Sanitation and river remediation, Tuxtla Gutiérrez, Mexico

Project data

Type of project: Architecture (infrastructure)
Estimated start of construction: November 2008

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Comment of the Holcim Awards jury Latin America

Today, the Sabinal River in Tuxtla Gutiérrez in the province of Chiapas is misused as the city’s sewage system and therefore extremely contaminated. This project intends to regain the river’s health through a cascade of primary filter systems retaining garbage and residues of purification operating at two different levels: the technical level consists of the urban wetlands and an ozone injection system that will filter and rejuvenate the water. The chemical level operates upon social behavior by creating a green pedestrian corridor along the river bank that will enhance ecological consciousness among residents and therefore contribute indirectly to better water quality. This project has been commended due to its simple purification technology based mainly on natural processes and its rarely-applied attempt to incorporate the population and modify awareness of the main originators of waste and effluent.

Project description by author

The project upgrades facilities in the Sabinal River valley for the city of Tuxtla Gutiérrez, the 500,000-inhabitant capital city of the state of Chiapas in southern Mexico. It generates design tools from environmental and urban problems. The Sabinal River crosses Tuxtla Gutiérrez from east to west. The river passes the city and merges with the Rio Grande before entering the Sumidero Canyon.

The city currently neglects the natural riparian areas of the Sabinal River valley and disconnects the river from everyday urban life. The river serves as the city’s sewage system as it crosses the urban sprawl. A deteriorated environment and poor water quality, along with odors and areas of vegetation in very poor condition discourage public use of the river—a waiting opportunity to bond the city on its longitudinal axis. Recovery of the river will allow it to take a leading role in the city, becoming the element that binds and generates a sequence of public spaces that cross the city.

Nature as infrastructure: The aim is to turn the river into the structural articulation element of the city that will give a new urban image, an image of a modern city concerned about its environment, creating ecological consciousness in the social psyche. The system can be readily applied in other locations in a low-tech manner using local technology and manual labor.

The intention is to regain the river’s health through local primary filtering systems that remove garbage and residual solids from the water which is then processed through a process of water ozonification. This water processing meets minimum water quality levels required to convert the river valley into living city stretches and also provides water for hydroponic agriculture.

The environmental improvement project also includes re-vegetation of the watershed to provide shade, moisture and a cooler microclimate where residents are encouraged to travel through the new linear park. Citizen involvement will also take place but at different levels according to citizen’s labor skills, time or direct financial contributions. The revitalization project includes a range of wetlands and ozone injection system that will filter and rejuvenate the water returning it in a purified manner to the river and allowing the water to be used in hydroponic organic-food production. The superior level operates as a linear green pedestrian corridor that connects the city and shows the symbiotic relationship between people and the natural environment, creating ecological consciousness in the social psyche. The system can be readily applied in other locations as it relies only upon low technology and local manual labor.

Quantum change and transferability

The system controls, purifies and utilizes sewage waters through the use of cells that operate at two different levels, inferior and superior. The inferior one contains the urban wetlands and an ozone injection system that will filter and rejuvenate the water. The chemical level operates upon social behavior by creating a green pedestrian corridor along the river bank that will enhance ecological consciousness among residents and therefore contribute indirectly to better water quality.

Relevance to target issues by author

Ecological quality and energy conservation

The system reduces energy consumption. It uses the filtered water in the hydroponic harvesting system of the city to grow food crops close to the city and reduce transportation requirements from more distant sources. It promotes pedestrian mobility reducing environmental pollution from private vehicle use, which in turn improves air quality and reduces respiratory illnesses. The revegetated river valley creates shaded areas that promote social interaction and ecological consciousness.

Economic performance and compatibility

Instead of building a capital-intensive sewage infrastructure which wouldn’t precipitate additional collective benefits, the proposed low-tech model of sewage water filtration through its process stimulates the local economy (hydroponic agriculture), provides social welfare and low-cost urban pedestrian infrastructure.

Contextual and aesthetic impact

The system creates urban corridors that promote public space and connects the river to the city. It forms a new facade of vegetation that mediates between the urban and natural river area, creating new spaces for new activities. Appropriate temperature, humidity and shade environments are generated to promote social interaction, sport and leisure activities.