IWAS South-East Asia (Vietnam)

Motivation

Water is an indispensable resource for human kind and natural ecosystems. However, the access to clean drinking water and safe, environmentally sound disposal of wastewater is still not a matter in many regions of the world. A sustainable approach to water as resource, as well as optimal distribution and use, implies the implementation of adequate strategies, measures and site specific technologies. The demographic growth, the economic development and the climate change associated with extreme weather conditions like flooding play a crucial role in this global change. These are challenges that also concern the partner institutions in South-East Asia, with special focus on Vietnam.

Project Area

The rapid growth of the city of Hanoi requires the development of new areas for sustainable and reasonable urban development. The Long Bien urban district located in the North-Eastern part of Hanoi, comprises Gia Lam town, Duc Giang and Sai Dong, is restricted by Duong river, Hong river/Red river and the connection road between Thanh Tri bridge and Phu Dong bridge with area of 6,032 ha (inter dyke area: 2,250 ha, outer dyke area: 3,782 ha) and has current population of more than 200.000 inhabitants. Long Bien district will become one of the trade and service centre and transport head estate of road, railway and air way for connecting Hanoi with other provinces in the North of Vietnam.

Nowadays, the old urban areas and some new unprompted residential estates are not developed with a systematic drainage system therefore flooding occurs in some areas. Waste water of many residential estates, factories, manufactories, hospitals is not drained and treated decentralized by septic tanks or centralized in a treatment plant. Hence the pollution risk from waste water is high and affects the welfare of people.

The area of Long Bien is one of the areas of Hanoi, where a master plan for the further development exists. Within this project this existing master plan for the urban water management will be refined according to new sustainable approaches.

Objectives

The overall objective of IWAS Initiative in Vietnam is the development of a sustainable drainage concept based on the existing master plan for the Long Bien district and its integration into existing local water cycle in respect to: supporting further urban development, flood avoidance and minimisation, and improvement of the quality of surface and groundwater. This will be achieved by applying the three main concepts considered as pillars of the IWAS Initiative:

System analysis: in respect to local requirements (climatic conditions, population growth, estimated land use etc), the optimisation and further development of the existing draft master plan will be done in collaboration with local sewage company. The general drainage concept will rely on sustainability criteria, being mainly based on strict separation of sewage and rainwater in newly developed areas, treatment of sewage and polluted rainwater, implementation of infiltration and rainwater harvesting facilities, as well as restoration or construction of ecologic valuable open channels and ditches. The conceptual design for domestic sewage and for the pre-treatment of industrial wastewater will include the sewage network, pumping stations and treatment facilities. A cost benefit analysis will help estimating the necessary number and location of the treatment plants. In addition, a sustainable rainwater drainage system making use of existing urban landscape will consist of network, infiltration ponds, canals, open ditches, pumping stations etc. The special conditions that must be regarded in Hanoi (strong precipitations, high population development index) impose customised, flexible solutions suitable for a step-by-step realisation and implementation of project requirements.

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Technology development: the general drainage system proposed will be amended by technical measures aimed to realisation of an integrated resource management by using natural occurring processes for further treatment of the sewage water. The solution proposed consists in artificial recharge of groundwater with pre-treated sewage water. Beside direct economical benefits (taking advantage of the natural occurring processes for water purification in the subsurface), the concept will overcome major problems related to lowering of the groundwater table caused by overexploitation. The sinking has been reported to reach in Hanoi even 35 m below the initial level which led over years to land subsidence of about 10-15 cm in areas near the extraction wells, causing thus major damages to surrounding houses, schools and factories. While the water demand in Long Bien district, as in the whole city of Hanoi, is assumed to closely follow the demographic trend, artificial recharge of groundwater represents a sustainable method to ensure adequate water supply to a continuously growing population. On a bigger scale, the method offers short and long term subsurface water storage, solution considered preferable to surface storage (in lakes and ponds) due to safety reasons (less exposed to human activities and negative environmental factors). By providing a close loop between recharge and discharge units it is also permitted a better management of resources in terms of sustainability at local level, with positive impact on long term.

Capacity development: the sustainable concepts proposed within the project cannot be implemented in practice without a solid long-term development of local factors' capacity in terms of human resources, organisational development, and institutional and legal framework development. The identified weaknesses vary greatly from organisational issues (e.g. inappropriate division of responsibilities between institutions, financial dependence of public service providers on local governments) to human resources (e.g. inadequate qualifications and insufficient number of staff, difficulties in implementing modern technologies). Moreover, a limited awareness at community level regarding importance of services benefited reduces the providers' capacity to improve and further develop the services offered.
The measures proposed in IWAS Vietnam for overcoming these problems are structured on five target levels: national government, local government, companies, academic, and local community level. Beside modular, customised training packages, workshops and roundtable discussions are organised during the project and the results will be documented in a handbook describing the conceptual design and supplemented by specific examples of existing situations (demonstration projects, case studies etc). Having both a particular and general character, the resulted guidelines will also be transferable to similar regions from Vietnam and other South East Asian countries.

Project partners

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