Service Provision Governance in the Peri-urban Interface of Metropolitan Areas Research Project

WSS PRACTICES AND LIVING CONDITIONS IN THE PERI-URBAN INTERFACE OF METROPOLITAN CHENNAI: THE CASES OF VALASARAVAKKAM GROUP AND KOTTIVAKKAM GROUP

DRAFT FOR DISCUSSION

Citizens Alliance for Sustainable Living (SUSTAIN)

Chennai, India

For more information, please contact:

Peri-urban Research Project Team
Development Planning Unit
University College London
9 Endsleigh Gardens
London WC1H 0ED
United Kingdom
Tel. +44 (0)20 76791111
Fax: +44 (0)20 76791112
E-mail project: j.davila@ucl.ac.uk
Email paper authors: unchssp@md2.vsnl.net.in
PUI website: http://www.ucl.ac.uk/dpu/pui

About the project

This report is one of several outputs from the project *Service provision governance in the peri-urban interface of metropolitan areas*. This is a three-year project run by the Development Planning Unit, University College London in collaboration with a number of institutions from developing countries and with support from the UK Government's Department for International Development (DFID).

The purpose of the project is to improve guidance on governance and management of water and sanitation in the peri-urban interface (PUI) of metropolitan areas, in order to increase access by the poor and promote environmental sustainability. Presently there is a gap in the operating knowledge of implementing agencies on the specific problems that arise in the PUI. A premise of the project is that greater knowledge of the social, environmental and governance issues arising from changes in the management of water supply and sanitation in the PUI, and more specifically of the impact on these of different and changing regulatory frameworks, would be beneficial not only for the poor but also for these agencies and other local agents.

The project examines the cases of five metropolitan areas, each with different and changing service management regimes influencing the governance of basic service provision: Chennai (India), Dar es Salaam (Tanzania), Cairo-Giza (Egypt), Caracas (Venezuela) and Mexico City.

A. Allen, J. Dávila and P. Hofmann
Development Planning Unit
University College London

TABLE OF CONTENT

ANNEXES

WSS PRACTICES AND LIVING CONDITIONS IN THE PERI-URBAN INTERFACE OF METROPOLITAN CHENNAI: THE CASES OF VALASARAVAKKAM GROUP AND KOTTIVAKKAM GROUP

1. PURPOSE OF THE STUDY AND APPROACH

1.1 Purpose of the Project

The purpose of the project is to produce guidelines on governance and management of water and sanitation in metropolitan peri-urban areas to increase access to the poor and promote environmental sustainability in these areas.

The guidelines will be formulated based on a study of peri-urban areas in selected metropolitan cities in Latin America (Caracas, Venezuela; Mexico City), Africa (Cairo, Egypt and Dar es Salaam, Tanzania) and Asia (Chennai, India). In Asia the study is being carried out in two selected peri-urban areas within the Chennai Metropolitan Area.

1.2 Objective of the Present Report

The purpose of this report is to present characteristics and impacts of WSS management regimes on the living conditions of the poor and on the environment in the two localities of Valasaravakkam Group and Kottivakkam Group in order to assess conditions prevalent in peri-urban areas.

This report follows the diagnosis and peri-urban profile of governance and management of water and sanitation services in the metropolitan area including the institutional mapping within the sector that was completed earlier in the project[1]. The Valasaravakkam Group consists of 5 local government entities and the Kottivakkam Group consists of 4 local government entities. The former is to the west of the City and is inland and the latter on the south along the coast facing the Bay of Bengal. The two study areas have been selected because they exhibit different aspects in physical, socio-economic and environmental terms.

1.3 Approach to the Study

The study is based on frequent site visits, field surveys, focus group meetings and interviews with key informants and representatives of several institutions and media reports.

1.3.1 Research Team

The research team consists, besides the main researcher and research assistant, of an urban planner and a community worker with experience in Metro studies.

[1] See the report entitled “An Overview of the Water Supply and Sanitation System at Metropolitan and Peri-urban Level: The case of Chennai”.

1.3.2 Field Surveys

The Field Survey was conducted by an NGO which had formed many Self-help Groups within the peri-urban areas of Chennai. This NGO, PIONEER TRAD, had significant activities in both Valasaravakkam and Kotivakkam Group of Towns.

The interview schedule for assembling data on water supply and sanitation systems was drafted by professionals and the schedule was pre-tested by organising focus group meetings in both case study areas. The focus group consisted of representatives from several self-help groups (SHGs) functioning in these areas. Based on the test results the interview schedule was finalised. This interview schedule may be seen in Annex-1. The actual survey was conducted by the animators of PIONEER TRAD and students of Alpha Arts and Science College who were trained by the research team to carry out their job.

Note on Self-help Groups

The self-help groups are formed with the help of NGOs assisted by the Women's Development Council and Social Welfare Board of the State based on recent developments for the empowerment of the poor, especially women. Each group consists of 12-15 women members who contribute a sum on a weekly or monthly basis which forms a Corpus Fund managed by the self-help group itself. This is then used by the members to take loans or advances for family needs like children's education, religious function, marriages, sickness or any other important event. These groups have made an important mark in the ongoing empowerment of poor women. Various programmes are being identified by the members of these groups with help from NGOs and government agencies for improving the members earning capacity. Projects like making soap, candles, cleaning agents and other consumer products are taken up based on training provided by NGOs under government sponsorship.

1.3.3 Identification of Survey Sample

The local bodies of the case study areas are Town Panchayats or Village Panchayats. These local bodies are being assisted by central and state governments to improve the economic level of the poor. For this purpose these local bodies identify the poor households in various localities under their jurisdiction. This information served as the basis for the research team to identify the geographic location of the poor living in the PUIs. A 5% sample was adopted to collect data and information of WSS from the poor households and a smaller sample from the non-poor households. A higher sample was selected for the poor households since the study was mainly to assess the situation of poor households in these areas.

1.3.4 Focus Group Meetings

Focus group meetings were held on two occasions in each of the case study areas. Four meetings were held altogether – two in each area. One focus group consisted of women from poor households to find out about the WSS system, its functioning and problems in delivery of services. The second focus group consisted of elected members of local government entities to explore the system and delivery mode of water and sanitation services.

1.3.5 Interviews

Interviews were conducted with few key informants in the area as well as from institutions particularly health delivery institutions to assess the WSS system and its impact on the health of the poor. Frequent inspection of the area was also carried out to identify the environmentally degraded areas in order to understand the impacts of an inadequate WSS system on the environment in the two case study areas.

Another important source of information was the print media including local neighbourhood newspapers, which regularly feature people's problems on civic services and environmental problems in the metropolitan area.

2. STUDY AREAS AND THEIR CHARACTERISTICS

The two peri-urban areas have certain common as well as distinct PUI characteristics. Both have mixed land uses, with a mixture of urban and non-urban uses and are yet to become fully urbanized. Both are adjoining the Chennai Municipal Corporation limits and have developed as overspill of city development. The difference is that while the former has several large industrial/business establishments and metropolitan level health and higher education institutions, the latter has a large number of small and medium manufacturing and business enterprises, speciality restaurants and recreation places. The former is made up of middle to low income people while the latter includes also upper income residents. In the matter of local governance these localities are comprised by either town panchayats or village panchayats.

The local Government entities in Tamil Nadu are presently organised at four levels. At the top are the Municipal Corporations for metropolitan and large cities, municipalities for medium and small towns, town panchayats for semi urban areas and village panchayats for rural areas. The census of India has classified some of the rural panchayats, which exhibit urban characteristics, as Census Towns.

The state government has recently taken a decision to reclassify several town panchayats as village panchayats to conform to the three-tier system of local government. The town panchayats in the case study areas are slated to be reclassified as village panchayats. Thus they are in a peculiar situation of being urban in character but governed by a rural level local government.

The effects of such downgrading of town panchayats in terms of governance tiers would benefit them generally, particularly those which are away from the large urban centres, as it allows them to access finances from central government for rural improvement projects related to employment generation, rural poverty alleviation and provision of basic rural infrastructure facilities including roads, water supply, low cost sanitation, etc. Thus their dependence on local financial resources is reduced and ensures improving the economic situation of the poor.

On the other hand this step will adversely affect those town panchayats and village panchayats which are in the peri-urban interface of metropolitan areas. Since by this step the self-generated taxation resources are likely to go down and the small administrative machinery that is available to the elected body is likely to be withdrawn thus weakening its governance capability. Whatever chances they had of accessing loans to improve infrastructure based on their tax and non-tax revenues will also be lowered. Thus it will be nearly impossible for these weakened local government entities to provide metropolitan or even basic urban level infrastructure especially in terms of WSS, roads and street lighting.

2.1 Valasaravakkam Group

2.1.1 General Characteristics

The Valasaravakkam Group study area has a population of 112,479 inhabitants (2001) and extends over 16.75 sq.km with a density of 6,715 persons/sq.km. It is comprised of five panchayats two of which namely Valasaravakkam and Porur are presently town panchayats and amapuram, Karambakkam and Manappakkam are village panchayats. The latter are designated as Census Towns.

Census Towns

The Census of India designates non-statutory towns exhibiting the following three characteristics as Census Towns.

- Population of 5,000 and above
- Density of 400 persons/sq.km. and above
- At least 75% of the main male workers are in non-agricultural occupations

2.1.2 Land Use Structure

The present population and activities in the area have basically arisen from an overspill of the city. In fact the developments in this town group form an uninterrupted continuation of Vadapalani and Virugambakkam, localities that are part of the City Municipal Corporation.

Since the area is made up of several small panchayats there is no clear urban structure for the area as a whole. In each panchayat there is a mix of residential developments, industries and institutions.

Many new industries and institutions could not secure necessary land extensions within the built up of the city. Even when they found small pockets of land, the cost was high. These institutions therefore preferred to go to the outskirts of the town where the lands were still mainly agricultural both in use and in value. Additionally, these institutions found that the local panchayats had a lower rate of taxation than the higher tier corporation local body. Thus many of these industries and institutions preferred to take advantage of the lower land values and lower taxation levels to locate and be close to the city at the same time.

It is thus that the PU area has two major hospitals, one in Ramapuram and another in Karambakkam. A few industries, offices and educational institutions are also located in Ramapuram. Most of these activities have come up on major roads leading from the city to the hinterland. Commercial activities have sprung up on these two roads namely, Arcot Road and Mount Poonamallee High Road. The junction of these two roads has become a commercial node. The transport and city level institutions in the area attract movement of workers, students and visitors from the city on a daily basis. The more important ones are indicated in the table below.

Major Hospitals	Offices and Industries	Educational Institutions
MIOT Hospital (Multispeciality) – *Private Institution*	Larsen & Toubro Offices (Engineering contractors & Business unit) – *Private Institution*	SRM Eswari Engineering & Dental Colleges – *Private Institution*
Sri Ramachandra Medical college & Research Institute (Multispeciality and Education & Research) - *Private Institution*	AUDCO (Manufacture of Automobile Accessories) – *Private Industrial Establishment*	
	WS Industries (Manufacture of Electrical Accessories) - *Private Industrial Establishment*	
	S&S Power Switch Gear Manufacture – *Private Industrial Establishment*	

2.1.3 Demographic Features

The composition of the population sex-wise, population density and growth rate for the constituent units within the group of towns are presented in Table 1 and 2.

Table 1 – Valasaravakkam Group – Population and Sex Breakup-up

Town Panchayat/ Village Panchayat	1991					2001				
	Persons	Male	%	Female	%	Persons	Male	%	Female	%
Valasaravakkam	21,953	11,302	51.48	10,651	48.52	30,265	15,642	51.68	14,623	48.32
Porur	19,507	9,974	51.13	9,533	48.87	28,782	14,845	51.58	13,937	48.42
Ramapuram	10,710	5,564	51.95	5,146	48.05	30,251	14,232	47.05	16,019	52.95
Karambakkam	10,467	5,519	52.73	4,948	47.27	14,591	7,569	51.87	7,022	48.13
Manapakkam	4,190	2,222	53.03	1,968	46.97	8,590	4,446	51.76	4,124	48.01
Total	**66,827**	**34,581**	**51.75**	**32,246**	**48.25**	**112,479**	**56,734**	**50.44**	**55,725**	**49.54**

Source: Census of India 2001

The sex break-up is fairly uniform in all panchayats except for Ramapuram. In the area as a whole the total female population, constituting 49.54% in 2001, has marginally increased since 1991 (48.25%).

The rate of growth of population varies from one panchayat to the other. The growth rate is higher in Ramapuram and Manapakkam panchayats mainly because of the availability of land to expand urban activities. However the rate of growth in all the panchayats is higher than for the City Municipal Corporation as a whole (9.76%).

Table 2 – Density and Growth rate - 2001

Town Panchayat/ Village Panchayat	Density in Persons /Sq.Km	Growth rate in % (1991 – 2001)
Valasaravakkam	7,390	37.86
Porur	5,240	47.55
Ramapuram	3,965	182.45
Karambakkam	3,210	39.40
Manapakkam	1,020	105.01
Total	**3,990**	**68.31**

Source: Compiled from Census of India, 2001

The growth rate of 68% clearly indicates that the population increase has been due to migration as the decadal natural birth rate for 1991-2001 for the State as a whole was only of the order of 17%. The area has attracted migrants (or overflow) from Chennai City and from rural areas.

2.1.4 Economic Structure

The occupational structure in 2001 is presented in Table 3. This table shows only the main and marginal workers in agricultural occupations and non-workers. The work participation rate is 32.32%. According to the 2001 Census only Karambakkam has a significant number of workers in agriculture located on the western edge of the PUI. In the rest of the PUI the number of cultivators and agricultural labourers is very small varying from 17 to 61. This clearly shows that most of the land in the area has been converted into urban uses or is in the process of conversion for such uses replacing agriculture.

Table 3 – Occupational Structure – 2001

Work Participation Rate	**%**
Total Participation rate	32.32
Male Participation rate	50.66
Female Participation rate	13.66
Workers – Categories	**100.00**
Cultivators	0.58
Agricultural labourers	0.81
Workers in Household Industry	2.54
Other workers (Secondary & Tertiary Sectors)	96.07

Source: Census of India 2001

Since the detailed occupational break up for 2001 is not yet available, occupational break up as per 1991 census is presented in Table 4 to indicate occupations in secondary and tertiary activities.

Table 4 – Occupational Structure – 1991

Work Participation Rate	**%**
Total Participation rate	31.33
Male Participation rate	52.33
Female Participation rate	8.80
Workers – Categories	**100.00**
Cultivators	2.62
Agricultural labourers	4.03
Live stock, Forestry, Fishing Etc.	0.18
Mining and Quarrying	0.10
Manufacturing, Processing, servicing and repairs in HH industry	0.46
Manufacturing, processing servicing and repairs in other than HH industry	28.97
Construction	8.17
Trade & Commerce	19.35
Transport, Storage & Communication	8.05
Other services	28.07

Source: Census of India 1991

It may be seen from this table that even in 1991 agricultural occupations in the area as a whole was minimal and the bulk of the occupations were in the secondary and tertiary sectors**.**

2.1.5 Social Characteristics

The literacy rates in all the panchayats have shown improvement from 1991. The present literacy rates both for men and women are substantially higher than in 1991. This is a clear indication of increasing urbanisation.

Table 5 - Literacy Rate

Town Panchayat/ Village Panchayat	**1991**			**2001**		
	Total %	**Male %**	**Female %**	**Total %**	**Male %**	**Female %**
Valasaravakkam	89.91	94.64	84.88	96.60	97.95	95.15
Porur	85.72	91.89	79.21	87.64	91.22	83.81
Ramapuram	62.32	70.90	53.05	79.25	92.21	67.87
Karambakkam	76.60	83.15	69.27	82.13	87.64	76.18
Manapakkam	54.20	63.54	43.65	81.99	86.29	77.32
Total	**73.75**	**80.82**	**66.01**	**85.52**	**91.06**	**80.07**

Source: Census of India1991 & 2001

2.1.6 The Poor

Urban planners in India identify the poorer sections of the community by the quality of their housing and environment or by income of households or a combination of these characteristics. Areas or localities notified/recognised as slums by government are taken to be poor class localities and the households residing here are considered as poor households. The criteria used for notifying any area as a slum are where buildings in them are in any respect unfit for human habitation; are by reason of dilapidation, overcrowding, faulty arrangement and design of such buildings, narrowness of faulty arrangement of streets, lack of ventilation, light, sanitation facilities or any combination of these factors which are detrimental to safety, health and morals.

In addition to such notified areas compact areas of at least 300 population or about 60-70 households of poorly built congested tenements, in an unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities are identified as slums by the Census of India.

As far as the PU areas are concerned the panchayats (local bodies) of the town groups in question have identified the number of poor inhabitants and their location based on similar housing and living conditions and income levels for purposes of assistance under state and central government financed poverty alleviation schemes.

Table 6 presents the estimates of such slum population in the constituent panchayats. A significant proportion of this population belongs to the scheduled castes that are traditionally bracketed as economically and socially disadvantaged.

Table 6 - Slum Population - 2001

Town Panchayat/ Village Panchayat	Slum Population	Total Population in 2001	Percentage of Slum Population
Valasaravakkam	4,136	30,265	13.66
Porur	2,948	28,782	10.24
Ramapuram	3,905	30,251	12.91
Karambakkam	4,125	14,591	28.27
Manapakkam	5,020	8,590	58.44
Total	**20,134**	**112,479**	**17.90**

Source: Census of India & Local Body 2001

It becomes evident that the panchayats of Karambakkam and Manapakkam, with proportionally more agricultural labourers, show a higher percentage of poor residents.

Table 7 - SC/ST Population - 2001

Town Panchayat / Village Panchayat	Total Population	Scheduled Castes (SC)			Scheduled Tribes (ST)		
		Persons	Male	Female	Persons	Male	Female
Valasaravakkam	30265	1130	595	535	29	15	14
Porur	28782	2752	1354	1398	35	15	20
Ramapuram	30251	2036	1008	1028	15	7	8
Karambakkam	14591	700	354	346	0	0	0
Manapakkam	8590	2912	1489	1423	18	7	11
Total	**112479**	**9530**	**4800**	**4730**	**97**	**44**	**53**
% to Valasaravakkam Group		**8.47**	**4.27**	**4.21**	**0.09**	**0.04**	**0.05**
Chennai District	**4343645**	**598110**	**301835**	**296275**	**6728**	**3368**	**3360**
% to total population		**13.77**	**6.95**	**6.82**	**0.15**	**0.08**	**0.08**

Source: Census of India 2001

Poor people in the area constitute nearly 18% of the total population. Nearly 9% of this population belong to scheduled castes & tribes, traditionally disadvantaged and socially backward communities. This population is, as may be seen later, poor in terms of income as well as access to water supply and sanitation.

2.1.7 Socio Economic Profile of Households in Slum Habitations

The socio economic profile of slum habitations as obtained from the survey is discussed below. The number of households surveyed was about 200. The figures presented for each characteristic represent the percentage of households within the sample survey.

(i) Type of Dwelling

Temporary or Kutcha	46.3 %
Semi-Pucca	25.6%
Permanent or Pucca	23.6%
Others	4.5%

(ii) Individual or Shared Accommodation

Individual Unit	56.6%
Sharing the same compound	42.4%
Two units in one compound	*14.3%*
Three or more	*28.1%*

(iii) Period of Residence

< 1 year	8.5%
2 to 5 years	24.1%
5 to 10 years	30.0%
More than 10 years	37.4%

(iv) Family Size

1 to 4 members	59.1%
5 to 8 members	40.4%
More than 8 members	0.5%

(v) Family Income

< Rs. 1,000[2]	10.8%
Rs. 1,001 to 2,000	40.9%
Rs. 2,001 to 5,000	44.8%
> Rs. 5,000	3.5%

(vi) Literacy

62% of the households are literate

(vii) Occupation

Salaried		32.0%
Private	*27.6%*	
Government	*4.4%*	
Non-Salaried		54.2%
Daily Wages	*34.5%*	
Manual Workers	*17.2%*	
Domestic Help	*2.5%*	
Petty Business		12.8%
Others		1.0%

2.1.8 Environmental Resources

The main water resource in this area is the Porur Lake with a storage capacity of 57.14 mcft (million cubic feet), which was earlier used to irrigate about 320 ha of cultivable lands. But with the disappearance of agricultural land under its command it is no longer useful for this purpose. But it has a new function now. Metrowater, the city-wide parastatal for water and sanitation, has incorporated this lake as a storage reservoir for the city's water supply system.

However it has recently becomesubject to environmental degradation due to new developments in the area. The poor use it for bathing and washing cattle. The lake is further degraded due to dumping of garbage on the banks. In fact, the poor have illegally occupied a part of the tank area on the west.

[2] £1=83 Indian Rupees

Although the area does not have significant underground water resources, some commercial exploitation is taking place because of the lower density of population and limited extraction for public supply. There is one enterprise which extracts water and markets it as packaged water-mostly for city residents. This may lead to overexploitation and lowering the overall quality of water in the area.

Valasaravakkam Group – Comparative WSS Characteristics

	Valasaravakkam	**Porur**	**Karambakkam**	**Ramapuram**	**Manapakkam**
Extent (in sq.km)	2.97	3.72	3.26	2.70	4.10
Population (2001)	30,265	28,782	14,591	30,251	8,590
Poor Nos. & %	4,136 13.66%	2,948 10.24%	4,125 28.27%	3,905 12.91%	5,020 58.44%
Growth rate (1991-2001)	37.86	47.55	39.40	182.45	105.01
Estimated Population (2011)	41,765	42,310	20,280	85,310	17,610
Sources of water	Ground water & Metro water	Ground water	Ground water	Groundwater &Metrowater	Ground water
Capacity in '000 & Supply in lpcd (2001)	988 16 lpcd	1,026 18 lpcd	840 29 lpcd	978 16 lpcd	605 35 lpcd
Capacity in '000 & Supply in lpcd (2011)	988 12 lpcd	1,026 12 lpcd	840 21 lpcd	978 11 lpcd	605 17 lpcd
HH connections	525	Nil	509	Nil	300
Street taps	117	263	238	600	200
Sintex	244	Nil	Nil	Nil	Nil
Sanitation (Public)	Nil	Available	Available	Nil	Nil
Inter-se Comparative Ranking among the constituent towns of the PUI based on the assessed status of the facilities in WSS					
Water supply	4	3	2	5	1
Sanitation	3	1	2	4	5
Solid waste Management	2	1	4	3	5
Environmental Situation	1	4	5	3	2

Lpcd= litre per capita per day
Ranking: 1 is considered most favourable whereas 5 indicates the least favourable situation
Source: Compiled from Census of India 2001 & information from Local Bodies

2.2 Kottivakkam Group

2.2.1 General Characteristics

The Kottivakkam group has a population of 54,055 spread over an area of 12.52 sq.km with a density of 4,318 persons/Sq.km. It is comprised of four panchayats namely Kottivakkam, Palavakkam, Neelangarai and Injambakkam. Although all four are statutory village (rural) panchayats the Census of India has classified them as Census Towns. These four panchayats are located along the coast and bisected by the East Coast Road (ECR), a major highway leading to the southern coastal areas of the state. It is bound on the west by a manmade canal (viz The Buckingham canal once used by small boats to transport salt, shells and firewood), which follows low-lying flats having connection with the sea at a few points.

2.2.2 Land Use Structure

As in the case of the Valasaravakkam Group, the population and activities in the area are also a spill over from the City Municipal Corporation Area. Compared to the Valasaravakkam group developments here area more recent. They represent virtually an extension of Adyar and Thiruvanmiyur, which are parts of the City Municipal Corporation. The original fishermen settlements form small islands within the new developments, which include residential dwellings for the higher income groups, small and medium scale industries, plant nurseries and restaurants. A few institutions for differentially disabled and senior citizens are also located here. The main reason for their location has been the more salubrious climate facilitated by the vicinity to the sea and availability of good quality water.
The East Coast Road (ECR), which bisects the area in the north-south direction leading to the heritage site of Mamallapuram in the south, is now being exploited for developing tourism as well as amusement facilities. Shopping and commercial facilities have also developed on both sides of the ECR. Some of the main institutions in the area are indicated below:

Industries	Recreation Places	Institutions
Manipal Motors (Sales & Service) - *Private*	Prarthana drive in Cinema - *Private*	Life Help Centre for Handicapped – *Private*
Marica Industries (Small Industries) - *Private*	Blue Lagoon Hotel - *Private*	Amy Carmichael Children's Home – *Private*
Devi Marine Food Exports - *Private*	VGP Amusement Park - *Private*	Cholamandal Artists Village – *Private*
Sri Sai Ram Hospital Equipment - *Private*		
Southern Instruments & Electronic Corp. - *Private*		

The through traffic on ECR and traffic generated due to the activities in the area have made it a high traffic route from the city boundary to Pondicherry, a town established by the French during the colonial period and beyond linking the towns on the east coast of Tamil Nadu. The area attracts workers and visitors from the city on a daily basis and vice-versa.

2.2.3 Demographic Features

The population composition sex-wise, density of population and growth rates for the constituent units in the group are presented in Tables 8 and 9.

Table 8 - Kottivakkam Group – Population and Sex Break up

Village Panchayat	1991					2001				
	Persons	**Male**	**%**	**Female**	**%**	**Persons**	**Male**	**%**	**Female**	**%**
Kottivakkam	11,856	6,160	51.96	5,696	48.04	13,914	7,171	51.54	6,743	48.46
Palavakkam	10,969	5,749	52.41	5,220	47.59	14,369	7,369	51.28	7,000	48.72
Neelangarai	7,134	3,684	51.64	3,450	48.36	15,688	8,151	51.96	7,537	48.04
Injambakkam	5,151	2,665	51.74	2,486	48.26	10,084	5,272	52.28	4,812	47.72
Total	**35,110**	**18,258**	52.00	**16,852**	48.00	**54,055**	**27,963**	51.73	**26,092**	48.27

Source: Census of India 1991 and 2001

The sex break-up is fairly uniform in all panchayats. In the area as whole females constitute 48.3% of the total 2001 population that is more or less the same as in1991.

The population density and population growth rate vary from panchayat to panchayat. The population growth in Neelangarai and Injambakkam has been high mainly because of the availability of land for expansion for housing & other urban activities. The overall population density is comparatively lower than in the Valasaravakkam Group. The present growth rate is also lower.

Table 9 - Density and Growth Rate - 2001

Town Panchayat/ Village Panchayat	Density in Persons /Sq.Km	Growth rate in % (1991-2001)
Kottivakkam	4,800	17.36
Palavakkam	5,300	30.99
Neelangarai	2,550	119.90
Injambakkam	995	95.76
Total	**2,805**	**53.96**

Source: Compiled from Census of India 2001 Data

Migration: The migrants consist of people from both the city as well as rural areas. Rural migrants appear to be fewer as the total growth rate is lower than in the Valasaravakkam Group.

2.2.4 Economic Structure

The 1991 occupational structure shows that the working force here is also dominated by males. The overall work participation rate is 33% of which 88.5% are male. Female participation is low at 7.89%. The main occupation categories are all urban in character with manufacturing leading, followed by services, construction and trade are equally represented (17 %) followed by transport. In the primary occupation fishing accounts for 6.46% and agriculture barely reaches1.1%.

According to the 2001 Census, the number of cultivators and agricultural labourers is negligible varying from 3 to 20. This clearly shows that there is no significant agricultural activity in the area and the entire working force is dependent on urban activities. However occupation in HH industries were comparatively higher than in the Valasaravakkam Group with a work participation rate of 32.32 %. The primary occupation consists of agriculture and it accounted for only 0.81% of the total work force, which continues to be male dominated.

Table 10 – Occupational Structure – 2001

Work Participation Rate	%
Total Participation rate	32.32
Male Participation rate	50.66
Female Participation rate	13.66
Workers – Categories	**100.00**
Cultivators	0.58
Agricultural labourers	0.81
Workers in Household Industry	2.54
Other workers (Secondary & Tertiary Sectors)	96.07

Source: Census of India 2001

Table 11 – Occupational Structure – 1991

Work Participation Rate	**%**
Total Participation rate	33.04
Male Participation rate	56.25
Female Participation rate	7.89
Workers – Categories	**100.00**
Cultivators	0.79
Agricultural labourers	1.10
Live stock, Forestry, Fishing Etc.	6.46
Mining and Quarrying	0.08
Manufacturing, Processing, servicing and repairs in HH industry	0.64
Manufacturing, processing servicing and repairs in other than HH industry	27.23
Construction	17.13
Trade & Commerce	16.53
Transport, Storage & Communication	6.08
Other services	23.95

Source: Census of India 1991

2.2.5 Social Characteristics

The literacy rate in this town group is lower than in the Valasaravakkam group particularly for females.

Table 12 - Literacy Rate

Village Panchayat	**1991**			**2001**		
	Persons %	**Male %**	**Female %**	**Persons %**	**Male %**	**Female %**
Kottivakkam	71.10	80.22	62.25	79.31	86.93	71.26
Palavakkam	67.70	75.38	59.25	83.19	88.95	77.16
Neelangarai	63.77	71.52	55.50	79.28	85.94	71.91
Injambakkam	59.09	67.84	49.72	86.02	91.88	79.64
Total	**65.42**	**73.74**	**56.68**	**81.95**	**88.43**	**74.99**

Source: Census of India 2001

2.2.6 The Poor

All the panchayats here have also identified the number of poor inhabitants within their jurisdiction and their location for purposes of various types of assistance available under the State and Central schemes. Table 13 presents the extent of slum population in the case study area. The percentage of slum population within the whole area is about 19% that is higher than the Valasaravakkam Group. 10% of this population belong to the Scheduled Castes that are traditionally bracketed as economically and socially disadvantaged. This is comparatively higher in this town group as compared to the Valasaravakkam Group.

Table 13 - Slum Population - 2001

Village Panchayat	Slum Population	Population In 2001	Percentage of Slum Population
Kottivakkam	3,300	13,914	23.72
Palavakkam	2,612	14,369	18.18
Neelangarai	2,750	15,688	17.53
Injambakkam	1,650	10,084	16.36
Total	**10,312**	**54,055**	**19.07**

Source: Census of India 2001 & Local Bodies

Table 14 - SC/ST Population –1991

Village Panchayat	Total Population	Scheduled Castes (SC)			Scheduled Tribes (ST)		
		Persons	Male	Female	Persons	Male	Female
Kottivakkam	13914	945	459	486	8	3	5
Palavakkam	14369	1107	559	548	15	6	9
Neelangarai	15688	1371	677	694	24	15	9
Injambakkam	10084	1962	1008	954	1	1	0
Total	**54055**	**5385**	**2703**	**2682**	**48**	**25**	**23**
% to Kottivakkam Group		**9.96**	**5.00**	**4.96**	**0.09**	**0.05**	**0.04**
Chennai District	**4343645**	**598110**	**301835**	**296275**	**6728**	**3368**	**3360**
% to total population		**13.77**	**6.95**	**6.82**	**0.15**	**0.08**	**0.08**

Source: Census of India 1991

2.2.7 Socio Economic Profile of Households in Slum Habitations

The socio economic profile of slum habitations as obtained from the survey are discussed below. The number of households surveyed was about 90. The figures indicated for each characteristic represent the percentage of households within the sample survey.

(i) Type of Dwelling

Temporary or Kutcha	32.6 %
Semi-Pucca	25.8%
Permanent or Pucca	37.1%
Others	4.5%

(ii) Individual or Shared Accommodation

Individual Unit	83.1%
Sharing the same compound	16.9%
Two units in one compound	*9.0%*
Three or more	*7.9%*

(iii) Period of Residence

< 1 year	16.9%
2 to 5 years	1.1%
5 to 10 years	6.7%
More than 10 years	75.3%

(iv) Family Size

1 to 4 members	49.4%
5 to 8 members	50.6%

(v) Family Income

< Rs. 1,000	-
Rs. 1,001 to 2,000	44.9%
Rs. 2,001 to 5,000	52.8%
> Rs. 5,000	2.2%

(vi) Literacy

58.4% of the members of the households were literate

(vii) Occupation

Salaried		28.1%
Private	*28.1%*	
Government	*-*	
Non-Salaried		66.3%
Daily Wages	*24.7%*	
Manual Workers	*36.0%*	
Domestic Help	*5.6%*	
Petty Business		5.6%

2.2.8 Environmental Resources

The main water resources of the area are the ocean, (the beach) and ground water resources in the top aquifer. It has a coastal line of 5 km. The safe yield from the aquifer is estimated at 10.0 mld (million litres per day).

The main environmental damage has been caused by the large-scale and unsustainable exploitation of groundwater. In many instances the groundwater has become saline and the quality of water on which the entire area depends has come down. The quality of water has deteriorated already in the northern part and similar trends are appearing in the southern part of this particular PUI. The beachside is also subject to environmental degradation because of solid waste littering and unregulated activities around the fishing settlements.

Although in economic sense, the Buckingham canal – proposed to be developed as a canal for tourism- is a resource, its location and surrounding topographical features create problems all along the canal during the rainy season. A great part of the land between the canal and the ECR becomes water logged, which particularly affects the poor who have built their residences along the canal.

Kotivakkam Group – Comparative WSS Characteristics

	Kottivakkam	**Palavakkam**	**Neelangarai**	**Injambakkam**
Extent (in sq.km)	2.47	2.07	2.80	5.18
Population (2001)	13,914	14,369	15,688	10,084
Poor Nos. & %	3,300 23.72%	2,612 18.18%	2,750 17.53%	1,650 16.36%
Growth rate (1991-2001)	17.36	30.99	119.90	95.76
Estimated Population (2011)	16,280	18,680	34,355	19,665
Sources of water	Ground water	Ground water	Ground water	Ground water
Capacity in '000 & Supply in lpcd (2001)	470 17 lpcd	295 10 lpcd	830 26 lpcd	340 17 lpcd
Capacity in '000 & Supply in lpcd (2011)	470 14 lpcd	295 8 lpcd	830 12 lpcd	340 9 lpcd
HH connections	2,100	1,566	4,000	2,500
Street taps	100	219	500	220
Sintex	Nil	Nil	Nil	Nil
Sanitation (Public)	Available	Available	Available	Nil
Inter-se Comparative Ranking of WSS based on the actual status of the facilities				
Water supply	3	2	1	4
Sanitation	3	2	1	4
Solid waste Management	4	2	1	3
Environmental Situation	3	2	1	4

Lpcd= litres per capita per day
Ranking: 1 is considered most favourable whereas 5 indicates the least favourable situation
Source: Compiled from Census of India 2001 & Information from Local Bodies

3. COMPARISON OF THE TWO CASE STUDY AREAS

3.1 Common Characteristics

- Both the study areas are abutting the city boundary and as such form virtually extensions of the city.
- These areas are managed by a lower-tier of local bodies each having a jurisdiction of a few square kilometres only.
- These areas are comparatively of lower density and less crowded than the city suburban areas.
- The public facilities and infrastructure are minimal compared to normal urban standards.
- Sex composition is similar
- Both areas have the same percentage of poor population.
- Both have environmental assets that are being eroded rapidly.

3.2 Differing Characteristics

Sl.No.	Valasaravakkam Group	Kottivakkam Group
1	Developed on agricultural lands of low value	Developed on coastal land of little agricultural value.
2	Agricultural activity has considerably dwindled after urban intrusion	The original fishing activity continues without much expansion
3	Middle income to low income residents	High income to middle and low income residents
4	% of SC (most underprivileged section of population - 45%)	% SC population higher (most underprivileged section of population - 50%)
5	Attractive to middle income residents	Recent influx of high income and recreation uses
6	Higher Literacy	Comparatively lower rate of literacy
7	Density 3990/sq.km	Density 2805/ sq.km
8	Industries and Hospitals	Small scale industries, recreation and tourism
9	Groundwater potential limited	Good groundwater potential
10	Colonisation due to nearness to activities of the city	Colonisation due to availability of good water and coastal location

4. WSS REGIMES IN THE STUDY AREAS

4.1 Valasaravakkam Group

4.1.. Water Supply

The supply of water is mostly based on local groundwater sources. Only in Valasaravakkam panchayat it is supplemented with water obtained from the Metrowater system through tankers.

Their local systems comprise of pumping water from wells (open and bore) using small HP motors (5 to 7.5 Hp) into ground level sumps and or overhead tanks and distributing them through a piped system. Only parts of the area and population are served through household connections. The poor particularly are served through street taps. At times of scarcity as during summer, street taps run dry and the poor as well as the higher income groups are served through supply by tankers directly or as in the case of one area through strategically placed plastic containers, popularly known as *"sintex"* tanks generally of the capacity of 1,000 to 5,000 litres.

The water drawn from the wells is not treated further before supply. The supply is intermittent for a few hours daily or on alternate days. The supply of water is meant for drinking and cooking purposes only. The households have to rely on whatever other local sources are available for washing, cleaning and other non-potable purposes. Generally water from wells and ponds in the neighbourhood are utilised. The Porur tank serves this purpose for those in proximity to the lake.

The quantity available for potable uses to the poor varies from two *"kudams"* (usually a plastic container with a capacity of about 20 litres) to five *"kudams"* for a normal household of 5 persons. This gives a per capita supply of 8 to 20 litres as against a minimum of 40 litres per day considered as appropriate for the poorer classes by water supply planners in the state government departments/organisations. Table 15 to 17 provide the basic information of the system. The per capita supply worked out in the tables is based on the theoretical estimate of maximum per capita supply. In reality this is much less since source dependability is low and there are considerable losses in distribution as well as at supply points.

Table 15 – Local Sources of Supply – Public

Town Panchayats/ Panchayats	Number of Open Wells (Shallow Wells)	Number of Bore Wells (Deep Wells)
Valasaravakkam	1	6
Porur	3	10
Ramapuram	6	3
Karambakkam	-	15
Manapakkam	-	11

Source: Local Bodies

Table 16 - Public Water Supply Infrastructure Facilities

Town Panchayats/ Panchayats	Existing Facilities				Ongoing Projects		
	No. of OHT	No. of Sump	Total Capacity in '000 litres	Per Capita Supply per day *	No. of OHT	No. of Sump	Total Capacity in '000 litres
Valasaravakkam	3	-	988	16	2	1	2,000
Porur	3	-	1,026	18	2	1	1,200
Ramapuram	14	2	978	16	-	-	-
Karambakkam	15	-	840	29	-	-	-
Manapakkam	11	-	605	35	-	-	-
Total	**46**	**2**	**4,437**	**33**	**4**	**2**	**4,200**

*Assuming two days supply in the Over Head Tank (OHT)
Source: Local Bodies

Table 17 – Public Water Supply Distribution Points

Town Panchayats/ Panchayats	Number of House Connections	Number of Street Taps	Number of Street Sintex Tanks
Valasaravakkam	525	117	244
Porur	-	263	-
Ramapuram	-	600	-
Karambakkam	509	238	-
Manapakkam	300	200	-

Source: Local Bodies

Valasaravakkam and Porur towns being designated as Adjoining Urban Areas (AUA) of Chennai City, they will receive additional allocations from the Metrowater system and certain basic infrastructure to receive this water has been taken up by Metrowater on behalf of the local bodies, the finances for which are secured by the concerned local body. The commissioning of this additional infrastructure is dependent on the availability of water after meeting the needs of the city.

To summarise

- Each panchayat has its own limited system of water supply constructed by TWAD based on local water availability under the rural water supply schemes of State Government.
- Assuming full utilisation of infrastructure (Pumping and OHT) the supply of water vary from 16 litres in Valasaravakkam (high density) to 35 litres per capita per day in Manapakkam (low density).
- The poor are mostly served by street taps. The number. of street taps vary from 1 tap for 258 persons in Valasaravakkam to 1 for 41 persons in Manapakkam
- Every household spends as an average Rs.1.50/20 litres (5paise / litre).
- These limited systems are inadequate to meet even current population needs and hence are grossly inadequate to serve the future population in these areas.
- The better-off residents, industrial and institutional establishments get their water from in situ shallow or bore wells and do not generally have access to public water supply.

4.1.2 Sanitation

The area does not have an underground sewer system at present. Also, there are no systematic open or covered drainage systems. The general way of disposal of effluents from toilets in middle and higher income areas, industrial and institutional establishments is through on-plot septic tanks. Sullage is absorbed in the plot itself but in rainy seasons it overspills on to the street side. In the case of poor settlements there are no toilets attached to their residential dwellings and the public toilets (when they are maintained and functioning) serve them. The poor are mostly forced to use any unguarded public/private open area for this purpose. The children invariably use street margins. The sullage from the houses of the poor overflow on to the street margins. The availability and status of public conveniences is presented in Table 18. Valasaravakkam being designated as an Adjoining Urban Area Metrowater has planned an underground drainage system but its efficacy in the absence of water availability is doubtful.

Table 18 – Public Sanitation Facilities

Town Panchayats/ Panchayats	Public Convenience	Status
Valasaravakkam	Nil	
Porur	Existing at Chinna Porur	Functioning
Ramapuram	Nil	
Karambakkam	Gandhi Nagar	Construction work completed not yet open for public
Manapakkam	Nil	

Source: Local Bodies

4.1.3 Solid Waste Disposal

The local bodies have a system for collecting solid waste in their areas. Each panchayat has a few tractors, trailers or bullock driven carts for collection of solid waste deposited (literally thrown) by the households. The collected garbage is dumped on designated sites where available. Much of the garbage remains uncollected and is littered along roadsides or deposited near water reservoirs. The rudimentary facilities available are indicated in Tables 19 and 20.

Table 19 – Public Solid Waste Collection Infrastructure

Town Panchayats/ Panchayats	Tipper Lorry	Mini Tipper Lorry	Power Tiller	Tractor	Cart
Valasaravakkam	1	1	-	2	-
Porur	1	-	1	1	-
Ramapuram	-	-	-	1	4
Karambakkam	1	-	1	1	-
Manapakkam	-	-	-	-	2

Source: Local Bodies

Table 20 – Public Solid Waste Collection and Disposal

Town Panchayats/ Panchayats	Waste Collected Tonnes/day	Location of Dumping site
Valasaravakkam	7	Sorting centre at Brindavan Nagar 1st Main road and Disposal at Maduravoyal (Outside PUI)
Porur	8	Near Chinna porur (within the PUI)
Ramapuram	1	Ramapuram lake
Karambakkam	2.5	Near Sivabootham Village & Samayapuram (Outside PUI)
Manapakkam	0.25	No designated site

Source: Local Bodies

4.1.4 WSS Situation – Assessed Through Household Survey

Drinking Water

(a) Sources of Supply

57.2% of the households depend on local body supply mostly through street taps. About 22% of the households depend upon open shallow wells.

(b) Quality of Water

Only 33% of the households get clear water. 5.9% of the households get water of very poor quality.

(C) Quantity Used

86.2% of the households use 1 to 5 pots or 20 to 100 litres per household. 12.3% of the households use 6 to 10 pots or on an average 160 litres. About 1.5% of the households use 200 litres.

(d) Treatment of Water

Only 36.5% of the households boil the water before using it for drinking. 63.5% of the households consume the water as obtained.

Water for Non-Potable Purposes

(a) Source

Nearly 50% of the households depend on local open shallow wells. 12.3% of the households depend on bore wells.

(b) Water Use

48.8% of the households use less than 100 litres per household. 40.4% use 150 litres and 10.8% of the households use more than 200 litres.

(c) Cost Involved

While 72.5% of the households do not spend money for obtaining water 27.5% spend some money for obtaining water. The usually pay money when water is supplied through tankers. Although the public supply is free the payment is made to the tanker driver/community coordinator to regulate the crowds around the tankers.

(d) Time Spent

More than 50.7% of the households spend about 30 minutes for procuring water. 25.6% of the households spend nearly an hour to fetch water. 15.3% of the households spend more than one and a half hours. 8.5% spend as much as two hours for procuring water.

(e) Involvement of Women in Fetching Water

In 82.8% of the households women are the main fetchers of water. In 16.8% of the households both men and women are engaged in fetching water.

(f) Involvement in Rainwater Harvesting

More than 60% of the households have not resorted to rainwater harvesting.

(g) Toilets

29.1% of the households do not have toilet facilities and use the open field. The other households have some form of toilet facilities.

(h) Solid Waste

About 27.1% of the households deposit their garbage in dustbins. About 3.4% of the households dispose of their garbage by burning it. Very few households segregate the garbage.

(i) Impact on Health

Nearly 75% of the households interviewed reported that their families were affected by diseases, normally associated with lack of quality water and inadequate sanitation, such as Jaundice, Cold, Wheezing, Malaria, Diarrhoea, Cholera and skin disorders. This was confirmed from discussions with medical personnel in the areas.

(j) Hospital Visits and Money Spent on Health Care

40.4% of the households depend upon private clinics or hospitals for health care. About 20.2% of the households spend around Rs. 50 per month on health care. 16.3% of the households spend between Rs. 50 and Rs. 100 per month and about 8.5% are reported to be spending even Rs. 200 per month on health care and medicines.

(k) Assistance for Securing Water

More than 50% of the households mentioned that ward councillors come to their aid when there are complaints about problems in securing water.

From this data, it may be seen that the Valasaravakkam area is very deficient in water availability and low income (slum) households suffer the most. This deficiency in quantity and quality of water available is reflected in the general health of the households as also in the incomes of the wage earners. It is a matter of deep concern that this situation will get worse in summer months particularly because of the failure of monsoon this year. Such a situation will have serious adverse impacts in this PUI and may disrupt the economic activity of the poor and lower their patience which may lead to serious civic unrest.

4.2 Kottivakkam Group

4.2.1 Water Supply

The water supply in the area is entirely dependent on groundwater sources. This resource also serves the needs of some parts of the city area. The water is of good potable quality and this is one of the main reasons for many residents of the city to relocate to this area. However, the water in certain areas particularly in Kottivakkam and Palavakkam has already become saline and exploitation of water should be within sustainable limits if continued availability of water to this area is to be assured. Tables 21-24 present the information on the water supply infrastructure and situation in this group of towns. Kottivakkam alone has been designated as AUA by Metrowater for the allocation of water from its city system. The per capita supply worked out in the tables is based on the theoretical estimate of maximum per capita supply. In reality this is much less since source dependability is low and there are considerable losses in distribution as well as at supply points.

Table 21 - Quantity of Water Sourced by Local Bodies

Panchayats	Number of Open Wells	Number of Bore Wells
Kottivakkam	2	20
Palavakkam	9	11
Neelangarai	3	10
Injambakkam	6	3

Source: Local Bodies

Table 22 – Public Water Supply Infrastructure Facilities

Panchayats	Existing Facilities				Ongoing Projects		
	No. of OHT	No. of Sump	Total Capacity In '000 litres	Per Capita supply per day	No. of OHT	No. of Sump	Total Capacity In '000 litres
Kottivakkam	3	3	470	17	1	-	60
Palavakkam	7	-	295	10	5	-	380
Neelangarai	9	1	830	26	-	-	-
Injambakkam	5	-	340	17	1	-	60

Total	**24**	**4**	**1,935**	**27**	**7**	**0**	**500**

Source: Local Bodies

Table 23 – Public Water Supply Distribution Points

Panchayats	Number of House Connections	Number of Street Taps
Kottivakkam	2,100	100
Palavakkam	1,566	219
Neelangarai	4,000	500
Injambakkam	2,500	220

Source: Local Bodies

Table 24 – Public Water Supply-Periodicity and Hours of Supply

Panchayats	Periodicity	Hours of supply
Kottivakkam	Morning or Evening	Two Hours
Palavakkam	Alternative days - Morning	Three Hours
Neelangarai	Morning & Evening	6 to 9 A.M & 4 to 6 P.M.
Injambakkam	Morning & Evening	6 to 9 A.M & 4 to 6 P.M.

Source: Local Bodies

To summarise:

- Each Panchayat has its own independent limited system of water supply executed by TWAD Board under the rural water supply scheme. TWAD Board generally provides such facilities at a standard of 40 lpcd for an assumed population.
- Assuming full utilisation of infrastructure the per capita public supply for the present population varies from 10 lpcd in Palavakkam to 26 lpcd in Neelangarai. The average over the entire area works out at 27 lpcd.
- Thenumber of street taps varies in each panchayat and on an average 1 tap serves 139 persons in Kottivakkam and 31 persons in Neelangarai. Over the entire PUI it works out at 52 persons / each tap or 1 tap for 10 HH.
- The better off residents, commercial, industrial and institutional establishments get their water from in situ shallow or bore wells and do not generally have access to public water supply.

4.2.2. Sanitation

Even in this study area there is no underground sewer system. The higher and middle-income households have on plot septic tanks. The effluents from the septic tanks are absorbed in the plots quickly because of the sandy nature of the substrata on the seaward side of the ECR that bisects the area. On the land ward side the substrata is impermeable and the effluent absorption is slow. Stagnation of sullage and rainwater is a critical problem in the areas close to the Buckingham Canal. As in the case of Valasaravakkam Group the sanitation facilities for the poor are rudimentary and the limited number of public conveniences serves the needs of a small section of the population. Most of the poor residents have to use the open fields, beach and canal banks for their daily ablution.

Table 25 – Public Sanitation Facilities

Panchayats	Public Convenience	Status
Kottivakkam	Existing at MGR Nagar & Kuppam	Functioning
Palavakkam	Existing at Palavakkam Kuppam	Functioning
Neelangarai	Near Panchayat office & Periya Neelangarai Kuppam	Functioning
Injambakkam	Nil	-

Source: Local Bodies

4.2.3. Solid Waste

The solid waste removal and disposal is less effective in this case study area because of the limited number of vehicles and carts.

Table 26 – Public Solid Waste Removal Infrastructure

Panchayats	Tractor	Cart
Kottivakkam	1	3
Palavakkam	-	7
Neelangarai	1 (rented)	-
Injambakkam	-	3

Source: Local Bodies

Table 27 – Public Solid Waste Collection and Dumping Yard

Panchayats	Waste collected Tonnes/day	Location of Dumping yard
Kottivakkam	5	No Designated site
Palavakkam	1.5	Perungudi Village (Outside PU area)
Neelangarai	1	Perungudi Village (Out side PU area)
Injambakkam	2	Buckingham Canal western side (Within PU area)

Source: Local Bodies

4.2.4. WSS Situation – Assessed Through Household Survey

Drinking Water

(a) Sources of Supply

92.1% of the households depend on local body supply mostly through street taps and household connections.

(b) Quality of Water

96.6% of the households reported getting good quality water.

(C) Quantity Used

91% of the households use 1 to 5 pots or 20 to 100 litres per household.

(d) Treatment of Water

97.5% of the households do not boil the water before using it for drinking.

Water for Non-Potable Purposes

(a) Source

91% of the households use water obtained from the public system. Only 2.2% depend on open wells.

(b) Water Use

Only 47.2% of the households use less than 100 litres per household. 21.3% use 150 litres and 31.5% of the households use more than 200 litres.

(c) Cost Involved

The majority of the households do not spend money for obtaining water since public supply is generally available through yard taps/ street taps.

(d) Time Spent

More than 74.2% of the households spend about 30 minutes per day in procuring water.

(e) Involvement of Women in Fetching Water

In 88.8% of the households women are the main fetchers of water. In 11.2% of the households both men and women are engaged in fetching water.

(f) Involvement in Rainwater Harvesting

More than 83% of the households have not resorted to rainwater harvesting.

(g) Toilets

59.6% of the households do not have toilet facilities and use the open field. The other households have some form of toilet facilities.

(h) Solid Waste

About 21.3% of the households deposit their garbage in dustbins. Very few households segregate the garbage.

(i) Impact on Health

A similar situation to the Valaaravakkam area applies here.

(j) Hospital Visits and Money spent on Health Care

53.9% of the households spend less than Rs. 50 per month on health care. 34.8% of the households spend between Rs. 50 and Rs. 100 per month and about 2.2% are reported to be spending even Rs. 200 per month on health care and medicines. 83.1% of the households depend upon private clinics and hospitals for treatment.

(k) Assistance for Securing Water

Almost all households (97.8%) mentioned that ward councillors come to their aid when there are complaints about problems in securing water.

The water supply situation for the poor in this PUI is comparatively better because of the availability of a recognised aquifer. However this may not last long because of the progressive saline intrusion into the freshwater aquifer due to over-exploitation of water. There is also a greater hazard of contamination of the aquifer through household sewage and leaching from solid waste deposits and dumps because of the sandy nature of the soil. The worst affected sections in this group are those residing between the East Coast Road (ECR) and the Buckingham Canal. This section of the population requires greater attention in the provision of better water supply and sanitation facilities.

5. LOCAL GOVERNMENT SET UP IN THE CASE STUDY AREAS

Under the 73rd and 74th Constitutional Amendments panchayats and municipalities have become permanent local governments. Elections are held to elect the President and Councillors of the panchayat every five year. For this purpose the panchayats are delineated into several wards. The Presidents and Councillors are directly elected, while the Town Panchayats have a government appointed officer as the Chief Executive, in the Village Panchayats the President himself is the head of the Panchayat (Chief Executive).

5.1 Human Resources

The scale of manpower resources of Town Panchayats is illustrated in Table 28 which illustrates the staff strengthof Valasaravakkam Town Panchayat.

Table 28 - Staff Strength in Town Panchayats

Staff	Number
Executive Officer	1
Assistant	1
Bill collector	3
Watchmen	1
Sanitary officer	1
Sanitary supervisor	1
Lorry driver	1
Sanitary workers-permanent	36
Sanitary workers-Temporary	14
Total Staff	**59**

Source: Local Body

It may be seen that out of a total of 59 staff about 50 are sanitary workers but there is hardly any staff to operate and maintain water supply and sanitation systems effectively which is supposedly their responsibility. Although sanitary workers are substantial in number their efficacy in solid waste clearance and management is poor. In the case of village panchayats the manpower resources are much less. This is illustrated in Table 29, which indicates the staff position in the village panchayat of Palavakkam in the Kottivakkam Group.

Table 29 – Staff Strength in Palavakkam

Staff	Number
Panchayat union assistant	1
Bill collector	1
Office assistant	1
Plumber	1
Water supply staff	7
Street light staff	5
Sanitary workers	17
Total Staff	**33**

Source: Local Bodies

5.2 Financial Resources

The financial resources of the town panchayats are weak and will not be able to meet significant capital costs for civic services, which includes water supply and sanitation services. Table 30 provides the revenue and expenditure pattern in the town panchayat of Porur to illustrate the items of revenue and expenditure as also the quantum of revenue and expenditure. The resources of Ramapuram, a village panchayat is presented in Table 31 to illustrate the financial position of village panchayats. Table 32 presents the demand, collection and balance of local takes of Pallavakkam panchayat to illustrate the tax levy & collection situation in village panchayats. It is observed that while the tax levels themselves are low, the collection performance is much lower. This situation is not conducive to systematic maintenance investments in infrastructure facilities.

Table 30 – Income & Expenditure – Porur Town Panchayat – (2002-03)

Receipts	Amount (Rs in '000	%		Expenditure	Amount (Rs in '000)	%
Revenue Account Own Revenue A. Tax				**Revenue Account A. Salaries including conservancy staff**		
a. Property tax	3,529	12.01		i. Provincialised	640	2.6(
b. Profession tax	750	2.55		ii. Nonprovincialised	1,880	7.6
Total (A)	**4,279**	14.56		**Total (A)**	**2,520**	10.2
B. Non Tax				**B. Obligatory services (Maintenance)**		
a. D&O Trade License Fee	171	0.58		1.Water supply materials & labour	**756**	**3.0**

b. Building License Fee	1,392	4.74		2. Water supply maintenance payable to TWAD & other agencies	**189**	**0.77**
c .Hoarding Cut-out	14	0.05		3. Public Health	**1,256**	**5.11**
d. Library Cess	351	1.19		4.Sanitation & Sewage	**522**	**2.12**
e. Other Miscellaneous	1,862	6.34		5. Street light	1,091	4.43
ii) Income from properties				6.Roads	1,772	7.20
a. Markets	0.6	0.00		7. Strom water drain	**1,235**	**5.02**
iii) Income from special services				8.Burial & Burning ground	3	0.01
Total (B) (i to iii)	**3,790**	12.90		9.Office management expr.	605	2.46
Total (A+B) (Own Rev.)	**8,069**	27.46		10.Library cess remitted	565	2.30
C. Assigned Revenue				**Total (B)**	**7,996**	32.50
a. Devolution	2,798	9.52		**C. Discretionary Service**		
b. Surcharge on stamp duty	13,180	44.85		1. Parks & Play grounds	120	0.49
c. Entertainment tax	99	0.34		**Total (C)**	**120**	0.49
Total (C)	**16,077**	54.71		**Total (A+B+C) (Revenue Expr.)**	**10,637**	43.24
D. Capital Account Grants in Aid from State Govt.				**ii) Capital account**		
a.10th finance commission	894	3.04		1.Roads	1,610	6.54
b. Others	4	0.01		2.Culverts	565	2.30
Total (D)	898	3.06		3.Storm water drain	**1,806**	**7.34**
E. Grants from Central Govt.				4.Others Burial &Burning ground	8,080	32.84
a. National Slum Dev. Programme	220	0.75		**Total (ii) (Capital Account)**	**12,061**	49.02
Total (E)	**220**	0.75		**iii) Loans repayment**		7.74
F. Loan Account Receipts from Loan Account				1. Mega city	1,903	
a. Mega city	4,121	14.02		**Total (iii)**	**1,903**	7.74
Total (F)	**4,121**	14.02		**Total (i to iii)**	**24,602**	100.00
Total (A to F)	**29,386**	100.00		**Closing balance (Without deposits & Advances)**	**104**	
Opening Balance	**-4,679**			**Grand total**	**24,707**	
Grand total	**24,707**					

Source: Porur Town Panchayat

Expenditure Statement for Ramapuram Village Panchayat

Expenditure	**Amount Rs in '000**	**% of expenditure**
A. Union Fund		
Salary	944	17.36
Travel allowance	0.8	0.01
Stationary	47	0.86

Electricity for street light	11	0.20
Electricity for union buildings	1.3	0.02
OHT/Sump and labour	**1,297**	**23.85**
Maintenance of Street light	176	3.24
General Health	**310**	**5.70**
Social forestry/Fruit garden	10	0.18
Festival Expenditure	45	0.83
Union building maintenance	59	1.09
Maintenance of Materials	46	0.85
Maintenances of road & small Culverts	1,959	36.03
Maintenances of Burial ground	160	2.94
Returning of Library tax	250	4.60
Returning of Balance amount	56	1.03
Construction of New Buildings	28	0.51
Construction new roads & maintenance	37	0.68
Total	5,437.1	100.00

Source: Ramapuram Village Panchayat

Table 31 - Demand and Collection of Revenue – Palavakkam Panchayat – (2001-02)

Name of the Tax	Demand		Total Collection	
	Rs in 'ooo	%	Rs in 'ooo	%
House Tax	2,259	69.19	1,237	75.20
Library tax	226	6.92	124	7.54
Professional tax	198	6.06	143	8.69
Water tax	498	15.25	133	8.09
Cable TV Tax	84	2.57	8	0.49
Total	**3,265**	**100.00**	**1,645**	**100.00**

Source: Palavakkam Village Panchayat

5.3 Constraints in Governance in Panchayats

5.3.1 Political

The Town and Village Panchayats in the case study areas have a jurisdiction over small areas ranging from about 1 sq. km to 5.2 sq.km. and have a population ranging from 10,000 to about 30,000 inhabitants. The administration is democratic in the sense that they have an elected body of councillors presided over by a directly elected chairman in the case of town panchayats and a president in the case of village panchayats. Although the elections are on a non-party basis what happens really is that the councillors owe allegiance to one of the two political parties. Unfortunately these two political parties do not see eye to eye most of the times either in policy formulation or decision making even in small matters. If the number of councillors owing allegiance to the opposition party at the state level is higher, the development of these panchayats is all the more difficult. Since there are a large number of panchayats in the state the rapport with the state government for assistance depends upon the political standing of the

chairmen/president. Even then the political capacity for civic governance in these local bodies is very weak.

5.3.2 Administrative

Among the two tiers of local government institutions in these PUIs the state government appointed executive officers to work only in town panchayats. The elected president himself acts as the executive officer in the case of village panchayats. The supporting administrative staff in both tiers of local bodies consists of a few tax collecting officers and some sanitary workers. There is hardly any staff to regularly look after infrastructure construction or maintenance.

Tax or revenue collection and elementary sanitation – cleaning of drains and collection of garbage - are the main functions carried out. For small capital works such as drain building, road making or water supply these local bodies have to approach state departments or parastatal organisations like the Tamil Nadu Water and Drainage (TWAD) Board, the highways department, Public Works Department (PWD), etc.

5.3.3 Financial

Most of the revenue of these local bodies is obtained through property tax and licences. In most local bodies the tax levels are low, the collection performance is weak and many properties are undervalued. So much so the revenue is meagre and in most cases just enough to meet the salaries of the staff; not much is left even for maintenance of existing.

Whereas the village panchayats can access some grants from central schemes for rural development such as poverty alleviation, low cost sanitation etc. the town panchayats are in a more difficult position since this facility is not available to urban local bodies. The capacity of the local bodies to raise loans from funding institutions is very little because of weak financial resources.

Under the above scenario, it is very difficult for these tiers of local government to plan, finance, execute or maintain satisfactory water supply and sanitation services to the growing population which continually requires an urban level of services in these sectors.

If WSS is to be vastly improved in these PUIs it is necessary to explore appropriate suitable options.

6. IMPACT ON THE LIVING CONDITIONS OF POOR

6.1 Valasaravakkam Group

6.1.1 Main Findings from the Women's Focus Group Meeting

- The quantity of water received through the public system by the poor is just adequate for drinking and cooking. The quality varies from acceptable to unsatisfactory.
- Water for cleaning, washing and hygiene has to be secured from sources such as shallow wells and ponds. The quality is generally poor (yellow or turbid).

- Men, women and children particularly women and girls are the main procurers and spend 30 minutes to two hours a day in fetching water. Some of them have to travel more than a km to fetch water. For more than 1 kudam, men have to procure it. When men engage themselves in procuring water they are forced to go late for work and it affects their wages and incomes. School children similarly suffer interruptions where they have to fetch water.
- Due to the poor quality of non-potable water used for washing clothes and utensils, clothes become yellow and vessels get corroded.
- Boiling of water involves fuel costs and also means more time for women to spend in the kitchen. To bring the boiled water to room temperature takes a long time. Moreover, the taste differs. Due to these reasons most of the households do boil water before drinking.
- The majority of women do not have in-house or shared toilet facilities. They are compelled to use the open fields. Public toilets are neither adequate nor fit to be used.
- Due to open field defecation and sullage flow from houses, sanitation is affected severely. This is compounded during rainy season.
- In the matter of solid waste, the general attitude is apathetic and littered waste is collected by the panchayat irregularly (many times at a periodicity of one week) and this adds further to the sanitation problem.
- To address their health problems they make use of the free hospital facilities available or go to local doctors. On an average households spend Rs200/- month and a few a lot more even up to Rs1000/- at certain times e.g. during monsoon. Cold, cough and fever were the general illnesses prevalent in the area. Sore throat was also one of the recurring complaints.

6.1.2. Main findings from Elected Representatives Focus Group Meeting

(a) Rainwater Harvesting

Due to the Government of Tamil Nadu making it mandatory to have rainwater harvesting structures in each household throughout the state, every one is aware of the scheme. Houses with thatched roofing have not installed RWH structures. Those who have adopted such techniques divert the rainwater into wells or into the ground. Though all the houses seem to have installed it in their respective houses, it was a measure taken only to satisfy the authorities.

(b) Sanitation

Valasaravakkam has initiated an underground drainage program under public-private participation through a loan from the World Bank. Even before the project is completed the local body has to start paying the interest for the loan. This is costing the local body a considerable amount. Further the scheme cannot be effective unless more water becomes available.

- The groundwater quality is not uniform in all panchayats and varies widely even within the same panchayat area.
- Supply of water by the local body covers their areas only partially and poor class areas get preference.
- Water supply can be improved only if Metrowater extends its services to the area through providing water from the city system (outside resource)
- Residents are willing to pay for water only if house connections are assured.
- Provision of facilities for sanitation take a lower priority to water supply and solid waste clearance and management.
- Solid waste removal has improved in a few middle class residential areas where there are removal services by residents associations initiated by the community.

- The final disposal is a serious problem due to non-availability of landfill sites.
- Though there are a few public latrines they are not in use due to lack of maintenance. The public on the whole does not have a sense of ownership of these facilities.
- In recent times sanitation problems have increased due to the construction of apartments and faulty arrangements for wastewater removal.
- Projects for improvement of WSS are funded by loans obtained from the TNUDF. Debt servicing is heavy and the delay in the operation of projects due to the implementing agency, viz. Metrowater in the case of AUAs.
- The local body pays about 7 paise per litre to Metrowater to get water for Valsaravakkam. This costs the local body an amount of Rs.7000/- per day, which is not recoverable.

Appraisal of Satisfaction of Services

Poor Households	Service	Local Body
Fair to unsatisfactory	**Water supply**	Fair The best we can provide under the circumstances
Poor	**Sanitation**	Fair
Poor	**Solid waste**	Clearance fair Problems in disposal
Not much thought except in rainy season when affected by flooding and contamination of water	**Concern for Environment**	Not much thought

6.2 Kottivakkam Group

Most of the findings from the Valasaravakkam group are applicable to this group also. In addition some of the differences are listed below.

- The area extracts water from a known aquifer. The water quality varies from not so good in Kottivakkam and Palavakkam to good in Neelangarai. The quality is poor in Injambakkam. Only the residents of Neelangarai are satisfied with the drinking water quality. Even quantity-wise satisfaction by consumers varies from good to poor.
- There are large numbers of household connections and street taps and these provide water for longer hours and thus access to water supply is better.
- As far as water requirements for washing and other non-potable purposes are concerned, the residents on the land ward side of ECR along the Buckingham canal are disadvantaged because of the poor quality of underground water in this part.
- Extraction from the main good aquifer is intensive from higher income areas and institutions in the area and several enterprises who manufacture packaged water.
- There is also a continuous 24-hour extraction by Metrowater to fill water tankers for supply outside the area.
- Local people have voiced their concern and protested against over-extraction, as the water is turning saline particularly near the coast.
- Sanitation problems are more acute on the inward side of ECR abutting the Buckingham canal where water logging is prevalent. On the seaward side the groundwater is subject to contamination because of large numbers of septic tanks in higher income residences and institutions.
- Only two of the panchayats have a designated landfill site outside the case study area. They are long distances away. The other panchayats dump their garbage along the canal.

- In addition to such illnesses like cold, cough and fever other complaints relate to sore throat, scabies and skin diseases. Malaria and other water-related diseases are also frequent.
- Those with household connections pay water charges at the rate of Rs30/- per month with an initial deposit of Rs.1000/-. These are middle and high income group residents.
- Underground drainage is a priority here because of fear of contamination of the aquifer and the panchayats consider that an integrated underground drainage project covering the entire area is urgent and requires Metrowater's intervention.
- The local finances of the panchayat are poor and cannot support comprehensive projects for adequate water supply and sanitation.

Appraisal of Satisfaction of Services

Poor Households	Service	Local Body
Good to Poor	**Water supply**	Mostly satisfactory
Poor	**Sanitation**	Poor
Poor	**Solid waste**	Clearance fair Problems in disposal
Quite high on land ward side affected by flooding and contamination of water	**Concern for Environment**	Fair
Highly concerned due to salinity intrusion	**Concern for Local water extraction**	Helpless as Metro water is a public agency

7. WSS SITUATION - REPORTS FROM THE MEDIA

The media particularly the national newspapers regularly feature in their local news the problems related to water supply, water contamination, deficiencies in solid waste collection & management, flooding and environmental degradation. These problems are common both within the city and the peri urban areas notwithstanding the different regimes in place. An illustrative selection is excerpted from 'The Hindu' a national newspaper and a few local newspapers.

Beware of Drinking Water

Water supplied by Metrowater and even the Mineral water supplies will be safe only if boiled to 100 degrees celcius before using for drinking. According to the Managing Director of the CMWSSB, (Hindu 26-09-2003), sources of city's water supply (like lakes and other water bodies) are polluted by people bathing, washing clothes and animals, and unrestrained use of shores for open defecation. In treatment plants, chlorination is the favoured method for piped water supply. Chlorine is maintained at 0.2 ppm at the supply end. Despite this it is safe to boil the water at 100 degrees celcius before drinking. Bacteria are killed at that temperature though viruses can still survive. By covering the container containing the boiled water, fresh bacterial contamination can be prevented. According to CMWSSB, potability standards of water are not uniform but region-specific because of variations of the chemicals leaching into the groundwater.

EXNORA – Ambassador 1st issue

No Krishna Water until Next Monsoon, says Jayalalithaa

Chennai will not get Krishna water until the next monsoon as there is no water in Andhra Pradesh reservoirs, the Chief Minister, Jayalalithaa, said today.

THE HINDU, April 30, 2003

A Costly Summer this

The difficult summer in Chennai is burning a hole in residents' pocket as they depend more on packaged water and private tanker services, even as piped Metrowater supply is failing in 'tail-ends' in the network. The growing demand in the city is reflected in the price of private tanker supply. A truckload of 12,000 litres, which was selling at Rs. 550 last month, has risen to Rs. 700. The Chennai Drinking Water Tanker Lorry Owners' Association attributes the hike primarily to the crackdown on private tankers by revenue department staff of adjoining Tiruvallur district. Extraction of groundwater was prohibited in 302 villages on the periphery of the city by an amendment to the Chennai Metropolitan Area Groundwater (Regulation) Act made last year. Almost all major corporate houses, hospitals and hotels turn to the private tanker operators. Currently, there are at least 900 tanker lorries, each undertaking five trips. This operation alone accounts for 54 million litres every day against Metrowater's claimed alternate day supply of 275 million litres. Unlike as the affluent society, the middle class has to apportion a sizable part of its salary every month for water. Residents of Agasthiar Nagar, Villivakkam, who have not received Metrowater piped supply since 1996, spend, on an average, upto Rs. 600 a month on procuring water. The Tamil Nadu Packaged Drinking Water Manufacturers' Association says that everyday the market is about 2 lakh one-litre bottles (sold at Rs. 10 or 12 each), one lakh 12-litre cans (Rs. 30-40), 15,000 25-litre cans (rs. 25) and more than four lakhs of the most popular 100-ml satchets (Re. 1). Another unaccounted spending is the 'token' amount residents pay to drivers or some local politicians who coordinate streetwater supply of 50 paisa or Re. 1 a pot. Metrowater is currently undertaking upto 2,500 trips across the city to provide supply to regions, where piped supply is not adequate.

THE HINDU, May 10, 2003

Summer of Discontent

Bleary-eyed they scramble out of bed at 4 a.m. to strain at the hand-pump for a little water. Chennai is often termed a flawed metropolis due to the lack of a perennial river as its source of water. While the World Health Organisation standard for a 'healthy' life-style pegs a per capita supply of 140 litres per person a day, all that Chennai residents get is something between 20 and 50 litres, which must often be collected at night or at the crack of dawn. For the office-going middle class, the prohibitive cost of packaged water means dependence on water through the pipelines. It is a common sight to find long queues at most of the water filling stations even late into the night. During one of the worst drought areas that the city had seen, 2001, even friendly middle class neighbours turned enemies as they chased the few water tankers brought from Neyveli, 300 km away. Fisticuffs were regular occurrences in front of some of the water stations, and at least 30 residents were run over by water tankers racing through the city. Naturally, the public vented its anger by demonstrations, both for water and against tanker drivers. This year too, Chennai is bracing itself for a drought with the storage in reservoirs dwindling fast. This time around, resident's welfare associations have started questioning the need to pay water tax when it is in fact not available in the pipeline for several years together.

THE HINDU, May 11, 2003

Combined Storage Dwindling / Lorry Trips May Go Up

Chennai Metrowater has reduced the quantum of piped supply from 225 million litres to 180 million litres. This has been done to ensure "equitable distribution of supply", say officials of the water agency. The present scheme of supply on alternate days is on since mid-January. "About 10 days ago, we brought down the quantum," says a senior officer. Moreover, there is no change in the quantum of water supplied to industry – 40 million litres a day (MLD) – and other bulk consumers 10 MLD. The managers say the daily city demand is 180 million litres (ml), of which groundwater accounts for 105 ml, private open wells-25 ml and surface water –50 ml. "We are planning to tap more open wells and hopeful of getting even 50 ml more. In that case, the quantity of water from this source alone will be 75 ml. So, this will see us through the next few months even if Red Hills and Poondi go dry," the officer explains. At present, the number of lorry trips is 7,500. "In the event of no addition to the storage of the reservoirs, we expect this to go up to 13,000", the officer says.

THE HINDU, December 13, 2003

Concern Over Wastage of Water

The State Government might be, at least seemingly, straining every nerve to ensure that people in the city and suburbs do not go thirsty is the wastage of water which they are concerned about. Shopkeepers said their repeated reminders to the Panchayat officials failed to evoke a positive response.

THE HINDU, May 13, 2003

Metrowater Turns to Gods

With the northeast monsoon nearing its withdrawal stage, Metrowater, the primary water supplier in the city, is seeking divine intervention. With experts forecasting a dry summer for Chennaiites and the water-level at reservoirs around the city dipping very fast, Metrowater officials have gone ahead with their plans to please Varuna, the God of rains, to bring the much-needed showers to the city and enable them to maintain the minimum water supply to residents. According to sources, they performed a five-hour yagna at the Puzhal lake, one of the main sources of drinking water to the city. Before the yagna, the Metrowater officials offered special pooja at 70-odd temples across the state. They had also collected 'holy water' from 63 temples to anoint the idols of Varuna, placed at the centre of the lake. Ten priests performed the pooja.

THE NEW INDIAN EXPRESS, December 6, 2003

Drinking Water Contamination

Sewage overflow at Elango Nagar in Virugambakkam has led to contamination of drinking water there and in adjacent Balambal Nagar, which now threatens to contaminate the groundwater, the residents have complained. Repeated representations to the authorities yielded no results and the sewage now threatens to enter ground floor of houses.

THE HINDU, December 4, 2002

Desalination Economical

Installing a desalination plant might need heavy capital cost but the investment would pay off in the long-run. "By desalinating seawater, drinking water can be made

available for about Re. 1 or even 50 paise a litre." However, care should be taken to treat effluents released from the plant. "Effluents from a desalination plant pose serious problems, but a variety of simple engineering solutions such as flash evaporation is available." Dr. Ravindran stressed the need to improve the storage capacity of water and guard against encroachments on lakes and rivers. He also warned against excessive withdrawal of groundwater from coastal areas as it would lead to heavy intrusion of seawater.

THE HINDU, December 9, 2003

Residents Protest Sewage Release into Lakes

Residents of more than half-a-dozen localities in and around Chromepet today observed fast protesting release of sewage into the Periya Yeri and Veeraraghavan Lake. The Tiruneermalai town panchayat is supplying water from the lakes to the residential areas.

THE HINDU, May 16, 2003

Expedience is Still the Norm in Waste Disposal

Although the Government has urged municipalities in and around the city to privatise collection and disposal of garbage, only a few have done so. Besieged with problems over land acquisition, most local bodies have found an easy way out – disposing of the waste on the nearest available land or in a lake. Rather than opting for scientific methods, many local bodies on the southern outskirts of the city have begun transporting garbage to a 15-acre site at Pallikaranai. The Alandur Municipality, which dumps garbage there, has been charged with strewing in the marshes refuse, affecting its fragile eco-system. The Pallikaranai marsh is one of the few nesting places for many birds and it attracts migrating species. The State Government acknowledges that urban local bodies have limited staff and vehicles, do not adopt modern methods of clearing garbage and face labour problems. Privatisation is being emphasised to take care of these problems, says the Municipal Administration department web site.

THE HINDU, December 5, 2003

Pollution of Pallikaranai Marsh Affects Adjoining Wetland

Severe pollution of Pallikaranai marsh is affecting nearby localities, including Sholinganallur and Perumbakkam. A relatively unpopulated stretch along Sholinganallur-Perumbakkam Road has become a garbage-dumping yard, a visit on Thursday revealed. Hundreds of rotten eggs were dumped beside rubber products, nylon bags and debris. Naturalists said that as a contiguous area of the Pallikaranai marshland, adjoining wetland also harbours a variety of aquatic life, besides birds. The ecology has already been disturbed with the setting up of many educational institutions close to the region.

THE HINDU, October 31, 2003

Voluntary Groups Protest Against Privatisation of Water

Strangers until yesterday, dozens of voluntary groups today got together in the Capital for a common cause. The cause – conservation of Ganga water. Today, we are together for an emotional cause. Dr. Shiva said, adding that the volunteers were from the towns between Haridwar and Tehri who had been working for conservation of the Ganga.

If it were the displaced women from Tehri, still seeking rehabilitation; the waterman, Rajinder Singh came down from Rajasthan and Sunder Lal Bahuguna chipped in his bit. The slogan today was "Suez, pay the full costs, or Quit India," to mark the Quit India Day. This is hijack of public investment, not a gift of foreign investment, the participants said.

THE HINDU, August 10, 2003

Sewer Connection Charges High: Residents

The councillors recalled that in September last year, the Council had rejected the Government's proposal to fix the house service connection charges at over Rs. 3,000 and unanimously passed a resolution that residents should not be charged more than Rs. 1,000. They felt it would be unfair to force assesses to pay another hefty sum, as "most residents just cannot afford to pay more than Rs. 1,000 for house connections". The actual cost of executing the house connections would work out to even less than Rs. 1,000. The Chairman, R. S. Bharathi, said the Rs. 27-crore project with private-public participation was the first of its kind in the country. The residents had contributed Rs. 8 crores and Rs. 2 crores had been earned as interest on this amount. He said the original cost was put at Rs. 34 crores and later pegged at Rs. 27 crores as the contractor preferred to bear the cost of the Sewage Treatment Plant of Rs. 7 crores on a BOOT basis. Meanwhile, residents feel they have been given a raw deal all along the project and seem to be a disillusioned lot.

THE HINDU, March 28, 2003

Local Bodies can do Without High-cost TWAD Board

At present, the Tamil Nadu Water Supply and Drainage Board maintains combined water supply schemes for the local bodies, apart from executing them. Given the recent emphasis on the local bodies managing supply on their own, in the wake of the Panchayat and Nagarpalika Acts, the existing arrangement is becoming outdated. Besides, voters in the local bodies are increasingly demanding that it is the primary responsibility of their representatives to ensure proper and adequate water supply. One reason why the necessity for reforms has arisen is that the local bodies, rural or urban, are becoming conscious of bringing down the cost they incur on several counts, including water supply. They perceive the Board as a "high-cost" service agency, says a government officer, who has observed the working of the local bodies. As of now, the dues to the Board from the local bodies are estimated to be around Rs. 200 crores, and for maintenance alone the annual cost is around Rs. 80-90 crores. Moreover, in the last few years, there has been a certain amount of cash flow into the local bodies, including village panchayats, because the concept of user-charges is being implemented through a levy of monthly charges and a one-time deposit at the time of sanctioning water connections. So, the local bodies come under pressure from their consumers to improve the quality of service. As a result, they are forced to look for "durable and economical" options when their business with the Board runs into rough weather. "Broadly, there are two options. One, form exclusive wings for water supply and strengthen them. Two, establish separate water utilities for bigger local bodies, say Coimbatore, as in Chennai, or create them in every region." Suggests another officer.

Regulatory Commission

Also, there is need for the establishment of a water regulatory commission, similar to the State Electricity Regulatory Commission, so that there will be transparency in the working of service providers. Consumers will also come to know how much it costs per litre to produce potable water and how the cost is determined. However, another section of experts is of the view that the space for the Board cannot be eliminated, at

least for the time being. When the water source for many local bodies is located outside their jurisdiction, the need for an agency like the Board arises, as the source development and water supply become the responsibility of that organisation. Private companies may be reluctant to enter the area, as they cannot recover their investment in 10 years, because of high investment. For instance, in the Vedaranyam combined water supply scheme, the cost of production is estimated to be around Rs. 30 per kL. Otherwise, the cost ranges from Rs. 7 to 23. So, the concession period has to be a minimum of 30 years. The message in the reforms is clear: water is no longer a free commodity. So, the service providers, given their financial conditions, are under compulsion to recover the cost from users.

THE HINDU, November 23, 2002

Rotting Cities

The signs are ominous. Road rage claims another victim. Riots over water and electricity. Ever-increasing crime. Gaurav Vivek Bhatnagar on the growing manifestations of urban anger.

THE HINDU, May 11, 2003

Govt. Public have A Vital Role in Controlling Gastric Disorders

The Government and the public together had an important role to play in controlling gastric disorders, the Tamil Nadu Health Minister, N. Thalavai Sundaram, said today. The Government also had a crucial role in providing clean drinking water and in disposing waste so as to restrict the incidence of gastric problems, he said, adding that the public had to be an equally responsible partner in maintaining a safe environment.

THE HINDU, November 21, 2003

8. GROWTH SCENARIO 2021

The present situation in WSS is sure to deteriorate as population increases in the peri-urban areas. The increases in the two PUI town groups have been much higher than in the city and this high rates are expected to continue into the next decades.

8.1 Valasaravakkam Group

This group of towns has grown at the rate of 68% during 1991-2001. A study to extend water supply from Metrowater has projected the population of three constituent units viz. Valasaravakkam, Porur and Ramapuram alone with 200,000 in habitants in 2011. These peri urban localities are growing at a faster pace than the city areas. The proposed land use for the group of towns indicates increases in residential uses. Considering the present low densities and high growth rates, the future population levels will be high.

Assuming even the growth rate of 68% growth between 2001-11, this group is expected to have a population of 188,965 by 2011. Trends in occupational structure indicate a higher proportion

of employment in construction, industries, services and these are expected to increase the proportion of poor for which these are traditional and lower wage employments.

8.2 Kottivakkam Group

This group of towns has grown at the rate of 54% with a higher growth rate in Neelangarai and Injambakkam. The population of Kottivakkam, one of the constituent units, has been estimated at 60,000 for 2001-11. The proposed land use for this group indicates increases in residential and recreation uses. Considering the population of this area for higher income residents and tourism related activities, the population growth rate can be expected to be much higher than 1991-2001. Considering a growth rate above 100% for two constituent units the population in this group may be expected to be in excess of 100,000 by 2011. The two main uses namely upper income residential uses and recreation and institutional uses are bound to increase the work force in construction and services. As in the case of the Valasaravakkam Group, the proportion of poor here is also bound to increase by 2011.

Such increase in population would impact more severely on the living conditions of the poor given the fact that local water availability is limited, the percentage of poor will be higher and tourism and construction activities in the area will require additional quantities of water.

8.3 Opportunities in Environmental Services

There are no large initiatives by enterprises or the community to bridge inadequate public water supply and sanitary services for the poor. However, initiatives exist for supplying water to the higher income groups through tankers operated by individual private entrepreneurs or small scale enterprises.

Vermi composting on a small scale exists in both case study areas. In the Valasaravakkam area there is a small-scale private initiative for segregation of garbage and composting. Limited community initiatives exist to collect garbage in both areas, which provides employment for a few poor through house to house collection of garbage using pedal-driven tri-cycles.

There are a few tanker owners who are engaged in the evacuation of sludge and wastewater from septic tanks from residences of the higher income sections of the residence.

Small enterprises for packaged water exist in both areas. While there is a single enterprise in Valasaravakkam, there are several small enterprises in the Kottivakkam area and the adjoining coastal belt.

9. WSS IMPACT ON ENVIRONMENT

The direct impacts of WSS on the environment in the two areas are summarised below.

9.1 Valasaravakkam Group

- Deterioration in quality and quantity of groundwater due to over-extraction and existence of a large number of septic tanks and waste from industries.
- Garbage dumping and pollution around Porur tank which is part of the Metrowater distribution system.
- Adyar River that adjoins the southern boundary is subject to pollution by liquid and solid wastes.
- Movement of tankers pose traffic hazards and air pollution.

9.2. Kottivakkam Group

- Deterioration in quality and quantity of groundwater due to excessive extraction for local as well as city use and existence of a large number of septic tanks.
- Garbage accumulation on both sides of the ECR designated as a scenic road.
- Water logging on the landward side of ECR.
- Environmental degradation of the beach through improper waste disposal.

10. IMPLICATIONS FOR MANAGEMENT OF WSS

10.1 Present Status

Both study areas – Valsaravakkam Group and Kottivakkam Group - are village panchayat clusters (local bodies) that fall within the Chennai Metropolitan Area (CMA). Under the Chennai Metropolitan Water Supply and Sewerage Act 1978, the legal mandate for supplying water and providing sewerage and drainage services in the CMA is with the Chennai Metropolitan Water Supply and Sewerage Board constituted for the purpose.

The Chennai Metropolitan Water Supply and Sewerage Act was notified and the provisions of the Act has been brought into force with effect from 22 July 1978. The Board is attending to the growing needs of and for planned development and appropriate regulation for water supply and sewerage services in the Chennai Metropolitan Area with particular reference to the protection of public health and for all matters connected therewith or incidental thereto.

The Chennai Metropolitan Water Supply and Sewerage Board constituted under the Act commenced functioning from 01 August 1978. Employees of the government and local authorities - Chennai Municipal Corporation, Ground Water Division of the Public Works Department, Tamil Nadu Water Supply and Drainage Board within the Chennai Metropolitan Area - serving in connection with Water Supply and Sewerage System were transferred and absorbed in the services of the Board.

The Board's Mission is to enhance the health and quality of life for citizens in Chennai City and Metropolitan Area by providing them adequate supply of clean and good quality of water and safe disposal of sewage / waste water at a reasonable price. But, though infrastructure is available, due to severe policy, technical, financial and functional constraints the Board is far from achieving this mission even within the urban core of Chennai City, leave alone the peri-urban areas covered in the project study.

Consequent to the Constitution of India (Seventy-third Amendment) Act 1992 conferring certain powers, authority and responsibilities to the panchayats (inserted through the Eleventh Schedule) the Tamil Nadu Panchayats Act, 1994 was enacted with the objective of ensuring "greater participation of the people so as to make them institutions of self-government and for more effective implementation of rural development programmes."(citation reference?) Village panchayats are elected local bodies headed by a president. The duties and responsibilities vested with village panchayats include provision of 'drinking, washing and bathing' water as well as sanitary and drainage services to the inhabitants. Among the important tasks assigned to village panchayats under the Act are "the sinking and repairing of wells, the excavation, repair and maintenance of ponds or tanks and the construction and maintenance of water-works for the supply of water for drinking, washing and bathing purposes." (citation reference?)

This duplication of agencies for the provision of WSS services in the peri-urban areas of Chennai has resulted in confusion and the worst sufferers are the poor, particularly women and children. Though elected bodies have a 'mission' to serve the poor and the downtrodden, village panchayats lack infrastructure, technical competence and financial resources to undertake the tasks assigned to them in the Panchayats Act. Besides, treating these peri-urban entities as village panchayats and enforcing the Panchayat Act could have major adverse impacts on the WSS regime especially because these areas are growing fast and provision of WSS services at reasonable levels is beyond the capacity of village panchayats.

With the State Government Institution (Chennai Metropolitan Water Supply and Sewerage Board) and elected local body (village panchayat) virtually failing to deliver the most basic WSS services in the study area the alternative is to look at community, private sector or household initiatives. These initiatives are presently faced with several policy, legal, institutional and administrative restrictions and constraints. The typical case is the hegemony given to Tamil Nadu Water and Drainage Board (TWAD) for providing WSS services in areas adjoining Chennai city which include the study areas. Since TWAD Board's jurisdiction covers the whole state their performance in the promotion of WSS sources in peri-urban areas leaves much to be desired. These need to be proactively addressed and an appropriate WSS regulatory mechanism evolved and implemented if the poor in the peri-urban areas are to gain access to at least a minimum level of WSS services. And given the critical supply position of potable water in the CMA, regulatory emphasis should also focus on demand management and conservation.

In the context of increasing urbanization, rapid growth of informal settlements and rising levels of urban poverty in the CMA, it is essential that utilities, state and local governments develop coherent policies for water supply and sanitation services that explicitly target the poor and policy must be accompanied by resources to get the job done. Policy should also be supported by strategies that spell out the roles and responsibilities of the various institutions involved at both state and local levels, define long and medium-term objectives and outline institutional and regulatory frameworks that recognize the role of intermediate and independent providers. Strategies should also promote the development of appropriate standards, contracts and other necessary tools for reorienting the business of delivering water and sanitation services.

Like in many countries, in India water is also considered a basic right and addressing the needs of the poor is a stated objective of national and state policies. Despite this, policy statements on water supply and sanitation in a range of national and state policy documents (such as urban development, water supply, health, local government and environment) are inconsistent and/or contradictory. Typically, policies are quite general, classifying activities as either urban or rural, and failing to address, in explicit terms, those factors that hinder service delivery to poor households in informal settlements. It is often assumed that the needs of the poor will be met in the same manner as other urban or rural residents. In practice however, this is rarely the case given the very different characteristics of informal, sometimes illegal, settlements. The lack of explicit reference to the particular needs of the urban and peri-urban poor in water and sanitation policies has led to a lack of clear direction (or mandate) for service delivery institutions and, as a result, past approaches that bring little benefit to the poor continue to prevail.

Compared with water supply, policies regarding sanitation are even less detailed and many lack quantitative and qualitative objectives. Due to the multi-dimensional and diverse nature of sanitation services, institutional responsibilities are often complex and difficult to structure and a wide range of agencies may be involved with varying roles and responsibilities.

WSS policies should be supplemented by clear strategies that spell out, in specific terms, just how existing barriers will be removed and how business practices (rules, procedures, standards) will be changed to facilitate service delivery to the urban poor. In particular, outdated laws should be amended to reflect policy shifts and to remove legal constraints to policy implementation.

These in short are the implications for the regulatory management of WSS in the peri-urban areas that are part of the present study.

10.2 Constraints and Potentials

The principal constraints and potentials present for establishing an improved water supply and sanitation system are summarised below:

10.2.1 Constraints

- Fragmented local body jurisdiction
- Weak finances and governance of town and village panchayats
- Dependence on parastatal organisations for design and implementation of projects
- Absence of long term planning
- Inability of Metrowater to extend its jurisdiction beyond the city
- Piece meal interventions by Metrowater (Agency for City) and overlapping jurisdiction of TWAD (State agency)
- Limited resources of water
- Non-availability of landfill sites and facilities for disposal of wastewater
- Lower awareness and priority for sanitation

10.2.2 Potentials

- Willingness of panchayats to work together to devise common systems
- People willing to pay for services particularly for water
- Potential for building up awareness for health & environment
- Reasonable expectation of people on water supply
- Community involvement possible if properly motivated.
- Existence of good local sources (Porur tank in Valasaravakkam and good aquifer in Kotivakkam)
- Scarcity of water has brought in need for rainwater harvesting and conservation of water
- New players – small and medium entrepreneurs for supply of water to non-poor (tankers and packaged water).

CONCLUSION

One of the important issues to be addressed would be how to provide comparable standards in water supply as well as sanitation for the city and the peri-urban areas. This is important since these areas are the ones in which there will be a higher rate of growth of population. These areas would also be the areas where new economic activities will come up. If standards of infrastructure are lower than in the city the quality of life in these areas, health status and the economic levels of the whole metropolitan area will be in jeopardy. This will affect the poor more than other sections of the population.

At present water supply and sanitation in the city is administered by Metrowater, a statutory body armed with considerable human resources with possibilities for funding large schemes whereas in the PUI these are managed by local bodies which are financially weak and do not have sufficient qualified personnel. Metrowater is so much burdened with the city's problems that it has not been able to extend its services to the settlements outside the city within the

metropolitan area even though its mandate is supposed to cover the entire metropolitan area. It would therefore be necessary to explore institutional and delivery mechanisms that can service the PUI providing the same or similar level of services that are normally expected in an urban set up to enable provision of adequate and equitable supply to the poor and the lower income groups as also to small and medium enterprises providing employment opportunities for this section of the population.

ANNEX – 1

DPU - SUSTAIN PROJECT

SERVICE PROVISION GOVERNANCE IN PERI-URBAN INTERFACE OF METROPOLITAN AREAS

Name of the Interviewer:

Locality Name:
House No.

Family Size	**Sex**	**No.**	**Literate Read (R) Write (w) Speak (S)**	**Languages known**	**Occupation** (Specify Code No.)	**Family Income Per Month**		**Type of Dwelling**		**Nature of dwelling**	
No.of Adults	F					0 - 1000		Thatched		Own House	
	M					1001 - 2000		Tiled		Rented House	
Children below 18 years	F					2001 - 5000		Concrete (Independent)		Period of residence	
	M					5001 - 10000		Concrete (Flats)		No. of dwelling units	
						10000 and above		Others			

Occupation Code:

1. Domestic help
2. Daily coolie
3. Salaried (Private)
4. Salaried (Government)
5. Unemployed
6. Physical Labor
7. Others

II. WATER (Drinking)

Source (Please tick)		***Quantity***				***Hygiene*** *(Please tick)*		***Quality*** *(Please tick)*	
Open Well		No.of pots used	<5	5-10	>10	Do you boil the water?	Yes	Clear	
Bore Well									
Metrowater/Local Body							No	Colored	
Piped									
Street Fountain		No.of pots required	<5	5-10	>10	Is it suitable for cooking?	Yes	Sediment	
Tanker									
Sintex Tank							No	Chlorinated	
Packaged Water									

III. WATER (Washing)

Source (Please tick)		***Quantity Used*** (No.of pots)				**Quantity Required** (No.of Pots)		
Open Well		Bathing	<5	5-10	>10	<5	5-10	>10
Bore Well								
Metrowater		Clothes	<5	5-10	>10	<5	5-10	>10
Piped								
Street Fountain		Utensils	<5	5-10	>10	<5	5-10	>10
Tanker								
Sintex Tank		Car/vehicle/House Cleaning	<5	5-10	>10	<5	5-10	>10
Packaged Water		Cattle	<5	5-10	>10	<5	5-10	>10

IV DIFFICULTIES ENCOUNTERED

Cost (Rs.) per month	Water tax		Tanker			Domestic help		Electricity (motor)		Mineral Water	
	<50	>50	<10	10-30	30>	<50	>50	<50	>50	<100	>100

Time Spent per day	30 minutes	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours

Crowd	Yes	Community Regulations (Distribution)	Exists
	No		Does not exist

Men	Yes	Women	Yes	Children (Below18yrs)	Yes
	No		No		No

V RAIN WATER HARVESTING

Awareness	Yes	Existence	Yes	Method Used	Well	Borewell	Sump	Ground
	No		No					

VI SOLID WASTE DISPOSAL

How do you dispose the Garbage?	In the dustbin provided by the local body		Garbage collection vehicle	
	On the road / vacant plot		Within the compound	
	Burn			

Do you segregate the garbage before disposal?	Yes	No	Are you satisfied with the present disposal system?	Yes	No

VII HEALTH

Sickness	Jaundice	Cold	Wheezing	Malaria	Typhoid	Diarrhea	Others

Money spent on medicines	Below Rs 50 per month	Rs 51 to 100 per month	Rs 101 to 200 per month	Above 200
Doctor Visited	Private	Health Centre	Govt. Hospital	Others (Specify)

VIII		**SANITATION** **Toilet** (Please Tick)				**Disposal** (Please Tick)		**IX** **COMMUNITY DETAILS** (Mention Code) 1. Elected representative 2. Local Body 3. Association 4. Others	
Private (Limited Sharing)		Private (Dry)		Private (Flush out Latrine)		Sewerage		**Mention the key person in your locality who helps the community to secure water?**	
						Septic tank		Mention the key person in your locality who causes problems to the community to secure water?	
Public (Free)		Public (Pay & Use)		Field				Mention the most influential person in your community.	

DPU - SUSTAIN PROJECT

SERVICE PROVISION GOVERNANCE IN PERI-URBAN INTERFACE OF METROPOLITAN AREAS
INDUSTRIAL & COMMERCIAL ESTABLISHMENTS AND INSTITUTIONS

Name of the Interviewer: Name of the respondent:
Address:

I TYPE

Commercial	**No.of custemers** (circle app. #)	**Institutional**	**No.of users** (circle app. #)	**Industrial**	**No.of workers**(circle app. #)
Office	< 10 10 to 50 >50 >100 >!000	School	< 10 10 to 50 >50 >100 >!000	Small	< 10 10 to 50 >50 >100 >!000
Shops	< 10 10 to 50 >50 >100 >!000	College	< 10 10 to 50 >50 >100 >!000	Medium	< 10 10 to 50 >50 >100 >!000
Hotel	< 10 10 to 50 >50 >100 >!000	Religious Establishment	< 10 10 to 50 >50 >100 >!000	Large	< 10 10 to 50 >50 >100 >!000
Others (specify)		Others (specify)			

II EXTENT

Land	Tick app. answer	**Building**	Tick app. answer
< one ground		< 500 sq.ft.	
1 to 5 grounds		500 to 1000 sq.ft.	
>5 grounds		> 1000 sq.ft.	
> one acre		> 5000 sq.ft.	
If Larger (Specify)		If Larger (Specify)	

III WATER (Drinking)

Source (Please tick)		***Quantity*** *(specify)*		***Hygiene*** *(Please tick)*		***Quality*** *(Please tick)*	
Open Well		Used		Do you provide safe drinking water?	Yes	Clear	
Bore Well							
Metrowater/Local Body					No	Colored	
Piped							
Street Fountain		Required		Do the inmates bring their own drinking water?	Yes	Sediment	
Tanker							
Sintex Tank					No	Chlorinated	
Packaged Water							

III (a) Mention your satisfaction level on availability of drinking water - Unsatisfactory / Fairly Satisfactory / Satisfactory

III. WATER (Washing)

Source (Please tick)		***Quantity Used*** (Specify)		**Quantity Required** (Specify)
Open Well		Utensils		
Bore Well				
Metrowater		Toilet		
Piped				
Street Fountain		Garden		
Tanker				
Sintex Tank		Others (Specify)		
Packaged Water				

IV (a) Mention your satisfaction level on availability of drinking water - Unsatisfactory / Fairly Satisfactory / Satisfactory

V DIFFICULTIES ENCOUNTERED

Cost (Rs.) per month	Water tax	Tanker	Help	Electricity (motor)	Mineral Water

Please state the time spent on securing water (per day)	

Community Regulations (Distribution)	Exists	Does not exist

Who is involved in the work related to securing water?

Men	Yes	No	Women	Yes	No	Children (Below18yrs)	Yes	No

VI RAIN WATER HARVESTING

Awareness	Yes	Existence	Yes	Method Used	Well	Bore well	Sump	Ground
	No		No					

VII SOLID WASTE DISPOSAL

How do you dispose the Garbage?	In the dustbin provided by the local body		Garbage collection vehicle	
	On the road / vacant plot		Within the compound	
	Burn			

Do you segregate the garbage before disposal?	Yes	No	Are you satisfied with the present disposal system?	Yes	No

VIII HEALTH

Sickness	Jaundice	Cold	Wheezing	Malaria	Typhoid	Diarrhea	Cholera	Others

Medical Facilities	Private	Health Centre	Govt. Hospital	Others (Specify)

IX SANITATION

Toilet (Please Tick)						**Disposal** (Please Tick)	
Private (Limited Sharing)		Private (Dry)		Private (Flush out Latrine)		Sewerage	
						Septic tank	
Public (Free)		Public (Pay & Use)		Field			

X COMMUNITY DETAILS

Mention the key person in your locality who helps the community to secure water?	
Mention the key person in your locality who causes problems to the community to secure water?	
Mention the most influential person in your community.	

(Mention Code)
1.Elected representative 2. Local Body 3.Association 4. Others

DPU - SUSTAIN PROJECT

SERVICE PROVISION GOVERNANCE IN PERI-URBAN INTERFACE OF METROPOLITAN AREAS

Name of the Interviewer: Locality Name:
House No.

Family Size	**Sex**	**No.**	**Literate Read (R) Write (w) Speak (S)**	**Languages known**	**Occupation** (Specify Code No.)	**Family Income Per Month**		**Type of Dwelling**		**Nature of dwelling**	
No.of Adults	F					0 - 1000		Thatched		Own House	
	M					1001 - 2000		Tiled		Rented House	
Children below 18 years	F					2001 - 5000		Concrete (Independent)		Period of residence	
	M					5001 - 10000		Concrete (Flats)		No. of dwelling units	
						10000 and above		Others			

Occupation Code:

1. Domestic help
2. Daily coolie
3. Salaried (Private)
4. Salaried (Government)
5. Unemployed
6. Physical Labor
7. Others

Duration of stay

< 1 year
2 to 5 years
5 to 10 years
> 10 years

II WATER (Drinking)

Source (Please tick)		***Quantity used***	***Quantity required***	***Supply timings***	***Hygiene*** *(Please tick)*		***Quality*** *(Please tick)*	
Open Well				Existing	Do you boil the water?	Yes	Clear	
Bore Well								
Metrowater/ Local Body						No	Colored	
Piped								
Street Fountain				Requirements	Is it suitable for cooking?	Yes	Sediment	
Others (Specify)						No	Chlorinated	

II (a) Mention your satisfaction level on availability of drinking water - Unsatisfactory / Fairly Satisfactory / Satisfactory

III. WATER (Washing)

Source (Please tick)		***Quantity Used***		**Quantity Required**
Open Well		Bathing		
Bore Well				
Metrowater		Clothes		
Piped				
Street Fountain		Utensils		
Tanker				
Sintex Tank		Car/vehicle/House Cleaning		
Packaged Water		Cattle		

III (a) Mention your satisfaction level on availability of water for washing - Unsatisfactory / Fairly Satisfactory / Satisfactory

IV DIFFICULTIES ENCOUNTERED

Cost (Rs.) per month	Water tax		Tanker			Domestic help		Electricity (motor)		Mineral Water	
	<50	>50	<10	10-30	30>	<50	>50	<50	>50	<100	>100

Time Spent per day	30 minutes	1 hour	1 ½ hours	2 hours	2 ½ hours	3 hours

Who is involved in the work related to securing water? Men / Women / Children

V RAIN WATER HARVESTING

Awareness	Yes	Existence	Yes	Method Used	Well	Borewell	Sump	Ground
	No		No					

VI SOLID WASTE DISPOSAL

How do you dispose the Garbage?	In the dustbin provided by the local body		Garbage collection vehicle	
	On the road / vacant plot		Within the compound	
	Burn			

Do you segregate the garbage before disposal?	Yes	No	Are you satisfied with the present disposal system?	Yes	No

VII HEALTH

Sickness	Jaundice	Cold	Wheezing	Malaria	Typhoid	Diarrhea	Cholera	Others

Money spent on medicines	Below Rs 50 per month	Rs 51 to 100 per month	Rs 101 to 200 per month	Above 200

Doctor Visited	Private	Health Centre	Govt. Hospital	Others (Specify)

VIII SANITATION **Toilet** (Please Tick)						**Disposal** (Please Tick)		**IX COMMUNITY DETAILS** (Mention Code) 2. Elected representative 2. Local Body 3. Association 4. Others	
Private (Limited Sharing)		Private (Dry)		Private (Flush out Latrine)		Sewerage		**Mention the key person in your locality who helps the community to secure water?**	
						Septic tank		Mention the key person in your locality who causes problems to the community to secure water?	
Public (Free)		Public (Pay & Use)		Field				Mention the most influential person in your community.	

Annex 2

SLUM CHARACTERISTICS - CHENNAI CITY

The Census of India defines areas as slums where they are notified or recognised as a slum by the state or local government and compact areas of atleast 300 population or abut 6-70 households of poorly built congested tenements, in unhygienic environment usually with inadequate infrastructure and lacking in proper sanitary and drinking water facilities.

The Census of India in their census of 2001 has found that 25.6% of the population of Chennai (4.4 million) as living in slums. The more important characteristics of housing and access to drinking water and sanitation is given below to understand the characteristics in these slums.

	Chennai City		Valasaravakkam	Kottivakkam
	Slums	Non-Slums	Totals for Town group	
House Types				
Permanent	64.53	91.21	83.80	75.21
Semi Pucca	17.83	5.28	11.99	10.99
Kutcha	17.64	3.46	4.19	13.80
Dwelling Rooms				
One room	66.96	36.85		
Two	24.19	31.51		
Three	5.85	19.48		
> Three	2.17	12.85		
Ownership				
Owned	56.23	45.17		
Rented	40.38	53.45		
Others	3.39	1.07		
Access to Drinking Water				
Within	26.58	71.16	59.84	59.85
Near (within 500 metres)	54.78	23.93	36.60	39.15
Away (more than 500 metres)	18.64	4.50	3.56	1.00
Sources				
Tap	30.89	47.57	28.32	83.58
Hand Pump	42.50	31.36		
Tube Well	2.52	8.42		
Well	4.06	6.01		
Others	19.92	6.54		
Drainage				
Closed	56.00	87.76	60.75*	67.63*
Not Available	30.11	7.50	39.25	32.37
Open	13.88	4.27		
Latrine				
Available	65.70	87.95	72.82	48.50
Not Available	34.30	12.05	27.18	51.50

Source: Compiled from Census of India 2001

Annex - 3

Valasaravakkam Group – Environment of Porur Water supply Lake

Valasaravakkam Group – Dump yard

Valasaravakkam Group – Composting on a Small Scale

Valasaravakkam Group – Village Street

Valasaravakkam Group – Slum Environment

Valasaravakkam Group – Typical Sintex Tank

Annex - 4

Kottivakkam Group – Typical Well & Pump Room

Kottivakkam Group – Overexploitation of Aquifer

Kottivakkam Group – Flooding, Stagnation & Garbage on the land side of ECR

Kottivakkam Group – Degradation of the Beach Environment

Kottivakkam Group – Bullock drawn carts for garbage collection

Kottivakkam Group – Focus Group Meeting

Kottivakkam Group – Meeting with Elected representatives

Chennai's water woes

Indiscriminate use of groundwater and lack of conservation of rainwater are some of the reasons for the present water crisis in and around Chennai. PRINCE FREDERICK provides some food for thought on the occasion of World Environment Day.