

# High Flow Rate Water Purification Technology

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## In News

CSIR-CMERI have come up with development of an **integrated, low-cost, commonly available multi-adsorbent based community level (high flow rate) water purification system** for effective and **simultaneous removal of fluoride and iron** (below WHO permissible limit) in an efficient manner from contaminated water.

## Features of the Water Purification Technology

- Three FRP (Fibre Reinforced Plastic) made vessels of specific dimensions have been set up: Chamber-I (oxidation chamber), Chamber-II (Iron removing filter) and Chamber-III (Fluoride removing filter).
- The first FRP make vessel (Chamber-I) is for **rapid removal of precipitated iron**. The next one (Chamber-II) is one of the most crucial chambers for **removal of the left over iron** from the contaminated water. In final stage fluoride will be removed from contaminated ground water by 'fluoride removal unit' (Chamber-III), where the adsorbents will fulfill the purpose of fluoride mitigation.
- The **oxidation chamber contains manganese oxide enriched ores** within the permissible limit, which act as an oxidising agent (screens out metal contaminants like  $\text{Fe}^{2+}$ ).
- The **Iron removal filter contains naturally abundant low cost adsorbent materials** such as gravels and treated sand of specific diameter.
- The **Fluoride removal filter also contains several low cost adsorbent materials** viz. activated alumina, ferrite

impregnated activated alumina (FIA, a patented product from CMERI) and zinc impregnated activated charcoal (patented product from CMERI) in a sequential manner to mitigate the residual fluoride from groundwater.

- A **hypochlorite dosing pump** with dosing in proper proportions and **micron filter** are installed in line with the mentioned vessels for disinfection of targeted contaminated water. Hypochlorite is used in permissible range in place of chlorine gas for safety reasons.
- The developed plant is successfully able to **mitigate iron from an initial concentration of ~9 ppm to less than 0.3 ppm (safe limit of Fe as per WHO guideline) and fluoride from initial ~12 ppm to <1.5 ppm (safe limit of F- as per WHO guideline).**