

Decentralized Wastewater Treatment Solutions — A proven solution for “Improved Sanitation for All”

Scope of Work

Since 1975, the mission of the Bremen Overseas Research and Development Association (BORDA) has been to improve the livelihoods of disadvantaged groups within societies, and to sustain the functioning of eco-systems through the dissemination of demand oriented Basic Needs Services, such as DEWATS Service Packages. BORDA and its BNS Partner Network have already implemented more than 1,500 DEWATS plants.

Due to the particular focus on decentralized sanitation, including wastewater and solid waste management, as well as health & hygiene education, BORDA emphasizes its efforts with the slogan: *“Improved Sanitation for All”*.

BORDA Laos started to operate in February 2013 and builds up on both the experience of BORDA's BNS Network in SEA, and the cooperation with a local civil society organizations.

On the one hand, BORDA Laos provides integrated community facilitation, on the other, comprehensive DEWATS services:

- ✓ Need assessment surveys
- ✓ Establishment of Community Based Organizations
- ✓ Health Impact Assessments
- ✓ Health & Hygiene Education inclusive the creation, production & distribution of health and hygiene promotion material
- ✓ Operation & Maintenance Training
- ✓ DEWATS promotion
- ✓ DEWATS planning & design
- ✓ DEWATS construction
- ✓ DEWATS monitoring and evaluation

BORDA Laos works on-demand and in close cooperation with the Laotian Government, INGOs, CSOs, and private sector stakeholders, to ensure the sustainability of DEWATS projects.

Benefits

- ✓ Reducing environmental pollution by superseding open drainage and efficient management of natural resources, including the protection of fresh water sources
- ✓ Improved livelihoods – reduction of health risks for the surrounding areas by avoiding contamination of groundwater and bore wells.
- ✓ Demand-oriented approach and reconciliation of all participant's interests
- ✓ Use of local materials and employment of local craftsmen in combination with optional pre-fabricated modules
- ✓ Cost efficiency – low maintenance costs, central sewer system is avoided and no to little energy supply is needed
- ✓ Custom made treatment plant – well integrated in the surrounding, aesthetic design
- ✓ One-site treatment of wastewater that meets legal regulations and standard disposal criteria set by pollution control authorities
- ✓ Easy operation and maintenance by local, trained staff (e.g. gardener, housekeeper)

Additional features include the production of biogas, which can be used for cooking or lighting purposes, Sludge, which can be used as fertilizer and the reuse of treated wastewater, which can be used for irrigation

Please find more information on our website, check out our Facebook page or contact us directly via telephone or email for an individual consultation.



BORDA Laos

DEWATS Service Packages

Decentralized Wastewater Treatment Solutions



An effective, efficient, affordable and proven wastewater treatment solution



Supported by the Ministry of Public Works and Transport, Department of Housing and Urban Planning, Lao P.D.R.



DEWATS Service Package
Developed and disseminated by
BORDA & BORDA Basic Needs Services Network

DEWATS Service Packages

- | | | |
|-------------------------------------|------------------------------------|------------------------------|
| ✓ School Based Sanitation | ✓ Sanitation for Prisons | ✓ Health Impact Assessment |
| ✓ Community Based Sanitation | ✓ Sanitation for Real Estates | ✓ Health & Hygiene Education |
| ✓ Emergency Sanitation | ✓ Sanitation Mapping | ✓ Capacity Development |
| ✓ Sanitation for Hospitals & Hotels | ✓ Municipal Sludge Treatment Plant | ✓ Standardisation |

DEWATS – Decentralized Wastewater Treatment Solutions:

Developed and disseminated by BORDA and over 20 BORDA BNS Network Partners in South and South East Asia, America, Middle East and Africa.

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Decentralized Wastewater Treatment Solutions — Water, Sanitation, Energy: “essential public services for all”

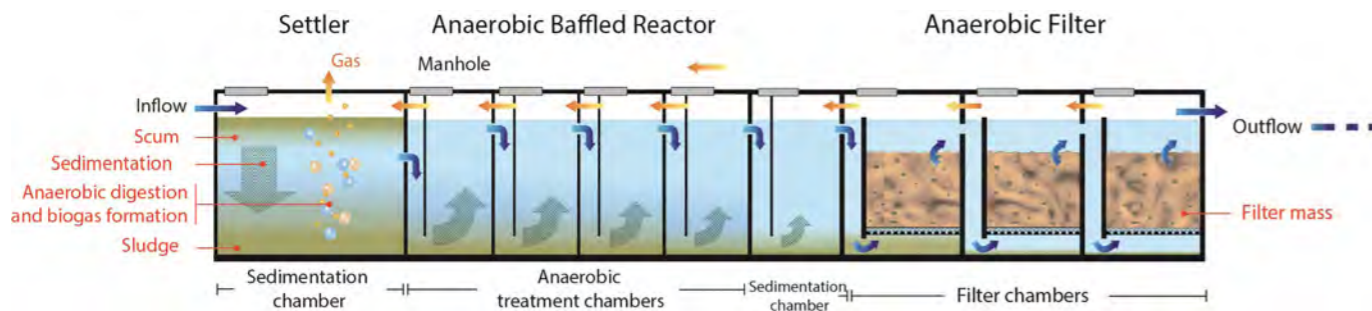
DEWATS

DEWATS is a **cost-effective**, **environmentally sustainable** and reliable treatment option for wastewater that particular responds to the needs of clients. DEWATS treats domestic wastewater up to 90% by simply using locally available techniques and material. It can be individually adapted to different effluent and pollution levels, topographical conditions, and the preferences and capabilities of clients. Power supply is not required if there is enough gravitational flow through the system.

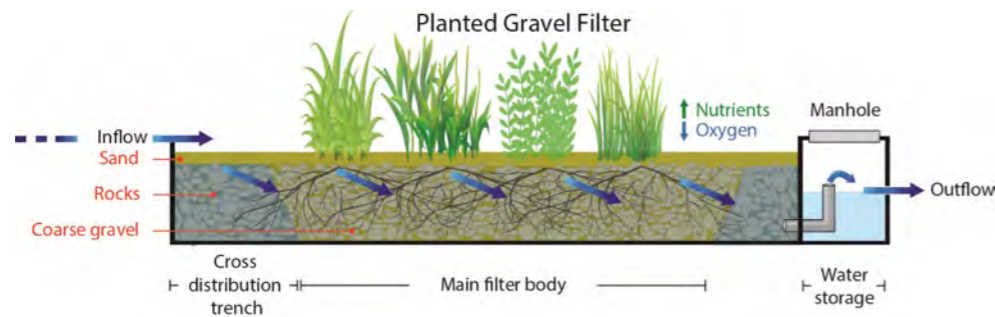
DEWATS has been successfully applied to hospitals, hotels, schools, orphanages, markets, prisons, communities and a range of agri-businesses including slaughter houses, bean curd factories, breweries and livestock breeding farms. Local authorities and clients are assisted by Department of Housing and Urban Planning (DHUP) and BORDA Laos with DEWATS consulting, design, supervision and institutional capacity building services throughout the project lifecycle.

The four main DEWATS modules have been standardized for **efficient implementation** and dissemination of the technology. An additional benefit to them is the optional biogas module. Depending on the wastewater composition the produced biogas can be used as an affordable and eco-friendly energy source.

Key Modules



The first module is the **Settler**. In it, suspended solids will be separated. In the second module, the **Anaerobic Baffled Reactor**, suspended and dissolved solids are treated. The third module is the **Anaerobic Filter**. In it, the anaerobic treatment of non-settable and dissolved solids and the filtration of small sized solids takes place. It also helps to prevent sludge transfer to the Planted Gravel Filter.



The last module is the **Planted Gravel Filter**, which ensures the oxygen intake and the aerobic treatment of the wastewater. This leads to a reduction of nutrients and the removal of smell and colour. The treated water still contains natural fertilizer and can be used for irrigation.

Evaluation of water samples

6 months after the project implementation, the first analysis of water samples is conducted. Experienced BORDA Laos staff will take probes from the different modules and analyse them in the BORDA Laos in-house laboratory. These tests mainly focus on the **chemical oxygen demand (COD)**, **biochemical oxygen demand (BOD)**, **pH** and **total suspended solids (TSS)** content of the water, investigating the performance of the treatment plant.

The picture on the right shows water samples from the four modules, starting from the left with the Settler.



Decentralized Wastewater Treatment Solutions — Implemented by Quality Management Standards



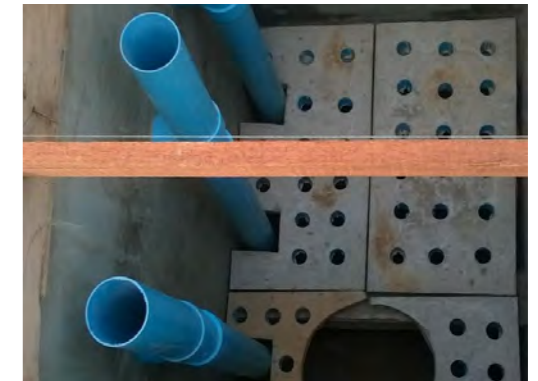
Design and construction are planned carefully.



Construction start



Construction of Anaerobic Baffled Reactor



Anaerobic Filter System



Pipe system



Construction of the Planted Gravel Filter



Successful implementation and Operation & Maintenance Training



Monitoring and Evaluation