



Decentralized Wastewater
Treatment Solutions

EmSan | Emergency Sanitation



**An innovative & rapidly
applicable solution to
safeguard hygiene and health
in emergency situations**



BORDA

EmSan |
DEWATS Service Package

Developed and disseminated by
BORDA & BORDA BNS Network

During an emergency an EmSan-DEWATS can respond rapidly to increased demands for sanitation services

Numbers and frequency of disasters & humanitarian crises on the rise

Considering the number and frequency of catastrophes, such as humanitarian crisis and natural disasters, it becomes clear that more and more people all over the world are and will be seriously affected by the consequences of disasters like risks to life and health as well as temporary homelessness.

- o According to the UN, there were 9.9 million refugees globally at the end of 2006 - a rise of 1.2 million or 14% - from the total of 8.7 million recorded at the end of 2005.
- o The natural disasters that occurred from January to June 2008 affected 130 million people (UN Int. Strategy for Disaster Reduction).



Living conditions in refugee camps are improved through the implementation of adequate DEWATS sanitation.

Improved sanitation in demand during emergencies

While emergency and relief-organisations take great efforts of providing food and drinking water, the necessity of combating sanitation deficiency in emergency accommodation is often not optimal. The issue of poor sanitation in emergency accommodations has to be solved – convenient and rapidly, pre-fabricated and low-cost solutions are urgently needed.

Borda BNS Network Mission

With a mission to improve the livelihoods of disadvantaged groups within societies and to sustain the functioning of ecosystems through dissemination of demand oriented Basic Needs Services (BNS), BORDA (Bremen Overseas Research and Development Association) and its BNS Partner Network, consisting of 20 civil society organisations based in Asia and Africa, develop and disseminate innovative solutions for facilitating better access to improved sanitation facilities and services.

DEWATS adapted to demands of Emergency Sanitation

Having developed and disseminated DEWATS Service Packages including the implementation of more than 900 permanent DEWATS plants in South East Asia and Southern Africa, BORDA and its BNS Partner Network noticed that there was a need for rapidly installable sanitation facilities, including an on-site underground wastewater holding and treatment system, to improve sanitation and public health in emergency accommodation. Therefore, a DEWATS Emergency Sanitation service package, including options for different types of prefabrication modules, has been developed and implemented at different occasions.



Rapid assembling of prefabricated toilet facilities made of ferro-cement



A prefabricated glass-fibre container DEWATS plant, with ferro-cement toilets installed after an earthquake in Indonesia.

Significant reductions of health risk and infections for refugees

Key DEWATS EmSan features

In order to combat the consequences of poor sanitation in emergency accommodation, the following measures are rapidly carried out for the installation of DEWATS EmSan:

- o Quick Feasibility study
- o Construction of "Sanitation Centres" with toilets and washing facilities that meet hygienic requirements, separating black and grey water
- o Assembly and implementation of a safe and simple prefabricated underground wastewater treatment system, including the option for biogas generation
- o Health and Hygiene Education (HHE), Health Impact Assessment (HIA) and maintenance training for the proper handling and management of the installed toilet facilities and the wastewater treatment plant



BORDA's glass-fibre DEWATS plants were successfully tested after the heavy earthquakes in Java, Indonesia, in 2006.

Prefabrication

After the Tsunami caused by the earthquake offshore from North Sumatra in 2004, BORDA and its BORDA BNS Partner Organizations started to develop prefabricated DEWATS plants by using glass-fibre.

This material is available & affordable in nearly all parts of the world. This means that the system can be prefabricated by local companies and operated by trained but unskilled operators.

Glass-fibre constructions can be built quickly and well in advance of need. Light-weight and size standardization facilitate transportation. The treatment capacity of pre-fabricated sewerage systems can be adjusted to local demand. The implementation costs are about 18 USD per user.



Health and Hygiene Education for refugees

Intervention areas for rehabilitation, in the Tsunami affected areas of Aceh, Indonesia (below) and Tamil Nadu, India (right).



Resulting benefits

The implemented measures improve the sanitation conditions notably:

- o Thanks to clean toilets and the provision of fresh water, the hygienic conditions are improved, which leads to a significant reduction of health risk and infection.
- o Good hygiene behaviour, due to Health and Hygiene Education and the availability of hygienic sanitation facilities, is improved.
- o Privacy and dignity of refugees, especially woman, are ensured by the new toilet facilities.
- o The biological treatment of wastewater without technical energy inputs by DEWATS applications makes wastewater meet basic hygienic needs in refugee camps and allows proper disposal to meet environmental standards.
- o The biogas that occurs at wastewater treatment can be used for cooking purposes.
- o The temporary sanitation facilities make users aware of necessary hygienic sanitation. Therefore, the idea of permanent sanitation facilities is spread.



Prefabrication – ongoing test with cargo containers & glass-fibre

Pre-fabrication benefits

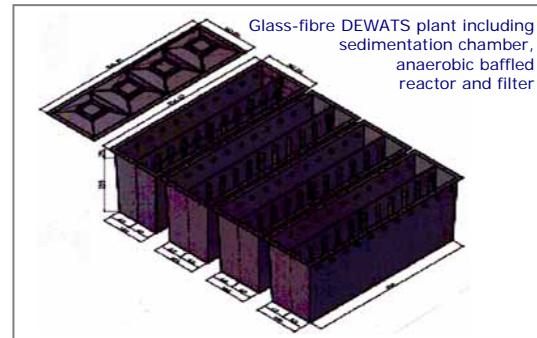
The pre-fabrication of the necessary components as well as easy and rapid implementation provide a number of specific benefits:

- o Construction time reduced by 90 % (min: 3-5 days / max: 2 weeks)
- o Implementation capacity is increased 10 times
- o Storage potential at logistical hotspots
- o Improved quality control
- o Reduced investment for capacity building
- o Increased number of clients
- o Utilization of un-skilled workforce

New approaches

BORDA's efforts to improve the DEWATS technology wherever possible has led to a new prefabrication approach: Integrating the DEWATS technology into cargo containers. This concept is gaining its applicability because it facilitates transportation and storage. At the same time, it guarantees higher stability of the plant (where there is no skilled workforce) and offers its re-use (dismantling).

Another new and promising approach, developed with a partner organization in India, is using prefabricated ferro-cement elements to build the toilet facilities.



A prefabricated fiberglass DEWATS plant before installation. It is capable of serving up to 500 people.

A whole DEWATS plant is built from this container – standardized & transportable worldwide.



DEWATS Service Packages

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> o Treatment Systems o Community Based Sanitation o School Based Sanitation o Sanitation for Hospitals & Hotels o Wastewater Treatment for Agro-Industry | <ul style="list-style-type: none"> o Emergency Sanitation o Sanitation for Prisons o Sanitation for Real Estates o Sanitation Mapping o Municipal Sludge Treatment Plant | <ul style="list-style-type: none"> o Health Impact Assessment & Hygiene Education o Capacity Development o Standardisation o Research & Development |
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DEWATS – Decentralized Wastewater Treatment Solutions

Developed & disseminated by BORDA and over 20 BORDA BNS Network Partners in South and South East Asia & Southern Africa

With support from:



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