



# Wastewater and Solid Waste Management in Provincial Centers

## Institutional and Organisational Approach to Decentralised Waste Water Treatment in Vietnam's Urban Areas

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The programme "Wastewater and Solid Waste Management in Provincial Centres" (WWM) includes German Technical Assistance to the Ministry of Construction (MoC), provided by the **German Technical Co-operation (GTZ)** in co-operation with the German Development Bank (KfW) and the German Development Service (DED).

The Vietnamese **Ministry of Construction** is the state agency in charge of waste water management, including centralized and decentralized options.

The overall goal of the program is the **enhancement of environmental conditions in urban areas** through the provision of improved wastewater facilities, comprehensive and efficient wastewater management, the improvement of customer services, and gradual changes of community awareness and behaviour patterns.

In the ongoing Phase 2 of the project, stakeholders and project partners will be informed about the various options of decentralized waste water treatment (DWWT). To this end, **demonstration projects** will be carried out in at least 3 cities, highlighting the advantages of the decentralized approach. The use of modern construction materials and sludge treatment are among the topics as well. One of the most important objectives is the **involvement of local waste water companies**, who are supposed to be in charge of operation and maintenance in the long run.

Furthermore, the development of **suitable effluent standards** for small-scale plants is also of great importance, since standards currently in place do not encourage decentralized solutions.

The **Administration of Technical Infrastructure (ATI)** of the MoC actively supports this approach. Both centralized and decentralized wastewater treatment options are of importance for the MoC. They specifically support demonstration projects in order to gain experiences and lessons learnt. A **handbook** will be developed for planners and decision makers.



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### The WWM Project's Approach to Decentralized Waste Water Treatment (DWWT) in Urban Areas (Proposal)

#### The General Idea and Definition

Decentralized waste water treatment (DWWT) is a concept to provide sanitation solutions in areas not yet connected to centralized waste water treatment plants, or areas that do not allow a connection to centralized treatment plants (for technical, financial or legal reasons), and where waste water is treated at or near the point of generation.

The term DWWT also applies to applications where waste water needs to be treated prior to the discharge into existing sewer systems (hospitals, factories, etc.)

It requires multi-level stakeholder involvements and expertise. Community participation is crucial for success

DWWT is a holistic approach that also looks into people's behaviour, living standards, production processes, utilization of resources, etc.

#### In-Line with Donor-financed Investments into Centralised Waste Water Systems

DWWT aims at accompanying international donors' investments into centralized waste water treatment systems by providing realistic treatment solutions for the cities' outskirts.

DWWT will therefore contribute to a sound urban environment even in areas not served by centralized solutions. Both components – the centralised and the decentralised - will therefore go hand in hand to achieve the overall goals of enhanced environmental conditions in urban centres.

#### Who is in Charge ?

Decentralized waste water treatment in urban areas requires a qualified management and skilled personnel. Hence, it is the WWM project's philosophy to put local waste water companies in charge of project development and operation and maintenance of DWWT plants operated in urban areas. They are currently in the process of acquiring the relevant expertise to ensure a professional operation of the plants, including sludge treatment and sewer maintenance. This will also remarkably contribute to a reasonable cost-benefit ratio, since all the above-mentioned activities can be bundled and standardised.

#### Technologies

We do not support a specific technology or treatment process, but strive to find the best solution based on local conditions and resources available.

#### Community Participation and Public Awareness

Cooperation with beneficiaries, communities and local governments on a long-term basis is required and crucial for success. DWWT does only work if the community is aware of the advantages and disadvantages, and accept their responsibilities.

#### Training, Education, Dissemination

Decentralised solutions are most suitable for training and education purposes as a basis for future investment into large-scale systems. The decentralized approach allows an easy integration into school curricula and education programs. Decision makers and technical experts (engineering companies, designers, contractors, etc.) need to be trained and informed as well.

Project results shall be disseminated through IEC campaigns, both locally and on national level.

#### Polluter Pays

This basic principle does also apply to DWWT. Cost recovery is crucial for the long term success of DWWT.

#### Effluent Standards and Reuse

The WWM project encourages local authorities to apply suitable effluent standards which are technically achievable at reasonable costs. It is proposed to apply the following effluent limits to all small-scale treatment plant with a maximum capacity of 100 m<sup>3</sup> / day:

BOD <sub>5</sub> :	50 mg/l
COD:	150 mg/l
Settleable Solids:	1 ml/l

Mentioned parameters are sufficient to assess the treatment performance of a DWWT plant. More parameters shall be added in the course of the development of the decentralized approach in Vietnam.

Reuse of treated water shall be encouraged by local authorities wherever possible and reasonable.