

Byrraju Foundation

Safe Drinking Water- Sujala Water Scheme



The Byrraju Foundation, a not for profit organization dedicated to rural transformation, is striving to develop creative, holistic and sustainable solutions by involving the communities, applying best management practices and modern technology. The Foundation, started in the year 2001, is presently working in 152 villages, spread over East Godavari, Guntur, Krishna, Ranga Reddy and West Godavari districts of Andhra Pradesh, India, impacting nearly a million people. The major interventions of the Foundation include Health, Education and Literacy, Water, Environment and Sanitation, and Livelihoods. All its initiatives are implemented through a village level institution, called Grama Vikasa Samiti (GVS), an 18-member body of volunteers.

Drinking Water - Foundation's Vision:

*As a part of water initiative, Foundation's goal is to provide access to safe drinking water, as per WHO/Bureau of Indian Standards, to **100%** of households in all the villages, adopted by Byrraju Foundation.*

Over the years water sources are highly polluted, with presence of both physical and chemical impurities and harmful bacteria. Because of this, drinking water, supplied through Rural Water Supply (RWS) Scheme, even after filtration and chlorination, in most of the villages is found to be unsafe. Tests carried out by Foundation in 150 villages adopted by it, showed that 94% of them failed in meeting quality standards, as indicated in the table given below:



Table: Test results of drinking water in villages adopted by Byrraju Foundation

No	Parameter and units	Desirable limit (IS: 10500–1990)	Remarks
1	Coliform Organisms	Absent	Present in 50% of Villages
2	Turbidity, NTU	5 Maximum	45% of Villages have > 5
3	Chlorides, ppm	250 Maximum	13% of Villages have > 250
4	Residual free Chlorine, ppm	0.2 Minimum	82% of villages have < 0.2

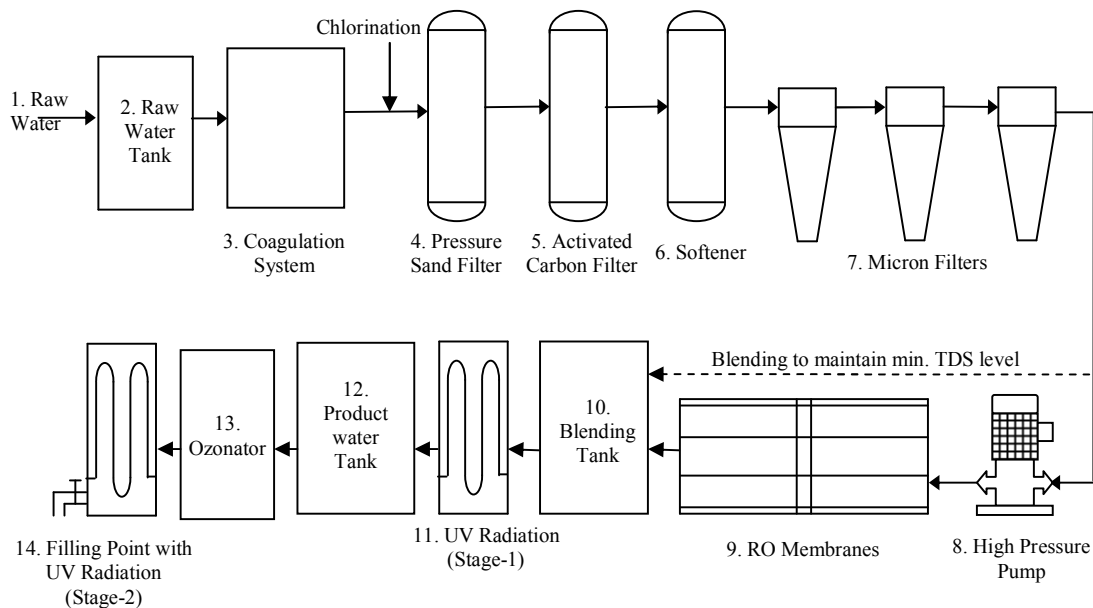
Realizing this, the Foundation, with active support from the village community and local government body (Village *Panchayat*), embarked on providing safe drinking water, named 'Sujala', in villages. Two technology options are chosen to take care of the variations in the quality of the raw water across the villages. These are:

Option-1: When the raw water has Total Dissolved Solids (TDS) less than 500 ppm:

- Purification through Coagulation to remove the majority of sediments and reduce turbidity,
- Chlorination to kill the bacteria,
- Pressure Sand Filter to further reduce the sediments,
- Activated Carbon Filter to eliminate the odour,
- Micron Filters to remove fine particles,
- Ultra Violet(UV) irradiation to eliminate residual bacteria and virus inactivation, and
- Ozonation for further removal of bacteria and odour and improve shelf life.

The processed water, stored in food-grade High Density Poly Ethylene (HDPE) tank, is again passed through Ozonator and another UV system, as an additional precaution, before filling in a 12-litre HDPE can for distribution.

Option-2: For TDS levels in excess of 500 ppm, which is mostly found in sub-surface water, the process comprises of the steps listed in Option-1, except chlorination. In addition, a step was added to soften the water (step 6), Reverse Osmosis (RO) Membranes were used (step 9), after Micron Filtration, to remove excessive salts, fluorides, etc. The process diagram is shown in the following Figure.



Note: Option-2 uses softener; high-pressure pump, RO membranes and blending (steps 6 and 9 to 11) but eludes Chlorination (Step-3) in addition to what is listed in Option-1.

The scheme, which is a true public-private participatory effort, envisages sharing of responsibilities between various stakeholders as mentioned below:

Village Panchayat	Community including Non-Resident Villagers	Byrraju Foundation
Permission to draw raw water	50% cost of equipment	50% cost of equipment
Allotment of land (free)	Construction of building (500 Sq feet covered area)	Technical guidance and supervision in setting up the plant and its operation
Obtain Power Connection (3 KW) at concessional tariff	Participation in operation of plant and distribution of water	Testing of water and quality assurance



Sujala Water Plant

So far (July 2006) 30 'Sujala' plants, each producing 1000 litres an hour, have been set up to meet the drinking water needs of people within as well as 60 other neighbouring villages, thereby providing access to nearly 450,000 people. The Foundation aims to put up another 20 plants by October 2006 so that all the adopted villages will have access to safe drinking water.

The Foundation ensures uninterrupted production and supply of purified water. To facilitate this, stand-by arrangement for all critical components is made and a dedicated team of technicians takes care of its maintenance and operation. It also monitors and assures quality of product water, meeting strictest standards, both at plant and in a well-equipped Laboratory in Dantuluri Narayana Raju (DNR) College, Bhimavaram.



Water Testing Laboratory



The product water is supplied in a food-grade HDPE can at Rs 1.50 for 12 litres. This user charge meets the cost of operation and maintenance, ensuring sustainability of the plant. People with in as well as neighbouring villages organized transport for delivery of the cans at home at an additional charge. Local youth are trained to operate and manage the plant, thereby creating employment in villages.

Foundation is constantly striving to create awareness in villages about the importance of consuming safe drinking water. In addition, Foundation is impressing upon the concerned government authorities, local bodies, villagers and other organizations in social sector on the need to reduce pollution to water bodies.

A team of experts from United Nations Human Resettlement Programme (UN-HABITAT) visited the Foundation and discussed about implementing the scheme in a few Asian Countries, under Water for Asian Cities Programme. The team also studied the operation of Sujala plants in a few villages and requested Foundation to set up similar plants, one each in Kenya, Nepal and Uganda, in near future.