

Intricacies of Chennai Metropolitan Water Laws

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Abstract

It is becoming increasingly clear that tough decisions will have to be made if Chennai's severe water service delivery problems are to be solved effectively. Current approaches to tackling water-related challenges are based more on crisis management than strategic planning processes that are based on the principles of adaptive management and stakeholder participation. Huge amounts of funding are being wasted annually on programmes of work that at best are providing temporary solutions and at worst are causing major damage to the resource base and the livelihood systems of people living in Chennai's peri-urban areas and the more rural areas that are also being used as sources of water supply. Whilst being good on paper, current legislation is not being implemented and, to all intents and purposes, this legislation commands minimal political and societal support. More worrying still, is the fact that institutions tasked with the responsibility of maintaining Chennai's water services are not respecting existing legislation.

Although the situation is grim, there is much that can be done if there is sufficient political will and cross-party support. Or put another way, long-term improvements in Chennai's water services will not be possible if the political parties in power ignore existing legislation and/or fail to seek cross-party and stakeholder support for changes to water-related legislation. It is also crucially important that there is good alignment of legislation and policies across the many different sectors that have the potential to impact on water supply and demand (e.g. agriculture, power, industry, environment etc). This paper reviews the current status of Chennai's water services and current approaches to water governance. Existing water-related legislation is described and some recommendations are made both for improving the legislation and for ensuring that the legislation contributes more effectively to better water services in Chennai and surrounding peri-urban and rural areas.

1. Introduction

In recent years, inhabitants of the city of Chennai and the surrounding metropolitan area have faced increasingly severe water shortages. Many programmes of work and large amounts of money have been directed at solving these water shortages but with only limited success. In fact, as both competition for water and demand have continued to rise sharply, it can be argued that the water challenges facing Chennai are becoming more severe and more difficult to solve. It is clear also that the escalating demand for water of the Chennai metropolitan area is putting more and more pressure on the peri-urban and more distant rural areas that are the main sources of Chennai's water supply.

This paper discusses the nature and scale of water scarcity in the city and the approaches taken by the Government to tackle the situation. This paper also discusses

how the State Government's approaches to water service delivery in the city one hand cater to the water needs of city dwellers but on the other hand deprive peri-urban areas and more distant rural areas of their water rights. It is argued that this leads to an imbalance of water equity between urban areas and the areas that are the sources of Chennai's water supply. Finally, the paper analyses how legislation, which has been formed to protect and regulate ground and surface water exploitation, has been blatantly violated.

This paper was prepared during the inception phase of the Negotiating peri-urban water conflicts (NEGOWAT) project. NEGOWAT is a multi-partner research project financed by the European Union, DFID (United Kingdom) and ASPA (Brazil). In Chennai (India), Sao Paulo (Brazil) and Cochabamba (Bolivia) the project is focused on developing tools to better understand water-related competition and conflicts and to help facilitate negotiations between stakeholders in these areas. The project, which started in 2003, is scheduled to finish towards the end of 2006. More information on the project can be found at <http://www.negowat.org/>

2. Situation of the City's Water Resources

2.1 Saline intrusion

Groundwater levels in the Chennai metropolitan area have fallen to alarmingly low levels and, in many places, intrusion of seawater into coastal aquifers has been reported. A national study conducted by the Central Ground Water Board stated that Tamil Nadu, Pondicherry, Daman and Diu, and Lakshadweep topped the list for saline intrusion into coastal aquifers caused by excessive groundwater extraction. The C.P.R. Environment Education Centre conducted a six-year survey of groundwater in coastal areas around Chennai from Injambakkam in the south to Ennore in the north. The main finding of this survey, which was based on monitoring 150 wells, was that the Total Dissolved Solid (TDS) and chloride content of water samples registered a significant increase during the six-year period. In other words, salt-water intrusion into Chennai's water sources is steadily increasing. Of the three zones in the city, namely south, central and north, central Chennai is the most severely affected. In Mandavellipakkam and Mylapore, TDS has doubled in the last four years. While 85 per cent of water sources in Central Chennai have shown an increase in TDS levels during the last three years, 50 per cent of water sources in north Chennai have shown an increase in the last four years and 66 per cent of all monitored water sources have registered increase in TDS levels during the last six years.² Heavy withdrawal of ground water by industries and increasing number of high-rise apartments have aggravated the situation. Unavailability of potable water in the metropolitan area and lack of proper water management has left the Chennai Metro Water Board with no alternatives but to look outside the metropolitan limits for good-quality water resources.

2.2 Efforts to supply water to the city

In 2003, Chennai received only 280 mm of rain from the northeast monsoon against the normal of 580 mm. Consequently, storage levels in the city's reservoirs, namely Red Hills, Poondi and Cholavaram, fell to the lowest in 55 years. If the Tamil Nadu government and the Metro Water officials pinned their hopes on the Telugu Ganga Project to combat the resultant water supply problems, the project flattered to deceive. The Krishna river water released from the Kandaleru reservoir in Andhra Pradesh reached the zero point near Uthukottai in Tamil Nadu, after covering a distance of 152

km. The plan had been for this water to be conveyed to Poondi and then to the Red Hills reservoir before being treated and ferried to the city in tankers. But such hopes evaporated on 18 February 2004 with the Poondi canal remaining dry. Illegal tapping of water by farmers and the withdrawal of water to meet the demands of Tirupati town in Andhra Pradesh were offered as the reasons for the non-arrival of the Krishna water in the Poondi canal.⁴

For the last decade, the Chennai Metro Water Board has depended heavily on peri-urban water resources as a source of supply. This water has been extracted from agricultural and domestic-supply wells and transported to the metropolitan areas on a daily basis using 10000, 12000 and 20000 litre capacity tankers. In 2004, improved rainfall meant that some parts of the city received water through corporation pipes and as a result the number of tanker lorries supplying water in the City was reduced as compared to 2003.

Apart from transporting by tanker from peri-urban areas and requesting Andhra Pradesh for more water, Tamil Nadu government has come up with a few so called long-term strategies. Foremost amongst these schemes was the one named as the " Revised Chennai Veeranam Project". This hugely expensive project aimed to bring 0.18 Mcum of water per day by pipeline from 235 kms away from Chennai. In 2004, it was anticipated that this project would supply about one third of Chennai's daily water requirement. However, the viability of this scheme is under question given that it depends on diminishing flows in the Cauvery River. The fact that, to date, the project pipelines have been used to convey groundwater rather than surface water only heightens concerns over the viability of the project. Other schemes that were considered included bringing water from Tirunelveli dams (Papanasam dam in extreme Southern Tamilnadu) to Chennai by rail.

2.3 Cost of water

In the summer of 2003, 2,000 privately-owned water tankers were in operation daily in addition to those hired by the Chennai Metropolitan Water Board. At the peak, a 12,000 litre tanker of water would cost as much as Rs 1,500 to Rs 2,000. Even though a number of apartment buildings were prepared to pay this amount, the quality of water was not assured. The informed view was that a number of fly-by-night operators, most of them with just one tanker, became involved in the tankering business sensing good fast money. According to industry sources, the cost of a 12,000-litre tanker of water fell to around Rs 450 to Rs 600 in 2004 depending upon the area of supply and the periodicity with which water was required.⁷ In 2003, a well owner was paid Rs 3.30 per 1000 lts of water by the Metro Water Board whereas water consumers paid as much as Rs 80 per 1000 lts to Metro Water Board and even more to the private lorry owners. For purified mineral water, the amount charged was as high as Rs.50 per 25 lts or Rs.2000 per 1000 lts of water. Rs 5 was being charged for 250 ml water sachets.

During 2003-2004, the Metro Water Board was spending around Rs 500 million to buy 3.7 billion litres of water each month. During summer months the figures were even higher.

2.4 Waste Water Treatment in the City

In the present system of water governance, the Chennai Metro Water Board is responsible for water supplies and domestic sewage treatment and management. It is believed that the amount of sewage generated in the City surpasses the amount of water

supplied by the Board. Around 220 Mcum of wastewater is generated every year as compared to 85 Mcum of water supplied by the Board. As per the sewage water treatment and management system of the Board, the sewage is supposed to be treated up to the permitted level and then discharged into the waterways and sea.

The wastewater system in the city has evolved over the past century and, although upgraded, much of the old system is still in use. The existing wastewater system consists of five independent zones. However this system is undergoing modification to a recently formulated comprehensive plan. Wastewater in all areas is collected in pumping stations in the respective regions. The sewage is then pumped to treatment plants. There are at present five treatment plants in the city; 2 treatment plants in Kodaingayur, one each in Koyambedu, Nesapakkam, Perungudi and Villivakkam. But out of these five plants, only three are functioning. Four new treatment plants have been constructed one each in Kodaingayur, Koyambedu, Nesapakkam and Perungudi.

The city generates around 220 Mcum of waste water every year but, according to the Metro Water Board, the total capacity of treatment plants does not exceed 80 Mcum per year. So the big question is where does the rest of untreated sewage go? Into the sea? Moreover the Board also confirms that during treatment, only BOD, COD and suspended solids are brought down to permitted levels. TDS (Total Dissolved Solid) is not tackled. All sewage, whether treated or not, is discharged into the Bay of Bengal directly or via the Adayar River, Coovam River and Buckingham canal with obvious consequences for the ecology and the environment. The Board has now come up with a proposal to plug all the outlets that drain into Adayar and Coovam River with the result that all the sewage generated in the city would be discharged directly into the sea.

2.5 Impact on environment and livelihood

There are laws to tackle these water and wastewater issues but in the sharply polarised political arena that characterizes water-related decision making in Chennai, they are rarely implemented. For their utter political benefit, the ruling party always tends to overrule the existing laws. To recharge the depleted aquifers the Government has made rainwater harvesting mandatory in all residential and industrial complexes and, according to the Board, around 98% of all houses and complexes have now installed rainwater harvesting systems. But the irony is that the Government has not prepared plans to harvest floodwater. Each year large volumes of urban runoff discharges directly into the sea via stormwater drains.

The existing water supply and sewage systems are essentially the result of crisis management and not part of a long-term sustainable water management strategy. The result is that: 1) Insufficient attention has been given to ensuring the water rights of each of every inhabitant of Chennai; 2) Many agricultural and domestic wells have been depleted to the point of failure; and, 3) Livelihoods and the environment in peri-urban areas are being badly affected as Chennai's water footprint grows in size.

In most parts of the city, pipelines have been laid and crores of rupees have been spent to bring water from Veeranam as an additional source of supply. But is the supply from Veeranam sustainable? The indications are already that once the sources in Veeranam have been exploited the Government will have to switch to some other area as a source of supply. Of course, no one can altogether deny the considerable challenges faced in meeting Chennai's increasing demand or the efforts made by the State Government to

provide drinking water to the people. But, given the lack of success to date, important questions that have to be asked include:

- Why has the State failed to provide drinking water facilities to its entire population?
- What are the main constraints on providing drinking water when the city lack neither money nor technology?

The answer is quite simple. Tamil Nadu has an annual ritual of: money allocated, money spent and areas covered. Each year money is allocated for the water crisis and spent to address the crisis on a temporary basis. The following year brings on the same water crisis and money is again allocated. Unfortunately the Government continues to look at this issue solely in terms of money spent.⁹ However, everyone knows that increasing expenditure will not solve the problem unless the State takes a more strategic long-term approach to tackling the problem of escalating demand and increasing competition for available water resources.

3. Rise of conflicts on water sharing

Compared to India's four other mega-cities, Chennai is alone in suffering from a lack of a reliable perennial source of water. Delhi and Kolkata have access to the Yamuna and Ganges rivers (or rather Hoogly river in Kolkata) and heavily-populated Mumbai is fortunate to get copious rains from southwest monsoon via a well-organised system of storage reservoirs. Chennai is unfortunate in that there is no perennial water source and the monsoon rains are both unpredictable and hugely variable.

Extracting water from one place to supply it to another has given rise to many inter and intra state water conflicts. We all are aware of conflict between Karnataka and Tamil Nadu on the issue of sharing of Cauvery River water. Conflicts have also erupted within Tamil Nadu on the issue of sharing water between different areas of the State. Peri-urban areas and more distant rural villages feel deprived of their water rights when water is extracted from their area and supplied to the urban areas. When some suggestions were made to draw water from Madhurantakam Lake some 80 km away from Chennai, there was stiff opposition and people demonstrated on the roads. Similar resistance was prompted by the proposal to draw water from the Veeranam Lake. The lake generally gets its supply from the Cauvery river system, however, in the last couple of years, it has dried up as a result of poor flow in the Cauvery. Now under the New Veeranam Project, as there is no water in Veeranam Lake, the Government is drawing water from bore wells that have been constructed by the government. Since 2004, Chennai residents have been getting Veeranam groundwater in their pipelines but all these processes have irked people of Veeranam region. They feel deprived of their share of water and their water rights.

The same scenario can be seen in many parts of the Kancheepuram and Chenglepet regions. People, especially farmers, have come on to the roads protesting against the heavy withdrawal of water from their domestic and agricultural wells by the Chennai Metro Water Board and also by private tanker owners. In many areas, the people, after giving an ultimatum to the Metro Water authorities, have gone on to ransack pump sets and pipelines laid to draw water from bore wells.

Reasons for conflicts can be summarised as follows¹⁰: -

- There is a huge and escalating demand for water from all sectors;
- Lack of a water pricing policy between and within sectors is further driving demand. In particular, industries, who can afford to, buy huge amount of groundwater for industrial purposes;
- Policies and institutions, which are supposed to solve conflicts, are to some extent contributing to further conflicts;
- Drinking water, which is hardly 2-5% of the total water consumed gets hardly any priority.

Conflicts have given rise to many questions that include¹¹:

- How can the State Government secure this 2-5% of available water for drinking and domestic use without imbalancing equity between regions;
- Are the State Government and the state-engaged organisation (e.g. the Chennai Metro Water Board) the appropriate institutions to manage water resources? Would vesting power to manage water to village panchayats be more appropriate and sustainable?
- What kind of regulations are needed to prevent groundwater exploitation without pushing peri-urban regions into a tighter corner?
- How can industries be forced to pay the true cost of water and of cleaning up waste?

The basic problem with the State Government and the Metro Water Board is that they lack appropriate long-term strategies to tackle the ever more serious water scarcity in the city. This is no easy task given that the challenge also has to be to maintain some kind of equilibrium between the metropolitan, suburban, peri-urban and more distant rural areas given the level of interdependency between the areas. Clearly the city's needs should be given priority over the needs of other areas, however, one region's benefit need not be the loss of another region. Moreover no policy or strategy should ignore the specific needs of the environment and poorer and more disadvantaged social groups.

4. Chennai Metropolitan Water Laws

4.1 Chennai Metropolitan Water Supply and Sewerage Act, 1978

In 1978, the Chennai Metropolitan Water Supply and Sewerage Board (CMWSSB) was formed to take on the responsibility of augmenting water supply in the city. This Act came to force on 14th June 1978 and was subsequently amended in 1997. The main functions of the Board are:

- Promoting and securing the planned development of water supply and sewerage services;
- Efficient operation, maintenance and regulation of the water supply and sewerage systems in Chennai Metropolitan Area;
- Preparing immediate and long term measures to meet future demands for water supply and sewerage services in the Chennai Metropolitan Area.

The mission of the Board is to enhance the health and quality of life of the citizens of Chennai by providing them with an adequate supply of clean and good quality water and

by safe disposal of sewage/waste water at a reasonable price and to improve the environment. At present the Board serves a population of about 7 million most of whom live in the Chennai City Area. .

To carry out all these functions, the 1978 Act gives the Board the power:

- To take over all existing responsibilities, powers, controls, facilities, services and administration relating to water supply and sewage in or for the Chennai Metropolitan Area;
- To prepare schemes for water supply and sewerage (including abstraction of water from any natural source and the disposal of waste and polluted water) in or for the Chennai Metropolitan Area
- To control extraction, conservation and use of groundwater in Chennai Metropolitan Area;
- To prevent pollution of any water including any water sources, water course or channel utilized for the purpose of Chennai Metropolitan Area and few more;
- Above all, to do all necessary things for the purpose of carrying out the provision of this Act.

The Board was formed as a response to water scarcity in the city. But after 25 years since its inception, the evidence indicates clearly that Board has failed in discharging its duty.

4.2 Chennai Metropolitan Area Ground Water (Regulation) Act, 1987

By the mid 1980s, available sources of water supply to the Chennai city were becoming insufficient to meet the demand for drinking and other domestic purposes. Rainfall had been below average for a period of two to three consecutive years and the reservoirs in Poondi, Choolavaram and Red Hills were almost dry. Water mining had become common place and, as a consequence, water quality was deteriorating. This situation prompted the enactment of the 1987 Groundwater Act. The aim being to facilitate the functioning of the Water Board and to regulate and control the extraction, use or transport of ground water and to conserve ground water in Chennai Metropolitan Area and some nearby notified areas,

The main features of the Act are:

- The CMWSSB is the authority to grant / not to grant permits to sink wells in the scheduled area;
- The CMWSSB is the authority to grant /not to grant licenses for extraction, use or transport of ground water;
- The CMWSSB is the authority to prepare and maintain a register showing the number of wells in existence in scheduled areas and also to maintain a register showing the use of groundwater in the scheduled areas for agricultural purposes. The register should contain particulars such as:
 - i. the type of well and its exact location;
 - ii. the device used for extracting the groundwater;
 - iii. the date from which the groundwater is being used;
 - iv. the purpose for which the groundwater is being used;
 - v. the quantity of groundwater utilized;

- vi. the extent, location and the survey number of the area where groundwater is used for agriculture purpose.
- No person shall extract or use ground water in scheduled areas for any purpose other than domestic purposes and no person shall transport ground water from these areas by means of lorry, trailer or any other goods vehicle. If any person desires to extract or use ground water in a scheduled area for any purpose other than domestic purposes or transport ground water by means of lorry, trailer, or any other goods vehicle, they must make an application for grant of a licence to the CMWSSB for the same. After examining the application, the Board has - the discretion to grant / not to grant the license.
 - The CMWSSB, by an order, can cancel the permit or licence if a holder of a permit or licence has failed to comply with any of the terms, conditions and restrictions relating to the licence.

The Act prescribes penalties for offences such as failing to comply with the provisions in the Act or rules made under this Act or the terms and conditions made under this Act or the terms, conditions or restrictions subject to which the permit or licence has been granted. The penalty is five hundred rupees for the first offence, one thousand or imprisonment, which may extend to six months or both for second offence. The Act prescribes another set of penalties for companies. If any offence is committed by a company which is punishable under this Act, the person in charge of and responsible for and also the company would be deemed guilty and would be punished. The Act has not provided any thing in this sub-section for any punishment if any such person proves that the offence was committed without his knowledge or he had exercised all due diligence to prevent the commission of such offence. Finally, the Act also advised the State Government to instruct the CMWSSB to implement appropriate artificial recharge measures of Arni – Kortaliyar basin.

Although the 1983 Act was legislated with the aim of regulating extraction and exploitation of ground water and unmindful transport of ground water for purposes other than domestic purposes, after more than two decades we find that the Government itself has consistently contravened this Act. Metro Water Board has been a party to the over exploitation of ground water inside the city and also in the peri-urban areas. The Board not only draws ground water from the scheduled areas but also from surrounding peri-urban areas as far as 50 km away from the city limits. The over extraction of ground water in many areas has adversely affected the quality and quantity of the ground water. As far granting license/ permission for a well/borewell is concerned the procedure is mere eyewash and stays only on paper. Many private lorry, tankers are operating in the city and drawing water from a radius of 50 kms from the city without any licence. Some of the private lorry drivers complain that their applications for a permit or licence are ignored. Many of the Board's tanker lorries also operate without license. Many industries are not only drawing groundwater violating the norms of the Act but also degrading the quality of the groundwater. There is no systematic procedure in operation to penalize the lawbreakers, be it any individual or any industry.

Till date only 2 check dams have been constructed in the Arani-Kortaliyar basin and these are in a dilapidated condition and serve no purpose. Crores of rupees spent on these constructions has totally gone waste. More check dams with proper functionality need to be constructed to check the rainwater flowing into the sea. Though the Act speaks about fixing up the limits of the withdrawal of ground water by the Board, no such standards have been maintained till date and in certain areas like Minjur the water has

become completely unpotable due to intrusion of sea water. The irony is that, the 1983 Act was introduced on the basis of clear evidence of seawater intrusion in Minjur aquifer and surrounding areas but unmindful withdrawal of water still continues in these areas.

The 1983 Act was amended twice to increase the notified areas from 229 to 243 and then to 302.

4.3 The Tamil Nadu Ground Water (Development and Management) Act, 2003

With the enactment of the 2003 Act, the 1987 Act became null and void. Similar to the 1987 Act, the 2003 Act was legislated to protect groundwater resources, to provide safeguards against the hazards of exploitation and to ensure planned development and proper management of groundwater in the State of Tamil Nadu.

The 2003 Act gave direction for the establishment of “The Tamil Nadu Ground Water Authority”. This authority has the power to direct and regulate the development and management of ground water resources in Tamil Nadu with the aim of ensuring its optimal and efficient utilisation. The 2003 Act encourages conjunctive use of surface and groundwater with the aim of stabilising existing supply and use and, where appropriate, improving or increasing the availability and use of water.

The Authority has the power to direct, regulate and control the development, extraction and utilisation of groundwater in notified areas. In the process the Authority is expected to undertake investigations in order to monitor ground water potential in these areas. The Authority has the sole power to grant certificates of registration for every use of groundwater in notified areas including existing well and uses. The Act prohibits sinking of wells in the notified areas without a permit. Similarly, transportation of groundwater from notified areas by means of lorry, trailer or any other motor vehicle is permitted if the person has a permit for it.

The Authority has the power to modify, amend or cancel the terms of certificate of registration, permit or licence, either permanently or for a specified period to prevent decline in water table or deterioration in water quality or other effects that may be detrimental to the continued availability or quality of the groundwater in the notified area. The Authority also has powers to require in writing any person using groundwater, who does not comply with the provisions of this Act, to cease extracting groundwater and to dismantle any unauthorised hydraulic structures.

The Act prescribes penalties for offences such as sinking of wells in notified areas without a permit, failing to comply with the requisitions in the Act and for furnishing false information. The penalty is one thousand rupees for the first offence, two thousand for second offence and, in case of continuous contravention of the Act, five hundred rupees every day for the period of contravention. The Act prescribes another set of penalties for companies. If any offence is committed by a company which is punishable under this Act, the person in charge of and responsible for and also the company would be deemed guilty and would be punishable. The Act prescribes no punishment for the industry or the person in charge during the time of the offence, if they show that the offence has been caused without their knowledge or they had exercised all due diligence to prevent the commission of such offence.

The Authority has the power to stop mining or quarrying of any mineral or rocks where large-scale pumping of water takes place and to divert this mining water for agricultural purposes and to groundwater recharge structures.

The Act has the power to override any other law, custom, usage, agreement, decree or order of a Court or Tribunal or any Authority.

Whilst the good intentions of the act are clear, there are serious limitations that include:

- No provision is made for giving priority to meeting domestic water demands;
- Instead of putting a ban on groundwater withdrawal in areas of severe over-exploitation, the emphasis is on a licencing system. This may work but only if there is strict enforcement which hasn't been the case with the licencing systems introduced as part of the 1983 Act;
- Penalties for breaching the act are unlikely to act as a major deterrent. In fact, in many places the 2003 Act appears to be weaker than the 1987 Act.

4.4 Government Order Ms.No.131

This G.O. was issued on 27.2.2004 for Municipal Administration and Water Supply (Metrowater) Department. This G.O. approved the implementation of the Chennai Water Supply Augmentation Project II at an estimated cost of Rs 4930 million for constructing checkdams, reservoirs, percolation tanks to store surplus water in Korataliar, Coovam, Adayar and Palar rivers. The Metro Water Board was nominated to be responsible for execution of this work. Moreover, it was considered the Chennai Water Supply Augmentation Project II should be split into two parts and merged with Chennai Water Supply Augmentation Project I and Third Chennai Project.

Under this new arrangements, it was proposed that check dams would be constructed: 1) Across the Palar river at Vayalur and across the Kortaliyar at Thirukkandaalam; 2) At Manapakkam village, Nandambakkam village, Anakaputhur village and Cowl Bazaar village across Adayar; and, 3) Across Cooum river at Paruthipattu and Kannapalayam. It was also proposed that Ambattur tank, Korattur tank and Madhavaram tank (Rettai Eri) would be desilted and rehabilitated. It was decided that the Chennai Water Supply Augmentation Project would be revised and that additional water would be conveyed from Kolavoy lake to the treatment plant at Managalam.

Although such a huge amount was allocated, in the following 12 months hardly any of the listed work was carried out.

5. Discussion and conclusions

India is considered by many to have, on paper at least, some of the best and most comprehensive water-related legislation to be found anywhere in the world. So there is no dearth of laws, the problems lie only with their proper execution and implementation. One major reason for this is that the legislation has not proved to be either politically or socially acceptable. Neither the implementing authorities nor civil society have been interested in making the laws work. Though the Chennai Metro Water Board was supposed to be the nodal agency for supply water and wastewater management in Chennai city the whole system runs in a haphazard way. There is no doubt that if the Board works had done its job of promoting and securing the planned development of water supply and sewerage service, Chennai could have been relieved of its acute water scarcity and Chennai waterways would not be highly polluted. One of the main

functions of the Metro Water Board is to prepare the immediate and long-term strategies for meeting the future demand of water supply and sewerage services in the Chennai Metropolitan Area. The demonstrable fact that none of the measures taken by the Board have proved to be sustainable proves that the Board has not been effective. Or put another way, the current approach to water governance, which comprises the legislation, the institutional structures and all the measures needed to enact the legislation is not producing the desired results.

The Chennai Metropolitan Area Groundwater (Regulation) Act 1987 and its successor the Tamil Nadu Ground Water (Development and Management) Act, 2003 have many positive aspects such as regulation of withdrawal of water in the notified areas. But, as many as half of the wells and bore wells in notified areas that should have permits are dug without any permits. Similarly, permits should be required for extracting and transporting water away from notified areas. But transport of water from far away places using tanker lorries has become common place and many of the private lorry owners have no licence. Either they have not applied for one or they have not received a licence from the Board. Instead of taking stringent action against these lorry owners, the Board has found itself in the invidious position of being both responsible for service provision and, at least until the establishment of the Groundwater Authority, responsible to conservation and regulation of water use. The result being that, although the Board has not taken action against unlicensed tanker operators because it has recognised that they have been crucial to maintaining water supplies. Similarly with unlicensed abstraction of groundwater from urban, peri-urban and more distant rural areas that are already suffering from overexploitation of groundwater. Strict enforcement of legislation is needed but this is not happening because of the critical need to meet Chennai's water demand.

Clearly, current approaches to water governance are not producing desired results. As discussed above, actions taken to meet Chennai's demands for water give the appearance of being based more on crisis management than long-term strategic planning. Legislation exists but for various political, institutional and social reasons this is not being enforced. So what can be done? What is absolutely clear is that there is no quick fix to Chennai's water problems. Improved water governance is absolutely essential as is a change in attitudes at all levels. Sustainable and effective planning and management of water resources and water services will only be achieved through better use of information, establishment of stakeholder platforms and carefully-structured awareness programmes that lead to consensus of the fundamental causes of water challenges and viable opportunities for meeting these challenges. To date, the regulatory instruments articulated in water legislation have been heavily biased towards direct regulation of water use by zoning and issuing of permits and licences. A much wider range of regulatory instruments are at the disposal of the Government of Tamil Nadu. These fall into three main groups: direct controls, economic instruments and encouraged self regulation. Whilst being mindful of the risks and potential unintended consequences of using regulatory instruments, it is recommended that consideration be given to modifying legislation so that a wider mix of regulatory instruments is used. Finally and most important, it is crucial the process of planning and managing Chennai's water services becomes less of a political football. Cross party support must be developed for long-term strategies so that these are carried through regardless of which party is in power.

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