

# **REDUCING WATER FOOTPRINT IN TEXTILE INDUSTRY WITH A NEW NON-CHEMICAL AND NON BIOLOGICAL WASTED WATER RECOVERY SYSTEM-AQUATRON;**



**Dr. Rajah Vijay Kumar,**

**Global Chairman  
Organization de Scalene**



# Today ...

*"...Water, water, everywhere, And all the boards did shrink;  
Water, water, everywhere, Nor any drop to drink."*

*Samuel Taylor Coleridge,  
The Rime of the Ancient Mariner*

- 70% of the earth's surface is covered with water
- 97% percent of the water on the earth is salt water
- 2% percent of the water on earth is glacier ice at the North and South Poles
- **Less than 1% is fresh water that we can actually use**
- Application : Drinking - Transportation - Heating - Cooling - Industry  
-Agriculture



# Water Issues Today .....

- Industries consume water but also pollute it...
- In developing countries, 70 % of industrial wastes are dumped without treatment - *World Development Report (WDR) of 2003*
- Each liter of wastewater discharged further pollutes about 5-8 litres of water ( CSE , 2004) raising industrial use to 35-50%
- Wastewater treatment systems are essentially installed only to meet the wastewater discharge norms ( concentration based )
- Industry meets required standards merely by diluting waste water with clean water - A counter-productive and not a cost-effective solution



# Water Issues Tomorrow.....

- Our future Textile Sector would consume more water than today; for capacity building and operation.
- Where are we going to get this additional water, when water resources are fast depleting.
- Water is going to be the main hurdle, in the future development of this sector..
- As much of water we use, we generate the same amount of wasted water, what are we going to do about it.
- Do you think the future 'Textile Innovation' can be achieved, without planning water resources.
- **WHAT'S THE ANSWER...**



A vertical strip on the left side of the slide shows a close-up of water being poured from a faucet, creating a series of concentric ripples and a clear stream of water. The background of the slide is a light blue gradient with a large white curved shape on the right side.

Recover wasted water  
Make Textile a

ZERO WATER FOOTPRINT **ACTIVITY**



# We Present a Solution

A Physical way to  
clean water and  
reuse...



# FPSTAR Technology

## History of Contaminated and polluted water - it's Simple

- Water was pure and clean before it got contaminated by human use or by natural pollutants.
- Contamination is a process of adding substances to the water, in the process of cleaning or dissolving something into it.
- Contaminants or pollutants getting mixed into water, whatever the source, it is simply chemical substances or chemical compounds. These chemical compounds are made out of elements found in the periodic table and nothing more.

## What needs to be done ?

- ✓ Simple - Remove these elements out and water is clean and pure again for reuse.



# FPSTAR - Mechanism of Action

- Now we have two things to deal with; water that we want and Contaminating elements that we don't want.
- **First of all, we need to determine the atomic elements in the contaminated or polluted water; this is done by taking a water sample and slowly evaporating it at 96 degrees centigrade over 20 hours.**
- The residue is then subjected to a ICP-AES (Inductively coupled plasma atomic emission spectroscopy (ICP-AES), is an analytical technique used for the detection of trace elements) to understand the elements of the periodic table that was found in the waste water.
- **Each element in the periodic table has a Specific Frequency of Disassociation (SFoD), that we have identified by experimental studies over 8 years.**



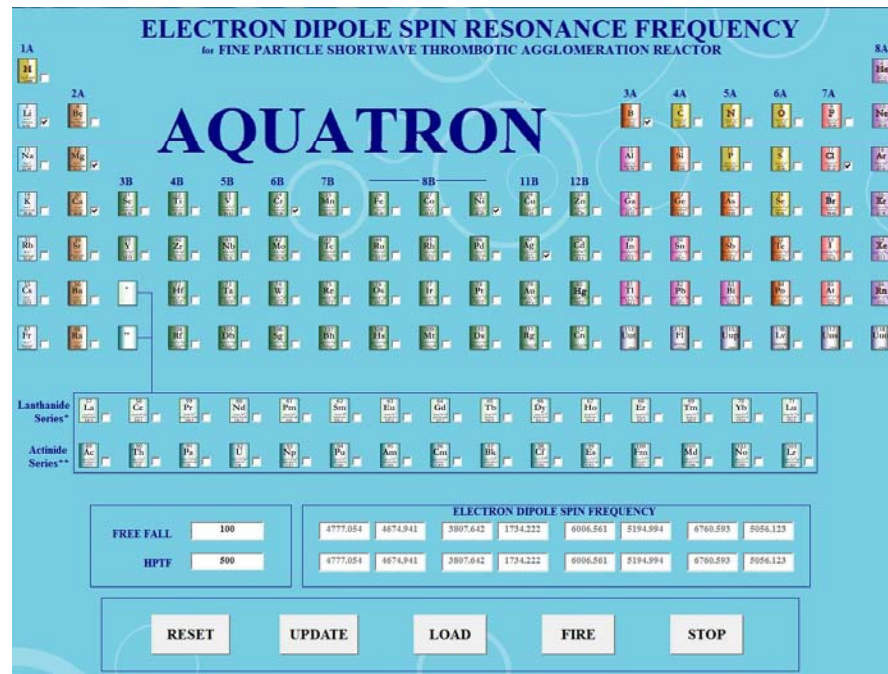


# FPSTAR - Mechanism of Action

- SFoD is a frequency in the electromagnetic spectrum, when resonated for a specific time at a specific intensity, through a resonating column, a targeted element disassociates from its compound.
- SFoD is unique to each element in the periodic table. The waste water contains many different elements; so many different frequencies are required.
- These frequencies are delivered to the waste water that flows through a special reactor called 'Boom Tube", which is a resonating column, tuned to different bands of frequencies starting from the lowest atomic weight to highest atomic weight.
- As the water passes through the Boom Tube resonator, the elements in the water (except hydrogen and oxygen), will start disassociating from its compounded form to their equilibrium elemental state by neutron capture, phonon interactions and electron reorganisation under a weightless condition created by continuous free fall in the reactor.

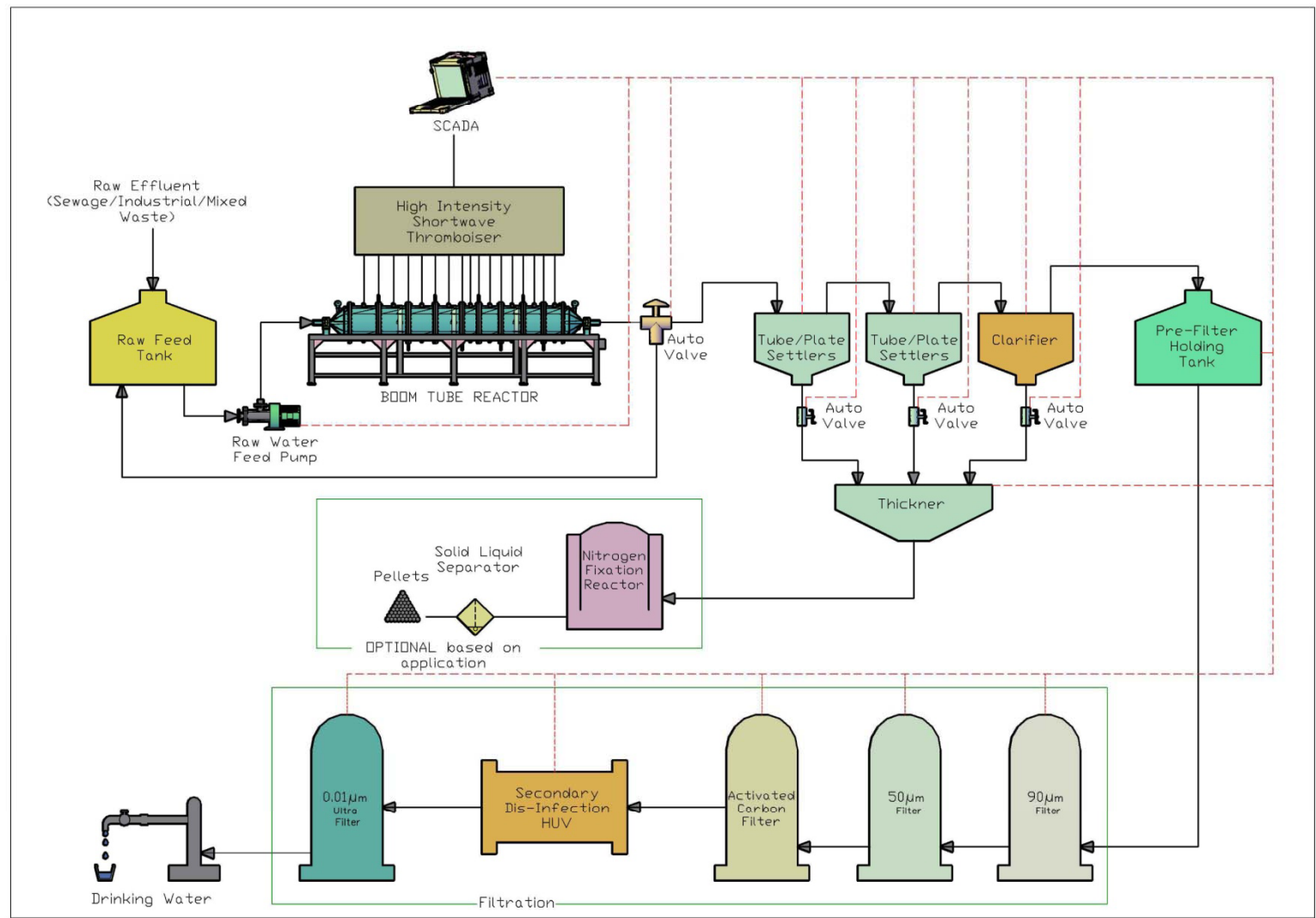
# FPSTAR - Mechanism of Action

The dissolved and suspended dirt particles disassociate into it's **elemental forms** and agglomerate by inter particle attraction induced by weak forces and come out of the reactor separated and permanently hydrophobic. **These particles now form a sludge, mainly of oxides of the elements when it comes in contact with the atmospheric air.**



# FPSTAR Technology

Fine Particle Shortwave Thrombolytic Agglomeration Reactor





# Difficult Constituents

- FPSTAR can also separate out substances that do not otherwise form precipitate...
- Sodium and Potassium and non-flocculating or non-coagulating materials like benzene, toluene or similar complex organic compounds can also be thrombulated by SFoD and removed.
- Tough to remove substances like lignin can also be thrombulated and removed by the FPSTAR Process by pre-treating it with extra high tension millimeter wave bombardment prior to the FPSTAR process





# Process Benefits

- Reduce COD and BOD by 99% +
- Agglomerate particles less than 15 nm to agglomerates of 100 µm to 1.5 mm that can be filtered through conventional aids.
- Extremely fast reaction time, processes water on-line and clean water available for recycle immediately
- Arsenic, Nitrates, Heavy Metals and Fluoride content removed.
- Softening Solids as fast sedimentation Aid
- Very small space requirements
- Very effective in the removal of high and low turbidity
- Extremely effective in removal of Color, TOC, NOM and DBP precursors.
- Works over a wide pH range
- Low cost compared to conventional methods of water treatment / recovery.
- Higher sludge concentrations resulting in lower sludge disposal costs
- Non-hazardous environmental sludge residue
- Compatible and beneficial with many land application residue programs and farming, depending on the source of original water.
- A “ZERO” chemical process





# Efficacy

<b>Constituents</b>	<b>% Removed</b>
<b>Suspended Solids</b>	<b>&gt; 99%</b>
<b>Oil /Grease / Hydrocarbons</b>	<b>&gt; 99%</b>
<b>Heavy Metals</b>	<b>&gt; 99%</b>
<b>Arsenic / Cyanide</b>	<b>&gt; 96%</b>
<b>Calcium, Magnesium, Potassium</b>	<b>&gt; 90%</b>
<b>Bacteria /Fungus / Algae / Larvae and their spores</b>	<b>&gt; 99%</b>
<b>Chemical Oxygen Demand (COD)</b>	<b>&gt; 96%</b>
<b>Biological Oxygen Demand (BOD)</b>	<b>&gt; 96%</b>
<b>Carbon, Ammonia and Sulphur Compounds</b>	<b>&gt; 98%</b>
<b>Nitrites and Fluorides</b>	<b>&gt; 96%</b>
<b>Naturally Occurring Radio Active Materials (NORM)</b>	<b>&gt; 94%</b>



# Our Experiences.....

Pilot operations have confirmed its efficacy in treating and recovery of the following waste water streams :

- Coffee Pulping Wash Water
- **Brewery spent wash**
- Distillery Effluent
- **Sewage water**
- Contaminated Lake water
- **Contaminated river water**
- Textile Dying Water
- **Tannery effluent water**
- Sea water
- **Automobile Servicing water**
- Dairy wash water
- **Contaminated ground water, etc.**
- LAND FILL LEACHATE

A vertical graphic on the left side of the slide showing a close-up of water being poured from a tap. The water forms a continuous stream with visible droplets and ripples, set against a blue background.

# AQUATRON in TEXTILE INDUSTRY

First Installation in Erode, Tamilnadu, India



# AQUATRON™ ERODE - SITE CIVIL WORKS

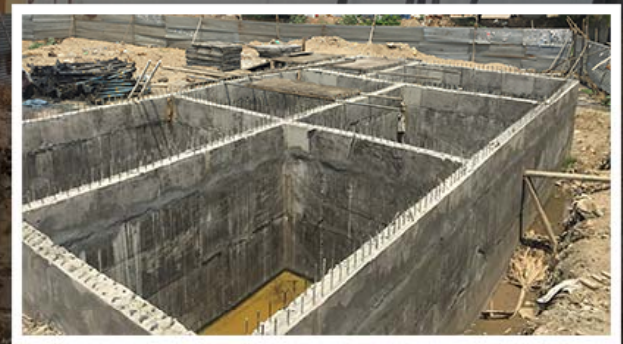


SCALENE ENERGY - WATER CORPORATION LIMITED  
INDIA | MALAYSIA | EUROPE | SOUTH AFRICA | USA | CANADA | AUSTRALIA | NEW ZEALAND

## Installation in Erode, Tamilnadu, India



# AQUATRON™ ERODE - SITE CIVIL WORKS

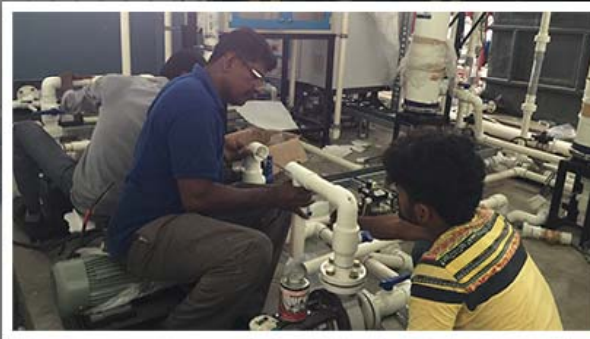


SCALENE ENERGY - WATER CORPORATION LIMITED  
INDIA | MALAYSIA | EUROPE | SOUTH AFRICA | USA | CANADA | AUSTRALIA | NEW ZEALAND

Installation in Erode, Tamilnadu, India



# AQUATRON™ ERODE - INSTALLATIONS



SCALENE ENERGY - WATER CORPORATION LIMITED  
INDIA | MALAYSIA | EUROPE | SOUTH AFRICA | USA | CANADA | AUSTRALIA | NEW ZEALAND

Installation in Erode, Tamilnadu, India

# AQUATRON™ - TANKS & FILTRATION SYSTEM



SCALENE ENERGY - WATER CORPORATION LIMITED  
INDIA | MALAYSIA | EUROPE | SOUTH AFRICA | USA | CANADA | AUSTRALIA | NEW ZEALAND

Installation in Erode, Tamilnadu, India



# AQUATRON™ BOOM TUBE RESONATOR



SCALENE ENERGY - WATER CORPORATION LIMITED  
INDIA | MALAYSIA | EUROPE | SOUTH AFRICA | USA | CANADA | AUSTRALIA | NEW ZEALAND

Installation in Erode, Tamilnadu, India

# AQUATRON™ BOOM TUBE RESONATOR



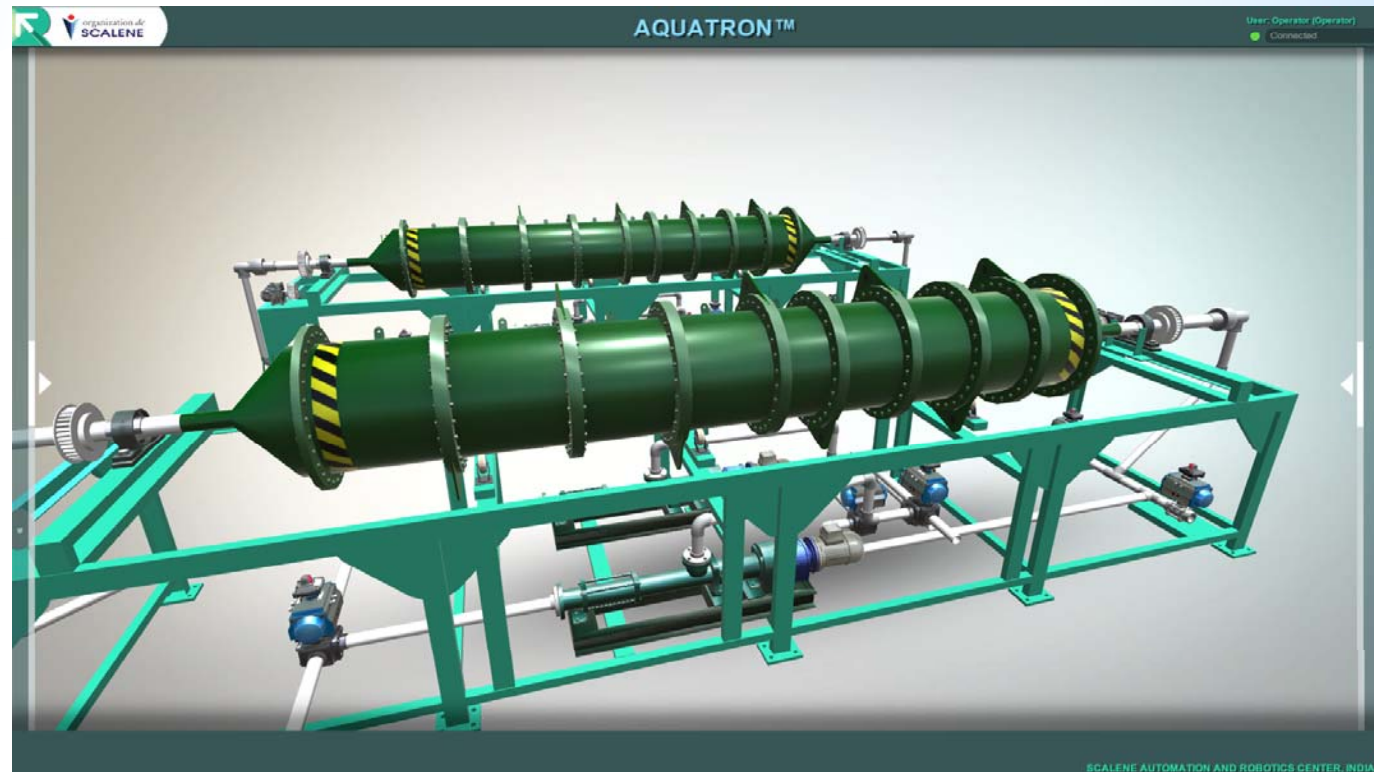
SCALENE ENERGY - WATER CORPORATION LIMITED  
INDIA | MALAYSIA | EUROPE | SOUTH AFRICA | USA | CANADA | AUSTRALIA | NEW ZEALAND

Installation in Erode, Tamilnadu, India



# FPSTAR Technology

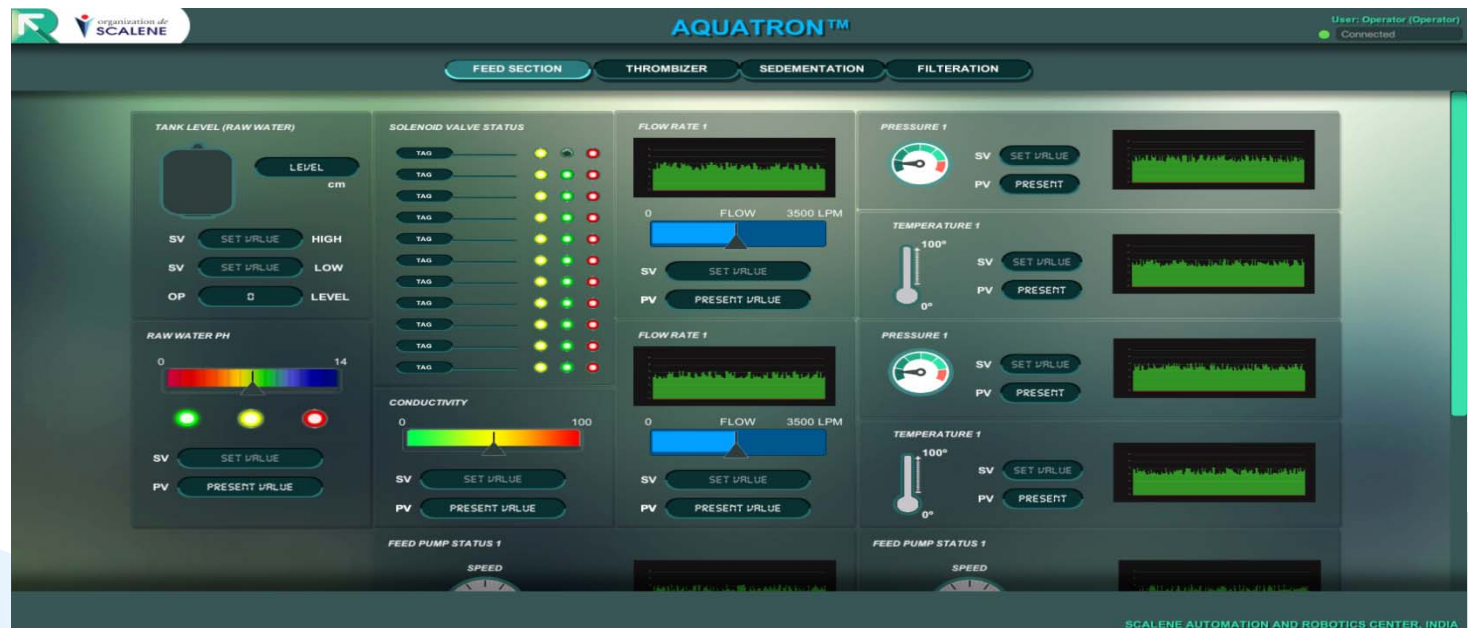
Fine Particle Shortwave Thrombolytic Agglomeration Reactor  
Realistic Geometry Animation based SCADA system





# AQUATRON™ - Automation and Robotics

- An **AQUATRON™** FPSTAR plant is a completely automatic computer controlled multi-stage system that is totally 'plug and play'
- Only one operator is required to start and stop the plant and occasionally check the quality of output water
- One time setting of all process parameters will ensure trouble free operation
- There are no chemicals added, so effectively there are no consumables except electricity for its operation.



AQUATRON™ Boom Tube  
Byproduct -  
Palletized Slug that can be used  
for resource recovery





# AQUATRON™ In field Operation..



25 M<sup>3</sup>/day, Pilot FPSTAR system at Scalene Energy Research Institute, Bangalore, India as part of scale-up process..



# AQUATRON™ In field Operation..



400 KLD, FPSTAR system Installed in Karnataka, India  
Processing Coffee Pulping Effluent for complete Reuse..



# AQUATRON™ In field Operation..



150 KLD expandable to 600 KLD, FPSTAR system Installed in Pune, India, Processing Food Industry Effluent to drinking grade water for Reuse..



Thank You

**AQUATRON-FPSTAR SCIENCE & TECHNOLOGY WAS  
INVENTED in INDIA**

Scalene Energy Research Institute (SERI)  
S-CARD Campus, Seegahalli Main Road,  
Bangalore 560 049, KA, India



Tel: +91-80-25614879  
Cell: +91-9845013088  
Email: [info@scalene.org](mailto:info@scalene.org)  
Fax: +918025614878

Due to Continuous R&D , this technical presentation is subject to constant updates

# AQUATRON™ Boom Tube at Work..

