

## Conservation and Restoration of Wells in Ogaki City

\*Syokan Kou<sup>1</sup>

1. Graduate School of Horticulture, Chiba University

### 1. Research Purpose and Background

Flowing wells, which naturally supply an abundance of quality groundwater, have been utilized in Ogaki City since the Edo Period. Wells survived as a connecting factor among the people in each local community. The purpose of this research is to clarify the history of the restoration of wells in Ogaki City and their current conditions.

### 2. Study Methods

Bibliographical research and field research were conducted in order to understand the history of restoration of wells in Ogaki City. Field research was organized after studying the current conditions of the wells, to uncover utilization and their design methods.

### 3. History of Conservation and Restoration of Wells in Ogaki City

The land of Ogaki City was formed by sedimentation of a river, and this enabled the formation of flowing wells, which naturally supplied an abundance of quality groundwater from the Edo Period. In the late 1960's, during the period of high economic growth, most flowing wells disappeared due to groundwater utilization for factories, which caused a severe drop of the groundwater level. In recent years, factories have been shut down in the consequence economic stagnation and the fall of the textile industry. This resulted in a rise of the groundwater level, and the government together with citizens and volunteer organizations started cooperating to utilize water for city planning.

### 4. Conservation and Restoration of Wells

#### (1) Environmental Development by Equipping Wells

Restoration of wells was initiated mainly in the castle town around Ogaki Castle, which has always supplied ample amount of groundwater since the Edo Period. The newly equipped wells had a classic design which imitated a natural pond as well as other unique ones. The surrounding environment around the wells became naturally with planting, and now serves as a recreational area for citizens. The wells and their surrounding environment are managed through the cooperation between the government and the local residents. Due to sharing water and cleaning wells, wells are contributing to energize local community, serving as a central point for the citizens to exchange information.

#### (2) Environmental Educational by Utilizing Wells

There are pond and water ways derived from the well of Kagano Hachiman Shrine in Ogaki City; and Smallhead Stickleback, fresh water fish which is designated as an endangered species, inhabits in this pond and water ways. Environmental education has been implemented so that the community would feel attachment to nature. An annual program has been developed for the primary and middle schools in the city, with which students observe the wells, ponds, surrounding environment of the water ways, and Smallhead Stickleback. They also conduct water quality survey and learn how Ogaki City manages its environment.

#### (3) Earth Thermal Energy Generation by Well Water

Ogaki City has been discussing earth thermal energy utilization since 2013, in the course of energy efficiency measures. The temperature of well water is stable throughout the year; therefore, it can be utilized as an energy source for air conditioning and water heating. As a result, since June 2015, the city has been distributing subsidies to offices, corporations, and organizations, which would install earth thermal energy heat pump facilities. This is, as mentioned above, one of the energy efficiency measures.

## 5. Conclusion

In Ogaki City, wells created a city environment which incorporates nature. At the same time, they are also utilized for the promotion of environmental education and for energy efficiency measures. Wells made the nature and life of the city rich, and contributed to energize local communities. Participation and cooperation among the diverse stakeholders, including local residents, in conservation and restoration of groundwater would be expected for the future.

Keywords: Ogaki, Wells, Conservation, Restoration



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|-------------------------|-------|------------------------|-------|
| ① 加賀野八幡神社井戸             | 1874年 | ⑧ 大垣女子短期大学<br>「みずきの森水」 | 2007年 |
| ② 春日神社<br>「春日の宮湧き出ずる名水」 | 1962年 | ⑨ 高屋稻荷神社               | 2008年 |
| ③ 西之川ハリヨの池広場            | 1965年 | ⑩ 弘法の井戸広場              | 2009年 |
| ④ 大手いこ井の泉緑地             | 2003年 | ⑪ 三城公園                 | 2011年 |
| ⑤ 八幡神社「大垣の湧水」           | 2003年 | ⑫ むすびの泉                | 2012年 |
| ⑥ 栗屋公園                  | 2004年 |                        |       |
| ⑦ 金蝶園総本家大垣東店<br>「葉生の泉」  | 2005年 |                        |       |

注：赤字は大垣城城下町以内の井戸を示す