

Water supply & sanitation as “urban commons” in Indian metropolis: how redefining the State/Municipalities relationships should combine global and local *de facto* ‘commoners’.

Joël RUET

Head, Economic Department, Centre de Sciences Humaines, 2 Aurangzeb Road, 110 011 New Delhi

Ph: (+91 11) 301 62 59/ 41 73; (+91 98) 104 26 124; fax (+91 11) 301 84 80

Email: joel.ruet@csh-delhi.com, Website: www.csh-delhi.com

Stream: Globalisation, Governance and the Commons

Key Words: Property rights, Creation of rights, Governance, Capacity building, Globalisation.

INTRODUCTION

Urban water supply and sanitation can be considered as an urban common in Indian Metros, since:

- (i) Though not in majority, water supply is still importantly based on common use of ground water, and sanitation/waste disposal is taken care through common practices. Further, anarchic waste disposal in cities themselves lead to ground water pollution, and, in the present institutional arrangements, through the issue of waste, ground water cleanliness is a subtractive good.
- (ii) Besides, access is not regulated by monetary appropriation, but mostly through administrative settlement of its many externalities.

The paper articulates (i) the characterising of the property rights and the Common Property Resources (CPRs) relationships at stake, (ii) the governance of the sector, and (iii) the need for setting up coordinated *de jure* rights on the resource through both channels of local and global actors. It focuses on Calcutta and Madras (now called Chennai) as case studies.

1. The study of water supply & sanitation in two major Indian Metros (Calcutta, Madras) shows the full administrative appropriation of the sector by the agencies of the State cum Municipalities. More specifically, the nature of the concerned administration can vary. One extreme is a Calcutta-style mono-technical (centralised) agency with principally a mono-output oriented objective (water

supply), strongly embedded in the State/Municipal sphere. The other pole is a rather autonomous agency, evenly focusing on different issues and aiming at a managerial delegation like in Madras (where institutional and organisational innovations are worth being exemplified). But whatever the arrangements between these two levels of administration, an important network of informal activities and local entrepreneurs is *de facto* acting, thus enjoying local appropriation of the resource management, *i.e.* property rights in the economic sense (under the definition by Grossman & Hart, 1986) over these CPRs. The mismatch between jurisdictions and reality is patent.

2. Given the dynamic situation, the governance reform can be based on specific trade-offs between some amount of reform of the public sphere (delegation of power within administrations, actual decentralisation from State) and contracting out. From the two case studies, the article provides the institutional specifics for such a trade-off. The Madras example shows both good Governance and a technical-cum-managerial solidity of the system that allows capacity building through delegation and contracting out. Unfortunately, in the Calcutta situation, the need of the time is to make clearer the definition in relationships and rights between the two levels of administrations (on administrative and financial aspects). In that aspect the State-level one seems to be the highest standard in governance terms.
3. Beyond, in a dynamic context of globalisation, this contracting out can happen not only with global firms, but also through the private local entrepreneurs, and through capacity building and the strengthening of the informal sector. The paper elaborates upon a stylisation of the pros and cons of each approach as far as practical implementation is concerned. The role of the state, it is argued, is to build competence and reduce the asymmetry in globalisation. But in this role it shall not enjoy a monopoly, and both local and global NGOs may be involved through a global/local capacity building. The paper further concludes through the theoretic questioning of Common Property Theory: the administrative vs. economic building of property rights in a globalised context is examined by conceptually separating in the property rights building and property rights transfer in both the process and concept of “privatisation”.

Figures are taken from various sources collected in a earlier report jointly written with Dr M-H. Zerah¹.

¹ « Water supply and sanitation in Indian Metros : Bombay, Calcutta, Madras », Research Report, Centre de Sciences Humaines, New Delhi, www.csh-delhi.com, & Ondeo Services, New Delhi, astran@vsnl.com, 71p, November 2001.

1. WATER SUPPLY AND WATER CLEANLINESS: COMMON POOL RESOURCES IN THE BIGGEST INDIAN METROS

Common property resources

Water supply in Calcutta still importantly relies on a 20% groundwater (including public system and local private wells). In Chennai (Madras) it amounts to a level as high as 80% for the water served by the public system, notwithstanding the fact that 36% of the total supply is not rooted through this system and is fully based on ground water (total figure is then 87% of total). Given a limited treatment capacity in Calcutta and a real surface water scarcity in Chennai, the ground water plays the role of the marginal regulation component. It is the *de facto* permanent adjusting variable in Chennai, and the adjusting variable in Calcutta during the peak consumption period. The water extraction is operated by a full set of diversified actors. For instance, in Chennai, 10% of the supply comes from community tanks & wells, and 21% from in-house wells. In Calcutta, there are approximately 6000 licensed tubewells and an equal number of unlicensed (these numbers have roughly doubled in last 15 years). In Chennai, there is a total of 5000 pumps, especially for poor and slum dwellers, while surveys show that 85% of domestic users have an access to ground water on their own. Beyond the official system, experts quote the figure of additional one-third for local, unofficial, ground water extraction. That way, supply of water is non-excluded and subtractive (highly subtractive in Chennai in the scarcity scenario). After decades-long efforts to settle water in Indian Metros as a public good operated by a public body (despite some marginal attempts here and there to develop a service market), water supply is however still importantly relevant of common property resource and common practices².

Let us as well consider waste disposal and sanitation, as far as they combine in a biological cycle with ground water. Lacunas in waste disposal in Calcutta engender severe pollution, health and environmental concerns in various areas of Calcutta, especially in terms of groundwater. The Calcutta Municipal Corporation cannot handle waste disposal alone, and the massive recycling informal sector in Calcutta ensures the remaining. Cleanliness of the city is then a CPR, and not a public good, due to the failure of the public system. In Chennai, in practice, while a huge majority of 'domestic users' have toilets and a sewer connection, for people connected through public taps and pumps, only 44% have an access to toilets. Up to these 44%, only 44% are connected to sewers, 18% to storm water drains, 33% to septic tanks, and 5% let it out into canals. This again leads to severe pollution in a City that relies so extensively

² This is the case in Delhi as well, Bombay being the noticeable exception.

on ground water. Indeed, though a part of this ground water comes from outskirts of Chennai, the figure of onsite pumps that serve slum dwellers give an idea of the pollution and sanitary risk. The poor of Southern Calcutta (poor of Southern Calcutta live for 60% in slums and 40% on pavement) are supplied through public hand pumps, at 80%, or private ones, at 20%. As well, average daily duration of supply of 6 hours with good pressure in Calcutta, and 4 hours in Madras, give an idea of the pollution through the piped system itself³. Boxes 1 and 2 give a general description of the situation.

The water supply in Calcutta is, by and large, and apart pre-monsoon shortages, good in quantity, with a well developed centralised piped system, and relying on a huge source through the Hooghly River. The ground water issue is tackled under a very centralised and normative approach, denying the present existence of CPRs. Indeed, projects are on progress to fully adhere to the centralised piped model, despite, actually, a mere technical approach based on promoting boosting stations rather leads to overflows and huge wastage. The sanitation facilities are very insufficient, especially for the poor, including in Central Calcutta; this is by far not the prior concern of the CMC. This informal sector dealing with solid waste, although well structured, is economically fragile, and not financially supported, despite the savings and added economic value it provides for the CMC and the City as a whole. Drainage is reasonably good as far as normal drainage is concerned, but far insufficient for storm drainage. Treatment hardly exists.

Box 1: The water, waste and sanitation scenario in Calcutta (source: Ruet & Zerah, 2001).

The Water Supply & Sanitation board ensures the water supply in Madras. Compared to other Indian Metros, the situation is characterised by a structural shortage of resource. For instance in 1999-2000, during the months of drought, the Board could maintain piped supply for about 70% of the population only, at the rate of about 55-60 lpcd. The part of ground water is relatively high for the Board water itself, further complemented with a large amount of extra-Board supply (36% of the supply is not rooted through the board). Sewerage and sanitation is relatively poor, despite the fact that the Board gets a good amount of its financing through an afferent tax. Treatment is of 60% of the Board-water (thus a substantially lesser percentage if one takes into account the non-board supplies). This is divided in 5% re-used by the industry, 10% re-used by the electrical industry, and 45% put back to rivers, In the scarcity context, the board has initiated recycling and re-use experiments, that have to be acknowledged and duly recognised. But it is very surprising that an integrated vision of the resource within a cycle is still not generalised, and that no techno-economic comparisons are made between the

³ Etancheity of piped system is never 100% nowhere in the world. As long as pressure remains high, there are o infiltrations in the pipe. When it drops, soil pollution and minerals enter the pipe.

long term cost of recycling water and the long term cost of such high capital intensive projects, as the Krishna river canal.

Box 2: The water, waste and sanitation scenario in Chennai (source: Ruet & Zerah, 2001).

Thus, in large respects, water supply and waste/sanitation issues are thus relevant of an “exclusive public good” analysis, in Olson’s (1965) words, that is, of a CPR. In a context where the public sector is no longer able to supply the whole of the demand as a (non-exclusive) public good, and where it does not focus on sanitation issues, management of and access to the resource thus becomes a collective action matter. A collective action problem with a 5 million stakeholders at least in each case study... Demsetz (1967) or Ostrom (1999) shows, that, in these circumstances, “many people facing collective action problems in the field have changed the structure of the problem they face by building walls (...) or creating property rights (...)”. The public sector has tried for decades to install a public property, but has failed. Let us show in what sense.

2. ‘BABUS’⁴ IN WATER: THE MUNICIPALITY AND THE STATE

The public sector has failed in municipal water supply and sanitation. Not only in the sense that the system can quantitatively survive only through its marginal actors, as indicated. But, more structurally, the repartition of roles and duties between the various stages of the municipal and State administration has never been clearly made: no property rights have been defined in the public sphere. This has been the core of the tariff/service vicious circle, which has rendered necessary more costly coping strategies for the users. Thus, beyond the administration officially in charge, it has opened the door to an important network of informal actors. As well, local entrepreneurs are *de facto* acting, actually enjoying local appropriation of the resource management over these CPRs, *i.e.* property rights in the economic sense of the term (that is, as residual rights of control).

State Government, Municipality, Water Board, and Development Authorities: a bundle of administrations without well defined property rights

Let us examine the administrative organisation of the so-called “water management”. Institutions generate institutions, and decentralisation amendments of the Constitution have materialised a curious way in Calcutta for instance. Calcutta Municipal Corporation (CMC) by and large *operates* a water supply

⁴ This term is popularly used, specially in North India, to designate bureaucrats.

network. But the latter is actually developed and ultimately financed by the Calcutta Metropolitan Development Authority (CMDA) and the Calcutta Metropolitan Water Supply Authority (CMWSA). CMWSA also supplies the treated water to the CMC. These organisations are supposed to be coordinated by and with municipalities, but *in fine* they also depend for the funds of the Government of West Bengal. Hence, the system is ultimately planned and financed by the Govt of WB. In this picture, the CMC complains on not having the control over water treatment and network development, while CMDA & CMWSA argue they would better ensure the maintenance and operation of the distribution network, if they were to control it. Hence there is a discrepancy between the CMC which owns the control rights over the network, and the State organisations which own the financial rights (which amounts to bearing the financial consequences or expenses) linked with a merely technical operation and absence of management properly speaking. Coordination between these entities merely becomes a ‘paper work’ of which the Indian administration is familiar with (see Ruet, 2001). This paper work implies respecting and following procedures specific to each administration, and therefore there is always a stagnating contradiction as these procedures are based on respect of different respective technical and legal provisions. As a consequence, the decision-making is technically segregated and not based on economic costs, and even less on long term costs that are the key factor for sustainability of policies for the poor. In this system, financial links and disputes are actually solved through political bodies, at as high a hierarchical level as the Secretary⁵ (GoWB): the Calcutta corporation and the two authorities (CMDA, CMWSA) can hence be considered as (i) not autonomous, and (ii) improperly articulated. The institutional situation in Chennai can be regarded as of better autonomy (Ruet & Zerah, 2001), but within the same administrative characteristics of administrative and non-cost based decision-making. In Chennai, the water is supplied through a more independent Municipal Board that refers to the State Government. In a sense, it exemplifies up to what levels managerial decentralisation can reach within the Indian administration frame. But however, relying on tax property collection and Government support (or Government-routed support) for its schemes, the Chennai Metropolitan Water Supply & Sanitation Board (CMWSSB) is still mostly structured around procedures (technical and administrative) and not yet around services and efficiency costs. As a matter of fact, providing full sanitation despite a tax is collected by it on the whole of the population for that specific purpose (this represents as high as 27% of its revenues) is not looked up as a compulsion. Similarly, dwelling upon the water scarcity situation, the Board has *de facto* given up on satisfying and supplying a part of the population, or rather a segment of the consumption.

No tariffs, but for no water and no sanitation

⁵ In the Indian civil service, the secretary is the high civil officer in charge of the administrative coordination for the Minister.

Even though the two cities have various tariff regimes and structure, they share common features, among them: large cross-subsidies among type of users that are not economically sound, substantial connection fees that have an averse impact on low-income communities and the dependence on political decisions.

In Calcutta, there are no water charges (neither volumetric charges as connections are unmetered and neither charges related to an estimated consumption). Revenues for the sector come from a share of the property tax. This is common practice in India and it is also the case in Madras. In Madras, volumetric tariff structure is applied. In both the cases, there are large cross-subsidies among the various types of users. In Madras, industrial establishments pay 10 times more than domestic consumers do. Hence domestic consumers hardly have to pay on the basis of their consumption. But sadly, another common point (shared with Bombay) in the two cities regards the policy towards connection fees and as such reflects a general tendency in all Indian cities. Connection fees are expensive: Rs. 650⁶ for a house drainage connection in Calcutta, and Rs. 3500 for sewerage in Madras. In addition, even though Madras has simplified the procedures, it is usually very complicated to get a new connection. In regard with the low-income communities, such policy raises concern. In most cases, poor households can afford to pay monthly charges. But, on the contrary, they are unable to disburse large sums, even in instalments. At the same time, the complexity of the procedures acts as a strong disincentive. To sum up, public bodies charge entry regressive costs, followed by a very low supply, since their tariff structure chronically leads them toward financial losses.

This has thus strong financial impacts, not only on the poor, who can hardly afford reasonable access to clean water, but also to domestic households, which have to turn towards more expensive alternative sources. Let us illustrate this point through the Chennai example (refer to Box 3). An individual flat is charged 50 Rs a month for water. By taking a daily consumption of 70 lpcd (official figure in Chennai), which is very low by all standards (Calcutta is three times this), and a family of 5 people (average figure worth for all India), this leads near to a full tanker for a month. That is around 500 Rs at the market rate in Chennai. This needs not being commented. Even if households can rely for most of them on private wells for a part of that quantity, at the end of the day, the inefficiency of the Board leads to high over costs for most of the people and unaffordability for slum dwellers (30% of Chennai population). Not mentioning local Mafia “regulating” access to water distributed by the Board lorries...

Conversely, non-metered tariffs are Rs.50/-month for an individual house or per flat and Rs.150/- for partly commercial. From water supply rates, a 25% surcharge is generally added for sewerage

⁶ 1 USD equals 50 Rs roughly.

of this water. It is especially worth comparing with sample surveys conducted by the company Economic Perspectives. The survey covers 4,500 users, domestic, non-domestic, or on public taps and hand pumps, or on mobile truck supply. The preliminary results of the survey show that 85% of the domestic consumers⁷ have their own source. 26% use the water tankers of the Board. People on public taps/tankers⁸ are segregated as such: 56% taps or pumps, 44% on tanks. 63% of these people feel the supply is insufficient. For these people, at which cost can they purchase additional water? Information has been collected through an interview of one of the earliest independent and leading water lorry owners. They purchase their water from farmers, and pay a 50 Rs per load (12,000 liters) to the farmers, to sell it out between 480 or 500 Rs for large customers (foreign consulates, universities, hospitals, hotels), up to 550 for private residential consumers.

Box 3: Cost of actually getting water in Chennai (source: Ruet & Zerah, 2001).

The mismatch between a public good jurisdiction and the reality of a partial private appropriation

Along with the full *administrative* appropriation of the sector by the agencies of the State cum Municipalities, the earlier sections illustrate enough the de facto *economic* appropriation by third parties. Beyond the social economic appropriation (private wells despite the Ground Water Regulation Act in Chennai, or slum dwellers achieving ‘illegal’ connections in both Chennai and Calcutta), there is an emerging commercial *de facto* appropriation properly organised by private party. There are around 700 to 800 lorries in the city of Chennai and they constitute 150 companies⁹. Apparently, the increase of private water tankers has led to increase competition among existing companies but at the same time, due to considerable water scarcity, there is up till now place for all these companies. Creation of private property rights has till now come out of inability of the public sector to frame and secure public property rights. Emergence of water as a private good has come as the failure of the state to technically and organisationally maintain the non-excludability and non-rivalry of access to water and sanitation. That is, it is an outcome of the myth propelled by the public sphere that it is no longer a CPR, at the expense of the fierce field evidence, but is instead normatively declared to be a public good.

3. THE INFORMAL MAN AS THE ECONOMIC VECTOR OF THE CIVIL SOCIETY, HAVING TO DEAL WITH THE BUREAUCRATS

⁷ 60% of the domestic users disclose their income, and the average is 5636 Rs monthly.

⁸ 85% of them disclose their income, with a family income of 1780 Rs.

⁹ Out of these 150, 10 are large companies and the remaining ones own only one or two trucks.

Let us now show how the vivid informal sector in India can be thought of for building sustainable property rights, with related advantages. Then let us show how Municipal Corporation in Calcutta and the Water and Sanitation Board in Chennai have until now precluded this to happen.

Ragpickers, recycling, and “street beautifiers”: when informality is an economic asset

Let us consider the problem of waste disposal, for instance in Calcutta, where 20 % of the daily 2500 tons remain uncollected. It is taken care by the informal sector. Beyond, waste recycling is 100% carried out by it. The EIP (1996) calls it the "two-world system of Calcutta". Separation of materials takes place both in the city –where some areas are even specialised in this- and outside, at the dumping ground. The figure of 2500 Tons is then itself a figure that hides the work done before collection: it represents less than the actual production of waste, since a part has already been recycled at the dumping stage, but more than the final residu, since recycling again takes place there. Also, there is an interesting system of agriculture at the top of the dumpings, as well as use of drainage and sewage water in ponds fisheries, informally organised. At the dumping stage, 56% of waste is compostable, 44% is not (EIP, 1996). As far as efficiency in waste disposal is concerned, Giri and Dev (1992), have observed that cost per ton of solid waste disposal is higher by 50% in Calcutta, compared to Bombay. Cost of solid waste disposal can be roughly segregated into 70% for collection, 25% for transportation, and 5% disposal. According to EIP (1996), municipalities in the Calcutta Metro pay 17% (this is decreasing, in relative terms; it used to be around 20%, though growing in absolute terms) of their revenues for waste disposal. This, "primarily with manual labour" (around 80%, EEF, 2000), for a staff of 15, 000 people working in municipal conservancy systems. Now, manual workers are paid a 4000 Rs a month by the CMC, while non-unionised workers hired by private contractors are paid a 1,500 Rs. CMC may be tempted to engage in that private sub-contracting. But no clear policy is announced, neither in terms of human resources, nor in terms of cleaning objectives.

The public cost for complete cleaning is actually structurally higher but kept low through the work of ragpickers and itinerant traders, as EEF (2000) claims that the CMC "is unable to clean Calcutta completely everyday". EEF (2000) shows that hundreds of people do this activity, but that its sustainability is questionable. Indeed, as far as itinerant traders and local receivers are concerned, EEF gives emphasis on the discrepancy between "immediate settlement of dues with the suppliers", and "delays in receiving payments from the buyers". From interviews, another structural issue seems to be the high level of intermediation in that sector. Ultimately, EEF concludes by stating that "the useful work done by the recoverers is not at all reflected in ensuring a sufficient income".

As far as Chennai is concerned, the most important NGO that is concerned with water supply, sewerage and solid waste disposal is Exnora. Regarding water supply, in slum settlements, Exnora helped in forming committees among the dwellers to organise the distribution through tankers. These self-help groups can be found in 800 areas in the city spread over 3,300 slums (both of small and large size). Exnora is, however, mostly well known for its action regarding solid waste disposal. They train a large number of people to collect waste at the household level and to dump it at sites where composting activities are carried out. There is also a strong lobbying action with the Metrowaterboard (CMWSSB) to build toilets, to rehabilitate storm water drains that are used for sewage. Exnora is also part of the consumer committee of the Metrowaterboard, as well as the vigilance committee. In the consumer committee, they are discussing issues such as frequency of water supply, staff attendance and the Exnora representative in the committee considers that there has been an improvement in the recent past (source: interview). In the vigilance committee, topics discussed vary from the malpractice of the water tankers (no supply provided, driving problems leading to accidents) to illegal tapping and attendance to complaints. Exnora appear definitely as the main NGO in Chennai and has both an action in the field as well as some recognisance with the Metrowaterboard.

Now if one looks with economic sustainability of this NGO-led, informal-sector oriented projects, previous examples show that the cost is lower within these schemes than within a Municipal environment, and generate a higher employment ratio. Besides, local recycling reduces transportation direct costs and externalities. Resident associations, as well as local communities are ready to go, Madras experience shows, for paying for a service. This would remain cheap, since it is in itself funding a viable economic activity, as Calcutta demonstrates. Marginal and targeted subsidies would then only need being catalysts.

Actually managing water

As far as water supply is concerned, the solution for giving incentives in Calcutta can be to take example on what happens somewhere else in the power sector: separating the operation and the supply (commercial aspects), the latter being transferred to CMWSA. Even in the present tariff situation, savings on water would be realised, thus savings on the CMWSA, and ultimately CMDA budgets. These savings could be dedicated to sanitation. Similarly, decentralised schemes (community-based ponds or ground sources under regulation for water harvesting for instance) should be authorised. As well, encouraging rainwater harvesting can largely be thought of as far as ground water usage is present, instead of pushing for technocratic policies for suppressing ground water use.

Generally, water supply can be thought of as divided into two usages: potable water (drinking and cooking, which is a mere 10% of the water usage) and the water for other purposes. The latter need not being at drinkability standards. Since the Indian piped systems no longer provide a guaranteed norm for drinkability of water, the centralised system could take charge of the second function. Drinking water can then be accessible through community-based groundwater, and/or pond water, or tankers when the former is not available. These schemes are to be maintained and developed in priority. The savings associated with the new use of the piped system as for non-potable water (less treatment cost) would finance this. Better than fighting against an existing system of ground water that regulates the consumption profile over the year, better using and maintaining it.

Creating common rights vs. maintaining administrative prerogatives

Quoting the Ekta Ecological Foundation report (2000), “the idea of enhancing NGO-role and resident welfare associations in solid waste management system is not to make the municipality a non-functioning entity. Rather, the NGOs and associations should be able to play both a supportive and questioning role and not merely be co-opted. NGOs should in turn realise that the municipality should continue to play in solid waste management a major coordinating role”.

But it has been seen that water administrations in Indian Metros are rather technical and political agencies that maintain the idea of installing a public good system, that is unachievable under present regressive and against the poor tariffs and connection conditions. In these conditions, articulating their action with NGOs and supporting the structuring of the informal sector is the economic need of the hour, but not the top of the administrative agenda. As long as administrative bodies in charge of water suffer from disincentive allocation of property rights, they are not in a position to grant rights to these civil-society organisations. On the contrary, Madras has seen the de facto termination of the Exnora activities, by granting a cleaning contract to a global services company in their acting zones. Figures lack as of now, but, given the capitalistic form of organisation chosen to be compared to the labour-intensive Exnora structure, it is widely believed that this decision has put both economic and social efficiency further back.

Given the dynamic situation, a governance reform of the public sector itself can be thought of, and be based on specific trade-offs between delegation of power within administrations, actual decentralisation from State, and contracting out. The Madras example shows both Governance and a technical-cum-managerial solidity of the system that allows capacity building through delegation and contracting out, but then the working methods and size of the contracting party should be thought of more deeply. The

model presented in next section aims at this. In the Calcutta situation, the need of the time is to make clearer the definition in relationships and rights between the two levels of administrations, that is, to unbundle the administrative knot (on both administrative, and financial aspects). In that aspect the State-level one seems to be the highest standard in governance terms.

4. THE LOCAL ENTREPRENEUR AND THE GLOBAL SERVICE COMPANY

In a dynamic context of globalisation, this contracting out can happen not only with global firms, but also with the private local entrepreneurs, and through the capacity building and strengthening of informal networks. Let us now elaborate upon a stylisation of the pros and cons of each approach as far as practical implementation is concerned. A model is proposed, which looks at the financial and social benefits as seen from the perspective of the benevolent State.

Hypotheses on costs and benefits

Please refer to Graph 1. Previous sections have shown that, as far as the formal sector (F) is concerned, and despite huge expenses (C_F), the benefits (B_F), both in terms of financial revenue for the public sector, but also in terms of coping costs linked with alternative supplies for the users.

Actually, $B_F \ll C_F$, and the revenue R_F (equal to $B_F - C_F$), is largely negative.

On the other hand, as far as the informal sector is concerned, investment costs are nil for the public sector, and very marginal as far as social investment is concerned (combination of them is called C_I). It also provides a high benefit through cheaper services (B_I). Then the social revenue generated from the informal sector, R_I (equal to $B_I - C_I$), is positive.

It is difficult to assess any comparison between B_F and B_I , but B_F has become so low (cost of coping strategies) that it can be imagined that, under some conditions of support for the informal sector, they reach a comparable level. The present contribution of the informal sector shall therefore not be neglected.

Graph 1 (Losses and profits of formal and informal sector) to come here

Formal vs. Informal in improving the revenue

Let us now examine the possibilities to better the service and the total revenue (financial plus social) *at given structure*, respectively from action on the formal and the informal sectors (please refer to graph 2). Since structure is in that stage of the model considered as given, there are no strategies of cost reducing that are available. Let us then examine the impact of further public expenses. Since, in the Calcutta situation, the links between planning, development, and operation are so intricate and cleared by administrative decisions in place of use of property rights, there is no straight evidence or direct implication that any increase in the expenses will result in an increase in revenues. Neither financial of course, since tariffs are by hypothesis not altered. Nor even necessarily in terms of social benefit. Indeed, if not properly maintained or operated in the right areas by the CMC, or not adequately supplied by the CMWSA, a network expenditure made by the CMDA can very well lead to no tangible result, or, say, to a second order result. Similarly in Chennai, the private sector and local Mafia having appropriated the water supply, and the resource itself being severely constrained at the peak season, any expense measure is not deemed to bring much of water in the piped system¹⁰. Similarly, for waste disposal, investment can lead to eliminate the problem of cleanliness in town, but at a higher cost than the present informal sector, and by suppressing the social benefit of recycling. On first approximation, one can reasonably consider that, for any expenditure of formal sector, $dR/dC_F < 0$.

On the other hand, reports and experiments in the country (see Ruet & Zerah, 2001) show that the informal sector is already contributing to the revenue (at least in waste disposal and recycling) and that it needs structuring and support. Without entering into details, this is rather a kind of legal support and limited amount of organisational support, all in all hardly costing. Again, this is not detailed here, but these measures equate to creating property rights for the informal sector. This would materialise into production of service worth being equated and valued at alternative services costs. Thus, $dR/dC_I >> 0$. One can consider that there is a multiplicative effect in investing in the informal sector: $\Delta R = \alpha \Delta C_I$, this is the structuring equation of the informal sector, with $\alpha >> 0$ (refer to central graph in graph 2).

Graph 2 (impact of support policies to informal sector) to come here

Besides, if well structured, the informal sector can very well develop and take charge of bigger zones or bigger share in the municipal activity, thus saving operating costs in the short run and public expenditures in the long run. In that case, $dC_F/dC_I < 0$. This is what is called the “coordinated” scenario in Graph 2. In terms of property rights creation, this coordinated system equates to associate the public sector and

¹⁰ Besides, in both cases, given the limited supply hours in the day, this would not help much as far as quality of the water is concerned.

provides one of the most credible ways to promote public property rights through regulated private property rights.

Reforming: Global vs. Local entrepreneurs to reform, and the role of the informal in the global game

Let us now look (illustrated on Graph 3) what happens if a transfer to global service companies over one zone is thought of. This is what happened for solid waste in Chennai. Given the economic distortion of costs and the current tariff structure, this can only happen through public subsidies as of now (at t_0 on the graph). In the terms of the model, the global Service Company will change the organisation, so we are no longer at a given organisational structure, but the development of the activity implies in other words, it corresponds to an investment. This investment has to be done quite quickly¹¹, and returns are slower (lower slope for B_F than for C_F). The initial formal revenue remains negative, and becomes even more negative. Besides, under circumstances of non-support and non-coordination with the informal sector, it disappears under combination of legal procedures and regressive subsidies to the Global Service Company. $R_I=0$. If successful, after a while, the revenue becomes positive.

Graph 3 (Transfer to a global service company) to come here

However, after the stabilisation of this strategy to a permanent positive revenue, the informal sector has disappeared, and the margin available from coordination with the informal (refer to graph 1) has therefore vanished. But let us now compare this permanent positive revenue:

- first, to a better transitory revenue by implying local entrepreneurs (graph 4)
- second, not only to this transitory revenue achieved through local entrepreneurs, but to a long term higher revenue linked with the possibility to maintain the benefits of coordination with the informal sector (graph 5).

Low let us consider, for the reform of the sector, a more refined strategy, combining the support (and coordination) with the informal sector, with the recourse to local entrepreneurs for pumping stations, which the experience of Chennai has prove to be profitable, as it reduces formal costs. Graph 4 shows results: the informal sector gradually achieves its increasing part of the revenue, while the formal sector reduces its deficit at given structure by aggregating local entrepreneurs. The experience of Chennai

shows that this is not enough to cover the structural financial situation but that there is a high profitability in such measures. This without mentioning the cumulative effects linked with a strategy that allows creation of local competence.

Graph 4 (Local entrepreneurs and support to informal) to come here

Let us now examine what is proposed by this paper as the best strategies, cumulating all the potential benefits in the reform of the water + waste sector in Indian Metros (graph 5). It proposes to support and coordinate with the informal sector, and to start with local entrepreneurs as proposed in previous version of the model. But after some time, when all the (limited) possibilities given to the local entrepreneurs and the informal sector have been reached or near to be reached, one can still consider the recourse to a Global Service Company. This then presents various advantages. From Graph 4, it obviously tackles margins unreachable through limited recourse to local entrepreneurs, since it allows bringing the initial investment necessary to structurally achieve a positive revenue from the Formal sector. But, further, under a regulatory policy of the State cum Municipality to coordinate with the informal sector (being supported under limited amount of public subsidies and self-sustainable as its structuring equation shows), the gains from the integration of the informal sector are achievable.

Another element, not demonstrated here, but analysed in previous articles (Ruet, 2002), brings a positive element. Given the administrative structure of water agencies in India (Ruet & Zerah, 2001), access to information is impossible in the sense that the information they gather is hardly “integrated”. That is, since management of physical quantities is done independently from the management of financial sources, which is rather an administrative clearance process (refer to Ruet & Zerah, 2001), investors face difficulties in investing in Indian public agencies or negotiating a contract with them (Ruet 2001). Initial recourse to local entrepreneurs *de facto* generates information and property rights that help analysing the situation of the agency for the potential investor, that is, the Global Service Company (Ruet, 2002). In that context, negotiating such a contract after the involvement of local entrepreneurs is also beneficial to the Service Company, and leads to less uncertainty, therefore to a lesser premium in financing investments, and to more targeted investments. That way, the transitory period after t_0 , that is, the period that the Company needs for the benefits to cover the costs can be considered as substantially less in that present scenario than in the one presented in graph 3 (strategy with direct reform through a Private Company alone).

¹¹ For illustration, refer to many such projects around the world, or, in India, the power sector can illustrate with the Electricity Distribution Privatisation that took place in 1999 in the state of Orissa.

Graph 5 (Local entrepreneurs and support to informal, then transfer to global service company with coordination to informal) to come here

This strategy is thus to be preferred by the Global Company, by the policy makers in the sense they save jobs and provide preliminary (visible) results before privatisation, and for the water agency itself in the sense that it is the strategy that maximises the revenue.

CONCLUSION

Whatever the aims of the Indian public sector, water and waste in the biggest Indian Metros are still importantly managed as Common Property Resources. The sole property rights creation noticeable has concerned some amount private appropriation linked with the failure of the public to create public property rights and actually operate the sector as a public good one. Users are no longer served, subsidies have become regressive, and these services have become costly or unaffordable, according to the household incomes.

But technical and financial solutions exist, and are to be found in better management. As far as solid waste disposal is concerned, it should explicitly, and with financial support, rely on the labour-intensive informal sector. For water, recourse to local entrepreneurs has been shown to be both feasible and profitable. These solutions combine with creation of property rights, and, through a recourse to private and civil society, they paradoxically are the sole to combine with the creation of (in that case: regulated) public property rights for water and waste disposal. They may be the sole possibilities to maintain a public good approach from a failed system.

Agreed, these solutions are limited in nature. But this paper shows that, under this regulated set of public property rights, they are the ones to open the space for a possible complementary intervention of Global Service Companies, as of now reluctant to come. They allow thinking about a practical way to implement a whole solution. In particular, they also prevent from unthought-out recourse to international companies only, which may be too capital-intensive, for being affordable for all the city areas. This combination of local and global, formal and informal solutions, offer a field for wide practice and applied research.

Indeed, given the Indian administrative lock-in between States and municipalities, clarifying administrative attributions and reducing them through contracting out are to be considered. In that framework, the role of the state, it is argued, is also to build competence and reduce the asymmetry in

globalisation. But in this role it shall not enjoy a monopoly, and NGOs supporting the informal sector may be involved through a global/local capacity building (both local and global NGOs). The issue is finally as such: in the practical and theoretic issue of building property rights and of Common Property Theory, one has to consider the administrative vs. economic building of these property rights. This practically happens now under a globalised context, and recourse to Global Companies is possible. But the conceptual issue is then to separate the building of property rights from their transfer. Users, but also the public sphere or the companies, can only gain from a better earlier definition of attributions, rights and duties, or in other words, property rights. The challenge is that, in the best case, “privatisation” of water has to be creation of property rights, rather than their transfer.

As of now, in the administrative and penury context, “privatisation of water” is rather “privatisation of what?”.

Bibliography

Demsetz, Harold (1967), Toward a theory of property rights, *American Economic Review*, May 1967, 57:2, 347-359.

Giri & Dev (1992), *Solid waste management in Calcutta Metropolis*, Centre for Urban Studies, Calcutta.

Grossman, Sanford & Hart, Oliver (1986), The costs & benefits of ownership: a theory of vertical and lateral integration, *Journal of Political Economics* XCIV (86) 691-719.

EIP (1996), *Sustaining Calcutta : present status report of the urban people's environment*, 217p, Environmental Improvement Program for Calcutta, CMDA, Calcutta.

Olson, Mancur (1965), *The logic of collective action: Public goods and the theory of groups*, Cambridge MA, Harvard University Press.

Ostrom, Elinor (1999), *Context and collective action: four interactive building blocks for a family of explanatory theories*, Working paper W99-17, University of Indiana, USA.

Ruet, Joël & Zerah, Marie Helene (2001), Water supply and sanitation in Indian Metros: Bombay, Calcutta, Madras, Research Report, Centre de Sciences Humaines, New Delhi, www.csh-delhi.com, & Ondeo Services, New Delhi, astran@vsnl.com, 71p, November 2001.

Ruet, Joël (2001), Winners and Losers of the reform of the State Electricity Boards in India, Occasional Paper, Centre de Sciences Humaines, New Delhi, 85 p.

Ruet, Joël (2002), The "entreprisation" of the State Electricity Boards, Chapter 2, in Organisational Restructuring of State Electricity Boards in India: Decentralisation, Information Building, Profit Centre and Management Contracts”, book Edited by Joël Ruet, Manohar Publishers, New Delhi.