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Title	:	Water supply and sanitation status of a Peri-urban area – case study of Ramapuram near Chennai city	
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Background:

Water supply and sanitation are two of the most important sectoral attributes for socio - economic development of any community. Access to water supply and sanitation are the basic human needs and rights. The supply of water in adequate quantity and proper sanitation is a major challenge to all cities. Rapid urbanisation, along with developmental activities not only overuse natural resources like water, but also deteriorates its quality, if waste is not properly managed. These issues are very serious in the peri-urban areas of most of the developing countries. The present water supply and sanitation status of Ramapuram, a peri - urban village panchayat of Chennai city is studied in detail.

The current status of water supply and sanitation is analysed with the help of data collected from the village records and by questionnaire survey and group discussions conducted among the villagers. The ground water quality deterioration due to sewage and solid wastes disposal is examined through water quality analysis at different sources like bore wells and open wells. The chemical and biological parameters are analysed as per standard procedures and compared with BIS (10500-1991) standards. The health and other socio-economic problems associated with inadequate water supply and poor sanitation was also examined through interviews conducted with public health centre officials and private medical practitioners in the village. In brief, the paper discusses the present water supply and sanitation status of Ramapuram, and also suggests appropriate policy options for improvement.

From the water supply and sanitation studies carried out in the Ramapuram Village Panchayat the following conclusions are drawn. The population of Ramapuram area was nearly one lakh in the year 2008 and the water supply, a very basic need, is inadequate, as a result of which there has been an over exploitation of ground water.

The Panchayat has its own limited system of water supply constructed by TWAD board based on local water availability under the rural water supply schemes of state governments. The quality degradation of the ground water is so severe that it cannot be used for human consumption. Due to this, at present, the local body is buying water from the metro water. This costs the local body an amount of Rs. 13300/- per day, which is not recoverable.

The quantity available for potable use for the people varies from two 'Kudams' to five 'kudams' (usually a plastic container with a capacity of about 15 liters) for a normal household of five people. This gives a per capita supply of 8 to 15 litres as against a minimum of 40 litres per day. The poor are mostly served by street taps. The number of street taps in the slum is 1 tap for 10 houses. Every household spends an average of 5 paise/ litre. These limited systems are inadequate to meet even current population needs and hence are grossly inadequate to serve the future population in the area.

Research Methodology:

To investigate the quality of ground water, water samples were analysed. It can be concluded that the dominant cations and anions are sodium and chloride respectively. Iron contamination is also found in majority of the locations, which is the leading to the need for iron removal in this area. Since the ground water is contaminated both chemically and biologically in this area, it is necessary to provide proper sewerage facilities to avoid further degradation of the ground water.

Research findings:

It was found that, the higher income group extracts the ground water at about 60-70 lpcd; industries also extract from in situ shallow wells or bore wells after treating (Like hardness removing, iron removal systems) the water. Institutional establishments get water from outside for various purposes.

The public sanitation is poor since most of the poor households do not have adequate facilities, either individual or community toilets, forcing the poor people to resort to open field defecation. Non-poor households, people living in apartments and institutions and firms have toilets but the wastewater is generally disposed through septic tanks. The effluent from the septic tanks is allowed to infiltrate in the ground or spill over to street margins. Due to this, there is a great possibility of polluting underground water.

In the Ramapuram Village panchayat, the number of sanitary workers is inadequate. So their efficiency in solid waste clearance and management is poor. The financial resources of the village panchayats are weak and will not be able to meet significant capital costs for civic services. Most of the revenue of the local body is obtained through property tax and licenses. In the village panchayats, the tax level is low. Due to this scenario, it is very difficult for these tiers of local government to plan, finance, execute and maintain satisfactory water supply and sanitation services for the growing population.

Since women are the main collectors of water, their main requirement is continuous supply or even increased supply time. They require daily removal of garbage, particularly in the low-income areas and provision for drainage facility for sewage removal and cleaning of the open drainage present in the slum area. Women's involvement is necessary for successful water supply and sanitation.

The water supply and sanitation in Ramapuram Village Panchayat was taken as a representative of peri-urban area in Chennai city. Through questionnaire survey and water quality analysis we found that the supply to the people of Ramapuram is inadequate in both quality and quantity.

The quality of ground water in many places, particularly those close to the solid waste dumpsite, is unfit for human consumption. The access to water by higher income groups is better as they are able to pay for packaged water or treat the ground water using reverse osmosis plants or iron removal plant. In Ramapuram, sewerage system is totally absent. There are only open drains available for collecting the sullage and only a part of it is disposed into the river Adyar. The higher income and middle-income groups' residential areas have toilets and septic tanks, soak pit and covered drains (for a smaller area). The low-income groups and the slum dwellers use public toilet facilities, which are grossly inadequate and expensive. This forces the poor to resort to open-air defecation. This leads to very poor sanitation conditions in Ramapuram village. This study examines the problems faced by women across different income groups with respect to inadequate water supply and sanitation. It was found that women from lower income groups suffer more. They spend more time in accessing drinking water for their family. They spend an average of 30 minutes to fetch 1 to 5 pots of water. Hence they use the ground water, which is very poor in quality in terms of odour and color according to their opinion. Yet they continue to use it. The women and girls are forced to use the open grounds to relieve themselves thus exposing themselves to anti-social elements. They face risks going out at night to lonely places.

This study has also found that water borne diseases are very common in the poor houses of Ramapuram, due to poor quality of the available water and contamination of ground water. This problem is further aggravated due to mosquito menace due to solid waste dumpsite. Respiratory diseases are also common in this section of the Ramapuram due to the practice of burning of solid waste.

Ramapuram, being a village panchayat has a population of 94,712 (according to village panchayat record 2006). Very soon Ramapuram will have a population of 100000. Hence it will be eligible to become a municipality. If so, Ramapuram may, in the near future, have adequate funding allocated by the government to cater to its water supply, sanitation and solid waste disposal. But at present, though it has proximity to Chennai, it is a village panchayat, which is densely populated. The result of increasing population, which depends on infrastructure facility of inadequate water supply and sanitation, is leading to over exploitation of ground water, pollution of ground water due to sullage and sewage infiltration, inadequate solid waste dumping and burning of garbage. These conditions reflect on the health of the people and shows that women suffer more under such situation, particularly from the weaker section of the society.