

Bringing Safe Drinking Water to Rural India

Our partnership approach for sustainability of solutions is amply demonstrated in these projects undertaken in Raigad and Yavatmal districts of rural Maharashtra.

INDION™ Fluoride Removal at Yavatmal

The level of fluoride in ground water is as high as 10 ppm at several sites in Yavatmal district. This provided an opportunity to IEI to demonstrate the INDION Handpump Attachment for Fluoride Removal at Mangikolam, Yavatmal. Our pilot unit successfully treated ground water fluoride contamination of 8.73 ppm, reducing this to 0.34 ppm, well below the WHO limit of 1 ppm. Its continuous good performance, as well as that of our pilot defluoridation installations at Nanded and Nagpur, resulted in the Government of Maharashtra's approval of our technology for fluoride removal from ground water. Subsequently, we received an order for 67 handpump attachments for fluoride removal from the Zilla Parishad of Yavatmal.

A Learning Process

All the units were successfully installed and commissioned. In course of time, however, several unanticipated problems cropped up.

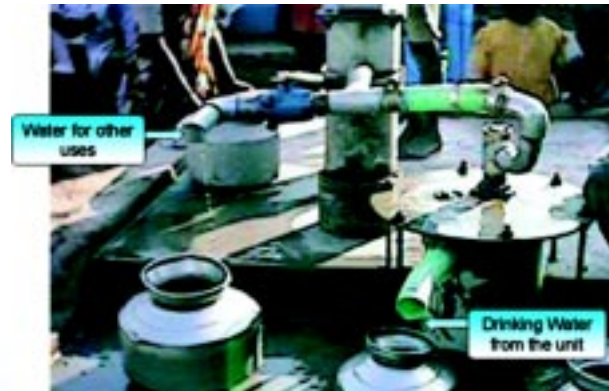
- As the units had been installed on the ground, many of them got partially submerged with the onset of the monsoons.
- The PVC pipe connecting the unit to the handpump, was not sturdy enough to withstand rough handling.

- There was no provision to isolate water for drinking from water for other uses such as bathing, washing, etc.

Working Together for Solutions

We entered into an agreement with various NGOs for the operation and maintenance (O&M) of the units as well as to educate the village community – the ultimate users and beneficiaries. The NGOs were thoroughly trained in O&M.

The units were reinstalled after the following modifications at site:



- Provision of a control valve in the inlet line facilitates separate collection of drinking water and water for other uses.





Committee formed by NGOs for maintenance of the unit.

- The unit was moved closer to the handpump and connected with a shorter, sturdy GI pipe.
- A common platform was constructed for the unit and the handpump, with the help of the local community. The raised height eliminated the problem of submergence during the monsoons, and also made it much easier for the villagers to collect water.
- The NGOs created awareness on the adverse effects of fluoride contamination on health, so that the villagers realised the benefits of the project and the importance of proper handling, use and care of the treatment units.

Today, the village community has in turn been trained in O&M by the NGOs. To ensure project sustainability, maintenance committees from among the villagers have been formed by the NGOs to monitor the functioning of the units while the NGOs coordinate and monitor the project.

Water Resource Project at Village Tondsure

It is a model example of cooperation for other water starved villages in India to draw inspiration from. Tondsure Jagamwadi in Maharashtra's drought prone Raigad district is helping create its own water resource through an integrated and participative project that has brought together villagers, corporates, NGOs and philanthropic organisations to develop safe drinking water and sufficient water resource for the villagers.

The Inspiration

It all started with a rainwater harvesting (RWH) project

at village Vihule Kond, near Mangaon in Raigad. IEI provided technical consultancy for NGO SHARE's RWH project. This participative project where villagers contributed *shramdaan* (voluntary labour) resulted in the construction of an RWH pond of 4.2 million litres storage capacity. Its success inspired several surrounding villages to start RWH projects and currently NGOs SHARE-SCESA are implementing RWH projects at 10 villages in six talukas of Raigad.

Water Problems at Tondsure

Tondsure Jagamwadi in Mhasala Taluka is one such village that requested for help to solve its water problems. A medium sized village of 60 households (350 – 375 population), Tondsure experiences severe water shortages every year. While the SHARE-SCESA team was surveying the village for potential RWH sites, the villagers informed them of contaminated water in the borewell, complaining that the water emitted a foul smell, tasted metallic and unpalatable, turned yellow after 15 minutes of collection, and exhibited suspended particles when kept longer. This prompted SHARE to send the water for analysis and potential solutions to IEI. Results revealed iron contamination of 5.2 ppm (the WHO limit is 0.3 ppm for drinking water).

IEI's Solution

We recommended our INDION Handpump Attachment for Iron Removal, designed specially for rural India and using iron specific resin developed by our R&D. The



INDION Handpump Attachment for Iron Removal installed at Tondsure.

INDION iron removal process using this special catalytic granular media, is a completely self-contained solution, making it highly suitable for rural areas. It overcomes the disadvantages of current methods that require sizable space, multi-stage treatment, use large quantities of chemicals, need electricity and require reasonably skilled manpower, careful monitoring and high capital outlay.

Although we have supplied such units to PHEDs in Orissa, Chattisgarh and West Bengal, *this was the first such handpump attachment for iron removal to be deployed in Maharashtra.*

Rainwater Harvesting to the Rescue

Whereas IEI supplied the technology to solve the problem of iron contamination at Tondsure, the Rotary



Rooftop rainwater harvesting at Tondsure.

Club of Mumbai Downtown and the SUNRICH Group financially supported the cost of raw material and skilled labour to construct a large RWH pond (storage capacity 4.5 million litres of water), gabions to recharge open wells and a rooftop RWH system to recharge the borewell along with the iron removal unit. Voluntary, manual, unskilled labour was contributed by the villagers while SHARE-SCESA monitored activities and ensured that the interests of all – villagers and the donors, were met, and the benefits to the villagers sustained in the long term.

Collaborative Success



Handing over the project to the villagers, Rotary District Governor Nitin Mangaldas said, "This is truly a project for the people, by the people and of the people – a model project that addresses both drinking water as well as water scarcity problems and will inspire villages all over India." Several surrounding villages of Shrivardan taluka have expressed interest in replicating such projects in their own communities.



We have successfully installed and commissioned our first **INDION Power Pump Attachment Fluoride**



Removal Unit, at village Lamkani, in Akola district of Maharashtra. The raw water with fluoride contamination of 2.34 ppm is pumped from the well through the fluoride removal unit which has a 10 m³/h flow rate. The treated water is stored in an overhead storage tank from which it is distributed to three villages having a population of around 1,000. The treated water has fluoride content of 1.3 ppm, well below the WHO limit of 1 ppm.



A second handpump attachment for iron removal has been successfully commissioned at village Maneri, in Maharashtra's Shrivardhan district. The iron content in the raw water was 2.5 ppm and nil in the treated water. This order was also received through NGO SHARE.

We have received an order from Society for Eradication of Rural Poverty (SERP) for 1,032 domestic point-of-use defluoridation units. These are for supply to Cuddappa and Nalgonda districts in Andhra Pradesh, where SERP is associated with the State Government's Velugu project for uplift of rural communities. Fluoride contamination in these districts is around 4-5 ppm.

PHED Rajnandgaon, Chattisgarh, has placed an order for two handpump attachments for iron removal.