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SEA WATER DESALINATION PLANT – A WATER RESOURCE MANAGEMENT IN TAMIL NADU

D. Sumathi

Assistant Professor, School of Education, Tamilnadu Open University, Saidapet, Chennai, Tamilnadu, India.

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ABSTRACT

The peoples must able to know about the push for better water governance. Sustainable master plans, empowered local governments and vigilant watchdog's bodies are for ensuring Chennai's water security. This paper tells us about the water scarcity in Tamil Nadu, steps and measures taken by government and benefits of sustainable water resources.

நீர்இன்று அமையாது உலகெனின் யார்யார்க்கும்

வான்இன்று அமையாது ஒழுக்கு.

-ThiruValluvar

KEYWORDS: *Water Resource, Sea Water Desalination, Management in Tamil Nadu*

INTRODUCTION

The duties of life cannot be discharged by any person without the help of water, so without rain there cannot be the flowing of water.

Gift of nature is considered to be a water which is more prestigeous for mankind and millions of other species living on the earth. In Tamil Nadu 4 percent of India's land area is constituted and is inhabited by 6 percent of India's population, but has only 2.5 percent of India's water resources. More than 95 percent of the surface water and 80 percent of the ground water have already been put into use. Major uses of water include human/animal consumption, irrigation and industrial use. Nowadays the demand for water in Tamil Nadu is increasing at a fast rate both due to increasing population and also due to larger per capita needs triggered by economic growth.

Actually no proper rainfall from monsoons to Tamil Nadu. This is major reason for scarcity of water in Tamil Nadu. Since the State is entirely dependent on rains for recharging its water resources, monsoon failures lead to acute water scarcity and severe droughts. Earth System Science Organisation (Meteorological Department of India), Ministry of Earth Sciences given Regional Report on South West Monsoon.

Table 1

Sub-Division		June	July	August	September
Tamil Nadu & Puducherry	ACL (mm)	49.4	58.2	71.7	103.7
	NOR (MM)	46.5	69.1	88.7	117.0
	PDN (%)	6	-16	-19	-11

ACL: Actual; NOR: Normal ; PDN : Percentage Departures from Normal

Table 2

Largely Deficient	Deficient	Normal	Excess	Large Excess
≤ -60%	-20% to -59%	-19% to +19%	+20% to +59%	≥+60%

According to the report, though Tamil Nadu gets normal rainfall, there is some other following reasons are there.

Reasons for Water Scarcity

Reasons for Water Scarcity in TamilNadu, particularly in Chennai

- Unplanned urban development that has destroyed the wetlands around the city
- There is little or no recycling of water
- Rainwater harvesting is not properly done
- water bodies disappeared is almost 2400 acres
- water bodies restored only 5 out of 210
- Due to poor maintenance 20% decreases in reservoir capacity
- No action on heavily polluted rivers
- 13-year delay in Master Plan notification, 25-year delay in revision of State Water Policy

CONSEQUENCES

Availability of quantity of water for drinking and domestic uses and also for commercial and industrial processes it is very critical to health and well being. aso..

Measures to take Action industries could sustain

- Implementation of rain water harvesting is necessary.
- Supplying desalination water

Now Government of Tamil Nadu takes initiative for supplying desalination water to satisfy the thirst of Chennai which is considered to be most important.. The Tamil Nadu The desalination plant was announced in 2013 by former Chief Minister Dr. J Jayalalithaa in the State Assembly. Sea Water Desalination Plant at Minjur and Nemmeli on the East Coast Road. The 150 Million Litres per Day (MLD) plant, which will be completed by 2021-end, will benefit around 10 lakh residents in North Chennai and 9 lakh people in southern Chennai, said by government press. It will come up near the existing plant in a 10.50-acre plot. For this project, The German agency KfW will provide a debt of 700 crore rupees and the balance is to be obtained as subsidy under the Atal Mission for Urban Rejuvenation and Transformation (AMRUT) of the Central government.

Chennai's total water requirement is 830 MLD. Chennai Metro water currently supplies about 525 MLD through various sources such as groundwater, lakes/reservoirs and desalination plants. This leaves a supply deficit of around 300 MLD every day. Therfore, Tamil Nadu government plans to construct small Sea Water Reverse Osmosis (SWSO) desalination plants to mitigate the drought situation. The plants of 10 million litres per day (MLD) each are being planned at Triplicane, MRC Nagar, and Kasimedu.

The Chennai Metropolitan Water Supply and Sewerage Board, in a Request for Interest, has asked companies to conduct pre-feasibility studies, and draw up Detailed Project Reports for the construction and commissioning of the desalination plants. The project includes erection of intake and outfall arrangements and integration with existing water supply network, operation and maintenance of the plants for five years.

Recently, Tamil Nadu sought a financial support of 5,398 crore rupees from the Centre for combined water supply projects across the State. The projects include desalination plant and connected pipeline works with a designed capacity of 100 MLD to Villupuram and Tindivanam municipalities; Marakkanam and Vikkaravandi town panchayats, and 1,601 rural habitations in ten panchayat unions of Villupuram district. The total project cost is around 2,000 crore rupees and expected to benefit 16.78 lakh people. And it costs 6 paise a litre, Rs 60 for 1000 litres against Rs 15 for a litre of bottled water. Whereas desalinated water is safe, clean and potable.

Chennai is a great example of bold initiatives. It has shown the intent and been bold enough in the face of criticism that sea water is expensive to go ahead. Currently, 20 per cent of Chennai's population is living on it. There will be a time soon when 60 per cent of the city will live on it. It's a model that at least coastal India can adopt.

Sea Water Desalination Plant

Nowadays, desalination has become a very affordable solution to cope with fresh water shortage typically in tropical as well as of off-shore areas. With the advances of desalination technologies, sea water has become an interesting water source to cope with fresh water shortage. This process can be applied wherever a reliable source of water is needed. The most widely applied and commercially available technologies for sea water desalination can be divided in two types: membrane processes and thermal processes.

Reverse osmosis (RO) and Nanofiltration (NF) are currently the leading sea water desalination solutions. The advances in key equipment (membranes, pumps, energycost recovery device), turned the process energy efficient, resulting in a low investment cost and low operational cost.

Type of water can be produced from a desalination plant:

- Drinking water
- Irrigation water
- Process water : boiler feed water, cooling water
- Ultrapure water

ADVANTAGES & DISADVANTAGES OF DESALINATION PLANTS

Desalination converts salty water into drinkable water by removing salt and other solids from seawater or brackish water. Although the desalination process has been around for centuries, desalination plants allowing large-scale treatment of water didn't come into being until the 1950s. In 2002, 12,500 desalination plants in 120 countries provided 14 million cubic meters per day of fresh drinking water. World-wide desalination plant capacity will nearly double by 2015.

Advantages

- Water desalination plants can provide drinking water in areas where no natural supply of potable water exists.

- Even in countries where fresh water is plentiful, desalination plants can provide water to drier areas or in times of drought. Desalinized water generally meets or exceeds standards for water quality.
- Water desalination plants can also decrease pressure on water supplies that come from areas that need protecting.
- By treating ocean water rather than removing it from sources that may also be habitats for endangered species, these important freshwater bodies can be preserved.
- In addition, removing salt water from the oceans can raise people's awareness about protecting these bodies of water.

Disadvantages

To operate desalination plants. It is very costly to build.

- Once operational, plants require huge amounts of energy. Energy costs account for one-third to one-half of the total cost of producing desalinated water. Because energy is such a large portion of the total cost, the cost is also greatly affected by changes in the price of energy.
- The environmental impact is another disadvantage to water desalination plants. Disposal of the salt removed from the water is a major issue. This discharge, known as brine, can change the salinity and lower the amount of oxygen in the water at the disposal site, stressing or killing animals not used to the higher levels of salt.
- In addition, the desalination process uses or produces numerous chemicals including chlorine, carbon dioxide, hydrochloric acid and anti-scalents that can be harmful in high concentrations.

CONCLUSIONS

Chennai is the best example of bold initiatives. It has shown the intent and been bold enough in the face of criticism that sea water is expensive to go ahead. Currently, 20 per cent of Chennai's population is living on 20% of it. There will be a time soon when 60 per cent of the city will live on it. Going forward Chennai could be the desalination capital of not just India but the world. It's a model that at least coastal India can adopt.

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