

Use of RO Plants in Hansot Taluka of Bharuch District

(Lecture notes of Dr.S.S.Rao)

Bharuch is located in the southern part of Gujarat, near the Gulf of Khambhat in Arabian Sea

The district has 8 talukas, of which the major ones are Bharuch (District headquarter), Ankleshwar, Valia, Jhagadia, Hansot and Jambusar etc with 1.3 million people and highly industrial status of the district with chemicals, petrochemicals, Engineering, ports and ship building etc. Because of high concentration of industries as well as due to nearness to coast, the drinking water is one of the major problems in the district. The Government of Gujarat had an innovative programme of installing Reverse Osmosis (RO) plants for providing drinking water in all the villages of the Hansot taluka of Bharuch district.



This report pertains to the study of general drinking water problem in the area and the working of R.O plants and the opinion of the villagers in the area regarding the present position of drinking water as well as how they received the concept of providing drinking water through the RO plants.

There are about 46 villages in Hansot taluka and all the villages are provided with RO Plants. Except in a few villages, all the RO Plants are working at present. The quality of water in the taluka varies from highly saline to moderately saline. The TDS varies from about 896 ppm to 4675 ppm in the entire taluka with an average of 2280 ppm indicating that the available water is not fit for drinking purposes except in some villages. The soils are very deep somewhat excessively drained calcareous coarse loamy soils on very gently sloping flood plains with moderate to severe erosion. The annual rainfall is about 1008 mm in the area. The groundwater levels are shallow and mainly saline except in some pockets of the taluka.

The population of Hansot taluka of Bharuch district is in the order of 68782 as of year 2001, which would increase to about 102006 by the year 2021 with a growth rate of 2 %. The water requirement of the taluka would be in the order of 1.49 mcm/year @ of 40 LPCD. As the total area falls in the saline area, at least pure drinking water @ of 5 lpcd has to be provided for drinking purposes. This would be in the order of 0.187 mcm/year.

The average population of the village is in the order of about 1495 souls as per the year 2001 which would be increased to about 2222 souls by the year 2021 for a growth rate of 2 %. The water requirement of the village would be in the order of 32439 cum/year @ 40 lpcd with a tank size of 88875 liters per village. Thus each village should have a drinking water tank of about 100000 lakh liters capacity by the year 2021. If pure drinking water has to be supplied @ 5lpcd, the daily requirement would be in the order of 11109 lpcd with a yearly requirement of about 4055 cum/year. The RO plant should be able to provide at least about 12000 liters per day by the year 2021. The present gap of water supply is in the order of 15 to 35 % of the requirement.

About 55% of the existing households only use the water from the R.O plants. Government has to promote the use of R.O plants in the area as the water quality is very bad and number of health hazards would come if the villagers do not use the same. The local Panchayats should ensure that at least about 70% of the households should use the water from R.O Plants, as the cost of the water is very cheap. The present use of water from R.O is about 652320 liters per annum per village which should increase to about 1228780 liters per year by 2021. The use of RO is at present is uneconomical, and even the maintenance would not be recovered. If the use is increased to about 70% of households, the maintenance of the RO Plants is recovered and gradually the use can be increased so that the cost of the RO plants can also be recovered. The Benefit cost Ratio (BCR) works out to be about 1.04 and the Internal Rate of Return (IRR) is about 21 % indicating the installation of R.P plants is technically feasible as well as economically viable provided at least 70 % of the Households use the same.

The field study indicated broadly the working conditions of ROs which are given below.

1. Poor drainage system of R.O. resulting of wastage water
2. Hygienic condition of R.O. room is average
3. Most of Economic backward people not use the R.O. water
4. Most of water sources for R.O. plant are polluted through weed and unnecessary growth nearby.
5. The income earned from the use of R.O. water is deposited in panchayat account and uses in other activities, other than maintenance of the RO
6. Not properly managed registers of R.O. water plant and Pani Samiti
7. Large variation in TDS level of different R.O. plant (9-400 ppm)

8. Condition of Water tank, stand post, and pipe line is not satisfactory
9. Less interest and irregular meeting of pani samiti
10. According to those people who are using R.O.water, there is reduction of stone formation and stomach pains
11. Regional water supply part 1 and part 2 are sanctioned but still not implemented
12. Implementation of Swajal Dhara scheme is slow and covered few villages
13. Outreach of canal water is very low in tail area of Hansot taluka

A detailed study was conducted in about 10 villages to know present scenario of drinking water situation in the villages of Hansot taluka of Bharuch district. About 200 people were contacted and the detailed discussions were held and the information was collected regarding the present position of drinking water supply vis vis their requirement as well other social aspects of the villages. The data has been analysed with Statistical package SPSS and the results are broadly as under.

- The average age of the people contacted is about 44 years and the majority of them are Hindus and about 56 % are females. The majority of them belong to SC/ST and OBC castes. The majority of the Households consist of 5 and more members in the family.
- The sources of water supply include, hand pumps, wells, tap tanks, canals etc. The peoples' perception has been given below.
 - The majority of the villages are not fitted with Hand pumps and even where they are installed, they are not properly working.
 - The majority of the villages have more than three wells for drinking water supply but only about 2 wells work on an average.
- 78 % of the villages get water supply every day. In the remaining villages, there is no fixed schedule of getting drinking water. In about 10 % of the cases, people get twice in a day.
- The water is supplied mainly in the morning while in some places; the water is supplied both in morning and evening.
- 52 % of the time, the water is supplied about less than one hour while 36 % of the time the water is supplied about 1 to 2 hours.
- About 70 % of people say that they are getting adequate water for drinking purposes.
- Majority of the people informed that they use about 20 liters for drinking, 8 liters for cooking, 10 liters for cleaning. They spend about 80 liters for bathing and they use pond water for washing clothes and about 10 liters for other purposes. So the general norm of about 40 lpcd for domestic purpose in villages appears to be alright. The high amount indicated for bathing purposes may be for the whole family or many times they use ponds or canals for bathing.

A few suggestions for its successful implementation RO plants as well as general drinking water schemes in the villages are given below.

- Establish properly scientific drainage system for dispatching of R.O. wastage water
- Water filtration plant room and surrounding should be hygienic
- Provide R.O. filter water at low rate to economic backward (specially BPL category) as compared to others
- Based on Panchayat rules and regulation bank account of Pani Samity should be separated and it should be spent only on maintenance and sustainability of R.O. Plant. At least one women member signatory should be there in the Bank account.
- Members of Pani Samiti should be changed periodically as per panchayat rules
- Register and other essential inventory should be maintained properly by the Pani Samiti member
- Provide training to the operators for maintenance, TDS setting and filter change etc. of R.O. Plant
- Provide motivational training to the all Pani Samiti Members so that they can actively participate in rural water supply system.
- Government should appoint reputed voluntary organization for motivation and peoples' participation specially focusing on women.
- Create an alternate of scientific rain water harvesting system and provide a provision of subsidy on this system
- Provide domestic electricity connection to the R.O. Plant rather than commercial charge
- A mechanic should be appointed in a cluster of 8-10 villages for regular technical support