Puducherry is a beautiful, clean and peaceful tourist destination with architectural and cultural remnants from French colonisation.

To further lend a helping hand to the clean image of Puducherry, Prof. S.A. Abbasi from Pondicherry University, Chinna Kalapet in Puducherry has designed a simple, low cost and efficient waste water treatment plant called SHEFROL (Sheet Flow Root Level) bioreactor. It costs just Rs 20,000 as compared to a standard sewage treatment plant which costs around Rs. 50 lakh.

This is a green technology as the system uses aquatic plants to absorb chemicals, pathogens and micro-organisms from waste water. Two aquatic plants – four-leaf clover and water hyacinth act as natural agents for phytoremediation. The system consists of pits and channels over which non-permeable sheets are placed. Waste water is allowed to flow slowly across the aquatic plants which are grown over the sheets, thus detoxifying and improving it for further use in irrigating fields and gardens.

Because of the intensive ‘water-root-micro-organism’ contact made in these units, more than 80% of the wastewater treatment is completed in about 2 hours as compared to 2 days or more needed in other systems.

Prof. Abbasi and his colleagues, S. Gajalakshmi and Tasneem Abbasi tested the system before setting up a pilot plant in the university campus itself way back in 2005. In 2011 they received financial support from the Department of Biotechnology and registered a patent claim and published it in the official journal of the patent office, India.

Eventually in 2014, a SHEFROL plant was set up in Chinna Kalapet by Ph.D. student of Pondicherry University,
Ashraf Bhat, as part of his thesis work with the guidance of Assistant Professor Tasneem Abbasi.

The SHEFROL plant is easy to build, is scalable depending on the need and requires low maintenance. Every day, grey water (household sewage) from nearly 38 houses is fed into the plant that has a capacity of 10,000 litres. The plant takes only six hours to treat the wastewater and does not use any chemicals. The system makes use of topography and gravity, thus doing away with the requirement of pumping water. This simple system can be set up or dismantled easily as well as scaled up or scaled down as per need.

The inventors of the SHEFROL plant want more villages across India to use this eco-friendly system to decontaminate waste water and they are offering transfer of process to communities free of cost. Also, the team is working for complete cataloguing of non-commercial aquatic plants that are commonly available in different regions of India.

Sarvam, a Tamil Nadu-based NGO, is already working to install SHEFROL plants in several villages in the state while several European and Middle-Eastern nations have expressed interest in implementing this system in their countries.

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