

WATER KNOWLEDGE NOTE

China

Sustainable Land and Water Management within Xining Municipality

With a participatory and watershed-wide approach, the Xining Flood and Watershed Management Project helped China to improve social protection, build livelihood skills, and foster the sustainable use of land and water resources. From the project's start in 2009 to the project closure in 2015, the project helped to protect more than 434,440 people from flooding through integrated flood risk management, while strengthening institutions through capacity building measures.

Challenge

The city of Xining is in Qinghai, is an economically lagging province in China. Found in the Huangshui River Basin, over 2.2 million people live in the Xining Municipal region, of which approximately one fifth of people live under the threat of severe flood risk. In an



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environment characterized by steep mountain ranges and eroded bedrock, the region experiences acute summer storms that lead to periodic flooding.

Due to the frequency of natural disasters, the residents of the Huangshui River watershed have lived with the constant threat of soil erosion and severe flooding. These natural disasters negatively affect the already underdeveloped local economy of the city and the province, particularly by limiting land use and destroying infrastructure. To compound the issue, Xining lacked robust and reliable wastewater and urban storm water infrastructure. A history of unsustainable land and water management practices worsens the region's environmental problems, threatening the region's natural resource base and economic growth prospects of its rural inhabitants.

Approach

Watersheds are socioecological systems that thrive on complex interactions between society and natural resources. As such, the Xining Flood and Watershed Management project activities ranged from improving livelihood opportunities to enhancing flood management and environmental protection systems. Within an integrated framework, the project combined measures, including flood control works, wastewater collection, environmental sustainability, watershed rehabilitation, and livelihood improvement. Through a participatory watershed management approach, the project was designed to ensure the sustainable use of land and water resources. The comprehensive flood intervention approach also included strategically planting natural flora;

implementing emergency flood warning and forecast systems; and creating livelihood opportunities related to sustainable land and water use.

The approach was based on key partnerships between rural communities and local government to maximize project sustainability. Both structural and non-structural interventions guided the project, including constructing wastewater interception pipes to connect with wastewater treatment plants. The project also emboldened community conservation efforts while simultaneously strengthening the community's resistance to environmental risk by improving urban environmental services.

Results

Under the umbrella of a watershed-wide and integrated approach, the project (2009-15) employed a combination of structural and non-structural interventions.

The following key results were observed during the life of the project:

- Over 434,000 people protected from flooding;
- More than 87 kilometers of wastewater collection pipes were constructed;
- Over 4.8 million tons of annual reduction of urban wastewater directly discharged into rivers;
- Over 16,000 farmers attended skills training and adopted sustainable agricultural practices;
- Farmers living in degraded watershed areas were offered green energy options such as solar water heaters and three-wheeled motorcycles;

Before



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After



Before



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After



- 3,330 municipality and county staff were trained, strengthening China’s institutional capacity for environmental sustainability;
- The project resulted in the formation of a flood warning center with a comprehensive system for flood forecasting, including a data collection system for rainfall, meteorological, and engineering monitoring; and
- The project resulted in environmental sensitization, including behavioral and mindset changes through education campaigns.

Bank Group Contribution

The World Bank provided the People’s Republic of China with a US\$100 million loan from the International Bank for Reconstruction and Development (IBRD). The total project cost was US\$216.62 million.

Partners

Central and local governments involvement was instrumental to the success of the project, and strong political leadership at multiple levels was demonstrated throughout the project design and implementation. Implementing agencies included the Xining Water Affairs Bureau, the Datong Water Affairs Bureau, the Huangyuan Water Affairs Bureau, and the Huangzhong Water Affairs Bureau. The project was supported by technical panels of experts at city and county levels.

Counterpart funding was also provided in the following amounts to ensure project momentum and sustainability: Xining Municipality (US\$72.59 million), Datong County (US\$15.57 million), Huangyuan County (US\$15.09 million), and Huangzhong County (US\$4.32 million).

Beneficiaries

Li Kengcheng is 84 years old and has lived near the Beichuan River, a tributary of Huangshui River which runs through the city of Xining, for over 30 years. “The riverbank was all coarse gravel. No one would come here,” he says. “After the river was cleaned up and the road was paved, we come here whenever we have time, to sunbathe or just spend some time together.”

Shen Junru is a 54-year-old farmer in Datong County of Xining Municipality: “My family’s annual income has increased from 3,000 yuan (US\$500) to 6,000 yuan (US\$1,000) per person.”

After the river was cleaned up and the road was paved, we come here whenever we have time, to sunbathe or just spend some time together.

—Li Kengcheng, Xining resident

Before



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After



Moving Forward

China continues its commitment to a demand-driven and participatory approach to improve flood management and support sustainable land and water use practices. Due to the project's capacity building activities, the project equipped

multiple types of stakeholders with the resources to continue improving the water and sanitation sector—from community level to government agencies such as the Xining Water Affairs Bureau and the Huangzhong Water Affairs Bureau.

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