

How people can “return” clean freshwater “borrowed” from Mother Nature in Shanghai, China

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Today, February 2, 2024 is World Wetlands Day, celebrating the role that wetlands play in human well-being. We are using this as an opportunity to highlight work being done on wetlands in the Huangpu River basin, as a partnership between Microsoft and Conservation International, and working with NGOs in the area.

Freshwater is the lifeblood of our planet and people. It supports healthy ecosystems and it fuels development. But freshwater resources are extremely limited; about 80 percent of the world's people are threatened with insufficient water quantity or quality.

China is facing severe water scarcity. About two-thirds of its 600 cities have an insufficient water supply — and 110 are facing severe water shortages, mostly in the northern part of the country.

Located at the Yangtze Estuary, Shanghai is China’s largest city. Its rapid social and economic development has led to increasing water stresses in recent decades.

Industries sometimes “borrow” clean water from nature and “return” contaminated grey and black water to it.

What if we could return “clean water” to the natural freshwater ecosystem?

As part of a partnership with Microsoft, Conservation International is piloting a project in Shanghai’s Upper Huangpu River to test this idea. We spoke with **Cheng Zhang, Program Director of Conservation International China** for more information.

Why the Upper Huangpu River?

Cheng Zhang: The Upper Huangpu River is one of Shanghai’s key drinking water sources; one-third of Shanghai residents (6.7 million people) rely on it. However, it is facing significant challenges, particularly poor water quality.

Tell me more about these challenges.

Cheng Zhang: There is non-point pollution, that can be washed into rivers and other wetlands from various different sources, and caused by agriculture, aquaculture, and livestock farming from surrounding areas. There are also direct, point-source pollutants

from pesticides and fertilizers and fish feed. There is also an insufficient treatment of domestic wastewater from surrounding communities. These water challenges are risking Shanghai's water security and have caused aquatic ecosystem degradation in the area.

How to face up to these challenges?

Cheng Zhang: *Conservation International-China* has worked on the health of freshwater ecosystems in watersheds across China for many years. Since last year, with support from Microsoft, we have worked together with local NGOs based in Shanghai and technical expertise from China University of Geosciences, Wuhan to demonstrate a cost-effective nature-based solution at Tianshanzhuang Village, a rural community in the Upper Huangpu River, to reduce pollution and securer Shanghai's water supply. It's like an effort to return clean water that local people "borrowed" from nature to sustain their daily life and agricultural development.

How to return clean water cost-effectively?

Cheng Zhang: We do this by installing a restored/artificial wetland system for rural wastewater treatment and promoting better water governance practices in surrounding rural communities. This artificial wetland system is supported by water channels and constructed small wetlands at different altitudes in the pilot community. It works as an unpowered purification system, to retain and hold nitrogen and phosphorus, as well as to promote the sedimentation of particles in flowing waters by restoring the natural wetland ecosystem with local plant species.

Meanwhile, we engage people from the pilot community in the construction and restoration effort and provide learning and training opportunities, thus helping them maintain the artificial wetland system and encourage better water governance within the community.

The artificial wetland system can operate without any power and it's easy to maintain, so it's more cost-effective than a wastewater treatment factory in such a rural community that is not densely populated. And there are multiple benefits from it.

What are the benefits?

Cheng Zhang: The first and foremost is the total amount of "clean water" we help to return to nature. The project will measure the annual amount when the whole artificial wetland fully functions. Secondly, the environmental condition in the Upper Huangpu River will be improved with cleaner water. Thus, more ecologically friendly development opportunities will be created for the rural communities in eco-tourism, nature education, eco-agriculture and rural lifestyle exploration activities.

Furthermore, local people who are directly engaged in the project implementation can earn additional income and learn more knowledge and skills in water governance. Last, but not least, is the decrease in nitrogen, phosphorus and organic matter pollutants (the main pollutants in rural wastewater) and the restoration of wetland ecosystems, which can help local communities better adapt to climate change.



Tianshanzhuang Village, the pilot community © Daorong



Removing invasive species © Daorong



Education and awareness raising activity in the rural community © Daorong