



Palestinian Hydrology Group

Black and Grey Water Treatment and Reuse Experience in the Palestinian Rural Areas

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Palestinian Hydrology Group









PHG Objectives

-  **To promote the adaptation of good local water governance in the water sector in Palestine**
-  **To promote the right based approach and insure equal and just allocation of water as well as the provision of sanitation services to Palestinian communities**
-  **To promote gender mainstreaming within the water sector**
-  **To insure the sustainable management of water and environmental resources in Palestine**



Major Activities

-  **Water Resources Development Projects**
-  **Sanitation and Environmental Projects**
-  **Training and Capacity Building**
-  **Public Awareness**
-  **Research and Studies**
-  **Lobbying and Advocacy**

Wastewater Facts in Palestine:

- About **66 Mcm** of wastewater is generated annually in WB & GS.
- About **35%** of Population is connected to sewage system.
- About **28% of the Population** in WB are connected to sewage networks.
- Less than **1%** of the discharged wastewater is properly treated.
- approximately **80%** of total Wastewater generated from household is Grey water.

Wastewater treatment technologies in the Palestinian Rural Areas

- The **UASB** reactor is the most widely and successfully used high-rate anaerobic systems for several types of wastewater. capable to retain a high concentration of active suspended biomass with simple and low cost means.



Complementary low cost technologies for secondary treatment in rural areas are mainly aerobic, such as:

Constructed wetlands are complex biological systems that mimic natural self cleansing processes. The basic elements of such systems are vascular plants alongside the fixed microorganisms available on the bed media (gravel bed).



Grey Water Treatment Technology

80% of GW COMES FROM

- bathtubs,
- showers,
- bathroom sinks,
- washing machines,
- dishwashers and kitchen sinks,
- any source in your home **other**
- **than toilets.**





**RAW GREY WATER VERY OFTEN
CAUSING PROBLEMS MAINLY:**

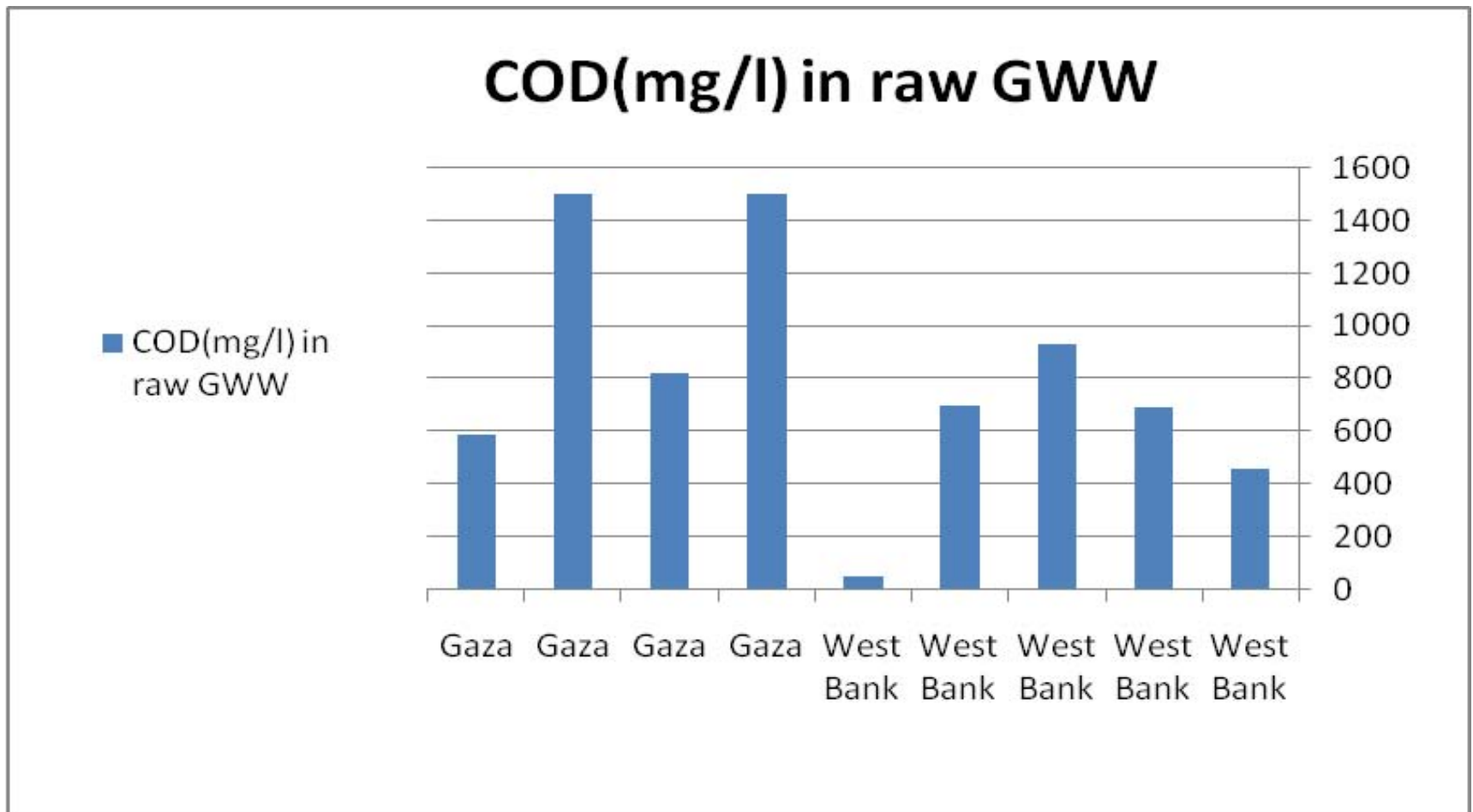
Soil salinity

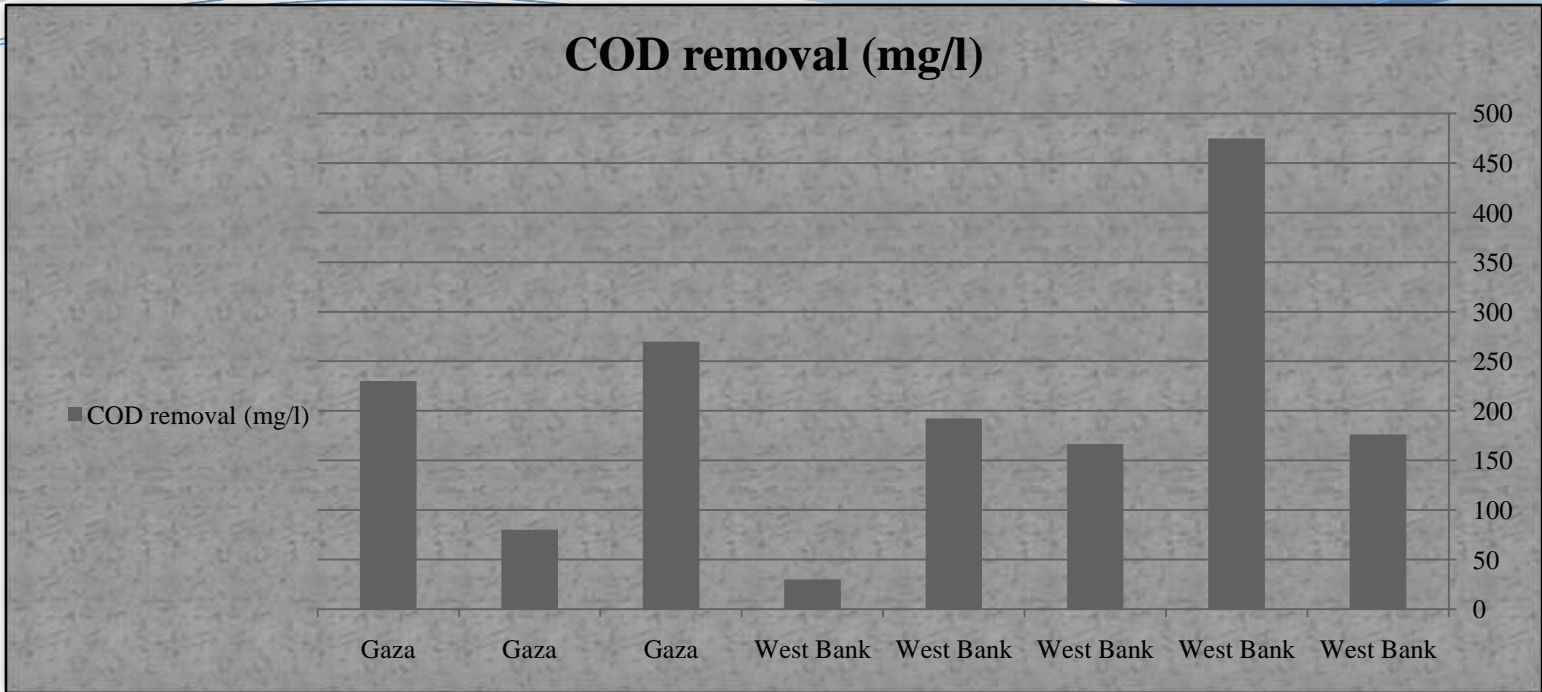
Viruses

Insects

Bad smells

Characteristics of raw grey





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- Turbidity, samples of water taken from anaerobic pond and after the sand filter.



Palestinian Experience in Grey water treatment

- **Developed** and tested reliable low cost on-site treatment methods
- Installed more than **500** GW units in WB & GS
- **Developed** environment friendly of Grey water treatment plant
- **Promoted** GW reuse as means for poverty alleviation and environment protection

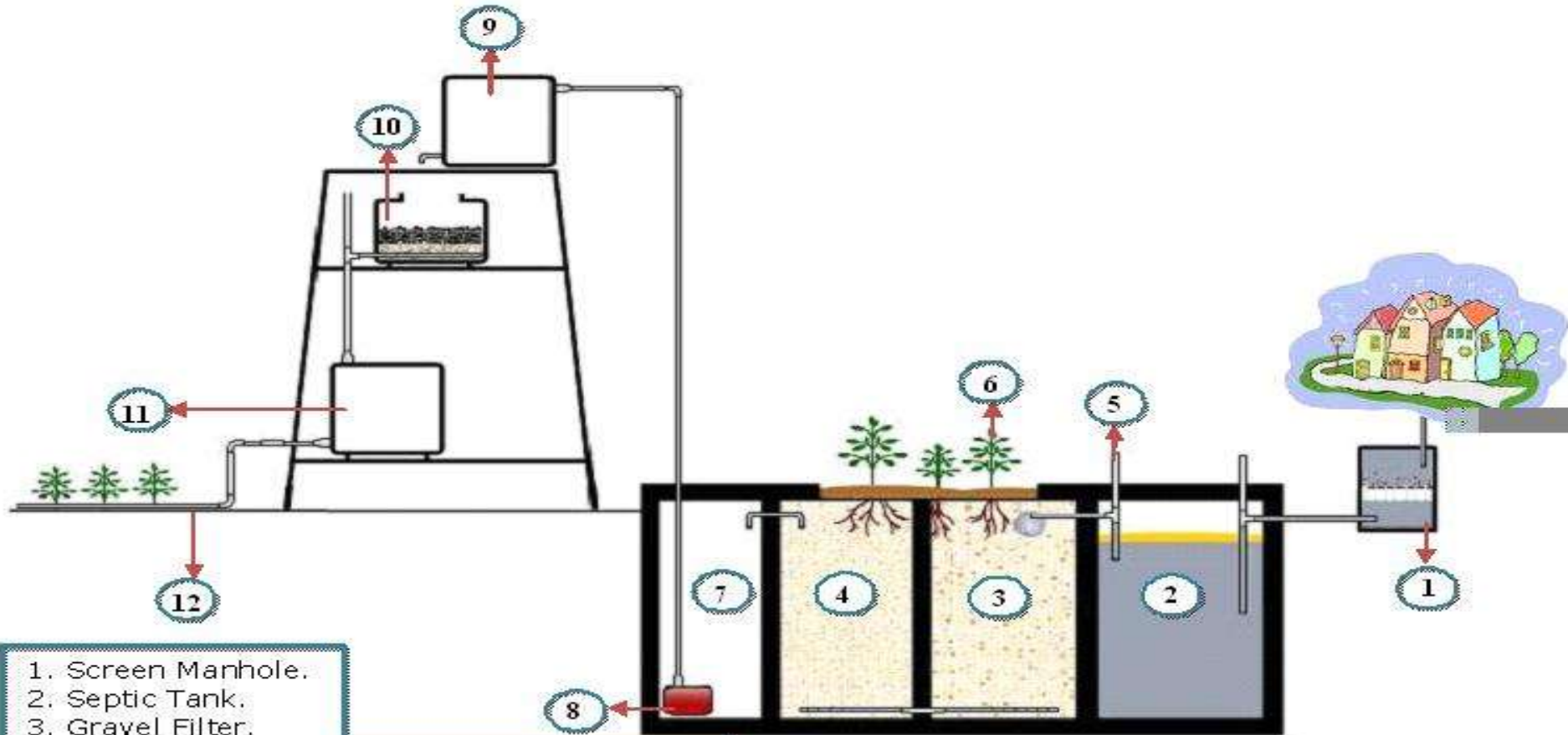
HERE COMES PHG RESPONSE

- In the year 2000, PHG started to develop appropriate small scale treatment technologies to reduce the impact of such problem
- Why Small Scale?
 - No need for permits
 - Low cost technology.
 - Requires small area.
 - TGW can be used for home gardens.
 - Improves the household economy.

PHG ACHIEVEMENTS

- PHG implemented more than **200** GWT and reuse units that served about **250** families and **30** schools.
- The capacity of each unit is about **one** cubic meter per day.
- PHG also developed one treatment plant for one village (Ijnisiya)

Up-Flow gravel filter Grey water treatment technology Developed By PHG



1. Screen Manhole.
2. Septic Tank.
3. Gravel Filter.
4. Gravel Filter.
5. Plastic Pipes.
6. Plants.

7. Balancing Tank.
8. Submersed Pump.
9. Plastic Tank.
10. Arobic Filter.
11. Distribution Tank.
12. Irrigation Network







- **Play Animation**



Thanks for your attentions