

A Comparative Study of Revitalization of Urban Streams in the Major Cities in Asia

EXECUTIVE SUMMARY

Background

The research team was commissioned by the Drainage Services Department to undertake a comparative study of revitalization of urban streams in the major cities in Asia. The main objectives of the commissioned study are:

1. To carry out a literature review on the key engineering features in the revitalization of urban stream;
2. To carry out qualitative research with the stakeholders on the revitalization of urban stream; and
3. To prepare a guideline for the revitalization of streams in Hong Kong.

This study consists of three phases:

Tasks	Deliverables
Phase I	
Literature review of international guidelines	Synthesis of existing literature regarding stream restoration and revitalization work and an inventory of related engineering features
Phase II	
Qualitative research with stakeholders involved in revitalizing urban streams in Seoul, Taipei, Singapore and Shenzhen	Case Studies Report
Phase III	
Preparation of a guideline for Hong Kong: <ul style="list-style-type: none">• Interviewing different local stakeholders involved or interested in revitalizing urban streams;• Conducting local site visits;• Synthesis of research findings; and• Presenting the findings in a seminar to solicit views from interested parties on the proposed guidelines.	River Revitalization Guidelines for Hong Kong

The following paragraphs summarize the key findings of each deliverable.

Deliverable One: Synthesis of existing literature regarding stream restoration and revitalization work and an inventory of related engineering features

Six sets of international and municipal guidelines on river restoration and revitalization were reviewed¹. Most of the guidelines were prepared in response to the pollution problem of deteriorating water bodies and the target is in general to restore urban streams as part of the initiatives to a sustainable future, ranging from restoring stream corridors, sustainable surface water protection to eco-city development. The concept of “restoration” adopted in the guidelines entails the restoration of the natural conditions or functions not only of a water body but also the basin and territory surrounding it that have been degraded or lost due to disturbances. The concept of “rehabilitation” is less ambitious and involves the stabilization of geological and hydrological landscapes that support the natural ecosystem as well as allowing a varying degree of public use by the riparian population.

In terms of goals and objectives, the guidelines range from the focus on restoring the eco-status of river for flooding control, improvement of the water environment and human habitats to the governing and management of surface runoff at the regional level. The guidelines highlight the importance of integrating stream revitalization with efforts to preserving and restoring species, re-establishing riparian cover and boosting biodiversity and at the same time, improving accessibility and enjoyment of the reengineered water bodies by the urban community through coordinated land use planning and urban design.

The research team also produced an inventory of the engineering techniques used in stream restoration.

Deliverable Two: Case Studies Report

Five case studies were identified in four different cities within east and south-east Asia, namely; Cheong Gye Cheon in Seoul; Zhong Gang Main Drainage in New Taipei City and Lao Jie River in Zhongli City, Taoyuan County; Kallang River at Bishan Ang Mo Kio Park in Singapore; and Futian River in Shenzhen. The research team not only visited the five cities to conduct onsite investigation, the team also interviewed 32 key stakeholders within relevant government departments, the academia and green groups.

The different practices of revitalizing urban streams through transforming drainage channels into natural greenways in the case studies offer a number of valuable lessons:

- The importance of water treatment through traditional engineering approach to more natural cleansing technologies;

¹ The guidelines reviewed are: European Union Water Framework Directive and Common Implementation Strategy; United Nations Economic and Social Commission for Asia and the Pacific (ESCAP): Draft Guidelines for Sustainable Rehabilitation of Small Urban Water Bodies. Wastewater Revolution in Asia Pacific to achieve the MDG target on Sanitation; Asian River Restoration Network (ARRN): Reference Guideline for Restoration by Eco-Compatible Approach in River Basin of Asia; Stream Corridor Restoration Handbook for Taiwan; Municipal Government’s Views on Strengthening the Comprehensive River Rehabilitation Work in Shenzhen; and Active, Beautiful, Clean Waters Design Guideline in Singapore.

- The importance of going beyond flood control to restore nature and biodiversity while at the same time, satisfying the recreational and educational needs of human beings; and
- Given the multi-dimensional functions of urban streams, collaboration within different government departments and between government and other stakeholders especially the citizens and concerned groups is quintessential to successful stream revitalization.

Deliverable Three: River Revitalization Guidelines for Hong Kong

A river revitalization guideline suitable for Hong Kong is compiled based on synthesized materials from all the research findings. Steep topography and concentrated urban development especially along the coastal areas are unique challenges of river revitalization in Hong Kong. As a result, river catchment areas were transformed from land with high porosity to concretized surface with low porosity. The change impedes the slow, natural process of infiltration of rain water into soil and river courses, whereby causing dangerous flashfloods threatening lives and properties, as rain water is conveyed into the channelized drainage all within a very short timeframe. Successful river revitalization in Hong Kong therefore would require concomitant efforts in minimizing urban development in flood plains, embedding natural streams in urban parks, sustainable green building designs such as green roofs to detain and store rainwater at source to delay release in public and private developments and other infrastructure projects. In other words, stream revitalization needs to be seen as one of a much bigger project of making urban development more sustainable and environmentally friendly.

The main purposes of river revitalization are flood prevention, promoting wildlife and biodiversity, promoting better quality of life and enhancing the built environment. In order to fulfill the main purposes, collaboration of relevant government departments is required to develop policy initiatives. Four key policy areas and the related government units with duties related to urban stream revitalization are identified. Moreover, a three stage process for river revitalization is recommended, including background research, mode of governance and the planning and design process.