



Water in Slums of Mumbai

View from the Field

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This report has been prepared by Dr. Padma Desai based on a qualitative study of slums in Mumbai to capture a view from the field on access to water supply and sanitation services. The study was based on studies in 10 slums in five wards of Mumbai. Dr Desai benefited greatly from discussions with the officials of the water Supply, Solid waste and maintenance Departments of P/N ward of MCGM, for willingly spending great amount of time. They also readily shared their insights and information. Most of all we acknowledge residents and natural leaders of numerous slums that were visited and local councilors for sharing their experiences and viewpoints. In the often hostile life that surrounds them, this easy acceptance of the prying questions gave priceless insights into their life and living conditions.

A detailed report titled 'Water and sanitation in the Slums of Mumbai: View from the Field' was prepared based on these studies. This paper has been prepared on the water supply situation in slums in Mumbai. A similar paper on sanitation services in Mumbai slums is also available.

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Background

Mumbai, a megalopolis of 12.4 million inhabitants, is the financial and commercial capital of India. It also straddles another reality – 41 per cent of its population stays in numerous slum settlements that dot the city (Census 2011). The Municipal Corporation of Greater Mumbai (MCGM) is entrusted with the herculean task of providing basic services to the entire city, including slums. The city's vision of achieving world class status mirrored in the Bombay First–McKinsey Report (2003) as well as the Chief Minister's Task Force Report (2004) admitted to fundamental gaps and suggested wide-ranging interventions. Although under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) a plethora of large scale projects are under way, promising to transform Mumbai, the city continues to grapple with acute service deficiencies on a daily basis.

This task is clearly made more challenging in its slum settlements due to the complex topographical, legal and eligibility issues that surround them. As admitted by the Human Development Report of Mumbai, "The major reason for degradation of city environment in slum areas is improper waste management, sanitation and inadequate water supply" (2009: 7). Two initiatives of the MCGM that attempt to ameliorate the most urgent problems faced by slum dwellers in gaining accessibility to water are the '**Stand Post Water Connection**' and '**Suction Tank Pumping Arrangement**'. Commencing

sometime in the mid-1980s and covering all notified slums, these localised improvisations have continued uninterrupted since then. Currently, under JNNURM's 'Basic Services to Urban Poor' they form the only strategy adopted by MCGM for including slums under its water supply network.

Under the PAS Project, a detailed report titled 'Water and Sanitation in the Slums of Mumbai: View from the field' was prepared for capturing the dynamics of water supply and sanitation services in slum settlements of Mumbai. The present paper is an abridged version of this report and concentrates on water supply. It analyses the decentralised system of water management that has actually emerged in slum neighbourhoods, the ensuing user group dynamics and the localised innovations that have organically responded to field realities. The report was prepared by covering 10 slums located in five wards of Mumbai. Data was gathered via numerous site visits, field level discussions and unstructured interviews with user groups, natural leaders in slums, Nal Committee secretaries, plumbers and elected representatives. Additionally, discussions were held with the officials of the Hydraulic Department of the MCGM in P/N ward. Desk review of literature connected to community driven, decentralised water supply systems in general, and the water scenario in Mumbai in particular, was also undertaken.



Introduction

Slums have been an integral part in the trajectory of Mumbai's growth. It was only in 1976, that the Government of Maharashtra (GoM) enumerated the number of slum pockets and hutments in Mumbai for the first time. It indicated 1671 settlements with 627,216 hutments housing a population of 2,864,000. Subsequently, as slums continued to proliferate, data was not compiled on a regular basis with the result that different agencies reported different figures.

For instance, Census 2001, pegged Mumbai's population at 11.9 million of which 5.8 million (48.8%) were slum dwellers. YUVA and Montgomery Watson Consultants Report the same year recorded a total of 1959 slum settlements housing 6.25 million i.e. 54% of the total city population (ibid, 'Situational Analysis': 2). Contrasting these figures, the 'Environmental Status Report for 2002-03' of MCGM reported 2245 slum pockets in the city (HRD, 2009: 58). In 2010, another official document of MCGM noted slum population to be 55 per cent of total (DRMMP, 2010: 36). The present Census (2011) reports 41.3 percent of city population living in slums whereas the 'Inception Report' of MCGM's Draft Development Plan, observes that 'over 55 per cent' of the city population lives in slums (MCGM, DP 2014–2024: 62). Such irreconcilable figures, possibly arising due to definitional issues, have come under much debate and controversy².

However, the stark reality of slums in Mumbai is hard to deny. Large and small slum colonies dot the entire city – close to marshes and garbage dumps, along creeks, mangroves, precariously balanced on hilltops or lining roads, railways lines and on open or litigated lands. Ninety-three per cent of these are notified, with 1995 acting as a 'cut off' date, implying secure entitlements under government programmes and safety against eviction.

Evolution of Programmes for Slums

A number of large scale programmes have been initiated in Mumbai to mitigate the problems of slums. Commencing from the earliest 'Clearance and Relocation' policies of the 1970s, which resulted in large scale city-wide demolitions, the

government's approach gradually moved towards in-situ upgradation and sites and services. In the 1980s, this was mirrored in the World Bank-aided 'Bombay Urban Development Program' (BUDP) that made a strong case for granting land tenureship to and recovering costs from slum dwellers. A parallel 'Prime Minister's Grant Programme' (PMGP) predominantly focusing on the sprawling slum of Dharavi included a plethora of objectives ranging from upgradation and relocation to dispersal of hazardous industrial activity and re-creation of a central industrial zone in this slum. The PMGP made meagre insistence on cost recovery. The BUDP's upgradation component was difficult to implement due to reluctance to transfer land ownership to community-based organisations (CBOs) and recover costs from beneficiaries, whereas the PMGP remained mired in fluctuating targets and approaches (Desai 1999; Desai 2001).

In the mid-1990s, another World Bank-aided programme, the 'Slum Sanitation Program' (SSP) formed a small part of the larger intervention of the 'Mumbai Sewage Disposal Project' (MSDP). The SSP had many innovative features: it set superior service standards and proposed partnerships between government departments, non-governmental organisations (NGOs) and beneficiary CBOs. This demand-driven approach, expected to result in community buy-ins, was to pave the way for a sustainable urban sanitation intervention. At present, the SSP forms the only model for sanitation delivery in slums.

The latest 'Slum Rehabilitation Scheme' (SRS) heralds private sector entry into slum redevelopment, by Floor Space Index (FSI) incentives and the concept of Tradable Development Rights (TDR). These twin goals are expected to release encroached land resources whilst simultaneously creating housing stock not only for rehabilitating slum dwellers but also the middle and higher income groups of Mumbai. With a slow momentum, the SRS continues to struggle with procedural eligibility issues and deadlocks (Desai 2009).

All the above large scale city-wide programmes had a limited impact. Residents of the sprawling slum settlements continued to struggle with actual, day-

¹For instance, three definitions of slums – Notified, Recognised and Identified – are used to demarcate slums either according to specific statutes, physical habitation and service levels or size (60–70 households). However, National Sample Survey 65th Round has recognised a much smaller cluster (20 or more) as a slum, thereby including dispersed and/or smaller slum settlements in its ambit.

²Some scholars have cautioned against this elasticity in reporting slum figures and noting that underlying definitional shifts effectively exclude smaller-newer clusters and inadvertently smoothen out the increased vulnerability of evicted and displaced households (Bhan and Jana 2013).

to-day problems in gaining accessibility to basic services. To ameliorate this, the MCGM devised a decentralised system of water supply sometime in the 1980s via two improvisations: the 'Stand Post Water Connection' and 'Suction Tank Pumping'. In recent times, the most decisive initiatives for Mumbai under the JNNURM umbrella are aimed at reform and efficiency in delivery mechanisms. Along with augmenting city-wide water and sewerage networks, 'Basic Services to the Urban Poor', an important component of JNNURM, recognises the efficacy of the '**Stand Post Water Connection**' and '**Suction Tank Pumping**' arrangements. Thus, these emerge as the only models of water supply currently adopted by the MCGM for all notified slums. A snapshot of the major programme interventions for slums in Mumbai is presented in Figure 1.

MCGM's 'Stand Post Water Connection' Scheme

Water supply, an obligatory duty of the MCGM, is

managed by the Hydraulic Engineer's Department, overseeing a huge distribution network of water supply to around 3,767,136, mostly domestic, consumers (Census 2011). A gravity-based system, it receives around 3,600 million litres per day (mld) from six lakes, with an average supply of around 240 to 250 litres per capita per day for a duration ranging for 24 hours to 90 minutes depending on the zone, topography and type of consumers (DRMMP 2010). Making water accessible to notified slums, given their highly dense and undulating character with a maze of criss-crossing lanes, is a technical and physical nightmare for the MCGM. It's 'Stand Post Water Connection' scheme is a practical response to this difficult ground reality. Within a simple operative framework, it allows five to 15 eligible households to form a 'Nal Committee', (Committee), appoint a 'Nal Secretary' (Secretary) and apply for a metered group water connection.

A prescribed procedural format outlines the overall

Figure 1: Timeline of major programme interventions for slums in Mumbai



process to be followed by Committees. The MCGM's role is strictly limited to giving water supply from the nearest Mains to an agreed upon common location in the slum cluster. Thereafter, field level extension of the feeder network by appointing a certified plumber, logistics of actual supply as well as management of the water collective is the responsibility of Committees. A subsidised water tariff of Rs 2.25 per 1,000 litres with additional 60 per cent sewerage charges is levied on all such connections. Currently, 1.62 lakh such metered stand post connections are being successfully managed through community water collectives (www.mcgm.gov.in).³ As noted in Table 1, close to 93 per cent of slum residents have access to treated tap water, the majority of which (that is, 97.4 per cent) is within the premises.

Procedural Requirements for 'Stand Post Water Connection' Scheme

Specific procedural requirements for availing water under this scheme include: documents establishing eligibility, total water requirement, category, type and charges of connection, resolution by Nal Committee, preliminary location sketch of connection, tentative physical details of distribution network at slum neighbourhood level and distance from the nearest Mains. On receipt and basic scrutiny of application, a field examination and verification is carried out by a Junior/Sub Engineer at the ward level. Parallely, the validity of submitted documents, technical viability of network and approvals from drainage and road departments are also secured. The average time taken for the sanctioning process is about 45 days with likely delays due to monsoons. Insufficient documentation or gaps in information are bridged by repeated visits to the ward office by the Secretary-plumber duo.

Release of Work Order to compliant schemes grants a metered connection at the slum cluster level. Thereafter, a mini-distribution network is extended to each member household with a lead taken by the Secretary by appointing a certified plumber. For this purpose, a one-time contribution in the range of Rs 2,500–3,000 (at 2009-10 prices) is raised from each Committee member. The ward office releases water only after payment of security deposit, meter fixing charges and compliance to all conditions mentioned in the Connection Order. The process mapping of 'Stand Post Water Connection' scheme is presented in Figure 2.

The 'Stand Post Water Connection' scheme of the MCGM responds to the complexities of Mumbai slums and embodies a realistic approach to cover notified slums under its water supply network. It is a simple participative format that draws upon the collective spirit already existing in slums. Field visits and discussions with Nal Committee members, Secretaries, natural leaders as well as officials of Hydraulic Department of the MCGM reveal that in some cases it functions as originally conceived; in others, it has responded to ground conditions and thrown up innovative models. In most cases, over a period of time, Secretaries and users have organically evolved a mutually interdependent pattern that responds to the unique challenges that confront them on a day-to-day basis. A discussion on the models that are observed in the slums of Mumbai now follows.

Water Supply in Slums: View from the Field

Model One:

Original format: 'Stand Post Water Connection' scheme catering to 5–15 households

Some slum clusters retain the original format of the scheme as conceived by the MCGM. In this, an



enterprising community member, a natural leader, capitalising on the water scarcity in the cluster, mobilises a group of about 15 eligible households and initiates the process of availing a metered stand post water connection. Oftentimes, creating a workable user group of members that live in close proximity to each other is a back and forth, time consuming and organic process. It entails not only raising the required funds for the internal feeder network but also assessing the paying capacity of potential user-

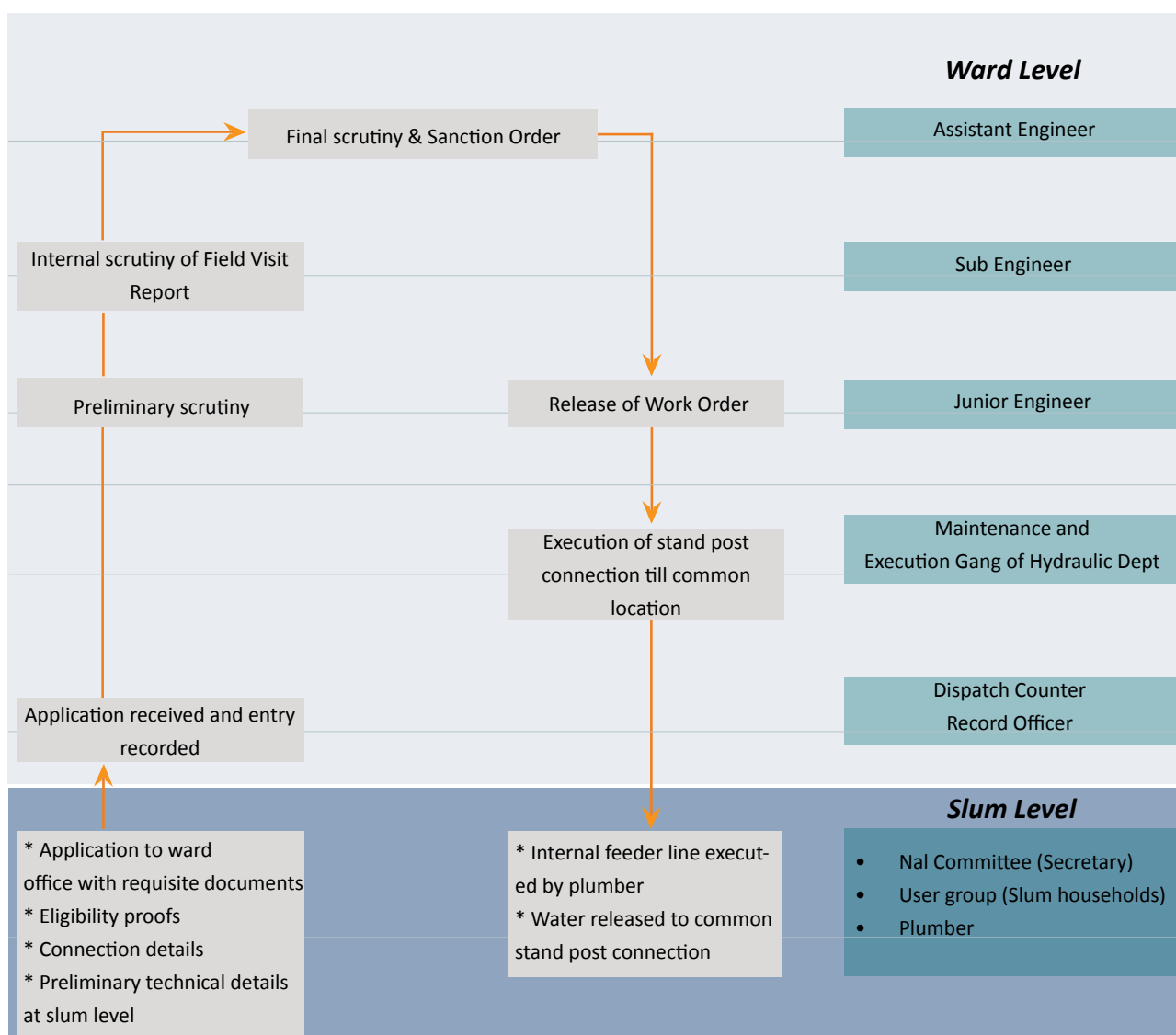
³ Two features distinguish such connections from the other, legal ones of the city – (1) Section 92 of the BMC Act under which such connections are granted; and (2) the water tariff. Although their modalities are drastically different, MCGM does not delineate between Stand Post Connection Scheme and the Pumpset Yojana, described subsequently.

Table 1: Water supply in slums: Location and Source

S. no.	Location of Source (%)	Main source						Total
		Tap water: Treated (%)	Tap water: Untreated (%)	Well (%)	Hand pump (%)	Tube well (%)	Others (%)	
1	Total	92.8	3.3	0.5	1.1	0.3	1.9	100
2	Within premises	97.4	1.9	0.2	0.4	0.1	0.0	100
3	Near premises	86.3	5.6	0.6	2.1	0.7	4.8	100
4	Away	62.1	10.8	4.8	6.2	1.7	14.4	100

Source: HH-6: Slum Households by Main Source of Drinking Water and Location, Tables on Houses, Household Amenities and Assets, Census of India (2011)

Figure 2: Process mapping of 'Stand Post Water Connection' in slums of Mumbai



members for the recurrent water bills. At another level, this natural leader also initiates a parallel process of identifying a certified plumber, collecting relevant documents to comply with all procedural requirements and, once submitted, following-up the 'file' at the ward level.

On sanction, a metered connection from the nearest city Mains is laid by the ward level at a common slum location. Thereafter, internal feeder lines extending



supply to member households are executed by the appointed plumber by raising a one-time contribution in the range of Rs 2,500 to Rs 3,000 from each household. In this initial stage, the Secretary and plumber orchestrate the entire follow up and execution of water supply at the micro, locality level and thus emerge as important intermediaries. The pre-eminence of the Secretary continues, as (s)he manages the day-to-day logistics of supply, resolves conflicts amongst users, represents the Committee at the ward level in case of problems in supply and finally collects water charges from members on receipt of water bill from the ward level.

In some older slums, a slight variation in this format



is noted. In these cases, although the overall group size is maintained (that is, 15 members) the member composition has changed – that is, original members have given way to newer (often ineligible) members due to 'selling' or renting of hutments in the cluster. Such new entrants are accorded the same status as the original ones. The ward office does not collect any data on such membership 'turnovers'; it is concerned only with punctual bill payment. Meters are often kept under lock and key.

Over time, in a majority of the Nal Committees, a workable self-organizing supply system has evolved such that even during times of erratic and/or inadequate supply a mutual rationing protocol is maintained. Water bills, usually issued every three months, are freely circulated amongst users for member contributions. Leakages or problems revolving around quantity of water are informally resolved at the user group level mediated by the Secretary. However, for recurring problems representations are made by the Secretary at the ward level either directly or via the local councillor. Indeed, the actual day-to-day operations of this water collective display a highly participative nature.

Model Two: 'Scaled Up' version of 'Stand Post Water Connection Scheme' catering to 70–80 households

In a variation of the basic format described above, the second model that is noted at the field level scales up supply to almost five times its originally sanctioned membership base. In this modus operandi, once again, under the leadership of the Secretary-plumber duo, a Nal Committee is formed representing a smaller, eligible user group of 15 to 20 households. All procedural requirements outlined by the MCGM are followed in the application process. Once sanctioned, internal feeder lines are extended



to about 70–80 households (three or four internal lanes with 20–25 households each) with a one-time contribution of Rs 3,000–3,500 from households. Ineligible households, mostly tenants, late entrants or those without the required documents, are part of this expansion. Although varying due to site conditions, in a typical scenario, the total cost of the entire internal feeder system is reported to be in the range of Rs 150,000 to Rs 225,000. In some slums the meter is secured via localised contraption, as indicated below, to protect it against rain.

In this model the water bill, not freely circulated amongst user members, ranges between Rs 200–300 and sometimes also includes extra ‘management’ charges. A variable, such discretionary ‘overheads’ are sporadically levied by the Secretary to



compensate for his/her time and effort invested in mediating between the ward office and slum collective, resolving conflicts, paying bills and for the general management of water supply. No differential pricing is noted amongst

‘eligible’ and ‘non-eligible’ users in this model. Clearly, the Secretary, an enterprising individual, captures the need of a relatively high number of non-eligible members in a slum cluster and links them to the already existing water supply format of the MCGM. The ward office, aware of this reality, is not directly involved with such field level dynamics.

Model Three: ‘Operator-Customer System’

Unlike the previous two models, the third innovation observed on the field is that of an ‘Operator’-managed water distribution network. In this, a monopolistic control on the water resource is exercised by natural slum leaders in a slum cluster. The same procedure for supply under group water is followed by forming a small eligible membership base. However, once the water connection is granted and a meter installed at a common location by the ward office, the system that emerges bears no resemblance to the original format. In it, unlike the previous models, no internal feeder lines are laid. Instead, natural leaders turn into water vendors, supplying water via flexible PVC pipes in zones controlled by them. The physical layout of internal

streets marks out their ‘territories’ for supply. Under this system households are granted access to water via a rotation system, that is, when members in one lane are covered the PVC pipe is shifted to the adjoining lane. Distribution via a flexible pipe accords a monopolistic and a clear-cut territorial control of the operator on the water resource. This system is observed in localities with a vibrant rental market with high turnovers with ‘imala-maliks’ substituting as water vendors.

As a natural corollary, a participative user collective, seen in the previous two models, is completely absent here, substituted instead by a hierarchical operator-customer relationship. The actual logistics of distribution embodies a resilient system that quickly responds to field level realities. For instance, in lean periods, both duration and quantity of water is shortened – with a corresponding adjustment in water charges. The water bill received from the ward office is shrouded in secrecy as the bill amount has no co-relation with the collections. A fixed monthly water charge, as part of the rents, is collected from tenants. In fact, the entire logistics of this arrangement functions within an opaque system as information sharing, especially related to finances, is not encouraged.

Yet, this is not entirely a hostile pattern of service delivery. The users view water vendors-operators as providing them with a valuable basic service that is otherwise denied to them due to their ineligible status. Many community-level disputes are resolved by these operators who may often extend support in times of distress. They also double up as powerful intermediaries having a close proximity to political leaders, field level bureaucracy and NGOs.

The MCGM’s ‘Stand Post Water Connection’ scheme, in operation since the 1980s, represents a practical response to the complex realities found in Mumbai slums. By devising this decentralised model of delivery, the MCGM has effectively circumvented the monumental challenges of water provision in slums. Indeed, these three models have harnessed the ingenuity of natural leaders as well as user groups and displayed many common features. Some of these are discussed here.

A Kaleidoscopic Reality: Parallel ‘User Groups’ and Models

In the sprawling slums of the city, parallel water collectives operate in close proximity to each other with their own Secretaries, user members and coverage areas. In a kaleidoscopic reality, criss-

crossing lanes in any cluster have small and large Nal Committees operating within their delineated areas with clear allegiance of members. However,



a wide variation in supply is observed with some pockets enjoying higher water pressure and quantity whereas others facing acute shortages. Different factors – such as slope or elevation, total number of users, water leakages in the feeder as well as Mains,

illegal tapping and age of the distribution network – seem to have a bearing on the water availability. Long standing deficiencies compel users to resort to a number of coping mechanisms – like devising an internal rationing system, regrouping to form smaller Nal Committees and reapplying for the same, relaying the distribution network at a lower level or installing pumps.

As with parallel user groups, a multiplicity of parallel models are also found in slum clusters, once again, operating in close proximity to each other.



These appear to emerge out of the composition of members in the water collectives. For instance, older slums with more embedded networks of solidarity and entitlement tend to display Model One and, to an extent, Two; whereas Model Three operates

in shifting rental markets of neighbourhoods with high turnover and thus temporary residents. In this dynamic slum reality, overlaid circuits of distribution emerge – adopting different models of supply and having different secretaries and user groups – with an informal demarcation of turf and control. Thus, at the field level, water supply certainly does not follow an optimal distribution pattern, but rather operates with a superimposition of networks, each displaying different time periods and user profiles.

A scenario far removed from the Models discussed so far is the MCGM's 'Suction Tank Pumping' arrangement (Pumpset Yojana).

Model Four:

MCGM's 'Suction Tank Pumping Arrangement' (Yojana)

The gravity-fed water supply system of Mumbai is unfeasible for slums situated on hilly, undulating lands, deemed 'difficult' by the MCGM. In such slums the MCGM has come up with another local improvisation, called the 'Suction Tank Pumping Arrangement' (Yojana). Not only is it tailored for the specific topographical features of such slum localities, a Yojana also creates a large distribution network, unlike the previously discussed models, covering anywhere between 300 to 1,000 households. Within a complex supply system, water from the MCGM's Mains is connected to base level storage and pumping systems of the Yojanas, which in turn operate and manage the gigantic distribution network in their slum areas.

The modalities of the Yojana differ significantly from the previous models. Herein, a registered 'Apex' CBO emerges as an intermediary between the ward office and the water collective members. A capital



intensive proposition, the technical and financial viability of a Yojana necessitates a large membership base as well as coverage area. For instance, for a small user group the considerable upfront costs

(for storage tanks, pumps and distribution) as well as subsequent operation and maintenance (O&M) costs are impossible to bear. On the other hand, too large a size potentially creates a complicated operational set up vis-à-vis actual day-to-day logistics and management. Hence, here too, akin to the previous models, the role of natural leaders is critical. They initiate the long process of mobilisation at multiple fronts, that is, convincing community members; gathering required documents, following procedural requirements at ward office, engaging a licensed plumber as well as soliciting financial aid

from political leaders and NGOs. The final emergence of a Yojana, under an Apex registered CBO, piloting smaller (even unregistered) CBOs, represents the most prudent and workable membership base as well as coverage area.⁴

Although this model adheres to the same procedural requirements as the previous models, the role of the ward office is enlarged to include technical-physical evaluation of the Yojana, that is, base location and its distance from the Mains; storage capacities and options; street pattern in distribution area; right of way issues (if network passes through larger city roads); soil characteristics and its impact on costs; pressure zones; network optimisation and overall water requirement. It also covers reviewing layout designs, pipe sizing, pumping, storage tanks and their carrying capacities, etc. This reconnaissance of field realities is done within an informal, consultative setting by the ward officials and does not involve preparing systematic feasibility reports. The main catalysts driving this process are the Apex CBO leaders and the plumber by orchestrating numerous visits to the ward office, seeking appointments with the Junior Engineer/Assistant Engineer (JE/AE), incorporating suggestions and parallelly, maintaining high interest at the slum level with selective information sharing with them.

After receipt of security deposit from compliant Yojanas, the Construction Division of the Hydraulic



Engineering Department executes the water supply network, connects the inlet to the sump and installs a single bulk meter. After this, a wide gamut of tasks that follow at the slum level – raising finances, procuring material, executing the internal distribution network and finally operating and maintaining the water supply – are completely handled by the Apex CBO. With larger Yojanas costing around Rs 1.4 million and smaller around Rs.5 million,⁵ self financing is

impossible with the result that multiple sources are tapped, that is, – contributions from members, aid by political leaders and NGOs. This rather complex and decentralised model of water supply, according to the Human Development Report for Mumbai, operates all over the city in areas deemed difficult by the MCGM (GOM 2009: 72). Indeed, in P/N ward that was covered, close to 34 such Yojanas are believed to be in operation, covering thousands of households.⁶

Logistics of Operation

In supply hours, water released from the Mains by the ward office is first stored in storage tanks at the base location. The actual motorised pumping operation commences after a gap of 30 minutes following a practical distribution pattern wherein



the entire coverage area is divided into zones depending on their elevation and distance

from the base pump. Valves to the first zone – hutments at the foothills and closest to the pump – are opened first and closed after a fixed time, with a corresponding release in the next zone. The entire distribution area is thus covered via this sequential pattern, finely calibrated by valve operators. The ward office has no role to play in this internal distribution of supply. Valve operators as well as members keep informal checks on indiscriminate usage, which is quickly detected if households in previous zones continue to use water beyond their allocated time, as the water pressure drops drastically. In some cases, taps in previously covered zones are physically locked! In addition to water bills, the O&M costs, borne by members of this water collective, include electricity bills, salary of valve operators, minor/major repairs and miscellaneous expenses of CBOs. Detailed monthly audited records are maintained by the Apex CBO.

Indeed, the Pumpset Yojana Model with its locational uniqueness is a model of water distribution sanctioned by the MCGM, as special case in difficult areas, only under a registered, Apex CBO format. Substantial investments are required, both for

⁴Establishing this workable 'threshold size', that is able to balance partnerships between multiple CBOs and their large membership, is a time-consuming process at the field level and emerges after numerous trials and false starts.

⁵A similar cost is noted by Remi De Bercegol and Adeline Desfeux (2011).

⁶As recounted by AE. Considering 34 Yojanas with an average membership size of 300 households, a total population of 51,000 is covered. The ward office does not maintain separate records for the previously covered 'Stand Post' and the Pumpset Yojana models.



creating as well as the operating such Yojanas. The actual water supply logistics also necessitate a fair bit of sophistication. Thus, CBOs emerge as one of the most important actors in

Yojanas and display a high level of mobilisation and management skills.

Pumpset Yojana: Shri Krishna Sewa Mandal, Tanaji Nagar

Registered in 1991, this Apex CBO heads about 11 smaller CBOs for the Yojana. Spread over an undulating topography, the gravity-fed water supply of the MCGM does not reach this slum. In the initial years, residents underwent acute hardships, often travelling long distances to collect water. Ultimately, in 1991 under the leadership of two enterprising local leaders, about Rs 3 million was raised from contributions from members as well as substantial financial support by a councillor, MP and a prominent builder. At present, the MCGM provides water to three tanks with storage capacities of 7,500, 10,000 and 15,000 litres. Following a lag of half-an-hour, the distribution to about 300 households is calibrated in six zones by two valve operators. Monthly expenditure of the Yojana that includes the MCGM's water bill as well as O&M costs and electricity bills amounts to Rs 53,000. This is distributed equally amongst all members of the water collective, with each household contributing an average of Rs 180/month. Collections by smaller CBOs are deposited with the Apex CBO that maintains audited accounts.



Source: Author

Table 2: Group Water scheme: A comparative overview of different models

	Model One (original format)	Model Two (scaled up version)	Model Three (monopolistic control)	Model Four (Pumpset Yojana - for slums on undulating lands)
No. of members (households)	5–15	80–90	70–100	300–500
Presence of ineligible members	Less likely	Mix of eligible and ineligible	Very high proportion of ineligible	Mix of eligible and ineligible
Average yearly water charges per household	Rs 640	Rs 800 –1,200	Rs 3,000–4,800	Rs 2,200
Role of ward office	Non-existent	Non-existent	Non-existent	Extends technical support
Internal distribution feeder network	½" GI pipes	½" GI pipes	Flexible PVC pipes	6"; 3"; 1/2" GI pipes
Duration of water supply	2–3 hours	2–3 hours	30 minutes	30 minutes to 1 hour (by MCGM; 2–3 hours by Yojana CBO)
Relative participation of members	High	Moderate	Non-existent	High

Source: Author

Emerging Lessons

For the MCGM, the operational reality of making water accessible to close to half its population that resides in slums is daunting. ‘Stand Post Water Connection’ Scheme and ‘Suction Tank Pumping Arrangement’ embody practical responses to cover slums under its supply network. Designed within a simple operative format of Nal Committees and Apex CBOs, they cover 93 per cent notified slums of Mumbai and emerge to be a highly effective intervention. Their actual field dynamics throw up a number of innovations that respond to ground realities. Some critical features are highlighted below.

Role of ‘Nal’ Secretary (Natural Leader)

The MCGM recognises the water collective solely via the Secretary (by virtue of his/her name on the water bill), which automatically creates a hierarchical relationship in the field. In fact, in the initial stages the Secretary-plumber team emerges as a fulcrum around which a plethora of activities revolve. Over time, the logistics of supply, management of the collective as well as interface with the ward office, is almost fully handled by the Secretary. Despite this, Models One and Two largely operate within a participative format. However, this turns into monopolistic control in Model Three, wherein the Secretary doubles up as an entrepreneur-water vendor with distribution via flexible PVC pipes. In the Pumpset Yojana, the core team members (office bearers of CBOs) orchestrate a far larger water distribution operation of a correspondingly large user group displaying a high level of management and logistical efficiency.

Emerging as the only ‘official’ link between the ward office and user group, the Secretary’s role is not limited exclusively to water management. A natural leader, (s)he resolves many other problems that slum residents face – choked drains, overflowing toilets, unpaved internal streets, non-functioning street lights, personal disputes, financial distress, etc. Often doubling up as a ‘karyakarta’ (functionary) of a local political party, in recent times the Secretary has also emerged as an important negotiator with builders/developers for SRS. To a large extent then, information pertaining not only to water supply but also other schemes and decisions of the MCGM is mediated via these natural leaders.

Ward Office and User Group Interface

The non-involvement of the ward office in the

daily logistics of supply to members (including to ineligible ones in Models Two and Three) is an official policy.⁷ Tacitly accepted by user groups, minor problems revolving around water quantity/cuts, timings, quality, leakages are resolved at the community level itself. However, severe shortages or erratic supply over a long period of time emerge as ‘real’ problems and get represented at ward office via different mediums – that is, direct and constant representations by Secretaries, written complains, pressure via local councillors and, in a few cases of acute deficiencies, public processions. The ward office, in turn, responds to the matter depending on the perceived gravity of the situation. Severe complains pertaining to the overall distribution network, likely to affect a larger neighbourhood (both slum and non-slum) require urgent attention and are taken up on a priority basis. Thus, there appears to be a notional demarcation of ‘level of involvement’ for conflict resolution – field disputes handled at the community level whereas larger network gaps at the ward level.

User Group Choices

In all the models, user choices appear to be limited. For individual households to opt out of a model that is acceptable to the entire slum cluster implies hardships vis-à-vis access, quality, cost and quantity of water. Thus, the overall Nal Committee format is tacitly accepted by slum dwellers as it at least assures accessibility to water, a basic necessity. In Model Three, user groups have no control as water brokers manage and exclusively control this resource. Prevalent in situations where the slum rentals are high, there are no user groups, only users! However, in Models One, Two and Four, the day-to-day logistics, supervised and monitored entirely at the micro group level, is based on personal dynamics – neighbourly ties, long shared history, locational proximity, common conditions of living and common insecurities.

Participatory Nature in Day-to-day Functioning

Within the range of models, levels of participation vary extensively. The highest user group participation in day-to-day functioning is noted in Models One and Four; in Model Three it is non-existent, whereas Model Two falls in the middle range of these two extremes. Concomitantly, water as a resource is tightly controlled in Model Three; with the rest having a largely representative and personalised day-to-day framework of operation. Except for Model Three, the ‘eligible’ and the ‘ineligible’ groups of the Nal Committee don’t share an impersonal

⁷ An overall formal policy of the MCGM, this applies even to the other ‘legal’ connections of the city. Here too, the MCGM is not involved with the internal feeder network at the building and household levels.

or hostile relationship. Staying in close proximity to each other, facing similar adversities and often sharing similar socio-economic backgrounds, close contact and reliance on each other is evident. Thus, resorting to self initiated water rationing, devising a workable pecking order in accessibility, lending support to households facing severe shortages and representations at ward office for longstanding cuts – capture the ever-changing realities of user relationships and the informal solidarity often displayed within it.

Parallel Networks

As noted earlier, in sprawling slum localities superimposition of all the first three models, each with a different Committee and Secretary is evident.⁸ This multiplicity creates a maze of criss-crossing distribution networks overlaid on each other, often also on open drains. The two critical reasons for this are: different time zones of laying networks and the varying dynamics of user group mobilisation. Admittedly, this leads to considerable inefficiencies as it does not offer an optimal water distribution network. It is not a free market in the true sense; households also cannot easily change from one user group to another or across different models at will. There are a variety of reasons for this:

- Slum dwellers coalesce around water to form water collectives but this entity is a subset of other personalised networks that offer a valuable support system that extends to other areas of their life – celebrating festivals, holding cricket matches, giving financial assistance and solidarity during distress. Thus, being part of a collective grants much more than a simple access to a basic service (water) and is therefore not strictly a matter of efficiency.
- Secretaries, important natural leaders, have access to information, close contacts with field level bureaucracy and knowledge about circulars/schemes of the local/state government. Post SRS, they have also emerged as the main conduit for negotiations with builders/developers. For a single-member household, antagonising him/her jeopardises its prospect for being included in community levels schemes and activities. Thus, personal relationships, camaraderie with a larger support group and alignment with a natural leader – these emerge as important factors and contribute to the relatively long continuity of user groups.
- In some cases the reason is purely technical: opting out of an existing user group by a single

member to join another Committee necessitates laying a new feeder network till the member's hutment. The costs for this internal piping, owing to the zigzag pattern in slum clusters, are considerably high and prove to be unaffordable for a solo household; whereas, in a collective, these costs are spread amongst all the members.

- Ultimately, such shifts of consumers from one group/model to another are not easy and widely prevalent. Indeed, there are clear demarcations between models and user groups and strong notional alliances. However, within an informal personal arrangement, groups do extend access to one another under hardship.⁹

Financial Details

In Models One and Four, a greater transparency is noted – the water bill is freely circulated for raising required member contributions, whereas in Model Two some level of secrecy is maintained by the Secretary, especially with ineligible members. In this, an 'extra management charge' is also collected from time to time. Model Three operates within a completely opaque framework with monthly collections being part of rentals and bear co-relation to the actual water bill. The MCGM does not get involved in collections at the field level.

Sustainability

For eligible slum dwellers, alternative methods of gaining accessibility to water are either non-existent or costly and unpredictable. This reality alone appears to bind user groups together and contribute to its sustainability. The MCGM, by granting water supply to slum dwellers exclusively under these two arrangements, further limits their choices. Faced with this prospect, slum dwellers and their leaders have responded to field level realities and come up with innovations. For instance, they have expanded and strengthened networks, reapplied and installed new ones or, over time, switched to a different model. Coalescing around the basic need of water, collectives have created workable systems at micro, cluster level such that these have been in operation for decades. In fact, the Pumpset Yojana represents one of the most decentralised modes of water supply fully managed by the community. Some of the older Yojanas have displayed astute managerial and community mobilisation skills by running this operation and maintaining unity amongst its members. From time to time, they have also raised the relatively high level of funds required to augment or repair the network.

⁸ For instance, Models One, Two and Three operated in the same geographical areas, overlaid on one another, with different user groups aligned to different Nal Committees. Model Four is exclusively operational in slums' hilly areas as the previous models are unfeasible in this scenario.

⁹ In some cases, entire groups facing acute hardships for extended periods of time have been able to get a new group water connection from the ward office with the active help of councillors. In such a situation, a reorganisation of the user group members is likely.

Conclusion

Both, the MCGM's 'Stand Post Water Connection' as well as 'Suction Tank Pumping Arrangement' (Yojana) embodies a strong community-driven process with a lead taken by enterprising natural leaders in the slums of Mumbai. They throw up innovative possibilities in community-based management and operations of water supply. Elsewhere in India, this self help approach has been harnessed in programmes of slum upgradation. For instance, a unique partnership between multiple actors – NGOs, private sector and slum communities – has resulted in slum upgradation programmes in the city of Pune, India. Similarly, the 'Slum Networking Programme' pioneered in Ahmadabad in 1995, once again by forging partnerships, has been able to provide basic services such as water supply, drainage, individual toilets and storm water drainage, as well as paved internal roads and street lighting in an affordable and sustainable way. This programme has formed an integral part of Gujarat's 'Urban Slums Policy'.

Although the above initiatives embody participative

models of service delivery in challenging slum environments, their application in Mumbai remains fraught with difficulties, especially as the overall housing policy of the Government of Maharashtra (GoM) itself comes under scrutiny. As already discussed, the shift from upgradation (BUDP, PMGP) to total redevelopment (SRS), in Mumbai's case, appears to be decisive and irreversible. The high stake real estate markets of the city and the extremely high land prices have created a policy climate wherein 'upgradation' appears to be increasingly an unacceptable approach. A more realistic solution to capitalise on the 'land starved city' of Mumbai is seen in the private sector driven slum redevelopment model as embodied in the current, city-wide approach of SRS adopted by the local government.

Indeed, as this approach gains credence, the sustainability of the present decentralised water delivery systems and the vibrant community collectives that manage and maintain them, captured in this report, have an uncertain future.

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The Performance Assessment System (PAS) Project

The 'Performance Assessment System – PAS' is a five-year action research project, initiated by the CEPT University, Ahmedabad, with funding from the Bill and Melinda Gates Foundation. It supports development of appropriate tools and methods to measure, monitor and improve delivery of urban water and sanitation services in the states of Gujarat and Maharashtra. The PAS Project comprises three components of performance measurement, monitoring and improvement.

The PAS Project is supporting the development of City Sanitation Plans (CSP) to achieve open defecation free status for four small cities in Maharashtra, which are Wai, Hingoli, Ambajogai and Sinnar. These cities were selected by the Water Supply and Sanitation Department, Government of Maharashtra, and Maharashtra Jeevan Pradhikaran (MJP). A framework for city-wide assessment using the full value chain for urban sanitation has been developed, which is being used in developing these CSPs. Initial workshops were organised by the MJP with officials of these cities to discuss the CSP approach. Draft plans for these cities are ready and will be discussed with city officials.