

Kumamoto, a World Renowned City of Groundwater Conservation: Collaborative Efforts in Groundwater Conservation beyond Municipal Boundaries



Background and Reason for the Project

Kumamoto City has been blessed with pure groundwater since ancient times, and has utilised it for various purposes. However, with the improvement of living standards and economic development, there have been issues with an increase in demand for groundwater and a decrease in the amount of spring water.

Therefore, for two years from 1973 to 1974, Kumamoto Prefecture and Kumamoto City jointly conducted a 'Kumamoto City and Surrounding Areas Groundwater Survey', which came to the conclusion that the amount of groundwater runoff exceeded that of groundwater recharge.

Furthermore, due to plans for constructing apartments near the water source area, nearby residents expressed concerns about the impact on the water source and started an opposition movement. In response, Kumamoto City conducted further investigations.

As a result of these issues, public interest in groundwater gradually increased, leading to the resolution of the 'Declaration of Groundwater Conservation City' by the Kumamoto City Council in 1976, aiming to 'permanently preserve the limited groundwater and pass it down to future generations.' Since then, the city has been working on groundwater conservation for over 40 years.

Project Aims

To conserve groundwater, which covers 100% of the water supply for the city's 740,000 residents, in terms of both quality and quantity.

To collaborate with 11 municipalities (below referred to as the Kumamoto region) that share groundwater and work together on a wide-ranging groundwater conservation effort.

To position water as a strategic resource for enhancing the appeal of Kumamoto City and establish it as part of the city's brand.

Project Outline

1. Preservation of Groundwater Quality

Operation of the 'Eastern Composting Centre', with the goal of preventing groundwater pollution caused by nitrate nitrogen.

2. Preservation of Groundwater Quantity

Implementation of projects such as flooding rice paddies in the middle basin of the Shirakawa River and encouraging citizens to save water.

3. Preservation of Groundwater through Wide-ranging Collaboration and Cooperation

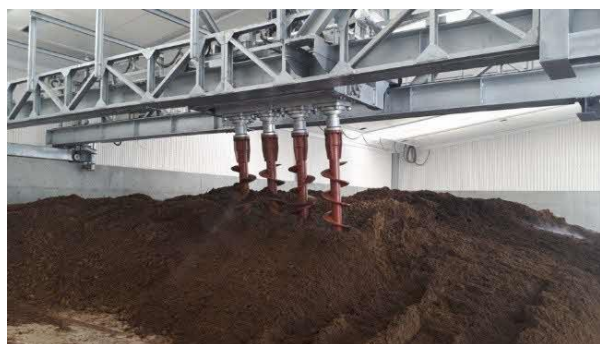
Engagement in wide-ranging groundwater conservation efforts through financial contributions to the 'Kumamoto Groundwater Foundation', a public interest corporation.

4. Promotion of the Kumamoto Water Brand
Creation and promotion of the city's brand featuring a unique water culture and local characteristics.
5. Utilisation of Groundwater in Disaster Response
Preparation for disasters by signing agreements with local companies for the establishment of emergency wells.

Special Features and Innovations

1. Preservation of Groundwater Quality

In April 2019, as the first composting facility in Japan aimed at preventing groundwater pollution, Kumamoto city established the 'Eastern Composting Centre' to reduce nitrate nitrogen. This facility ferments livestock excrements to produce high-quality compost, which is then used by surrounding farms to prevent an increase in nitrate nitrogen concentration. Additionally, a mechanism of circulation through wide-area distribution is established by selling some of the compost at home centres and other outlets.



The process of compost production at the East Composting Centre in Kumamoto City.

2. Preservation of Groundwater Quantity

(1) Project of flooding rice paddies in the middle basin of the Shirakawa River

The rice paddies in the Shirakawa middle basin, which extends across Kumamoto City's eastern area and neighbouring towns Ōzu and Kikuyō, have a unique geological structure that allows water to penetrate 5 to 10 times more easily compared to typical rice paddies. This area is crucial for groundwater recharge in the Kumamoto

region. Kumamoto City collaborates with Ōzu, Kikuyō, and local land improvement districts to conduct the rice paddy submergence project, artificially flooding of rice paddies in this area. Kumamoto City, downstream from this area, provides subsidies to farmers who cooperate in this project.



Flooding of rice paddies in the middle basin of the Shirakawa River in Kumamoto City.

(2) Water Conservation Campaign

Since 2005, efforts have been made in collaboration with citizens and businesses to reduce domestic water usage, which accounts for 80% of total water consumption. These efforts include organizing parades to promote water conservation and conducting awareness campaigns through various media channels.

(3) Supporting Rainwater Penetration

In urbanized areas, measures are taken to increase rainwater infiltration. The 'Kumamoto City Groundwater Conservation Ordinance' mandates the installation of rainwater penetration facilities during development and construction projects. Guidance is provided during pre-construction surveys and other administrative procedures. Additionally, Kumamoto City offers its own subsidy program for the installation of rainwater penetration pits.

3. Conservation of Groundwater through Wide-range Collaboration and Cooperation

In order to address groundwater conservation

across municipal boundaries and to engage residents, businesses, and administrations in a unified effort, the 11 municipalities in the Kumamoto region established the 'Kumamoto Groundwater Foundation', a public interest corporation, in 2012. This foundation conducts four public interest projects, including groundwater environmental surveys, complementing the efforts of the prefectural and municipal governments to conserve groundwater. Kumamoto City contributes financially to this foundation.

4. Promotion of the Kumamoto Water Brand

(1) Kumamoto Water Guardians (Mizumori)

The city has registered the nickname 'Mizumori' to promote the protection of water and water culture, as well as the fascination of water. This initiative involves training individuals and providing related information.

(2) Kumamoto Water Heritage

Resources related to the nature, history, customs, and personalities associated with water in Kumamoto City are publicly solicited, registered, and honoured as Kumamoto heritage.



Lake Ezu, registered as part of the Kumamoto Water Heritage.

(3) Kumamoto 'Water' Certification

The 'Kumamoto Water Certification' was introduced in 2008, which allows people to enjoy and learn about water in Kumamoto.

5. Utilisation of Groundwater for Disaster Prevention

Taking lessons from the Kumamoto earthquake, Kumamoto City has prepared measures to swiftly secure water in the event of a disaster. The city has signed agreements with 95 companies and other entities that own wells (96 wells) in the city for 'emergency wells' as of the end of October 2023. In the event of a water outage across the city due to a natural disaster, these companies will provide well water free of charge.

Results of the Project

Local groundwater pollution that has been identified so far is being addressed with purification measures and continued monitoring based on concentration levels. Consequently, improvements have been observed in the extent and concentration of the pollution. The impact of the Eastern Composting Centre after its establishment and operation will become more and more apparent, so proper operation will continue in the future.

The groundwater level, which had been decreasing for many years, has been showing a trend of recovery in recent years, and the water usage by citizens is gradually decreasing.

Issues, Problems and Responses

In the eastern region where the trend of increasing nitrate nitrogen concentration in groundwater continues, it is necessary to continue the operation of the Eastern Composting Centre and implement further wide ranging measures in the upstream area. Since it takes a long time for polluted groundwater to recover, it is crucial to prevent groundwater pollution in advance.

Regarding groundwater quantity, the rice paddy inundation project is facing issues such as the decrease in agricultural land, changes in farming methods, and a shortage of successors. However, in order to enlarge the groundwater recharge amount, it is necessary to work with relevant organizations to implement measures such as extending the inundation period, expanding the area, and

reviewing the used crops, as well as expanding the system.

To address these challenges, we will continue to promote the five projects mentioned above.

Future Developments (expected effects and project vision and issues)

These wide-range groundwater conservation efforts involving residents, businesses, and administrations have been recognized worldwide, and our city has received the '2013 UN Water for Life Best Practices Award'. In April 2022, under the participation of leaders and ministers from 30 countries in the Asia-Pacific region, including Japan, the '4th Asia-Pacific Water Summit' was held, and the 'Kumamoto Declaration', an outcome of the summit, was presented to the world at the March 2023 'UN Water Conference.'

We will continue the city's recognized efforts in groundwater conservation and aim to contribute to solving global water issues by continuing to work closely with various stakeholders and taking a leading role in addressing water-related challenges.

Reference URL

Kumamoto Water Life

(https://www.city.kumamoto.jp/kankyo/hpkiji/pub/List.aspx?c_id=5&class_set_id=20&class_id=2655)

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