



Urban Agenda Platform

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The "Rebirth" of Urban Waste Dump – Ecological Restoration Bridging the Social Gaps

Region	Asia and the Pacific
Award Scheme	Guangzhou Award
Sustainable Development Goals	Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable

Summary

Abandoned Jinkou Landfill, once the largest landfill in Wuhan, and malfunctioned Zhanggong Dyke were two notorious pollution sources in the city of Wuhan. Their very existence not only tainted the city's appearance but also wreaked havoc on the local environment. To make a difference, a renovation project covering an area of 213 hectares was undertaken in the city: At the beginning, the project was mainly to create a suitable site for the China International Garden Expo from 2015 to 2016.

Background and Objective

To prevent the landfill and the dyke from polluting the city and to mitigate the negative environmental impact on city dwellers. To ensure a good ecological environment in the city, and guarantee the quality of air and drinking water. To bridge "pollution divide", restoring the quality of life and to improve the desirability of these neighborhoods. To ease the city's ecological and economic imbalance as well as the widening gap between the rich and poor in the wake of the environmental damage. To make "Ecological Environment First" as the city's new development pattern and promote the synergies of industrialization, innovation and city culture. To build a more inclusive and sustainable city.

Outcomes and Impacts

This initiative has brought about the following changes: The ecology has been improved: birds and people are returning. A garbage town turns into a world-class ecological demonstration garden. Clear water and lush mountains have been restored. Red-crowned cranes and black swans inhabit in the garden. Baer's Pochards, the world's endangered bird, appear in nearby Fuhe Wetland. A large number of residents who have left their homeland come back. Zong Ganyun, an almost-70-year-old who lives here for many years, once suffered depression because her children would not come to visit due to the bad environment. Fortunately, her children came back and lived nearby after restoration. She was elected the voluntary garden leader through community election to safeguard her hometown with her husband. According to third-party investigation, over 90% former residents are willing to move back and 60% of them have already done so. It has reduced pollution, improved the livelihood of almost 100,000 people in 14 communities, promoted economic and social growth, and closed the development gap between different districts of Wuhan city. According to a survey, the prices of new residential areas were relatively low due to landfill pollution and Zhanggong Dyke. Although most residents are of low income, their housing property value has appreciated thanks to the renovation. Living environment is better than that of downtown. Tenements have become "Dyke-view apartment," narrowing the gap between the rich and the poor. The contradiction is mitigated between unbalanced and inadequate development and the people's ever-growing needs for a better life and it inspires new ways to solve social problems through investment in public facilities. The contradiction is fully demonstrated in Zong Ganyun's family. Parents and children have different perceptions on environment and society. The income disparities between Zong Ganyun and her children distanced the two generations. Zong Ganyun's middle-class children moved away from where she and her husband live because it did not have a sound environment. However, her children have bought apartments here now after the restoration. Their moving back not only shortens the physical distance between the two generations, but also shows that the economic gap is narrowed as the livelihood and social identity of low-income people have been greatly improved. The ecological, economic and social benefits brought by the project are as below: 1) It has greatly improved people's living environment and fundamentally solved the waste problem that had bothered residents for a long time. With the restoration, green area per capita in Jiangnan District, Qiaokou District, and Dongxihu District that the project covers increases by 1.2 square meters, equivalent to 20% of previous green area per capita in the three districts. In particular, green area per capita in Qiaokou District rises by 3.1 square meters, equal to 58% of its previous data. 2) In the past, it lacked public entertainment and cultural facilities. With the completion of Garden Expo Park, residents nearby can hang around in parks and museums now. (There are Changjiang River Civilization Museum and Behring River & Life Museum, which form the first natural science museum in Wuhan.) 3) As supportive facilities for the surrounding area, 19 roads have been constructed and restored; two buslines and two subway lines were built nearby, and now there are more than 20 buslines and two subway lines offering service on people's doorstep, which makes it very convenient for the residents here to traffic to anywhere in Wuhan; three mobile public restrooms and 400 trash cans set up; the long-bothering 1.27-kilometer-long



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drainage moved underground, reducing its pollution to surrounding area; substations established to meet electricity demand of people here; over 28,000 plants planted and green belt and small gardens covering 183,000 square meters built. What's more, two new schools are open to the residents. All of these works have greatly improved the environment and upgraded facilities of surrounding neighborhoods and communities. 4) Thanks to the works above, business opportunities, property appreciation and jobs have sprung up here. Before Garden Expo Park was established, the housing price here was much lower than that of apartments in similar sections in other districts. Now, the housing price here has been rising up since 2015, keeping pace with the overall market. In the past, no one would rent shops here, but now all kinds of stores, such as supermarkets, restaurants and laundries and car-washing shops, have started their business in this area, making it a place of hustle and bustle. Ding Honglan, a resident here, always says, "My once unemployed daughter-in-law has got a job at a pharmacy nearby since there are so many shops around our neighborhood now. And the price of the apartment we live in now has risen from RMB200,000 to over RMB800,000." The construction and operation of the park require many employees, such as gardeners, cleaners, drivers and security personnel, and many positions are provided to the local residents. Thousands of jobs have been created by the radiation benefits of the park. Therefore, the project does economically benefit people who live here. 5) Confidence of residents have also been boosted. This area has been transformed from a stinky, disgusting place to a beautiful garden that residents are proud of. "My Garden Expo, My Home" working group gave away 140,000 pots of flowers and invited horticulturists to teach people about gardening techniques and help residents set up gorgeous balconies and gardens. Many people volunteer to take part in projects for urban public welfare and they now have a stronger sense of belonging. Taking this renovation as an opportunity, an overall ecological Wuhan rejuvenation strategy is put forward, namely "One Park, Multiple Spots, One Spot, Overall Area", which exerts profound influence on the ecological layouts and balanced sustainable development of Wuhan. 1) Restoration of Jinkou Landfill and Zhanggong Dyke solved the ecological problem that had troubled Wuhan for almost a decade. This restoration means a lot to the ecological security for over a million residents living there and removes barriers for the expansion of Northern Hankou. 2) Zhanggong Dyke and 10 parks, together with Fuhe Wetland, comprise a 50.5-kilometer-long ecological belt with an average width of 3.1 kilometers. It covers over 170 square kilometers and ecologically connects downtown with new suburban districts. Wuhan is expanding in a moderate pace, avoiding a urban sprawl. 3) It increases Wuhan's green area per capita. The green area per capita in Qiaokou District, where Garden Expo Park is located, has increased by 3.1 square meters. The project has raised Wuhan's green area per capita by 0.2 square meters, which accounts for 2% of that before the restoration. 4) Garden+Social Humanity pattern for ecological restoration is applied in projects including Eastern Lake Greenbelt and Daijiahu Lake Park; Garden Expo Park, as one of the first batch of pilot sponge cities in Wuhan, has gained practical experience for building sponge cities, such as seeping, maintaining, storing, cleaning, utility, drainage and water diversion. The experience has been spread throughout the city; Zhanggong Dyke urban forest park covering 30 square kilometers has been built, turning the "gray belt" into "green belt;" over 60 polluted mountains have been restored, improving the ecological residential environment comprehensively. 5) The ideas of "paying back the ecological debts first and do not owe new ones" and "letting ecology be the main designer" have been turned into an urban development model, offering a demonstrative example for the construction of "ecological civilization and beautiful China." These changes are measured by a number of indicators, including Effects of Garbage Disposal: The organic matter content, methane concentration of landfill gas and settlement in aerobic remediation area meet the requirement of moderate utilization in national standard. Air quality, emission standard for odor pollution, leachate from municipal solid waste and landfill gas disposal all meet national requirement. Assessment method: data monitoring by professional third-party organizations. Ecological spillover: According to the conservative estimation of ecological experts, the ecological value created by Wuhan Garden Expo Park amounts to over RMB 100 million and it is increasing at the annual rate of 8% to 10%. It absorbs smoke and releases over 10,000 tons of oxygen every year. Air pollutant concentration in this area has dropped by 60% on average. After the restoration, the contribution to the reduction of greenhouse effect has increased 20 times. Assessment method: calculation by experts according to corresponding data and formula. Spillover effects on economy and society: appreciation of surrounding houses; the number of tourists of Garden Expo Park; the returning rate of former residents; public opinion poll through questionnaire and interviews by official departments, media and other organizations. Urban government impact assessment: urban construction projects copying and learning from the experience of the project. To achieve the desired outcome of the initiative, the following measures are taken: "My Garden Expo, My Home" working group: By means of official documents, Wuhan Municipal Government demanded related government divisions be included in the working group to make sure all the work is carried out. The working group should hold regular meetings to discuss, check and urge work implementation. Related government divisions include Wuhan Municipal Publicity Department, Wuhan Municipal Civilization Office, Wuhan Municipal Urban Management Commission, Wuhan Municipal Education Commission, Wuhan Civil Affairs Bureau, Wuhan Municipal Planning, Land and Resources Administration, Wuhan Tourism Bureau, Wuhan Municipal Commission of Communist Youth League of China, Jiangnan District Government, Qiaokou District Government, Dongxihu District Government. The three district governments above should establish special working team led by heads of district governments, prioritizing on work implementation. Innovative Labour Competition: Some new thoughts were added into it this time. Garden Expo Park Project is a provincial Achievement Demonstration Labour Emulation in Hubei Province. Before this, the Three Gorges Project is the only emulation at this level. And similar emulation in other places is Shanghai World Expo. Aerobiotic Technology for Landfill Remediation: it is an advanced landfill ecological remediation technology developed by Tsinghua University. It is a mature and reliable technology recommended by state administrative department. It can degrade refuse quickly without secondary pollution. It has little contribution to greenhouse effect and enjoys low cost of percolate treatment. It will cost at least RMB 1 billion for harmless disposal of trash in traditional ways, but the new technology helps to save RMB 199 million this time. Ecological Bridge: Two ecological bridges are built in box structure over third ring road of city expressway. Topographical design and plantation are made on the bridges based on deep soil cover. Great Rivers International Forum: This specialized forum is initiated in 2016 by the Yangtze River Civilization Museum, a sub-project of this project, hosted by UNESCO and Wuhan Municipal People's Government, and undertaken by Wuhan Municipal Bureau of Culture, Foreign Affairs Office of Wuhan City and Yangtze River Civilization Museum. It aims to conduct exchanges and dialogues in the context of the world's major river basins, and constantly bring together the most cutting-edge development experience, ecological conservation methods,



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economic wisdom and cultural attraction of the major basins. From October 28 to 30, 2018, the second session of the Great Rivers International Forum was held with the theme of “Gathering the Civilizations of Great Rivers and Exploring a Sustainable Future”. This initiative has not only improved the surrounding environment, but also Wuhan's reputation. Wang Qiuyu, a resident in Flower Town Community, used to call for environmental improvements and rights protection. Now, she has become a volunteer of Garden Expo Park. Zong Ganyun, one of the voluntary park directors, had depression in the past. But now, she passes happiness to others and becomes a volunteer for Garden Expo Park. There are many people like Wang Qiuyu and Zong Ganyun. They share personal experiences about their present beautiful communities and improvements this project has reached. Here is a story about Wang Qiuyu. One day, a tourist could not find her way back to hotel. Wang Qiuyu showed her way to the bus stop and introduced her to Wuhan culture. She wrote in the work log of voluntary park director, saying, “we represent all the Wuhan people. We are the master of our city. We shall present the best of the city.” “Garden Expo Park on a Landfill” of Wuhan was reported as the first typical case in ecological civilization construction in the ecological chapter of a series report called “the marvelous 5 years led by President Xi” produced by CCTV in October, 2017. It has been awarded with China Habitat Environment Example Prize 2016 by Ministry of Housing and Urban-Rural Development of PRC. It is the only award-winning project in Hubei Province. And Daijiahu Lake Park, following the suit of the project, has won China Habitat Environment Example Prize 2017. It is also the only award-winning project. In December, 2015, Wuhan has won the C40 Cities Bloomberg Philanthropies Award 2017. It is the first international award received by Hubei province in addressing climate change. It has won China Human Rights Development Award 2015, Low Carbon Example in Low-Carbon China Tour 2015, etc.

Sustainability and Scalability

Goal 6: Ensure availability and sustainable management of water and sanitation for all Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation Goal 10: Reduce inequality within and among countries Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable Target 3: Participatory, integrated and sustainable human settlement planning and management Target 6: Improve air quality and manage municipal and other wastes

Initiative Contribution

In terms of scale, this was an unprecedented initiative by the Municipal Government of Wuhan. It therefore called upon the following actors and partners to fulfill different roles: Ministry of Housing and Urban-Rural Development of the PRC, Hubei People's Provincial Government, Wuhan People's Municipal Government and Wuhan Gardening and Forestry Bureau led and coordinated different parties. Wuhan Landscape Construction Development (Group) Co., Ltd. was charged with investment, construction and operation of the project. 82 cities in China contributed human and technical resources including engineers and designers; experts were seconded from 12 countries. They assisted in project implementation and construction. Tsinghua University provided technological support.

Innovative Initiative

This project has conducted exploratory practice to repay “ecological debt” and resolve long-term issues in urbanization process. Primarily, the practice of the Garden+Social Humanity pattern for ecological restoration has addressed pollution, narrowed the ecological and economic development gap caused by pollution within the city, and reduced income disparities and inequality. In addition, this project advocates ideas of “letting ecosystem become the chief designer” and “urban governance should prioritize ecology”. Furthermore, CrowdFunding+Co-construction Model gathers government, people from all walks of life, experts and the public to tackle the huge environmental challenge. These are what other cities can learn from our experience. After the project was promoted, many cities and institutions came to Wuhan to exchange experience. The ecological restoration mode has transferred to similar projects and various ecological projects construction in Qinhuangdao and Hengshui in Hebei, Zhengzhou in Henan, Huangshi in Hubei.

Resources devoted to delivery

The resources used for the implementation are as follows: Source capital: A total investment of RMB 4.75 billion, 25% of which was direct investment from the Wuhan Municipal Government, 75 % financed by Wuhan Landscape Construction Development (Group) CO., LTD and China Development Bank. The initiative also received an investment of RMB 4 billion from other participating Chinese cities. The three administrative districts (Dongxihu District, Qiaokou District and Jiangnan District) involved in this project invested hundreds of millions of yuan in the expropriation and compensation of lands, relocation for the related households and companies, upgrading peripheral facilities and so on. Technology: Cutting-edge technologies in architecture and landscape design were introduced by domestic and international experts and partners. Three Pritzker Architecture Prize winners, one European architect with ecological philosophy, four landscape design masters, the director of Landscape Architecture in Harvard University, teachers and students majoring in landscape design from worldwide universities were also engaged in the initiative. Chuck Comisky, then vision sector director for “Avatar”, was in charge of designing the 4D experience scenes in the park. A professional committee was set up to provide technological and intellectual support for the initiative, consisting of academicians, scholars and experts in the field of city planning, architecture, landscape, botany and literature.



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Managerial resource: The headquarters were led by Wuhan Municipal Government to coordinate the work of over 100 different construction teams and up to 100 project units.