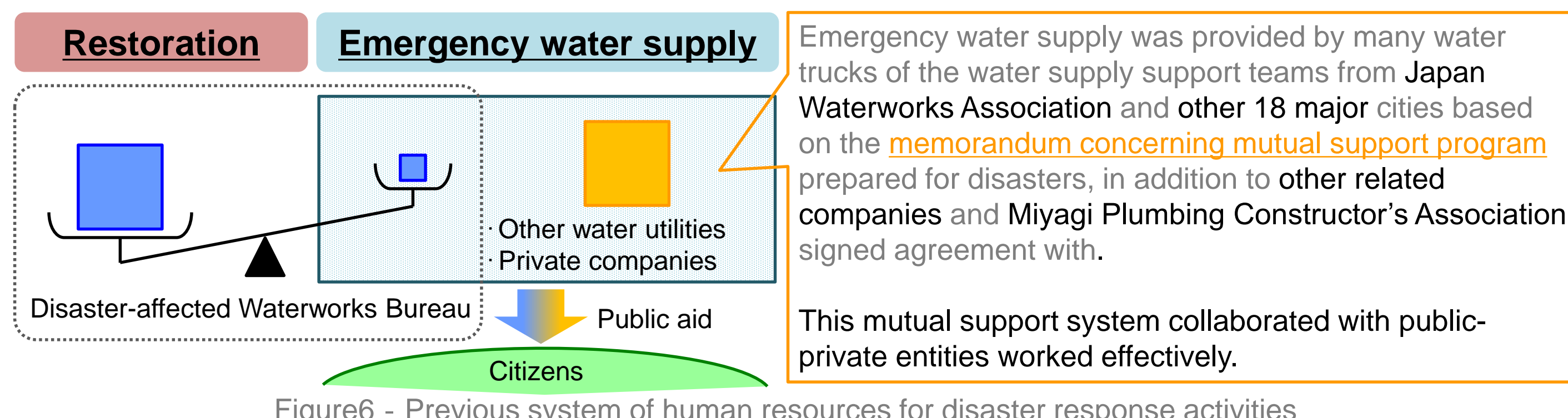


Figure6 - Previous system of human resources for disaster response activities

For the Disaster-affected Waterworks Bureau, highest priority should be given to restoration of damaged facilities, however, this also meant that **only a limited number of staff members could be allocated for emergency water supply activities**. As a result, many emergency water supply facilities had not been set up due to **the shortage of human resources**.

New System

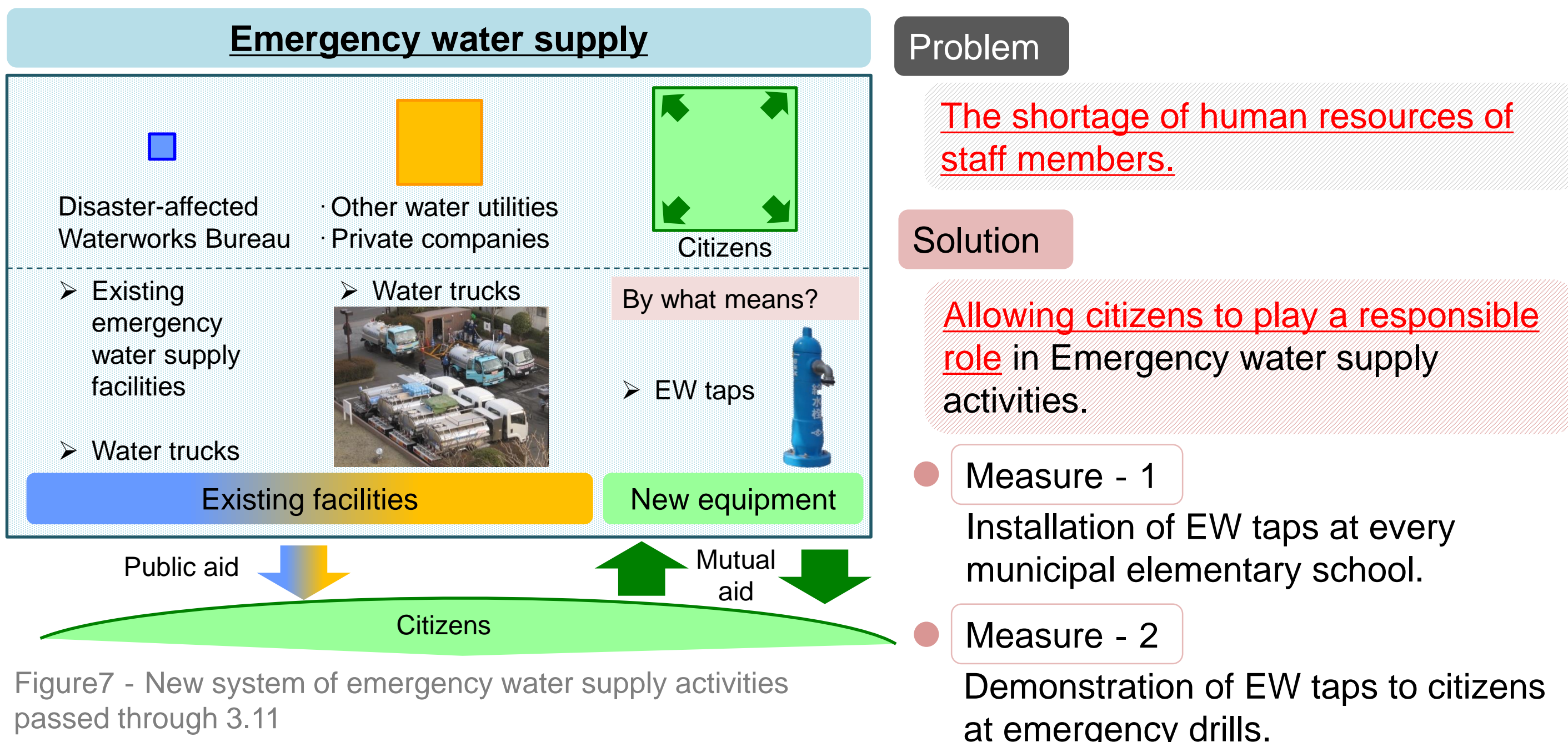


Figure7 - New system of emergency water supply activities passed through 3.11

Measure - 1 (Installation of EW taps)

Features of EW taps

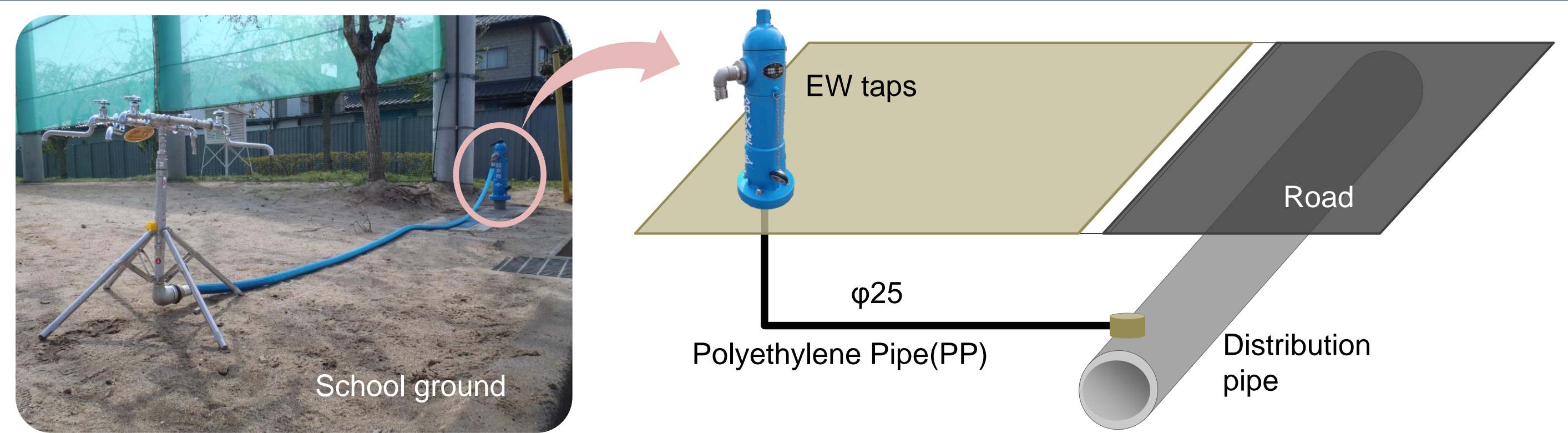


Figure8 - Schematic of EW taps

1) **EW taps will allow citizens to set up water supply stations on their own in a disaster.**

➢ Tools for setting up are kept in an emergency depot.



Figure9 - Tools for setting

➢ It's safe to use and easy to handle.

The tools are light enough to carry. And it's suitable water pressure for water supply.

2) **It's possible to set up water supply stations within the walking range (1km).**

➢ We are undertaking a project to install at every municipal elementary school.

3) **EW taps are equipment remodeled from the existing fire hydrant.**

➢ The cost of construction is considerably lower compared with that of other emergency water supply facilities.

The cost of construction for an Emergency drinking water storage tank is approximately equal to **80** EW taps cost of that.



Figure10 - The comparison of the cost

Measure - 2 (Demonstration of EW taps)

Who	Waterworks Bureau staff members to citizens
When	At emergency drills in communities.
Where	At municipal elementary schools
What	How to set up and use EW taps.
Why	In order to promote citizen cooperation in emergency water supply activities.



Figure11 - Demonstration of EW taps at emergency drills

Framework to operate Evacuation center

Municipal elementary schools are specified as the place of refuge for disaster victims in Japan. So, we decided to install EW taps at Municipal elementary schools to cooperate with citizens.

From our experiences, we learned the importance of **individual self-help** and of **mutual assistance**, mainly carried out by **community groups**. So, Sendai City decided to organize a **"Evacuation center steering committee"** for each evacuation center. Evacuation center steering committee consists of **local communities** and **Public facilities staff members and Teachers** and **City officers**.

In order to make operation of the evacuation center smooth and raise the community's disaster-prevention and disaster-response ability, they hold preparatory meetings and emergency drills **every year**.

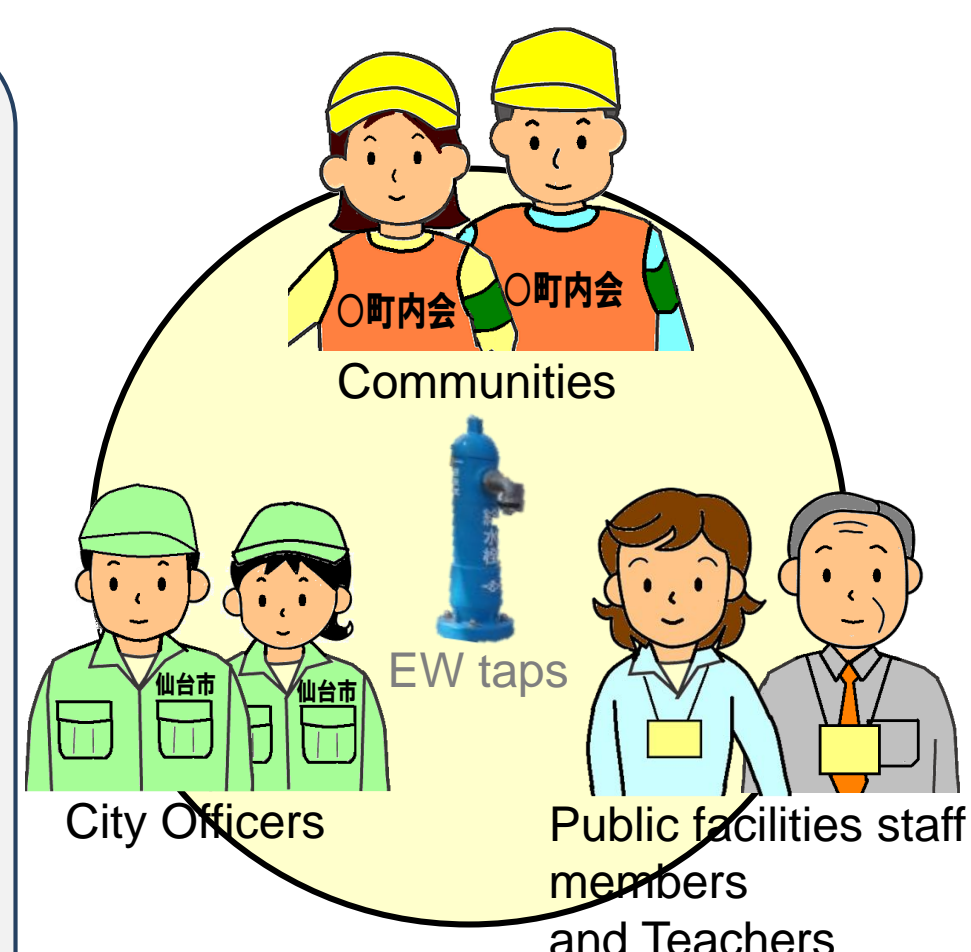


Figure12 - Evacuation center steering committee

Future Image

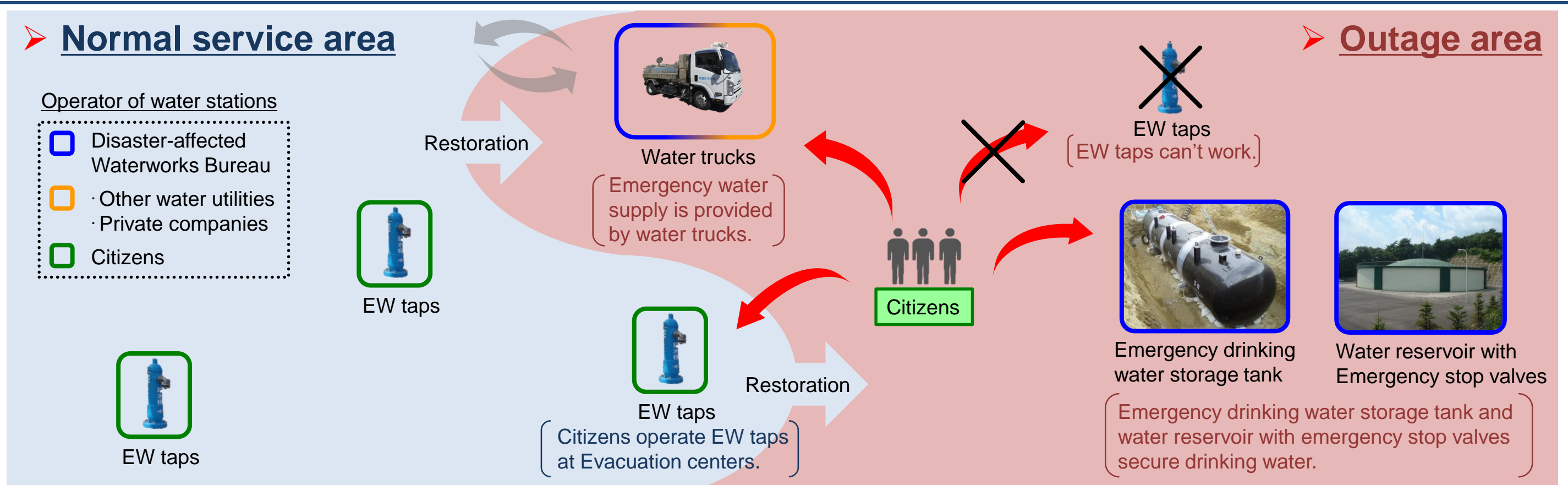


Figure13 - New system of emergency water supply activities

In case of disasters, it's very important to provide citizens more opportunities for accessing to emergency water supply. We are going to supply water by **combining various facilities and equipment** in the disasters.