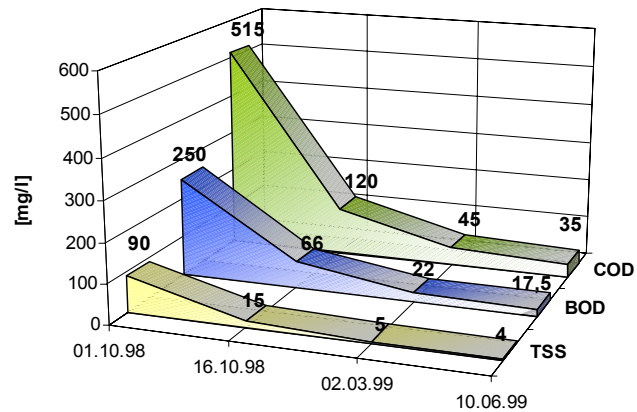


Effluent Laboratory Test Results

Effluent quality during first month of *dewats* operation



Laboratory result of treated wastewater

No	Parameter	Satuan	Kadar Maks.	Hasil Analisa		Reduksi
				Inlet	Outlet	
1	Suhu	C	<30	-	-	-
2	BOD	mg/l	30	57	28	50,88%
3	COD	mg/l	80	138	46	66,67%
4	TSS	mg/l	30	44	13	70,45%
5	NH ³ bebas	mg/l	0,1	0,37	0,09	75,68%
6	PO ⁴	mg/l	2	5,7	2,42	57,54%
7	pH	6,0 - 9,0		7,48	7,45	-

Note: BOD: Biological Oxygen Demand, COD: Chemical Oxygen Demand, TSS: Total Suspended Solid, NH₃: Amoniak, PO₄: Fosfat



German Federal Ministry
for economic cooperations
and development

Freie
Hansestadt
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dewats

Decentralized Waste Water Treatment System



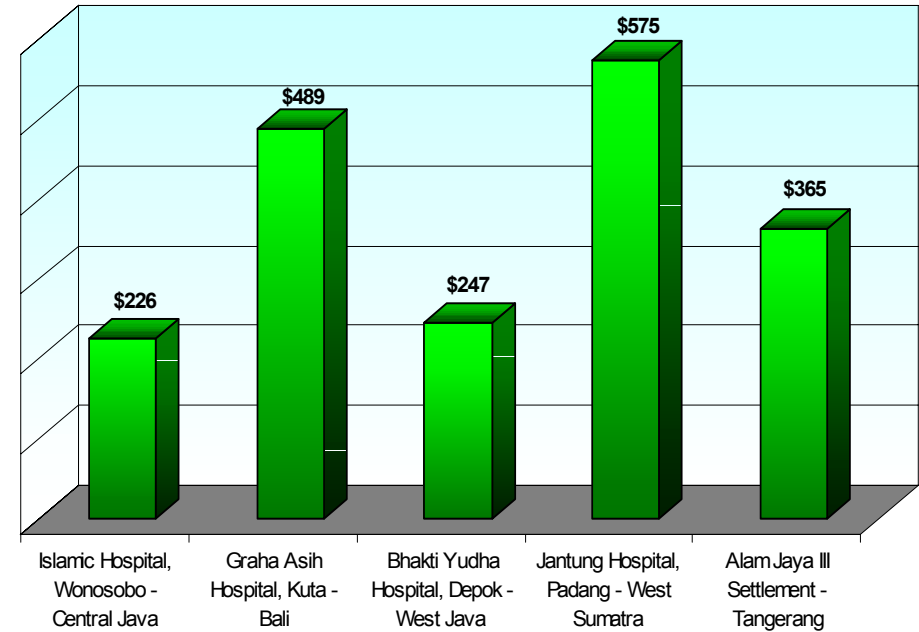
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Overview



Construction Costs (Approximately)

Examples of prices (\$ / m³) for *dewats* treatment volume



Typical *dewats* cost factors for 100 m³ anaerobic filter reactor

Factors		%
Sand, Cement, Concrete, Iron, Stone, Pipes, Plats, Filter material	30.000	60
		40
		100

Implementation

dewats – implemented in four steps:



Seminar and workshop

Potential clients are encouraged and informed about the importance of wastewater treatment & *dewats* technology.



Feasibility study

On-site surveys by *dewats* experts:

Collection of first hand information about all important aspects related to wastewater treatment, which then be transformed into project proposal.



Construction and supervising

Construction is the most important part in *dewats* technology.

Wastewater discharged is treated appropriately in this section.



Monitoring

dewats project is responsible for monitoring and maintaining the wastewater treatment system for a generate period of 12 months.

Demand

Common wastewater problems within communities and small & medium enterprises



Communities, Small and Medium Enterprises are often not able to meet high investment and maintenance cost required for sophisticated wastewater treatment system.

Maintenance of sophisticated wastewater treatment system are found to be difficult due to low human resources.



Wastewater treated does not meet wastewater discharge standard regulation.

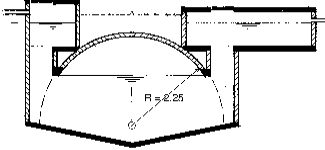
Low maintenance and operation of wastewater treatment system are required to avoid problems during operation.



A combination between wastewater treatment system and landscape is required to achieve environmental friendly communities, small and medium enterprises

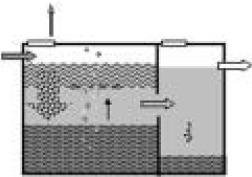
A combination of low-maintenance based technology

Biogas digester



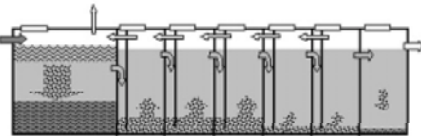
- Half-ball-shaped fixed dome plant
- Suitable for rather “thick” and homogenous substrate like sludge from aerobic treatment tanks, liquid animal excreta and excrements

Basic septic tank



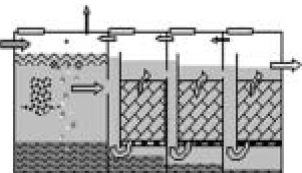
- Basically principled on sedimentation tank in which settled sludge is stabilized by anaerobic digestion
- Mechanical treatment by sedimentation
- Biological treatment by contact between fresh water and active sludge compete with each other in the septic tank

Baffled up-flow reactor



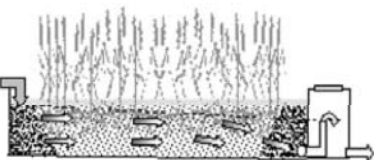
- Treatment by forcing incoming wastewater to pass through active bacteria sludge in each compartment. The settler in front prevents larger solids to enter the baffle section

Anaerobic filter reactor



- Treatment of non-settleable and dissolved solids by bringing them in close contact with a surplus of active bacterial mass

Horizontal sand filter



- Provides continuous oxygen supply to the upper layers
- Treatment by permanently soaked sand or gravel filter with water and operates partly aerobic, partly anoxic, and partly anaerobic

Wastewater discharged is treated to meet wastewater discharge standard



Sedimentation biodigester

- Optionally constructed and integrated with ‘Baffle Reactor’
- Brick construction, fully waterproof, and air-tight plastering
- Biogas produced as renewable energy source
- Functioned as settler for ‘Black Water’



Baffle reactor and anaerobic filter

- Anaerobic degradation of suspended and dissolved solid based on up-flow principle
- Simple, durable, easy to maintain
- Underground construction, little permanent space required
- Effective, efficient, and low cost maintenance
- BOD reduction up to 90%



Horizontal sand filter

- Aerobic-facultative-anaerobic degradation of dissolved and fine suspended solids
- Pathogen removal
- No wastewater above ground
- No nuisance odor
- High treatment efficiency



Aerobic ponds

- Aerobic degradation
- High pathogen removal rate
- Simply constructed
- Naturally & environmentally reliable in performance
- Provide possibilities for pleasant landscaping

