

# **A snake in the grass! Unequal power, unequal contracts and unexplained conflicts:Facilitating negotiations over water conflicts in peri-urban catchments**

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## **Executive Summary**

Chennai city and the surrounding peri-urban areas face severe and growing problems related to the delivery of water services. This is due to a mixture of poor strategic management, outdated infrastructure and rapidly growing population (and hence demand). Although legislation is in place for controlling and regulating overexploitation and pollution of water resources, this does not have widespread public or political support and, as a result, it is not being enforced. Responsibilities for managing water resources are spread across many government department and agencies who, in general, do not cooperate with each other or share information.

As a consequence there is very poor alignment of the many policies and strategic plans that influence availability of water and, as important, the demand for water. An emphasis of supply-side measures has led to huge levels of investment in major infrastructural projects aimed at solving Chennai's water supply and pollution problems. However, the general opinion is that much (probably most) of this money has been wasted as none of these projects have delivered the expected results. The net result is that people and, particular the poor, in the Chennai metropolitan area are suffering major hardships.

Arguably as Chennai's "water footprint" grows in size, even greater hardships are being experienced by people and communities in the in the peri-urban areas. Simplistically speaking, access and entitlements to water in peri-urban areas are being reduced so that water can be transferred to urban areas. Given the weak institutions in the peri-urban areas, people are almost powerless to stop a process that is quite simply destroying their livelihoods. So what can be done? Clearly, the current biased approach to funding large infrastructural projects is not working. Whilst infrastructural improvements are needed, especially for treating wastewater, the regional situation is that unallocated water resources are severely limited except in high rainfall years. Hence, inter-basin transfer projects are just exporting Chennai's water shortages to other areas.

The contention of this paper is that the need of the hour is a more integrated approach to water services planning and delivery that recognises the fundamental problems and needs of peri-urban areas. Multi-stakeholder dialogue, improved information management and sharing, better alignment of policies and new approaches to enforcing legislation are all needed and, arguably, this is best achieved within a framework of integrated water resource management.

# 1 Introduction

Rapid industrial growth and fast urban expansion pose serious problems in many cities and peri-urban areas all across the world. Without doubt, these problems are most pronounced in developing countries and when industrial development and urban expansion is unplanned and unregulated. When little account is taken of interactions between urban and peri-urban areas, it often the case that the main casualties of haphazard developmental activities are to found in the peri-urban areas<sup>1</sup>. As urban areas spread, they engulf and/or exploit the natural resources of an increasingly large peri-urban area. Furthermore, many other factors contribute to marginalisation of people and communities in the peri-urban areas. These include: unstable employment patterns, insecure agriculture, increasing rural – urban migration, increasing numbers of people with no fixed abode and the emergence of cultural practices that undermine or conflict traditional practices. Thus the status of peri-urban areas is eventually reduced to the one of a *'neither here nor there'* situation, in which they lose their traditional characteristics of being predominantly agrarian economies and at the same time do not have the benefits of being an integral part of an urban economy. In other words, people in the peri-urban areas lose their traditional identity and livelihood options and get none of *assured benefits* an average city dweller might expect (e.g. urban employment, urban infrastructure).

Spreading of cities and subsuming of peri-urban areas into mega cities can be likened to a snake catching a frog! A snake catches a frog; the latter screams initially but the sound gets reduced gradually and finally we will not hear anything at all. And, this snake is a hidden friend!! This particular process does not have a specific time frame – it is a process which is determined by many socio-economic, political and environmental factors. In this process, some people in the peri-urban areas benefit but a majority suffer in one way or another. Therefore, the key issue is not that the growth of large cities is bad per se but that unplanned and unregulated spread of cities and the increasing demands put on peri-urban areas for water and other resources can bring about unacceptable societal and environment consequences.

The process of urban expansion is almost inevitable and unstoppable. If the process is not planned and regulated conflicts are inevitable. These can emerge for a range of reasons that include:

- Water, hitherto claimed only by the agricultural sector is used more and more for non-agricultural urban uses and/or it is conveyed by various means from peri-urban

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<sup>1</sup> The expression peri-urban is used quite frequently in recent literature; however, there is little conceptual clarity in the usage and definitions are more restrictive and location specific. The Organization for Economic Co-operation and Development (OECD) in its report on peri-urban agriculture (OECD, 1979: 10) states: *The term "peri-urban area", cannot be easily defined or delimited through unambiguous criteria. It is a name given to the grey area which is neither entirely urban nor purely rural in the traditional sense; it is at most the partly urbanized rural area. Whatever definition may be given to it, it cannot eliminate some degree of arbitrariness.*" Multiple meanings of the term peri-urban include: fringe; edge city; urban spread; less important part; incidental to main activities; outer edge; fringe to the main; spillover, peripheral to or adjoining main area etc.

to urban areas. As a result, competition for water and risks of over-exploitation increase in the peri-urban areas;

- Pollution and degradation of natural resources such as land and water takes place as a result of increasing urbanization and industrialization in peri-urban areas;
- Agricultural employment declines causing serious livelihood problems for the people living in peri-urban areas. Women, who have lost agricultural employment, are often the worst hit.
- Village commons, both land and water bodies, are either encroached or fall into disuse.
- In the transition stage, peri-urban areas often suffer from an institutional “vacuum” which leads to inadequate provision of services (e.g. schools, clinics etc) and infrastructure (e.g. sewage systems, water supply networks, roads etc)
- Dramatic changes in land use patterns and land prices as, for example, industries are relocated or start up in peri-urban areas.

Although the majority of people living in peri-urban areas suffer from the consequences of urban expansion, there are certain social groups, who often gain distinct benefits. For instance, due to a hike in land values (in those plots which are favourably located) a few land owners get a huge jump in their asset value; but a majority may lose even the existing value of their lands due to lack of water. Similarly, some farmers can make large profits by abandoning agriculture and by selling water for urban use but this can affect groundwater availability in the nearby agricultural wells. Depletion of groundwater or fast declining groundwater tables can affect the livelihoods of a majority of people in village population. Very often riverbed aquifers are exhausted by installing bores along riverbed which reduces water availability (both surface and ground water) for agricultural uses in the adjoining villages and the village commons are encroached which reduces access to poor people in the villages. Therefore in each one of these developments the majority loses and a few gain significantly. Most importantly, urban users exploit the natural resources to their best advantage and transfer the pollution to the peri-urban areas from where the natural resources were exploited. Or put another way, urban demand for fresh water is met from rural areas but urban wastes (by way of sewerage, industrial effluent, urban solid wastes, hospital wastes, industrial sludge etc) are dumped back into the peri-urban areas.

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 NEGOWAT Project**

### **2.1 NEGOWAT's core argument**

Urban areas almost always rely on peri-urban areas as a source of water and other natural resources. Demands do not necessarily lead to conflict when cities are small, when they have a low demand for resources or if the peri-urban areas are well endowed

with unutilised resources. However, if these conditions do not apply or if there is an absence of effective planning and regulation, conflicts are common place

## **2.2 NEGOWAT's main objectives**

Objectives of NEGOWAT:

- The project aims to document and analyze the impacts of unregulated and unchecked horizontal urban expansion on: 1) Natural resources and, in particular, on water resources and 2) Poverty and livelihoods, ecology, environment and the health conditions of people living in peri-urban areas.
- This project will also develop and test tools and institutional structures that support and enable effective stakeholder-led water resources management that involves negotiations on emerging conflicts and water rights. It aims to draw upon developments in Integrated Water Resources Management (IWRM), and decision support methodologies that can be readily understood and adapted to support multi-stakeholder dialogue.

## **2.3 Proposed methodology and tools of analysis**

The methodology of the study includes the following components:

- First and foremost is to accomplish a comprehensive literature survey on: 1) Issues relating to peri-urban areas; 2) Competition between rural, peri-urban and urban areas in the use of natural resources; and, 3) Stakeholder participation and stakeholder platforms as a policy option for achieving sustainable use of natural resources.
- A meso-level survey in various parts of the peri-urban area of Chennai (covering as many villages as possible) and a detailed a survey in a small sub-set from among these villages with a view to collecting information on various aspects of: poverty and livelihoods; current and past water use patterns; the nature, extent and history of rural-urban water markets; impacts of water sales on agriculture, employment and income-generating opportunities; ecology and environment and so on.
- A water resource assessment of the Chennai municipal and metropolitan areas and the two adjacent districts of Kancheepuram and Tiruvallur. The aim being to develop a common water-related information base that can be used by relevant stakeholder platforms.
- Development of agent-based Bayesian models or Bayesian networks<sup>2</sup>. The aim being to produce practical decision-support tools that can be used when assessing the potential benefits of different water management strategies.
- Development of stakeholder platforms and user groups for a sustained dialogue that is part of stakeholder-led IWRM<sup>3</sup>.

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<sup>2</sup> A Bayesian network is basically a graphical tool that can be used to build a decision support system, i.e., to help decisions under certain conditions. It helps to conceptualizing a basin or an environmental system to be managed. "In an uncertain world, Bayesian networks allow users to estimate the chance that a management intervention will have a particular effect and then investigate the consequence of their uncertainty" (P.7 for details, Cain, Jeremy, 2001)

<sup>3</sup> Although the IWRM tool has been widely accepted as an effective way to manage water resources, there is however less agreement about its implementability in particular a developing country because of lack of enabling environment. It is possible however to make use of the merit of the IWRM tool with the appropriate participation of all stakeholders in a river basin. But in this case, the application of the IWRM will be through bottom-up approach rather than through the conventional top - down method. Nonetheless, it would be a big challenge to bring together

### 3 NEGOWAT study area

#### 3.1 Introduction to the Palar Basin

The Palar River Basin covers an area of about 18,300 sq.km, of which, approximately 11,000 sq.km lies within Tamil Nadu. Average annual rainfall ranges from 800 mm to 1200 mm with a West-East gradient of increasing rainfall (Anon, 2002). Most of the rainfall is linked to the southwest and northeast monsoons. The climate is tropical and highly humid particularly near to the coast. Evaporation rates from open water are as high as 2000 mm per year which is much higher than the average annual rainfall. Flash floods are common only during the northeast monsoon months. A water balance study undertaken by the Institute of Water studies, Government of Tamil Nadu, indicated that even in 1992 the Palar Basin was a water deficit area (Anon, 1992). Major irrigated crops in the basin are paddy, sugarcane, groundnut and to some extent banana. Major unirrigated crops are coarse cereals and groundnut. .

Tanks have historically been the most important sources of irrigation water in the basin (Janakarajan, 1993). There are no major storage reservoirs but one finds a series of seven anicuts (diversion weirs), which fill a large number of irrigation tanks. The total number of tanks filled by these anicuts is little less than 700 and the total area irrigated by these tanks is about 61,000 hectares. These are called system tanks. Besides system tanks, a large number of non-system tanks also exist in the basin.

In addition to tanks, there were numerous springs, which were used historically as a source of supply for irrigated areas. According to the Institute of Water studies, there are about 606 spring channels in the basin area (Anon, 2000). However, as tanks and springs are becoming more and more undependable, wells have emerged as the major source of irrigation water. Indeed, the introduction of high yielding varieties in this region in the mid-1960s prompted farmers to invest in groundwater irrigation quite extensively. This trend peaked in the 1970s (Farmer,1977; Janakarajan, 1986). The situation in 1998 was that the net irrigated area by wells in the basin was around 75% of the irrigated area (Rajagopal and Vaidyanathan, 1998). A study carried out by the Institute of Water Studies indicated that in the late 1980s there were around 132,000 irrigation wells in the basin area and the density of wells varied from 0.74 to 2.82 per hectare. By 2003, groundwater utilization was believed to be as high as 92% of sustainable yield.

As well as meeting demand for irrigation, groundwater has also been a major source of water for domestic, industrial and other non-agricultural uses. Quality, however, varies a great deal across the basin. To date, the issue of water quality has not been addressed fully during the assessment of groundwater potential across the river basin. As will be discussed later in this paper, the tanning industry is a major source of groundwater contamination.

#### 3.2 Urbanization in the Palar Basin

Although the agricultural sector is still the single largest user of groundwater, there have been growing demands for this resource from other sectors or users. Urbanization process, increasing demographic pressure and expansion of industrial activity have all

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various stakeholders, who have diverse and competing interests into a common negotiating platform. One of the motivations of the present project is to create space for such stakeholder-led IWRM in the context of peri-urban areas of Chennai, in particular Palar basin

contributed to a situation of high-levels of competition for groundwater<sup>4</sup>. Competition is particularly acute because almost all the available surface water sources have been utilized. As competing claims on the limited groundwater stock has increased over time, conflicts or conflicting interests have also emerged among various user groups. The word 'conflict' in our present context need not be understood as the one, which refers to physical violence. It should be rather seen as a potential force for competition and change. This competition could lead to stagnation or advancement of an economy depending upon degree of cooperation among stakeholders.

In the particular context of groundwater resources, conflicts take place due to one critical factor, namely, scarcity. The scarcity in turn is caused due to imbalance between supply of good quality water and demand. One can attribute two reasons for this: 1), Excessive unregulated pumping resulting in lowering of water tables and 2) Groundwater pollution caused as a result of discharge of industrial effluent, the use of chemical inputs in agriculture and discharge of untreated domestic and municipal sewage.

The primary non-agricultural users are urban industrial owners and municipalities. Whatever quantity of water, that is consumed for domestic needs and industrial processing is discharged as sewage and effluent in water courses, lakes and tanks. Contributing thereby, significantly to pollution of surface and groundwater bodies. Therefore, the transportation of potable groundwater from peri-urban to urban areas not only aggravates the problem of falling groundwater levels, it also contributes to generation of effluents that contaminate water courses and aquifers. The net result is increased water scarcity, increased health hazards, decline in soil quality, reduction in agricultural yields, rise in the cost of living and, as a general consequence, an increased likelihood of conditions of persistent poverty<sup>5</sup>.

### **3.3 Impacts of the tanning industry on water quality in the Palar Basin**

India's export earnings from the leather industry shot up from a mere Rs 0.32 billion in 1965 to Rs 100 billion in 2001. This industry provides direct employment to over 2 million people in the country. 51% of leather exports originate from the southern states and 70% of the tanning industries are concentrated in this region. Tamil Nadu is responsible for 90% of the total exports from southern states. The value of which is Rs.50 billion. And finally, 75% of the tanning industries in Tamil Nadu state are concentrated in the Palar basin.

While these facts about the leather industry may appear quite heartening, the current environmental impacts of the industry are totally discouraging, demoralizing and frightening. Let me give some details on the impact of tannery pollution on the local economy, agriculture and people<sup>6</sup>.

- On an average, 35 to 45 liters of wastewater are discharged per kilogram of raw skin /hide that is processed. Total quantity of water used by the tanneries in the basin

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<sup>4</sup> The transformation processes in Latin American countries have contributed to a similar competing demand for water resulting in growing contamination and vulnerability of human settlements in marginalized areas. See Moreyra, Alejandra, 2001

<sup>5</sup> Similar cases have been observed in the Latin American Countries (Moreyra, Alejandra, 2001).

<sup>6</sup> Most of the information provided in this section has been collected through a survey carried out during the years 1997-99 in 51 villages of the Palar basin. This was a part of the research funded by International Development Research Center, Canada

works out to a minimum of 45 to 50 million liters per day. The quantity of effluent discharged from the tanneries (numbering 847), works out to 37,458 kld or 13.5 Mcum per year. Note that in theory, these tanneries are supposed to be connected to one of the 8 Common Effluent Treatment Plants (CETPs) installed in the Palar basin.

- For each 100 kgs of raw hides and skins processed, solid waste generation works out to be 38.5 to 62 kgs.
- According to a study carried out by Stanley Associates sponsored by the Asian Development Bank and executed by the Tamil Nadu Pollution Control Board, pollution loads in the Palar river are extremely threatening: (all parameters are in kilograms per day) TSS: 29,938, TDS:400,302; Chloride: 101,434, Sulphide: 3818; BOD: 23,496; COD: 70,990; Total Chromium: 474; Cyanide: 22.
- The drinking water is sold at Rs.2 per pot in Ambur (one of the worst affected towns in the basin). In 1997, eight deaths were attributed to consumption of polluted water in this town (The Indian Express, 8-4-1997).
- A detailed survey of 8 villages conducted as a part of the IDRC research programme indicated that the value of land had come down drastically due to degradation of groundwater and soil salinity.
- There has been a steep reduction in the area under paddy in the affected villages. Since 1980, area under paddy has come down by more than 50% as a result of poor germination, stunted vegetative growth, poor grain formation, reduced grain weight and low quality output.
- Net area irrigated by wells in the affected villages is extremely low compared to those of unaffected villages.
- More than 60% of the wells in the affected villages are defunct due to water contamination as a result the investments that have gone into those contaminated wells are also lost permanently
- Of the 51 sample villages (located along the river) that were selected for the survey, 42 were very badly affected, 3 were moderately affected, 3 were marginally affected and 2 were unaffected
- Forced migration of people from many villages in the area villages.

### **3.4 Summary of issues and concerns in the Palar Basin**

To sum up the information presented above, the extreme stress in the upper Palar catchment is characterized by issues that include:

- Decline in the utility and reliability of traditional irrigation sources such as tanks and springs.
- Competing demand for groundwater among agricultural, industrial and domestic sectors.
- Groundwater tables that are falling progressively.
- Declining agricultural activity and employment.
- Flourishing rural-urban water trade.
- Contamination and drying up of the river bed aquifer which was the most important source of drinking and irrigation for 100s of villages and towns in this basin.
- Emergence of market for drinking water in the urban, semi-urban and rural areas.
- Declining groundwater quality and increasing number of abandoned wells and a consequent increase in indebtedness among farmers.
- Declining life expectancy of tannery workers as well as people in the basin area

- Fear of impotency due to the consumption of contaminated water

### 3.5 Societal reactions to water problems in the Palar Basin

This situation in the Palar basin is extremely serious and, arguably, at crisis point. Such a volatile situation could have been contained had there been some thoughtful policy measures. But unfortunately, all hitherto policy measures have failed to address the important issues of conflicts in the use of water, competing demand for water, relationship between over-use of groundwater and pollution on the one hand and rural-urban migration, deteriorating health due to water contamination and poverty on the other.

An example of societal reaction to one aspect of the water situation is provided by the following case. The Vellore Citizens Welfare Forum filed Public Interest Litigation against the tanners in 1991 before the Supreme Court of India under Article 32 of the Constitution. The Supreme Court Bench in their judgment clearly upheld the Precautionary Principle and the Polluter pays Principle as the most fundamental and essential features of sustainable development. An excerpt from what is regarded as a far-reaching judgment delivered by the Supreme Court Bench, constituting, Justices Kuldeep Singh, Faizan Uddin and K.Venkataswami:

“It is no doubt correct that the leather industry in India has become a major foreign exchange earner and at present Tamil Nadu is the leading exporter of finished leather accounting for approximately 80% of the country’s export. Though the leather industry is of vital importance to the country as it generates foreign exchange and provides employment avenues, has no right to destroy the ecology, degrade environment and pose as a health-hazard. It cannot be permitted to expand or even to continue with the present production unless it tackles by itself the problem of pollution created by the said industry”.

In response to the Supreme Court’s direction that polluters should pay for the restoration of the ecology and compensation for the victims, about four-fifths of the tanners said that the Government and society should bear most of the burden. Many of them asked why the tanners alone should be penalized for the past environmental degradation’ (Madras School of Economics 1998). They have even gone to the extent of asserting that the notification of the Government of India conferring power to Loss of Ecology Authority is *ultra vires* of the Environment (Protection) Act 1996 and the provision of the Constitution. They also added that the Authority has no jurisdiction to assess or demand compensation in law and that the Authority by claiming compensation is violating principles of natural justice.

Notwithstanding the above, the popular view is that the polluters should pay for damage. But what is the practical mechanism with which one can ensure that the industries internalize environmental costs? This is difficult particularly in a situation where there exists a nexus between bureaucrats and polluters. The Tamil Nadu Pollution Control Board (TNPCB) prescribes the norms; the Supreme Court orders for the closure of the units which do not comply with the norms prescribed by the TNPCB. But this is all that happens as orders are not enforced.



## 4 Rural – urban and peri-urban – urban water markets

### 4.1 Water markets and water transfers

Why is it increasingly important to take a serious view of rural – urban and peri-urban – urban water markets or water transfers? *Firstly*, India is projected to be more than 50% urban by 2020. While the absolute number of people living in rural areas will continue to grow, urban populations will grow far faster. This will create huge demands on water resources. *Secondly*, as a result of the above, there will be increasing pressure to transfer water from agricultural to urban use. In driving this trend, urban dwellers are likely to be more educated, politically active and influential than their rural counterparts. As a result, political power in India is likely to shift even more heavily toward urban areas. While agricultural interests may resist pressure to transfer water, it may be very difficult to sustain such resistance (Moench and Janakarajan, 2003).

Water market and different systems of water transfer are becoming increasingly common in areas adjacent to both large urban areas and large towns. The transfers typically involve sale of water by well owners (generally farmers) either directly to industries or to tanker companies who then deliver supplies to end-users (smaller industries, commercial establishments and households) or to the Metro Water Board. This type of market has, in comparison to rural water markets, been less studied. The impact of transfers on agricultural users is probably the most controversial point of debate in respect to these water markets (Janakarajan 1999).

### 4.2 The lower Palar Basin: The case of peri-urban area problems

The lower Palar Basin is highly relevant to the NEGOWAT project because of its proximity to the Chennai city for reasons that include:

- Large volumes of groundwater are pumped from aquifers in the lower Palar and transferred to the Chennai metropolitan area. Although the exact volumes are difficult to estimate, it is believed that extraction is of the order of 40 mld (i.e. 14.6 Mcum/year).
- As they do not have their own transport, farmers selling water are compelled to enter into contracts with agents. Although these contracts have the potential of bringing short-term gain to individual farmers, they run the risk of depleting resources and thereby causing long-term problems for individual farmers, the agro-ecology of the village and future generations.
- The irony is that an individual seller often enters into a contract with a buyer knowing fully well that his bore-well will become dry sooner or later due to non-stop pumping. The reason for this action being that he prefers to sell water, even at the cost of his agriculture not just because his income from water sales is more than what he might get from agriculture but mainly because, if he does not enter into a contract for selling his water, his neighbour would do so. In which case, the net result would be the same.
- Illegal sand mining from the riverbed is a major issue in this part of the basin. This activity reduces the storage capacity of the riverbed aquifer.
- Overexploitation of coastal aquifers has led to seawater intrusion to a distance of over 10 km.

- Unsustainable rates of groundwater extraction and resultant lowering of water tables has led to drying up of springs and seepage zones. This has had a detrimental impact on agricultural production and the environment.
- The past one decade has been quite dreadful for the people of this region because of overexploitation of water resources. The problem is particularly severe in the lower Palar as a result of the proximity of this part of the basin to the city. This part of the basin can be classified as being peri-urban and, as such, it attracts the attention of neither the local Panchayat nor the city administration. There is in fact an *institutional vacuum* and little or no action is taken against, for example illegal encroachments on wetlands or illegal sand mining.
- Agriculture as an occupation has been on the decline. This has led to an increase in the agricultural unemployment, particularly among women, and a simultaneous rise in rural-urban migration.
- Traditional water bodies such as irrigation tanks, spring channels, ponds etc are either in a state of total neglect or have been encroached for urban use.

#### 4.3 Water transport from other peri-urban areas close to Chennai

Large volumes of groundwater are pumped from agricultural wells and transported into the city everyday from other peri-urban areas that are close to Chennai city (other than the lower Palar basin). Particularly important well fields exist in the Araniar and Kosathaliar river basins. The United Nations Development Programme (UNDP) and the Water Resource Organisation (Government of Tamil Nadu) estimated that the total water potential available in Araniar and Kosathaliar river basins is about 350 and 594 Mcum/year respectively. Currently over 37 Mcum/year of groundwater is drawn from these basins to supplement the drinking water needs of the city population. So in fact the extraction of groundwater is a relatively small proportion of the potential yield. However, there is a big question mark over the sustainability groundwater supplies. It was apparent from NEGOWAT field visits in these areas that many agricultural wells and many wells, which were supplying water to the Chennai city, have become dry. Moreover, due to the proximity to the sea, seawater intrusion has already reduced the quality of groundwater in these areas. In several places, farmers and local people are agitated by round-the-clock pumping of groundwater from agricultural wells to meet the city needs. In fact, women's organization in two villages in the Panjatty – Minjur area have successfully stopped sale of water to the Metro water Board. Project staff were informed that the officials invoke an emotional argument while searching for water sellers: *that if you cannot supply water to your own people at Chennai, how can we ask water for our farmers from Karnataka?*<sup>7</sup>

## 5 Chennai drinking water supplies

### 5.1 A brief discussion on the current and persisting crisis

Although it is quite clear that many households in Chennai face major problems accessing sufficient domestic water, important questions exist on fundamental causes of the problems. These include: Does Chennai face a scarcity for water? To what extent is the persisting water crisis in Chennai is due to lack of integrated - long term planning?

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<sup>7</sup> There is a long-running inter-state dispute between Karnataka and Tamil Nadu on flows of water in the Cauvery River.

Over a period of past two or three decades, the Government of Tamil Nadu has spent over Rs 30 billion augmenting water supply to the city but still problems persist. Leaving aside the fact that poorer communities are facing the greatest hardships, average per capita water supply to the Chennai city's population is the lowest (76 lpcd) when compared to the major cities in India (Joel Ruet, Saravanan and Marie-Helene Zerah, 2002). Chennai's water supply is also extremely unreliable and sporadic. Even during good rainfall years, water is supplied hardly for three hours per day.

The following is a brief analysis of recent water supply initiatives:

**(i) Chennai water supply augmentation project – I – New Veeranam project:**

The Tamil Nadu Government has been executing this project at an estimated cost of Rs.720.00 Crores. The proposal is to draw 190 mld of raw water from the Veeranam tank in Cuddalore District situated about 230 km. south of Chennai. After the treatment, 180 mld should be available to Chennai city. Recent analysis of this scheme suggests that performance has fallen far below expectation.

**(ii) The second Chennai water supply project (started in 1995 and scheduled to be completed by 2002):**

The revised cost of the project is Rs 778 crores with financing coming in part from a World Bank loan to the tune of US\$ 86.50 million. The nature of work executed in this project includes: construction of a pump house at Red hills, installing archemidian screw pumps at Koyambedu sewage treatment works and making improvements to 16 sewage pumping stations.

**(iii) Krishna water project (Telugu Ganga):**

The project envisaged bringing water from the Krishna river in Andhra Pradesh to the extent of to 15 TMC ft of water at the cost of Rs 600 crores. The Government of Tamil Nadu has already executed this project but most of the water transferred to Tamil Nadu is being extracted by users en route.

**(iv) Chennai city river conservation project:**

Government of Tamil Nadu, jointly with Ministry of Environment and Forest (Government of India), undertook a comprehensive study of the causes of pollution of the waterways in Chennai and its impact on the environment. The Chennai city has six waterways viz. Adyar, Cooum, Buckingham canal, Otteri Nullah, Captain Cotton Canal and Mambalam Drain.

Essentially, these waterways perform the role as flood and sewage carriers. Flash floods occur in these waterways during heavy monsoon months. However, for most part of the year, the flow is maintained in these water ways entirely as a result of discharge of treated, partially treated and untreated industrial effluent and domestic sewage. This discharge takes place from about 311 outfalls that are meant for stormwater discharge and the result is an accumulation of large volumes of sludge particularly at the mouths of rivers. Hence, the long term objective of the project is to improve the wastewater or sewage disposal network so as to prevent toxic substances from reaching the waterways. The entire project would be implemented by Chennai Metro Water by the end of 2004 at an estimated cost of Rs 720 crores,

**(v) Amount spent on transporting groundwater from rural and peri-urban areas:**

Besides all major projects mentioned above, the state government has been spending huge amounts of money pumping and transporting groundwater from distant rural and peri-urban areas. Although these projects are planned to solve a short-term crisis, they involve a substantial amount of recurrent and capital costs. It is estimated that on an average, the Metro Water Board is spending about Rs 10 million on purchasing water from farmers and transportation<sup>8</sup>. Furthermore, there now seems to be no end to the crisis<sup>9</sup>.

#### **(vi) Gedilam –Paravanaru aquifers**

The latest initiative is to tap water from Gedilam riverbed aquifer near Cuddalore. The plan is extract water from 45 deep bore wells being sunk near the Gedilam –Paravanaru riverbeds at an estimated expenditure of Rs 49 crores and convey the water through 200 km newly of laid pipe line. This scheme warrants infrastructure that includes high power motor, transformer installations and other electrical appliances. This would hike the original estimated cost quite steeply. The authorities are expecting the total capital cost to cross Rs 100 crores mark. According to the TNEB (as quoted in The Hindu), each borewell is going to be connected with a 85 HP motor which requires a 100 kVa capacity transformer. It was stated that once the system becomes operational water will be pumped nonstop from 45 bore wells with a view to ensuring uninterrupted water supply of 90 mld (i.e. 33 Mcum/year). The proposed depth of each bore well is about 200 meters. The recurrent cost of running these motors – by way of electrical consumption alone will nearly Rs 70 lakhs per month. There is, however, another dimension to this project. The Gedilam aquifer is the lifeline for the people of this region in terms of providing farmers with water for irrigation and villages with water to meet domestic demands. If this aquifer is exhausted, not only agriculture will be very badly hit but also the reliability of drinking water supplies may deteriorate (The Hindu April 7, 2004).

## **6 Applicability of IWRM to the Chennai and Palar water-related challenges**

### **6.1 Integrated Water Resources Management (IWRM)**

It is clear that the Chennai metro area and surrounding peri-urban have been and are continuing to face severe water supply problems. This is despite the huge amounts of the money that has been spent by the Government of Tamil Nadu. The obvious question is therefore: Is there an effective way out of the approach to strategy development which does not appear to be producing a long-term solution to the water problems facing Chennai's urban and peri-urban area? A widely-held view is that solutions to water crisis are only feasible if there is a shift towards an integrated approach to water managements and, probably more importantly, an integrated approach to water governance. Such an improved approach to water governance

<sup>8</sup> The Hindu, dated 13<sup>th</sup> March 2004  
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	<b>Nov 2003</b>	<b>Jan 2004</b>	<b>Mar 2004</b>	<b>May 2004</b>
No of tanker lorries hired	595	726	1100	1300
No. of daily trips	6733	7555	9500	12000
No of tanks installed	10030	10430	11315	13500
No of pumps installed	5500	6500	7000	7500
Daily expenditure (in million Rs)	5.5	7	8.5	10

Source: The Hindu, dated 13 March 2004

would a broad-based partnership and dialogue among all key stakeholders that leads to strategic planning that is based on a common vision, scenario building and good-quality information.

## **6.2 National and state-level policies concerning water use, protection and conservation**

In the particular context of India, there are national water policies that have been drafted at the highest possible government level but they are no more than a statement of intentions as these policies are not supported by legislation or timebound action plans. Therefore, the policies made at the highest level as prescribed by IWRM have very little operational impact due to lack of institutional mechanism to plan, coordinate and implement water development across State boundaries and among users. This is a clear case of a fractured institutional structure.

## **6.3 Appropriate water laws**

Are there not laws to take care of the provisions of IWRM in India? The 42nd Amendment of the Indian Constitution passed in 1974 was a landmark. This enabled a series of water and environmental protection laws to be enacted. The most important of which is *The Water (prevention and control of pollution) Act*. Subsequently many state governments have passed their own Ordinances in order to:

- Arrest seawater intrusion;
- Regulate groundwater use by way of imposing a space constraint between wells;
- Banning groundwater pumping from all surface water courses such as streams, rivers, canals etc.;
- Prevent illegal sand mining from riverbeds;
- Prevent pollution of surface and groundwater bodies;
- Protect all water bodies from encroachments;
- Achieve equity between head and tail enders within an irrigation command;
- Protect the water rights of farmers etc.

But still one encounters problems of huge groundwater overdraft, appalling pollution, competition between various sectors, rural / peri-urban versus urban conflicts, neglected state of traditional water bodies such as tanks and springs, widespread sand mining, seawater intrusion etc. Therefore, there are laws but unfortunately what India lacks is law enforcement and monitoring mechanisms. Dilip Biswas, the Chairman of the Central Pollution Control Board confessed:

‘Enforcement of such legislation is a challenging task because of various reasons including the inherent flaws in the laws and infirmity of enforcement machinery’ (Environmental Legislation Challenges of Enforcement, Eastern Window E-mail, Vision 2001, p.1).

He further adds that though environmental laws and specific empowered authorities have been set up for pollution prevention and payment towards compensation, monitoring mechanism for implementation is undefined. This is indeed the reason for the disquieting levels of pollution in the Palar river basin.

#### **6.4 Creating a conducive institutional framework for IWRM or adapting existing institutions**

Creating a conducive institutional framework for IWRM in and around Chennai is a tough challenge. The Water Resources Organization (WRO), which is supposed to be the parent organization for all water related activities in Tamil Nadu, operates independently from many other government agencies with an interest in water. For instance, there is virtually no coordination between the Metro Water Board, WRO, Pollution Control Board, Groundwater Board, Department of Agricultural Engineering, Department of Agriculture, etc. Each one of these agencies formulate their own policies and action plans. A good example of this lack of coordination was the construction of a dam across a polluted river at the Orathapalayam in Tiruppur. As a result of a lack of integrated planning, this dam, which was meant to collect good quality water, effectively captures all the effluent from Tiruppur town.

The revenue department is considered to be a rival organization by the WRO, as it enjoys more powers compared to any other departments. For instance, unlike the revenue department, WRO cannot take any punitive action against defaulters on an irrigation system. At best it can lodge a police complaint or make a report to the revenue department. Similarly, the WRO can do nothing about the polluters of water bodies which are under its control. The Agricultural Engineering department, which works on issues relating to installing community wells, water logging, sanitation, land reclamation, creating recharge structures, water sheds, on farm development work etc, is detached from WRO and other agencies.

Finally and most important of all, the State agencies such as Groundwater Board, TWAD Board, and Metro Water Department which are directly involved in water use and management, do not share information nor do they collaborate actively with WRO or other agencies. To cut a long story short, the existing institutional structure is such that it neither pays attention to creating a conducive organizational framework for IWRM nor does it develop appropriate human resources for a coordinated activities.

#### **6.5 Appropriate management strategies**

The fractured institutional structure, myopic policies coupled with competitive populism and lack of political will, stand in the way of attempts to promote or adopt any of the management instruments prescribed by IWRM. This is despite the fundamental need for a move towards sustainable use and development that ensures that water resources and ecosystems are given certain ethical, social and economic values and that external costs are internalized into market values ensuring at the same time some level of social justice. This said, demand management and associated regulatory instruments, if used incorrectly, have the potential to have disastrous consequences in a country like India where one third of the population lives below the poverty line.

To sum up, the existing institutional structure in Tamil Nadu does not provide the required enabling environment for adoption of strategies prescribed by IWRM. **Nevertheless, the emerging water crisis leaves no option but to work hard towards improved long-term management that includes many of the elements of IWRM.** But, how to adopt the IWRM, in a situation where everything is misplaced? Clearly, multi-stakeholder dialogue (MSD) hold much promise. Let us discuss this issue in the next section.

## **7 Approaching IWRM through Multi-Stakeholder Dialogue**

### **7.1 The experience of the Palar Basin**

In an atmosphere of intense competition and bitter conflicts, the key questions are: How to best bring together the multi-stakeholders for dialogue and coordinated action? Who could initiate the multi-stakeholder dialogue (MSD)? Government or NGOs or academics or any other?

The real usefulness of MSD lies in the fact that it provides a platform for all stakeholders to express and discuss their views and concerns. As such, it provides an enabling environment for better understanding and analysis of existing situation and past and future trends. MSD also provides a means by which stakeholders are able to appreciate other stakeholders' problems whilst keeping in mind the welfare of the society at large. In theory at least, MSD should help the authorities to have a better understanding of grass-root realities and to make improved management and investment decisions. IWRM clearly cannot be imposed from above (in an atmosphere, in which law enforcement and monitoring mechanisms are very weak). It has to be bottom-up and has to be induced by multi-stakeholders. To date, government institutions have failed or have not been successful in resolving critical water management challenges facing the Chennai metro area and the peri-urban areas. Therefore, it is in the best interest of government to try and facilitate such direct negotiations and become both a welcomed arbiter instead of being considered as the incapable bully who wants to decide everything without taking into consideration the local realities' (p.20, Chert, Ivan, 2000, Letter to my Minister, Global Water Partnership, Stockholm, Sweden).

As discussed earlier in this paper, almost all water-related initiatives have failed in the Palar river basin, including the interventions from the highest judicial authority of the country. It was precisely this state of affairs in which MSD was attempted in the upper Palar basin. The experience of facilitating MSD process in the upper Palar basin are described below.

### **7.2 Multi-stakeholders' meeting – experiences in the upper Palar basin**

The first step was to organize a meeting of multi-stakeholders with participants drawn mostly from the Palar river basin. Preparatory research and the initial stakeholder analysis carried out in the basin were found immensely useful to the organisation of the first stakeholder meeting (for details on stakeholder analysis see, Janakarajan, 2002a). However, involving tannery owners (the main polluters) in the meeting was found to be very difficult. Tanners initially were even refusing to meet with project staff and it took a couple months before their confidence was won over. They only agreed to participate in meetings after repeated visits and after giving the assurance that the closure of the industry was not regarded as a solution. There were 12 participants from the tannery sector and all of them participated in the dialogue for 2 full days.

Even greater difficulties were encountered in involving government officials particularly the Tamil Nadu Pollution Control Board (TNPCB). Many officials called it a 'sensitive matter' and expressed fear in participating in MSD. Altogether there were five officials from the Government, which included one from the TNPCB. All of them stayed for not more than half a day.

Other participants at the first MSD meeting were farmers' representatives, NGOs, local doctors, residents of local towns, micro-biologists, lawyers, media persons, academics and interested general public. Thus, the '*Multistakeholders' Meeting of Water Users of the Palar River Basin*,' was held, during 28th and 29th January 2002 at Chennai, with 120 participants<sup>10</sup>. Before beginning the dialogue on the first day, there were panelists' presentation on various aspects of water use and abuse with particular reference to the basin. These presentations prompted a good deal of heated arguments and lively discussion. The fact that the meeting gave an opportunity for all stakeholders to air their views was much appreciated by the participants to the extent that towards the end of the meeting there was a big sigh of collective relief. During the meeting, it was widely acknowledged that MSD is a process and not a one-off meeting. Therefore, there was a general agreement to constitute a Committee from among those who were present so that the dialogue process could be carried further. The result was the birth of the *Social Committee* with 24 members. This Committee since then has met six times and has transacted a good deal of business. The stakeholders have understood their problems better and they have proposed future courses of action for implementation. The stumbling block however is the lack of much needed support from the government. This is going to be biggest challenge for the Committee and therefore, the success or failure of the Committee will depend upon the degree of involvement of the government<sup>11</sup>.

## **8 Returning to the main issue: Negotiating water conflicts in the context of the peri-urban area of Chennai, including the lower Palar**

In the context of NEGOWAT there are two key questions:

- Since the urbanization is an inevitable process, should we let the peri-urban population / areas to suffer at the expense of urban areas? Or
- Is there a way in which urbanization can be planned and managed for the best use and advantage of people and the environment in urban, recently urbanized and peri-urban areas?

These questions arise in part because the problem of peri-urban issues have not been tackled correctly. For a long time, research was carried out independently on either rural or urban areas. But as discussed in this paper, peri-urban interactions and issues are becoming increasingly important. They need to be examined as a part of a single biophysical system and a part of an integrated socio-economic developmental process. D.L. Jaquinta and A.W. Drescher have expressed similar views: *Rural, peri-urban and urban form a linked system (R-PU-U), which constitutes an uneven multidimensional*

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<sup>10</sup> This was a part of the research '*Local Water Supply and Conservation Responses*' funded by the International Development Research Center (IDRC), Canada.

<sup>11</sup> A similar stakeholder dialogue approach was attempted with a view to resolving the much vexed Cauvery water dispute between Karnataka and Tamil Nadu. Farmers' representatives of both states have been meeting since April 2003 and have been quite successful in resolving the differences between them



*continuum*.<sup>12</sup> A fragmented approach only brings about rural-urban and peri-urban – urban conflict and poor strategic planning. A fragmented approach also, contributes to destruction of eco-systems and livelihood options in the rural and peri-urban areas. In other words, the peri-urban issue has been mistakenly viewed in isolation from the overall processes of 'change'.

The following important areas of interest arise in the context of NEGOWAT:

- Horizontal urban expansion encroaches upon natural resources, in particular land and water, enjoyed hitherto by rural and peri-urban communities. As a consequence, severe competition and conflicts can develop between urban and peri-urban areas. While Municipal corporations, Housing Boards and State Metro water agencies collectively negotiate claims over land and water rights on behalf urban areas, the peri-urban areas are represented individually and often are subject to threats. These kinds of negotiations are often one-sided because of unequal bargaining power enjoyed by these agencies. This is precisely the context in which a collective - multistakeholders' dialogue approach and a participatory planning process would be useful for a better negotiated democratic settlement.
- Though urban interests are deeply committed to make the most of the available land and water resources of rural and peri-urban areas hardly any of these state agencies pay attention to or analyze vulnerabilities and the long-term implications of different development strategies.
- The majority of people living in peri-urban areas suffer some negative consequences from the process of urbanization whereas some people benefit significantly from the 'spillover effects of urban development' (e.g., enhanced land value due to locational advantage or due to water selling). Important related questions that need addressing include: What are the coping strategies that are being developed in response to negative impacts of urbanization? Are these effective and sustainable and/or do they need to be supported in any way?

Other questions that need addressing include: What have been responses from civil society, farmers' organizations, trade unions, NGOs and media to emerging peri-urban issues? Are political parties fully cognizant of peri-urban issues and, if yes, how are they reacting?

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<sup>12</sup> D.L. Iaquina and A.W. Drescher, 'Defining the peri-urban: rural-urban linkages and institutional connections' (by) (<http://www.fao.org>)

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