A green plant stem with several leaves is positioned on the left side of the slide. At the bottom left, there is a small icon of a globe with green continents and blue oceans, resting on a brown, curved base.

Application of Root-zone treatment system for waste water in Automobile Wash and Sewage Treatment

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Various Names

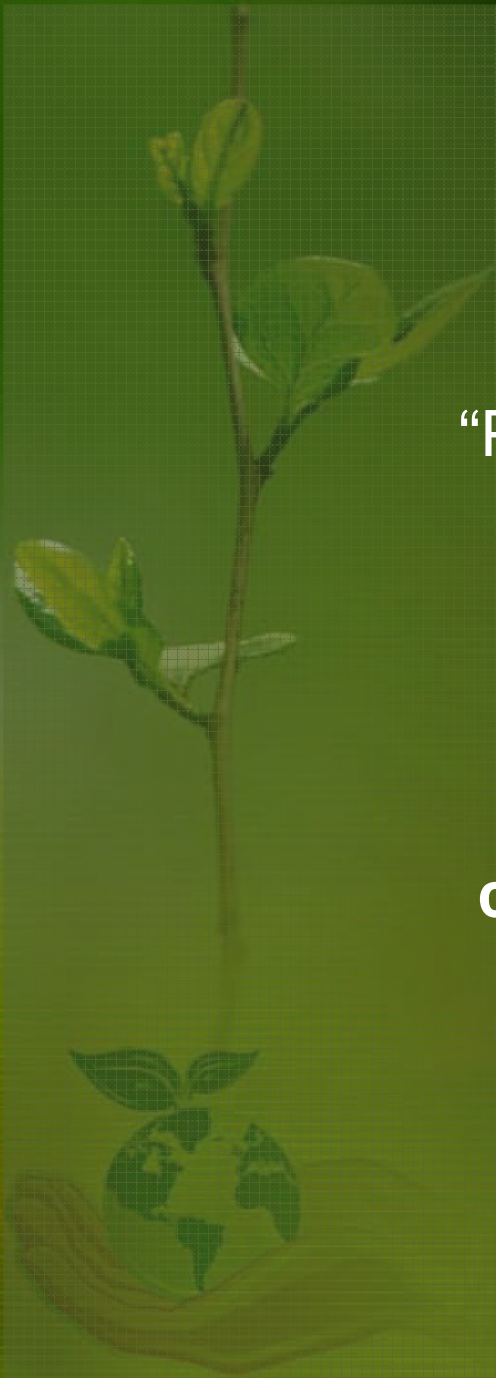
- Also known as **Root-zone system** or **Bio-Filter** or **Reed Bed System** or **Constructed wetland system** or **Treatment wetland system** or **Phytotechnology** or **Phytoremediation system** (any of these terms may be used in this report).

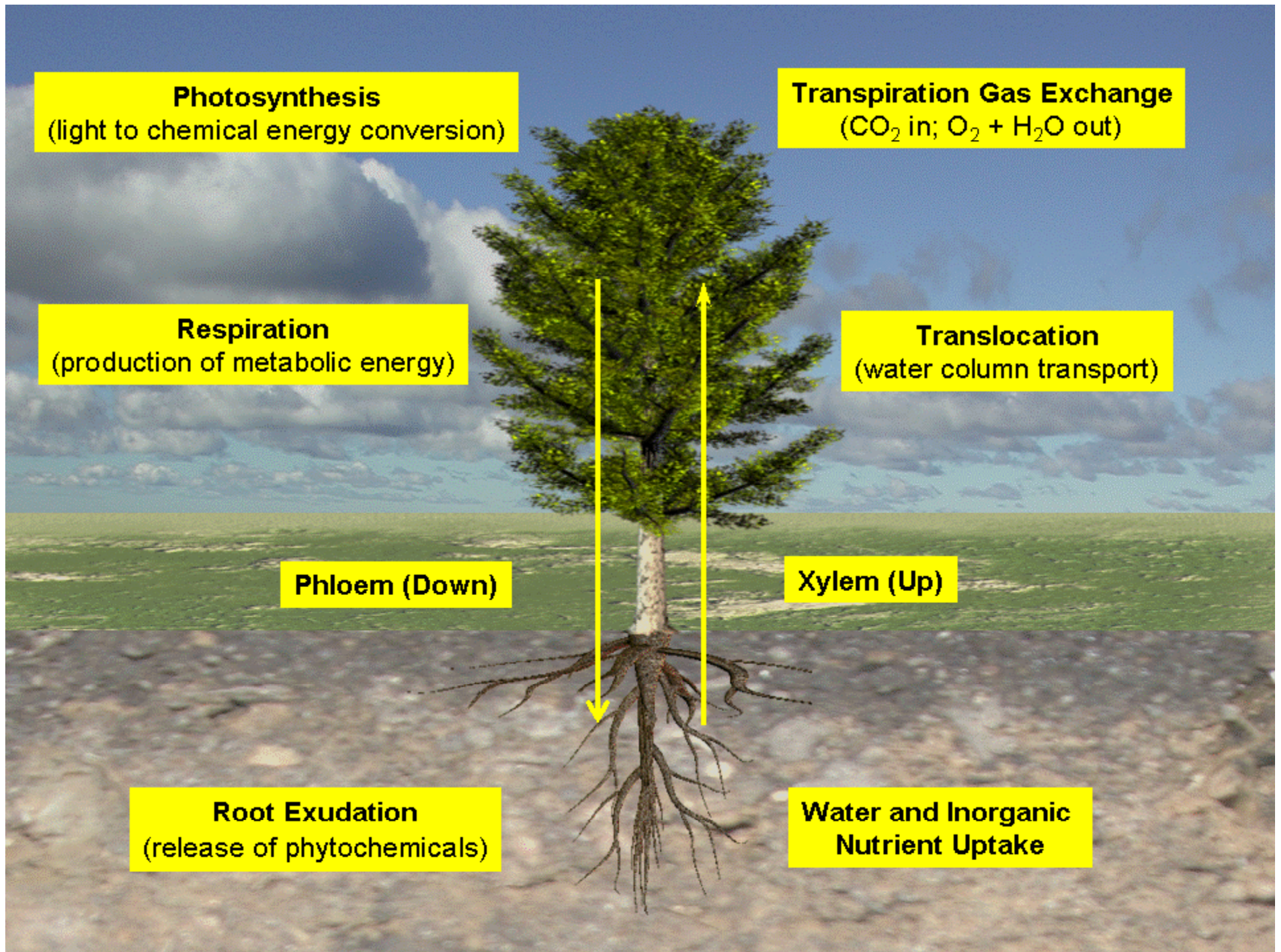


What is it Exactly ?

“Phytoremediation is the name given to a **set of technologies / methods based on** various mechanisms associated with root-zone of different plants. This system leads to **decontamination, destruction, containment of pollutants.**

Figure showing typical reed bed system





Mechanism of Treatment

1. **Extraction of contaminants from soil or groundwater.**
2. **Degradation of contaminants by various biotic or abiotic processes.**
3. **Breakdown action carried out by microorganisms dwelling at the root zone degrade / breakdown pollutants.**
4. **Filtration process / biofilm formed at surface of pebble / gravel / coarse sand bed.**
5. **Processes like adsorption / absorption in soil strata or their combination.**
6. **Vertical and horizontal flow patterns & another possible mechanism for contaminant degradation is metabolism within the plant.**



The Problem at Selected Case

The waste water from septic tank outlet and auto-wash water in combination had very bad odor. Although parameters of septic tank and automobile wash water combined like mainly COD, BOD, TDS & Suspended Solids were on border lines of the specified limits but foul odour & oil and grease were to be addressed. Also quantities were more than existing capacity of treatment. Hence treatment system was needed. We proposed root zone treatment to improve quality of treated water before release.

The Solution

- ❖ Existing filtration system at car wash centre was modified with desilting, specially designed grease trap, graded gravel filter and then sent to root-zone treatment system.
- ❖ Corridor space at the entrance was selected to introduce well designed root-zone treatment system.
- ❖ Outlet of treated root-zone was tested to ensure that all the observed parameters are within the specified limit.
- ❖ Holding tank is provided for treated water.

Some Photographs

❖ The Venue

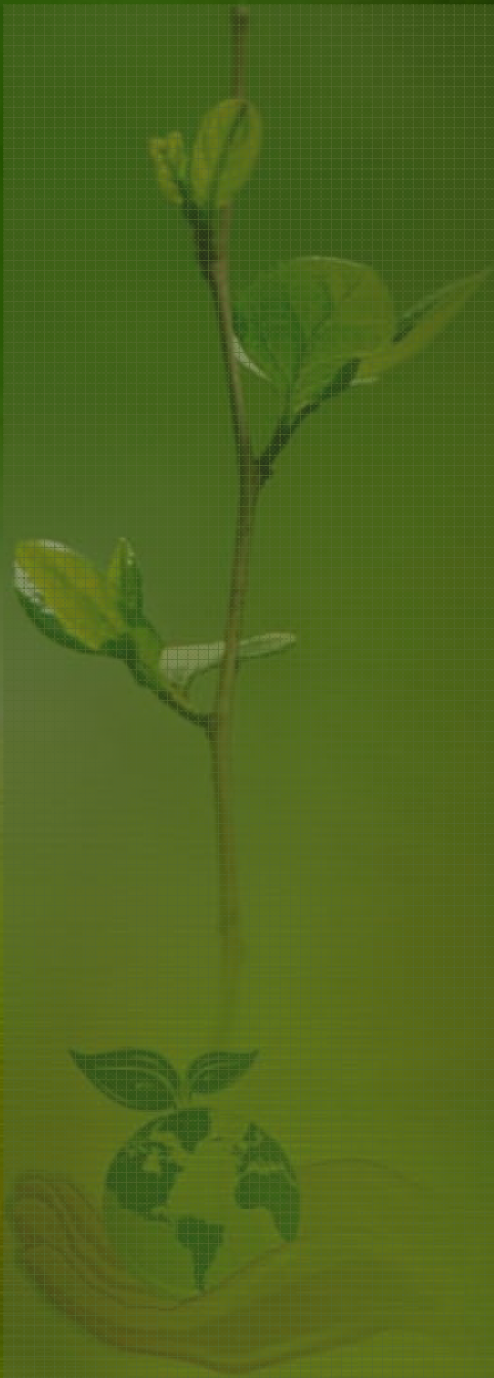
❖ The space before constructing root-zone system.

❖ **Photos of root – zone system – work in progress.**

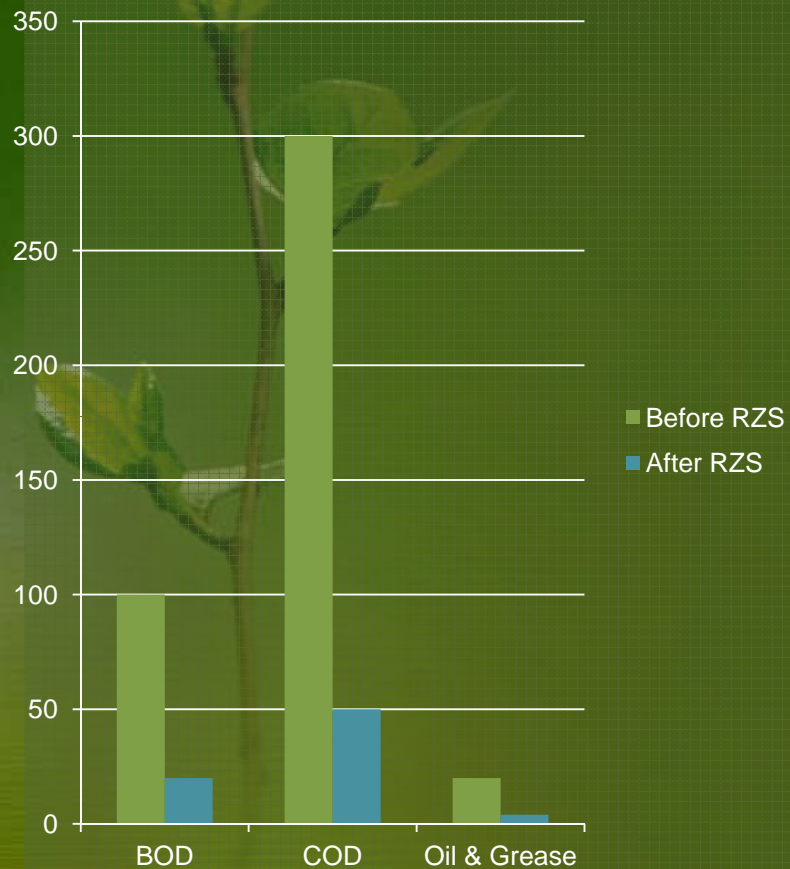
❖ 1, 2, 3.

❖ Fully developed system.

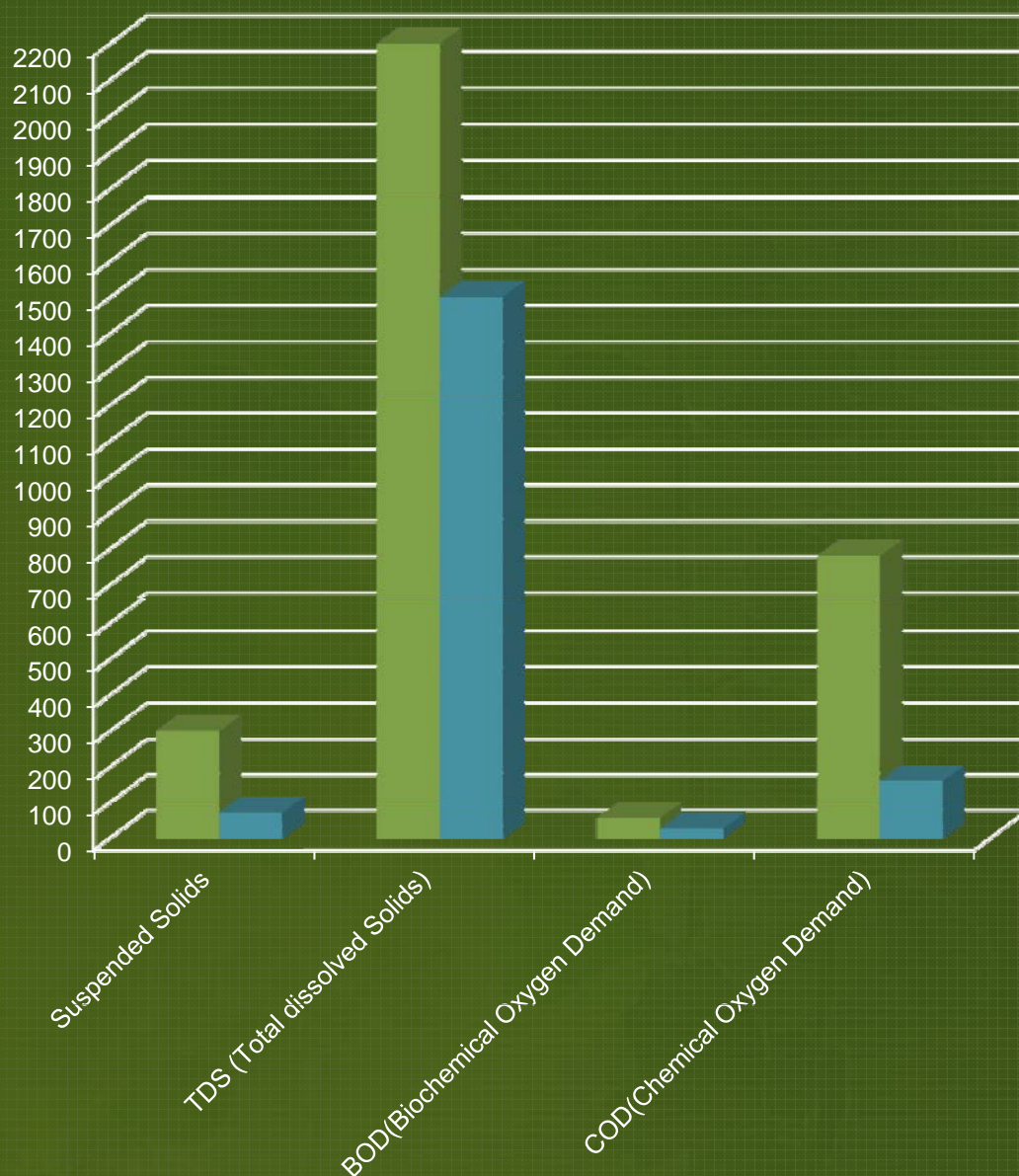
❖ **Analysis of Parameters**



Key Parameters Trend at Goa Rajee



Performance for high levels of pollutants at Brewery



Advantages of this treatment method

- Roots of plants provide favorable environment for bacteria diversity thereby **reducing pollutant loads**.
- **Least consumption of electricity**. Use of gravity for water flow.
- **Aesthetically better looking than any ETP** as it looks like garden.
- **Low maintenance** and that too twice or thrice whenever plants grow and need replacement.
- **Complete biological and eco friendly method of treatment**.
- **No foul odor** is released.

Applications

Best recommended For

- ❖ Septic tank outlet treatment.
- ❖ Treatment of polluted streams, nallas, rivulets and water-bodies (floating beds may be recommended).
- ❖ Bathroom water recycling.
- ❖ In combination with specific / simple pre-treatments, it can be used as polishing treatment for any waste water. Eg – Brewery, (1) Sugar factories,

Thank You

