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IMPACT OF NTR SUJALA PATHAKAM ON FLUORIDE ENDEMIC VILLAGES OF ANANTAPURAM DISTRICT, ANDHRA PRADESH - A STUDY

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ABSTRACT: Groundwater forms the main source of drinking water in the chronically drought affected Anantapuram district. Fluoride, considered as a major pollutant of groundwater is found in more than permissible limit of 1.5 mg/L (WHO, 2004) in drinking water sources in many parts of the district. A total of 204 Fluoride affected villages exist in the district. The district is a typical region showing endemic fluorosis caused by drinking water. The answer to the problem is to treat groundwater for drinking purposes. To address the issue of quality of drinking water, the Government of Andhra Pradesh has taken a policy decision to implement "NTR Sujala Pathakam" to provide treated Safe Potable Water of 20 litres for Rs. 2.00 to each household. The aim of the scheme is to set up water treatment plants to provide safe drinking water in all 13,000 panchayats in the State with service oriented motive on non- profit basis. But the scheme is confronted with various issues such as lack of financial sustainability, unscientific way of choosing the Water Plant locations, drying of water source, low quality unsafe water supply resulting in dead units. In this backdrop, the present paper attempts the impact of the scheme on Fluoride Endemic villages of Anantapuram district.

Index Terms- NTR Sujala Pathakam, Fluoride Endemic villages, Issues.

Introduction

Water is critical for sustainable development and is indispensable for human health and well being. Eighty percent of the human body is made up of water. Water is vital for nearly every bodily function, including digestion and elimination. It is a unique commodity which can never have an alternative and an increased supply creates greater demand. The very existence and survival of life on earth is because of water. It is no exaggeration that future wars will not be for petrol but for water. Water not only serves biological needs but also economic and cultural needs of man. One can see economic development where water availability is in abundant. Water is an important component for performing religious rituals for almost all religions in the world.

Safe drinking water is vital for human health. But Earths 97 percent of water is saline and only 3 percent is fresh water which is drinkable. And again in this 3 percent available fresh water, 68.7% is tapped in Ice caps, glaciers, 30.1% is ground water and only 0.3 percent is surface water which reflects the stress on available water. 19 percent of world deaths are due to water borne diseases. Access to safe drinking water, improving sanitation and hygiene (WASH) can prevent 1/10th of global disease burden. India is no exception. 37.7 million Indians are affected by waterborne diseases annually. India will be water stressed country by year 2020.¹ 85% Drinking Water sources are ground water dependent which is contaminated by Arsenic, Fluoride and other salts and minerals which are detrimental to human health. The problem of Fluoride has reached alarming proportion affecting at least 19 states of India. Andhra Pradesh, Gujarat and Rajasthan have 50 to 100% districts affected by fluoride, whereas, Bihar, Jharkhand, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Tamil Nadu and Uttar Pradesh have 30 to 50% districts affected. Chhattisgarh, Delhi, Jammu and Kashmir, Kerala and West Bengal have less than 30% of districts affected.² According to Ministry of Water Resources 267 districts of the country are affected by fluoride in 2012.³ It is estimated that about 66.62 million people are at risk of consuming fluoride- contaminated water in 19 states of India including 6 million children below the age of 14 years (UNICEF, 1999).⁴ It is estimated that about 65 million people of India are suffering from Dental and Skeletal Fluorosis and other Kidney related ailments. Table 1 gives the list of Fluoride affected villages in the 13 districts of Andhra Pradesh.

Table 1
List of Fluoride affected villages in the districts of Andhra Pradesh

District	No.of.Villages	Level of Fluoride (in ppm*)
Anantapuram	204	1.5-2
Chittoor	21	1.5-2
East Godavari	03	1.5-2
Guntur	19	1.5-2
Kadapa	--	--
Krishna	06	2-3
Kurnool	17	2-3
Nellore	70	2-3
Prakasam	53	4-5
Srikakulam	21	1.5-2
Visakhapatnam	25	1.5-2
Vizianagaram	0	1.5-2
West Godavari	03	1.5-2

Source: Eenadu Daily, May 15, 2017, Pg-2

*1 ppm=1gm/ltr

Fluoride is essential in minute quantity for normal mineralization of bone and teeth (for formation of dental enamel).⁵ However, when consumed in higher doses (>1.5 mg/l), it leads to dental fluorosis or mottled enamel and excessively high concentration (>3.0 mg/l) of fluoride may lead to skeletal fluorosis.⁶ The World Health Organization (WHO) recommends 1.0 mg/L of fluoride concentration in drinking water (WHO, 1984) and the Bureau of Indian Standards IS 10500:2012 recommends requirement (acceptable) limit of 1 mg/L and permissible limit of 1.5 mg/L in drinking water sources. The adaption of lower drinking water standards of fluoride is desirable because of the hot climate with a mean temperature as high as 38°C (100.4°F) and correspondingly, high water consumption in rural India.⁷ The permissible consumption of fluoride is recommended to be 0.05 mg/day/kg of body weight for maintaining good health. The average weight of rural Indian is about 50 to 60 kg. Thus per day permissible consumption of fluoride is about 2.5 to 3 mg. The scientific data about the fluoride contents in food indicates that about 2 to 3 mg fluoride is consumed from food, milk and tea alone leaving very little scope for the consumption through water. As it is very difficult to isolate the food having high fluoride content in the daily food chain, the option left with is defluoridate groundwater.⁸

Thus it becomes inevitable to treat water and defluoridate it for drinking purposes. When supply of water is itself a challenge, supply of quality treated water is even more a bigger challenge. To address the issue of supply of quality drinking water, the Government of Andhra Pradesh has taken a policy decision to implement "NTR Sujala Pathakam" to provide treated Safe Potable Water of 20 litres for Rs. 2.00 to each household from October 2nd 2014 onwards, which is also a poll promise.

The main objectives of NTR Sujala Pathakam

- To address the issue of quality of water where there is a problem.
- To address the water quality problems associated with water supply and distribution networks.
- To also address the issue of hygiene and handling of water at the house hold level.

An amount of Rs 120 crore a year will be required for the scheme implementation. Waiver of VAT tax, power tariff at subsidized rates are some of the concessions given by the Government to make them financially viable as the plants work on non profit basis.

Study Area

The present study makes an attempt to study the impact of NTR Sujala Pathakam on Fluoride Endemic villages of Anantapuram district of Andhra Pradesh in general and Raptadu Madal in particular. Anantapuram, one of the four districts of Rayalaseema region of Andhra Pradesh is located in the South-Western part of Andhra Pradesh, India. It lies between longitudes 77° 30' - 78° 15' east and latitudes 14° 0' - 14° 30' north. The district is economically backward and chronically drought affected. Anantapuram district has been classified as desert-prone district by the Government of India.⁹ On an average once in every five years, the district experiences drought conditions.¹⁰ It is in the rain shadow area and the normal rainfall is 553 mm which makes it the second lowest rainfall district in the nation after Jaisalmer, Rajasthan. Hence Groundwater forms the main source of irrigation and drinking water in the district. Fluoride concentration in many locations of the district is more than permissible limit in drinking water sources. A total of 204 Fluoride affected villages exist in the district. The district is a typical region showing endemic fluorosis caused by drinking water. Dental Fluorosis and Skeletal Fluorosis in some cases is very common in this region.

The study area, Raptadu Mandal in Anantapuram District lies between North Latitudes of 14°29' to 14°36' and East longitudes of 77°29' to 77° 42'. The Mandal consists of 29 Villages/Habitations, 16 Panchayats and 11 Revenue Villages¹¹. The total population of the Mandal as per 2011 census is 38057 of which 19558 are Male and 18499 are female. The literacy rate is 61.57%, male literacy rate is 59.13% and female is 40.86% which is very much below the national standards, 75.3% and 53.7% respectively¹². Sex ratio is 946. The Average annual rainfall in the region is just 544mm which categorizes it under drought prone area. An attempt was made to supply safe treated drinking water which is defluoridated and affordable by establishing plants under the NTR Sujala Scheme in the mandal.

Table 2 gives the list of Water Plants sanctioned under NTR Sujala Scheme in various Gram panchayaths in Raptadu Mandal.

Table 2
List of Water Plants under NTR Sujala Scheme in Rapthadu Mandal

S.N o	Grama Panchayat	Habitation	Popula tion	Water Plant	Location
1	Raptadu	Raptadu	5501	NTR Sujala Scheme	OHSR-ZPHS
2	Raptadu	Gangalakunta	786	NTR Sujala Scheme	OHSR
3	Gollapalli	Gollapalli	1018	NTR Sujala Scheme	OHSR
4	Hampapuram	Hampapuram	2097	NTR Sujala Scheme	Gundam
5	Marur	Marur	2403	NTR Sujala Scheme	China Kadarayya Swamy Temple
6	Cherlopalli	Cherlopalli	1118	NTR Sujala Scheme	GP Office
7	Bandameedapalli	Bandameedapalli	3078	NTR Sujala Scheme	Village Center
8	Gandlaparth	Gandlaparth	1607	NTR Sujala Scheme	Poleramma Temple
9	Yerragunta	Yerragunta	1114	NTR Sujala Scheme	Anganvadi School
10	Gondireddipalli	Gondireddipalli	1607	NTR Sujala Scheme	OHSR
11	*Bommeparth	Bommeparth	998	Sachidanand a Ashram	GP Office
12	Bhoginepalli	Bhoginepalli	1114	NTR Sujala Scheme	Racha Katta
13	Gollapalli	Pesarakunta	88	NTR Sujala Scheme	Pesarakunta
14	Cherlopalli	Palabavi	581	NTR Sujala Scheme	BC Colony
15	Marur	Chapatla	626	NTR Sujala Scheme	Mremma Temple
16	Bandameedapalli	Varimadugu	463	NTR Sujala Scheme	Varimadugu
17	Palacherla	Ramnepalli	905	NTR Sujala Scheme	Site to be Identified
19	Parsannayapalli	Chinmayanagar	1163	NTR Sujala Scheme	Near Bus Stop

Source: Dept of Rural Water Supply and Sanitation

*The plant in Bommeparth was sanctioned under NTR Sujala Scheme but maintained by Sachidananda Ashram

Methodology:

Group discussions were held with the village head men & villagers of the 19 habitations listed in the Table 2, where the plants were functioning under NTR Sujala Scheme.

Findings:

80 percent of the villagers of the habitats were quite positive about the functioning of the water plants under the scheme. The water was coming at a very affordable rate of just Rs 2/ per 20 lts can which is Rs 5/-Rs 7/ from private suppliers. The villagers also felt that they could feel the difference in their body system after drinking treated water. Complaints like body pains, joint pains, and ailments like, stomach ache, diarrhea, cholera etc have been reduced.

Issues:

The scheme is confronted with various issues such as

- Lack of financial sustainability. As the scheme is service oriented, no profit basis, it has become difficult to run. Plants have been shut down due to financial unsustainability. Many times wage/salary is delayed or denied to the waterman who operates the plant, who in turn loses interest. This affects the functioning of the plant. He/She may not open the plant for public collecting water in time/irregular timings where public have no idea at what time should they go to the plant to collect water. Gradually they lose interest and stop going to the plant and rely on private suppliers who supply water promptly at their door steps.
- With Plants functioning under NTR Sujala Scheme, the public has to go to the plant for water collection. There is no mechanism/arrangement to supply treated water to the public to their homes. This poses a great disadvantage as households away from the plant cannot come.
- Drying of water source which is very common in the drought prone Anantapuram District. Receding groundwater levels every year resulting in non functioning of water plants.

- d) Unscientific way of choosing water purification technology is another drawback. The officers at Dept of RWSS themselves personally feel that the technology adopted not only eliminates fluoride but also other nutrients and minerals.
- e) A section of public feels that the scheme is party oriented. And hence they don't go to the plant for water.

Conclusion:

There is no doubt the scheme has made positive impact on the health of the villagers. Safe drinking water supply is one of SDG Goals and this scheme helps to realize the goal. The issues and problems need to be addressed to get the real fruits of the scheme.

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