

The Benefits of Using Bio-Utility or Bio-Plant to Treat Wastewater and Rubbish



BIO UTILITY

INGREDIENT: BACTERIA

PRODUCED BY

ATREMIS & ANGEL CO.,LTD.

77/34 LAMAI SON CONDO, SOI SAINUMTHIP 2, SUKHUMVIT 22 RD.

KLONGTOEY, BANGKOK, THAILAND

TEL : +662259-3716, +6686329-6038 FAX : +662663-3020

Email: somkiet999@hotmail.co



**Bio-Plant
can be used
equally well
because of
the range of
bacteria in it.**



1.

What is Bio-Utility and How Does It Work?

What It Does

- Bio-Utility is a 100% natural, environmentally friendly, chemical-free, non-pathogenic, live, microbial product that uses naturally occurring and beneficial bacteria to eat and digest waste and other organic contaminants in a wide array of commercial, industrial, agricultural, aquaculture, and residential applications, including water that has been polluted by distilleries and breweries.
- It provides a very effective biological alternative to chemicals and caustic solvents.

Micro-organism Ingredients

- Bio-Utility is a very concentrated microbial liquid, with a heavy concentration of micro-organisms, such as Bacillus, Nitrobacter, Nitrosomonas, and Pseudomonas. Specific micro-organisms can be added according to the needs of certain problems.

Where It Can Be Used

- Residential wastewater treatment.
- Household and commercial property drains, drain pipes, and septic tanks.
- Municipal wastewater lagoons and treatment plants.
- Fish farms and shrimp farms.
- Lakes and ponds, including on golf courses.
- Distilleries, sugar mills, and breweries.
- Textiles, chemicals, and pharmaceuticals factories.
- Oil industry wastewater treatment plants.
- Portable toilets.
- Hotels and restaurants.

Treating Rubbish

- **Bio-Utility can be used:**
 - To degrade rubbish in landfills and turn it into fertilizer.
 - To remove the foul smell caused by piles of rubbish.

A Typical Smelly Rubbish Dump



Treats Rubbish Biologically

- Bio-Utility provides biological rubbish and wastewater treatment by using micro-organisms which multiply very rapidly to degrade organic waste naturally.
- 1 cc contains 1 billion cells. Each cell multiplies into one million cells per day.
- In wastewater this results in Biochemical Oxygen Demand (BOD) reduction, Chemical Oxygen Demand (COD) reduction, and smell control.
 - *(They indicate the amount of organic pollution present in an aquatic ecosystem.)*

The Bacteria Produce Enzymes

- Bio-Utility provides a heavy concentration of micro-organisms to treat rubbish, wastewater, and polluted water.
- As the bacteria metabolize, grow, and divide, they produce enzymes. It is these enzymes that break down pollutants.
- The bacteria are literally factories for the production of enzymes.

Here is some research about the effectiveness and benefits of using enzymes to deal with polluted water and wastewater biologically.

[https://scielo.conicyt.cl/scielo.php?script=sci_arttext
&pid=S0718-95162010000100008](https://scielo.conicyt.cl/scielo.php?script=sci_arttext&pid=S0718-95162010000100008)

The Enzymes

- The enzymes which are produced by the bacteria are appropriate to the environment in which the enzymes will be working.
- You therefore have automatic production of the right enzymes for the biological reduction of any waste material because Bio-Utility contains the appropriate bacteria to start with.

How the Enzymes Work

- Enzymes create biochemical reactions as organic catalysts. The enzymes create a reaction, and after having caused it, split off and are unchanged.
- After the biochemical reactions are complete and products formed, the enzyme is released to catalyze another reaction.

The Enzymes Break Down the Organic Matter

- The enzymes break down the organic matter into water soluble nutrients, which the bacteria digest. The bacterial digestion process consumes the organic matter.
- Using complex chemical reactions, the organic waste is metabolized down to water and Carbon Dioxide, thereby providing the bacteria with energy for growth and reproduction.

The Action of the Enzymes

- The enzymes decompose the organic waste instantly.
- The micro-organisms in the formula degrade totally the waste decomposed by the enzymes by means of biological oxidation.
- Because the organic waste is consumed by the bacteria, it is then no longer present to produce odours, sludge, pollution, or unsightly mess.

Bio-Utility Removes the Chemicals

- The smell disappears as the chemicals are consumed by the micro-organisms in Bio-Utility.
- The micro-organisms break down the chemicals into different forms, which are then made harmless or are consumed by the micro-organisms.

It Eliminates Foul Smells

- The enzymatic and bacterial action removes the source of the smell problems.
- Removes foul smells from rubbish, drains, ponds, golf course lakes, and waste water lagoons.
- Degrades solid waste (such as in portable toilets and septic tanks) and eliminates foul smells.
- Prevents blockings and foul smells in bathroom and kitchen drains.
- Eliminates foul smells from kitchen exhausts.
- Degrades biologically the organic deposits in grease traps.

Ensures Effective Treatment of Organic Matter

- Foul smells arise from a lack of oxygen and by the slow decay of organic matter in the water.
- The strong concentration of aerobic and anaerobic micro-organisms in Bio-Utility is very effective in breaking down organic matter and removing smells.



2.

**How to Apply
Bio-Utility to
Treat Rubbish
and Turn It into
Compost**

The Common Solution: *Rubbish Is Burned*



Effect of the Micro-organisms on the Rubbish Piles

- Ideally, the non-degradable rubbish (metal, polystyrene, cans, etc.) should be separated from the degradable, organic rubbish first.
- If this cannot be done, while the rubbish is decomposing, people can separate the non-degradable rubbish from the piles of rubbish.
- After spraying the rubbish, there will be much less smell and danger for the rubbish pickers.

Method for Treating Rubbish and Turning It Into Compost

- *For municipal rubbish dumps where the organic matter has not been separated from the non-biodegradable rubbish:*
- Spray Bio-Utility on the rubbish. The dosage should be 1 litre of Bio-Utility mixed with 200 litres of water per 5 - 10 MT tonnes of rubbish.
- Leave the rubbish for 35-40 days. Turn over the rubbish every 3-4 days. It will turn into compost.
- 1 litre of Bio-Utility is enough per 400 square metres of land. 10 bottles per 4,000 square metres.

Water Cannons to Spray Micro-organisms Onto Rubbish



Spraying Micro-organisms onto Piles of Rubbish



The Micro-organisms Decompose the Rubbish

- Bio-Utility contains anaerobic and aerobic micro-organisms.
- This means that the decomposition can take place both inside the piles of rubbish as well as near and on the surface. This speeds up the speed of decomposition.

Turn Over the Rubbish

- Use bulldozers to turn over the rubbish every 3-4 days so that the rubbish deep down in the piles can receive oxygen.

Turn Over the Rubbish Regularly



Effect of the Micro-organisms on the Rubbish Piles

- The micro-organisms will decompose the organic matter, and after about 35-40 days the rubbish piles will be about 50% lower.
- The organic matter can then be screened and turned into compost, which can be bagged and sold.

The Volume of Rubbish Will Decrease by About 50%



Some of the Benefits

- Significant reduction of:
 - foul smell (No need to spray perfume on the rubbish!)
 - mosquitoes, flies, crows, and pests.
 - gas emissions.
- Reduced BOD and COD levels in water flowing from the rubbish piles.
- The remaining rubbish will be rich in micro-organisms, Nitrogen, Phosphorus, and minerals, and can be used to make excellent compost.
- Some screening of non-degradable rubbish may be necessary before the compost can be sold.

Turning Rubbish into Compost



3.

Composting
Biodegradable
Rubbish

Prepare the Windrows

- Obtain the bio-degradable materials from the rubbish dump for the compost.
- Grind or cut up the material before composting it.
- Lay out the material in windrows. Mix it with soil and organic matter.
- Turn it regularly with a windrow machine. Spray the windrow with water mixed with Bio-Utility or Bio-Plant as it is turned.

Bio-degradable Rubbish Being Composted



Windrows of Compost Being Made with Bio-degradable Rubbish



Fish & Shellfish Waste Can Be Composted with Bio-Utility



Compost the Rubbish with Organic Matter



Bacteria have reduced the size of the windrow.

The waste is shown in the early stages of being treated.

Create Many Windrows of Compost



Create Many Windrows of Compost



A Windrow Compost-Making Machine



Mix the Compost Materials in Rows



A Windrow Compost-Making Machine in Action



Video of Windrow Composting

- This video shows a windrow composting machine in action. Bio-Plant mixed with water would be sprayed onto the compost, just as you see water being sprayed in the video.

<https://www.youtube.com/watch?v=x71nIMkYvVM>

(Until 2:10 mins.)



4.
Using the
Compost Made
with Rubbish in
Soil Preparation

The compost made with rubbish and organic matter can be used in the same way as ordinary compost. But if no soil and/or organic matter was added, farmers should double the amount they use when preparing the soil.



5.

Treating Rubbish
with Bio-Utility to
Turn Desert &
Savannah into
Agricultural Soil

How to Turn Desert or Savannah “Dirt” into Agricultural Soil

- There are various ways to apply the compost made with rubbish to change the “dirt” of savannah land into agricultural land.
 - e.g. the “dirt” could be covered with the compost and then lightly ploughed. A mixture of cover crops would then be planted. Before the cover crops go to seed, they would be mowed down and the seeds of the cash crop would be planted through the organic matter. Conservation farming would then follow.

The Volume of Rubbish in Landfills Could Be Reduced

- By treating large amounts of bio-degradable rubbish with the micro-organisms of Bio-Utility in windrows, a huge amount of rubbish could be turned into compost. This is a solution to the constant increase in the amount of rubbish.
- Vast areas of desert and savannah could then be turned into soil that can be used for agriculture.

The Main Effects and Benefits

- As the process is implemented around the country, and the new land is used for crops and for planting forests, there will be fewer and fewer desert soil (sand) storms.
- Towns could be created in current desert-like areas.
- Forests could be created as part of the transformation process.



6.
Using Bio-Utility
in Wastewater
Treatment Plants,
and Fish and
Shrimp Ponds.

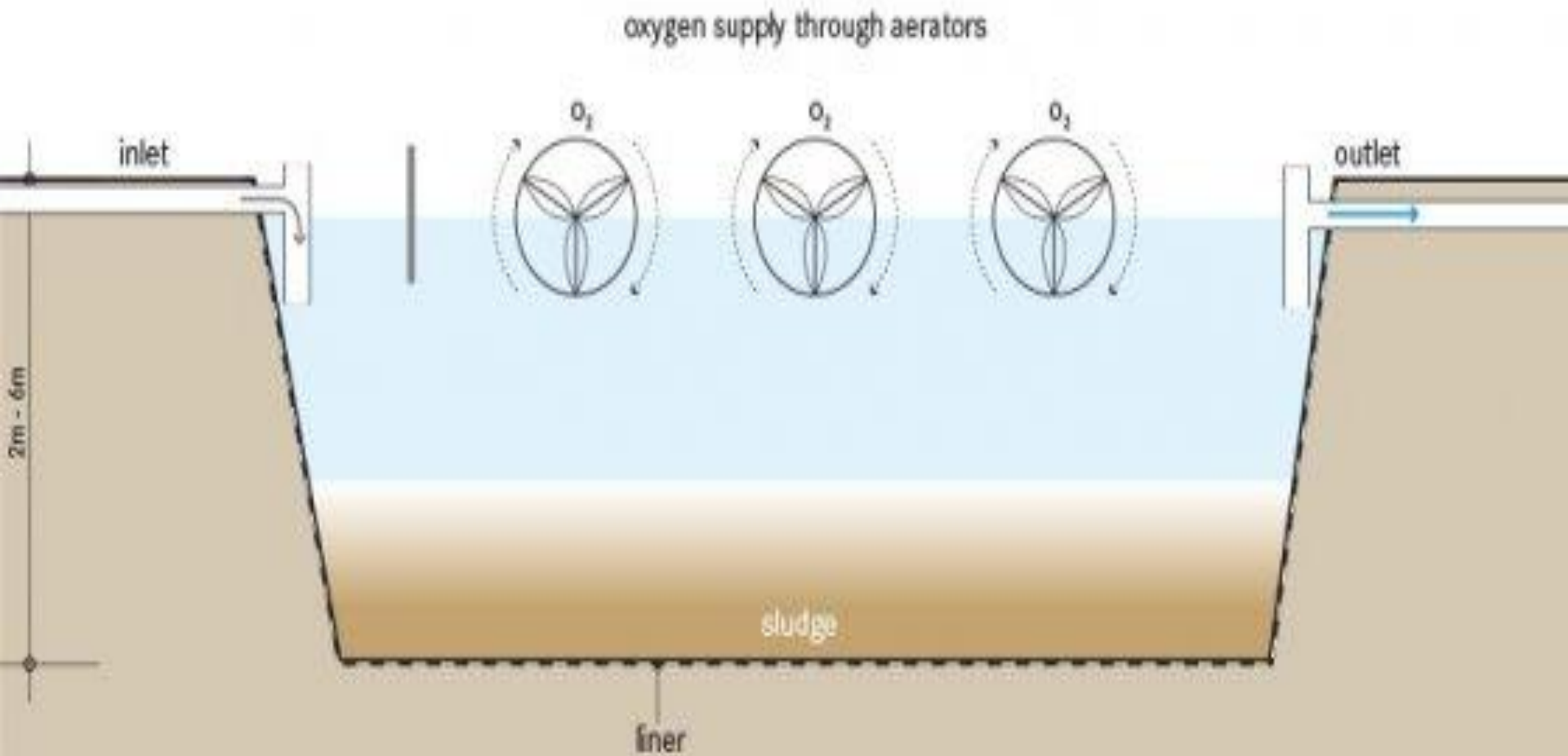
Treating Municipal Wastewater

- Bio-Utility can be poured into a wastewater treatment plant where the wastewater enters the Nitrification Unit.
- Chlorine would not be needed in the water treatment process.
- The resulting treated, clean wastewater can then be re-used or released into streams. Shrimps are sensitive to polluted water, but they grow well in the treated wastewater.

The Main Effects

- The biological treatment of wastewater is based on the ability of the bacteria in Bio-Utility to degrade the organic matter present in the wastewater for their own growth. Oxygen is essential in this process. Aerators will provide this.

An Aerated Pond



The Main Effects

- Apart from oxygen and organic matter, the bacteria need water containing nutrients, especially nitrogen and phosphorus, to grow. Wastewater contains these nutrients.
- The bacteria in Bio-Utility will remove both particulate and soluble organic matter present in the wastewater,

Treating Aquaculture Ponds

- If the aquaculture ponds do not have a wastewater treatment plant, then add Bio-Utility to the pond by spraying it over the surface. The aerators will spread it around the pond.
- Apply it once every 2 weeks.

Standard Dosage

- 1 litre / 500-1,000 cubic metres
 - The wastewater is at Level 1.
- 1 litre / 300-500 cubic metres
 - The wastewater is at Level 2.
- 1 litre / 100 cubic metres
 - The wastewater is at Level 3.

Note: 1 cubic metre = 1,000 litres

Level 1 – Household wastewater.

Level 3 – Putrid and foul-smelling wastewater.



7.
Treating a
Community's
Wastewater
with Bio-Utility.

Treating Household Wastewater

- Bio-Utility can be used to treat wastewater in households and communities where there is no centralized wastewater treatment system.
- In these places Bio-Utility can be used to treat the wastewater **in decentralized treatment systems** because it contains bacteria that are active in aerobic and anaerobic conditions.

Examples of Decentralized Wastewater Treatment Systems

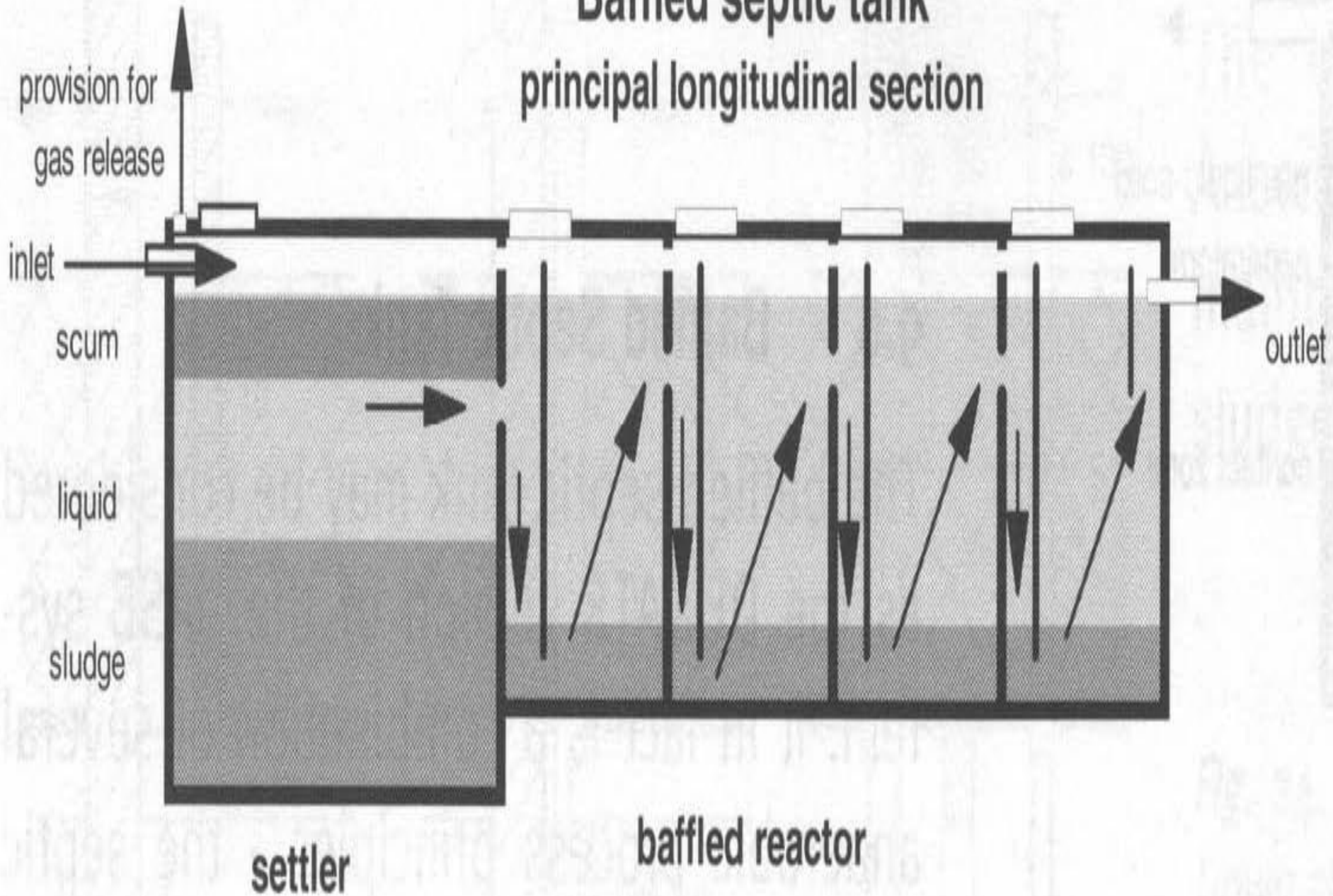
- **Tank Systems:** These are the Septic, Imhoff, and Baffled treatment tanks.
- **Pond Systems:** These consist of Anaerobic, Facultative, and Maturation Ponds.
- Bio-Utility could be used in any of these systems.

The Baffled Tank System

- The Baffled Tank System is an improvement of the septic tank system, which many households have already. It consists of a settling tank followed by series of up-flow chambers.
- The process of treatment is anaerobic (no oxygen) degradation of suspended and dissolved solids.
- It has a high treatment efficiency compared to a Septic Tank.

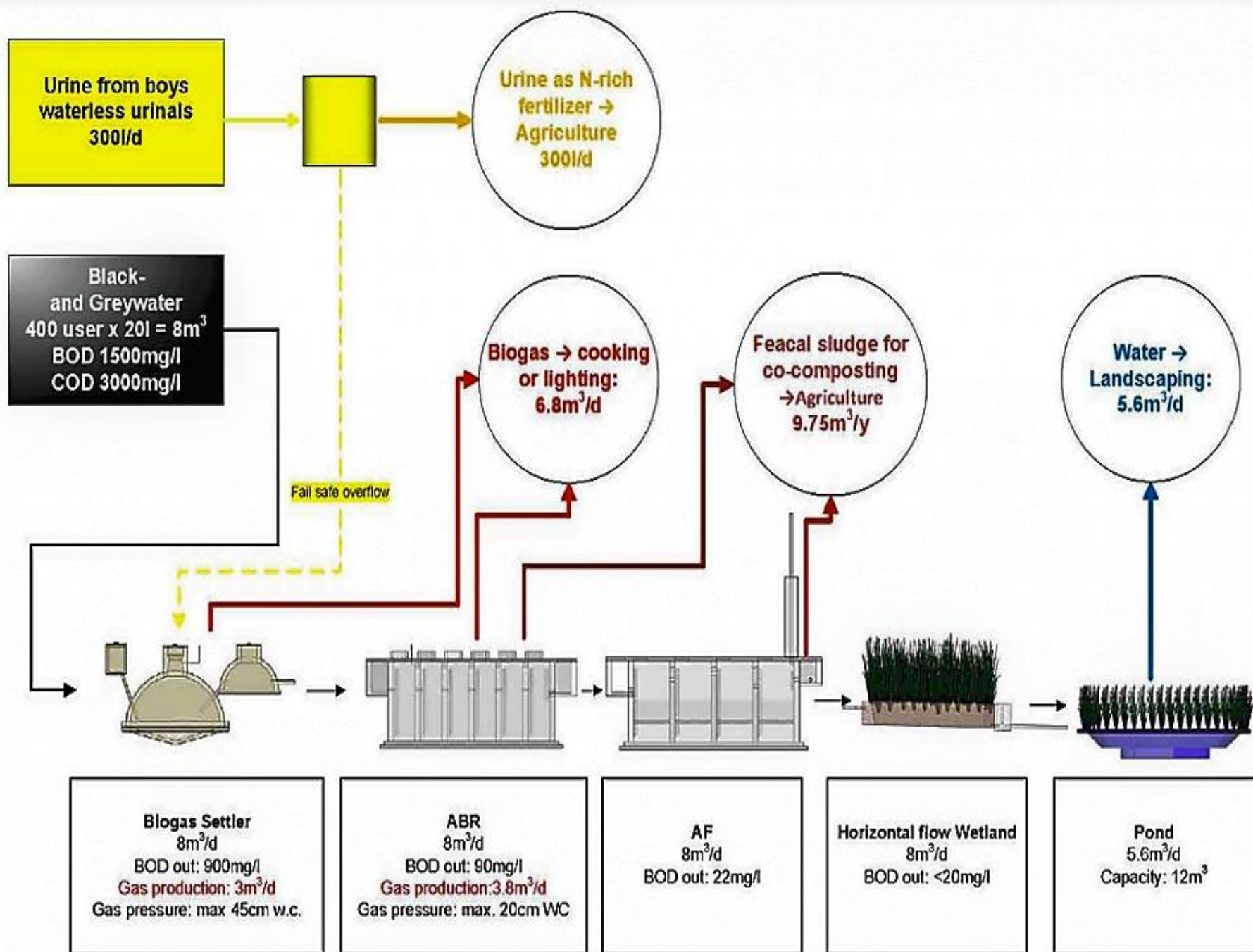
Baffled septic tank

principal longitudinal section



How a Baffled Tank System Works

- The first compartment is purposely for the settling of larger solids and impurities.
- Existing septic tanks could serve the purpose of the first compartment.
- The first chamber is where the Bio-Utility would be. The water goes from there into a series of up-flow chambers. The stream of flow from chamber to chamber is directed by baffle walls.
- The water would pass on to a second chamber for further treatment.



How a Baffled Tank System Works

- The wastewater flows from the bottom to the top so that in effect the sludge will settle against the upstream of fluid. The sludge in the wastewater is deposited on the bottom.
- There is intensive contact between the wastewater and Bio-Utility in the tank over the 2 days the water is in the tank. Treatment efficiency even without Bio-Utility is 65-90% COD removal.


The Baffled Tank System Is Much More Effective

- A household septic tank is the basic wastewater treatment system, but it has a limited treatment performance. The Baffled Tank System is much more effective at treating wastewater.
- The septic tank can be turned into a Baffled Tank with the existing septic tank serving as the first chamber to treat their sewage before the water is led into the baffled sections.
- In this way the treatment performance of septic tanks could be increased by 80% - 90%.

A Community Baffled Tank Could Connect Septic Tanks

- Or the wastewater in household septic tanks could be connected to a community Baffled Tank.
- Bio-Utility would be used in the community Baffled Tank.
- The system can connect groups of 20, 40, 80, etc. houses and treat their wastewater.

After the wastewater has been treated biologically with Bio-Utility it can then be used for agricultural purposes or released into an ecosystem without any harm to it.

The background of the slide is a dense, repeating pattern of various tropical leaves. These include large, dark green monstera leaves with characteristic splits, and several types of ferns with long, feathery fronds in lighter green shades. The leaves are scattered across the entire white background, creating a lush, naturalistic feel.

8. Fish Farming (Pond Water Treatment with Bio-Utility)

The Standard Dosage of Bio-Utility for Water Treatment

- 1 litre / 500-1,000 cubic metres
 - The wastewater is at Level 1.
- 1 litre / 300-500 cubic metres
 - The wastewater is at Level 2. (*The norm.*)
- 1 litre / 100 cubic metres
 - The wastewater is at Level 3.

Note: 1 cubic metre = 1,000 litres

Level 1 – Household wastewater.

Level 3 – Putrid and foul-smelling wastewater.

Cleaning Aquaculture Ponds

- $0.5 \text{ km}^2 = 50 \text{ hectares}$.
- 4 months per fish production period x 3 periods per year.
 - One hectare of fish ponds holds 20,000 litres of water.
 - With the pond water being at Level 2 you will need 50 litres of Bio-Utility per hectare every month.
 - $50 \text{ litres} \times 12 \text{ months} = 600 \text{ litres per hectare per year} \times 50 \text{ hectares} = 30,000 \text{ litres per year}$.

Bio-Utility would be mixed with water and poured or cast into the fish pond every 2 weeks. The aerators will then spread it around so that the water throughout the pond can be treated.

At the end of each fish production period the water can be released into a central reservoir and fed to water the fields where crops are grown and to help regenerate degraded pasture.

The End