Chapter 3
'Total Sanitation Campaign' Intervention for a Semiurban Village Through 'Public–People–Private' Partnership

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Introduction

Water, sanitation and health are interlinked sectors. Typically, the water and health sectors receive greater attention from the local, national or international agencies, whereas the sanitation sector often gets a low priority. Even today, 2.5 billion people (36%) lack access to improved sanitation worldwide, out of which 610 million people are in India. One of the targets set under the 'Millennium Development Goal' (MDG) set in 2000 is to halve (by 2015) the proportion of the population without sustainable access to safe drinking water and basic sanitation. At its present pace, India would take time till 2054 to meet its MDG 2015 on sanitation (Unicef and World Health Organisation 2012). This is a concern because poor public services in rural areas cause unchecked migration into urban areas.[1] Sridhar et al. (forthcoming)[2] find that the lower the level of education of the migrant, the greater the importance of the push factors which includes public services such as roads, public transport, water supply or sanitation.

[1] Rural–urban migration may not be a necessary evil. Sridhar and Reddy (2012, 2013) estimate the contribution made by the urban poor (who are usually migrants) to the city economies of Bangalore and Chennai and find that they contribute, respectively, 3% and 14% to these city economies.

[2] Sridhar, Kala Seetharam, A.V.Reddy and Pavan Srinath. Is it Push or Pull? Recent evidence from Migration into Bangalore, India, Journal of International Migration and Integration (Springer), forthcoming.

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In spite of the huge deficit in the sanitation services, only 3 % of the total outlay of the eleventh 5-year plan (2007–2012) of the Government of India was assigned to the 'Total Sanitation Campaign' (TSC) programme (Planning Commission 2011, 2002). As shown in Table 3.1, the investment in the sanitation sector is very low as compared to other development sectors.

The Government of India's sanitation programmes, namely, TSC and 'Nirmal Gram Puraskar (NGP) scheme', have helped in accelerating the progress in the sanitation coverage in rural India. As a result, more and more gram-panchayat are becoming free of open defecation. However, now it is necessary to address problems of solid and liquid waste management in rural areas, especially in the urbanising villages, in order to make them really clean and green. Sustainability of the sanitation services is also an issue in the villages.

Solid waste management is one of the components in TSC. As per the report of TSC in May 2012, only 29,917 villages in the country have taken up activities of solid and liquid waste management since 2001–2002 (www.tsc.gov.in, accessed 9 May 2012). In a rapidly urbanising village, referred to as 'semiurban village' in this chapter, the issue of the solid waste management needs to be addressed considering its growth features. Manchar is a rapidly urbanising village in Pune district of Maharashtra (India). The gram-panchayat of Manchar approached the Centre for Technology Alternatives for Rural Areas (CTARA), Indian Institute of Technology Bombay, Mumbai, with the issue of solid waste and liquid waste management in the village (A letter from the Gram Panchayat of Manchar to CTARA, IIT Bombay, Mumbai, 18 October 2011). Hence, in the further discussion, a case study of Manchar (Maharashtra) is presented.

The solid waste management is a crucial issue for the urbanised areas also. The Pune Municipal Corporation is tackling solid waste issue in Pune city with the help of a private service provider, 'SWaCH', an organisation working in solid waste management. The services include collection, resource recovery, recycling and end treatment of the solid waste. There is a need for such approach in the solid waste management in the semiurban villages as well. As a result of the TSC implementation, the community ('people') as well as the institutes ('public institutes') in the rural area have been mobilised and motivated to tackle the sanitation issues. The present study is focussed on the solid waste management in the semiurban villages.

The objectives of the chapter are to:

1. Identify the peculiar features of the semiurban villages;
2. Assess the sanitation situation in such villages with special reference to the solid waste management;
3. Identify the scope for improvements in the solid waste management by the gram-panchayat; and
4. Explore the potential areas in which the private service providers (through public–people–private (PPP) partnership) may help the Gram Panchayat to improve the services based on the analysis of the best practices followed in the other successful interventions.

Table 3.1 Investments in different development sectors in the 10th and the 11th 5-year plans (2002–2007 and 2007–2012, respectively) (Planning Commission 2011, 2002)

Sr. no.	Development sector	Development programme	10th 5-year plan outlay for the programme (in billion rupees and percentage)	11th 5-year plan outlay for the programme (in billion rupees and percentage)
1.	Employment	Sampoorna Grameen Rojgar Yojana (SGRY)/Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)	300 (*16%*)	1,563 (*23%*)
2.	Education	Sarv Shiksa Abhiyan (SSA) and Mid-day Meal Programme	223 (*12%*)	1,162 (*17%*)
3.	Health	National Rural Health Mission (NRHM) and Integrated Child Development Scheme (ICDS)	467 (*25%*)	692 (*10%*)
4.	Infrastructure	Pradhanmantri Gram Sadak Yojana (PMGSY)	125 (*7%*)	650 (*9%*)
5.	Irrigation	Accelerated Irrigation Benefit Programme (AIBP) and other water resources programmes	44 (*2%*)	466 (*7%*)
6.	Drinking water	National Rural Water Development Programme (NRDWP)	132 (*7%*)	308 (*4%*)
7.	Sanitation	Total Sanitation Campaign (TSC)	9.5 (0.5%)	227 (*3%*)

Overview

This chapter is organised as follows. In the 'Introduction' section, the overall context and the objectives of the study are explained. Next, 'Literature Review' defines a 'semiurban village', and briefly discusses the history of the sanitation programmes in India and the role of various stakeholders. This is followed by a 'Case Study' of Manchar, a semiurban village, whose current solid waste management system has been compared to that of Pune city. Finally, the inferences from the comparison and the scope for PPP partnership in a semiurban village like Manchar have been outlined in 'Results'.

Literature Review

Defining a 'Semiurban Village'

Semiurban villages are the 'growth centres' in rural areas that are rapidly urbanising. They show both rural and urban characteristics such as economic linkage to agriculture, modern living conditions and changing social systems. Defining a

semiurban village based on the population size alone would not be adequate to understand the development challenges of the region (Caplan and Harvey 2010). The semiurban village is also characterised by larger community size, core trading centre and relatively scattered settlements around a densely populated area. The main source of income here is small trade followed by agro-based industries and farming. These areas attract people from surrounding rural areas. The presence of health, education and administrative centres may attract further in-migration (Mugabi and Njiru 2006). In India, such areas are defined as 'census towns', having a minimum population of 5,000, with at least 75 % of the male main workers engaged in non-agricultural activities and population density of at least 400/km^2 (www.censusindia.gov.in).

Due to such diverse characteristics, the typical rural approach such as community participation and mobilisation becomes less effective in addressing water- and sanitation-related challenges in a semiurban village. In view of the rapid unplanned growth and lack of economic resources, there is a need to blend various approaches for providing basic services of water and sanitation in these semiurban villages.

Sanitation Programmes in India

Sanitation broadly includes provision of healthy living environment, namely, safe handling and environmentally sound disposal of human excreta (urine and faeces), solid waste and liquid waste disposal, vector-control and water drainage (Avvannavar and Monto 2008). Along with taking care of human health and environment, recovery of valuable resources from waste could be another important goal of a complete sanitation system (Nelson and Murray 2008). Open defecation and unimproved sanitation systems cause waterborne diseases like diarrhoea and cholera. About 88 % of the total disease load is due to the lack of clean water as well as that of improper solid and liquid waste management. On an average, 30 million persons in rural India suffer from sanitation-related diseases and more than half a million children die of diarrhoea annually (Sulabh ENVIS centre newsletter 2008).

As far as the sanitation sector in rural India is concerned, sanitation policies have evolved through different modes. The Government of India initiated several programmes to improve sanitation conditions and provide sanitation facilities to the people. India's first nationwide programme for rural sanitation, the 'Central Rural Sanitation Programme (CRSP)', was launched in 1986 with the objective of providing sanitation facilities and improving the quality of life of the rural people. The programme was supply driven and gave emphasis on toilet construction. Subsidy was provided on the hardware, i.e. for the construction of toilets. No parallel component of community participation was given any importance. This approach was not successful in meeting the intended outcomes as there was no perceived need for sanitation among the communities. Later, a demand-driven low-cost sanitation approach was adopted increasingly in some parts of India through a mass-level campaign. Based on the success of this community-led total sanitation approach, the

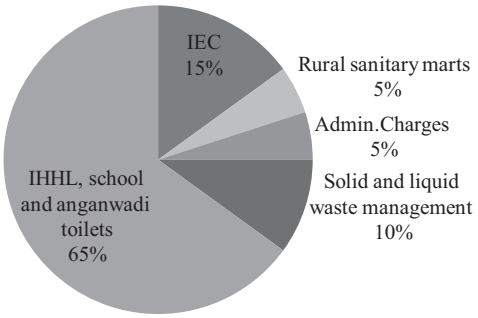

Fig. 3.1 Distribution of funds for components in 'Total Sanitation Campaign' (TSC) (Guidelines of 'Central Rural Sanitation Programme' and 'Total Sanitation Campaign', July 2011, www.ddws.gov.in, accessed 23 May 2012)

TSC was launched in April 1999, giving emphasis on the people's involvement and on (information, education and communication (IEC) for generating demand for the sanitation facilities. Thus, there has been a shift in the strategy of implementing the sanitation programme to involve 'people' along with the 'public institutes' (Water and Sanitation Programme 2010).

TSC

The TSC of the 'Rajiv Gandhi National Drinking Water Mission' (RGNDWM), Government of India, was launched in April 1999. The primary objectives of TSC are to cover all the rural household sanitation facilities and to promote hygienic behaviour for overall improvement of health of the rural population. The following components have been framed in the campaign:

a. Information, education and communication (IEC) activities,
b. Rural sanitary marts and production centres,
c. Construction of individual household latrines (IHHL),
d. Construction of community sanitary complex,
e. Cnstruction of institutional toilets (schools and anganwadis), and
f. Solid and liquid waste management.

Involvement of the 'Panchayati Raj Institutions' (PRIs) in scaling up the TSC was felt necessary for large-scale social mobilisation leading to behavioural change.

The funding pattern for different components of TSC is shown in Fig. 3.1.

As stated in the guidelines of TSC, one of the key objectives is to accelerate the sanitation coverage in rural areas so that there is access to toilets to all citizens by 2017. TSC also aims to motivate the communities and the PRIs to promote sustainable sanitation facilities through awareness creation and health education. The campaign also encourages cost-effective and appropriate technologies for ecologically safe and sustainable sanitation action to develop community-managed environmental sanitation systems focussing on solid and liquid waste management. The achievements of TSC, up to May 2012, are shown in Tables 3.2 and 3.3.

Table 3.2 Physical progress of the various components in TSC (1999–2012) (www.tsc.gov.in, accessed 9 May 2012)

Sr. No.	Component	Component-wise achievement: Physical (in thousands)		
		Target	Achievement	Percentage
1	IHHL total	125,726	87,500	70
2	Sanitary complex	33.7	24.2	72
3	School toilets	1,375	1,262	92
4	Anganwadi toilets	535	413	77
5	Rural sanitary marts	4.5	4.46	99
6	Solid and liquid waste management	238.9	29.9	13

IHHL Individual household latrine

As shown in Table 3.3, the achievement of solid and liquid waste management component in TSC has been very less compared to the other components.

As shown in Tables 3.2 and 3.3, these approaches, based on 'public' (i.e. public institutes like PRIs) and 'people' (i.e. people's participation), were found to be successful in the achievement of individual toilet facility coverage, school toilets and sanitary marts. However, the objectives, to develop community-managed environmental sanitation systems of solid and liquid waste management as well as to encourage ecologically safe and sustainable technologies in sanitation, are not satisfactorily achieved. Solid waste management has not been initiated in most of the Gram Panchayats and, hence, dumping solid waste outside in the open space or by the roadside is a common practice followed by most of the rural households. The status of the liquid waste management is also poor. The maintenance of the community toilets is another major issue in the sustainability of this campaign. Even villages that are successful in the 'Nirmal Gram Puraskar (NGP)' scheme have not performed satisfactorily in these issues (TARU 2008).

Recently, the people's involvement and IEC has been emphasised on for demand generation of the sanitation facilities. The interventions were successful in achieving open-defecation-free status due to an increase in the use of toilets for the village. However, the solid and liquid waste management component of TSC needs to be strengthened (Pardeshi et al. 2008). Recently, the Department of Drinking Water Supply, Government of India, has made policy changes in TSC guidelines and incorporated this element as one of the important activities. It is estimated that the rural people in India are generating liquid waste (grey water) of the order of 15,000–18,000 million litres and 0.3–0.4 million metric tons of solid waste (organic/recyclable) per day. In the absence of proper disposal of solid and liquid waste (grey water and waste water from a hand pump), the people are vulnerable to vector-borne diseases such as diarrhoea, malaria, dengue, cholera and typhoid (Unicef 2010).

In rural areas, solid waste is generated mainly at the household level and then at a community level like market places and common streets. In order to manage the solid waste effectively, the focus must be on household level waste management. Only the solid waste, which cannot be managed at the household level and that col-

Table 3.3 Financial progress of the various components in TSC (1999–2012) (www.tsc.gov.in, accessed 9 May 2012)

Sr. No.	Component	Component-wise achievement: Financial (*amount in million rupees*)		
		Approved	Achieved	Percentage
1	IHHL total	138,346	76,140	55
2	Sanitary complex	4,939	2,963	60
3	School toilets	32,821	23,975	73
4	Anganwadi toilets	3,340	2,177	65
5	Rural sanitary marts	1,590	576	36
6	Solid and liquid waste management	8,957	1,036	12

IHHL Individual household latrine

lected from a market place or common streets, should be handled at the community level. The rising population in villages, particularly in the semiurban villages, is leading to a very rapid growth in the rate of solid waste as well as liquid waste generation. In the semiurban village, a village administrative unit needs a more comprehensive strategy to tackle these issues. Many a time, it is seen that the local PRIs lack the necessary capacity as well as the financial resources to deal with these issues. Thus, specific efforts in capacity building and partnership with private organisations may be desirable.

Scope of the 'PPP' Partnership

The sanitation sector poses a great challenge for the developing countries, especially in the fast growing rural and urban areas. As mentioned earlier, there is only a limited capacity and minimal budgetary allocation from the government. Thus, the private sector has an important role to play in solid and liquid waste handling in the urban and the semiurban areas. Also, the guidelines of TSC now focus on the role of non-governmental organisations (NGOs) and corporate bodies to help in achieving this objective. Small-scale independent providers (SSIPs) or private service providers (PSPs) are already quite active in many developing countries, specifically in waste collection and treatment. There are various opportunities for developing novel PPPs that hinge on resource recovery from these wastes. In Bangladesh, it was found that solid waste management and service delivery through PPP partnership is possible (Ahmed and Ali 2006). Developing country governments are increasingly looking to boost the private participation in solid and liquid waste management. These partnerships could help incentivise and even cofinance sanitation sector, while simultaneously promoting small- and medium-scale entrepreneurs. Along with the collection of waste, technologies for waste segregation, biogas recovery and compost production can be easily taken up and sustained if catalysed by participation of private entrepreneurs (Murray et al. 2011).

The absence of sufficient funds with the local authority to operate the solid waste management services properly further supports the argument for the private sector involvement (Obirih-Opareh and Post 2002). Recently, it has been found that the PPP strategy has helped in improving health sector functions in some parts of India. The success of such a scheme would, however, depend upon continued profitability of private enterprises and the collaborative working of public institutes and private parties on the various details pertaining to the activities to be performed. The private participation not only increases availability of resources through pooling of public and private funds for social purposes, but also shifts the responsibility of a state's welfare activity into a profit-making enterprise (Purohit 2001). It is estimated that more than US$150 billion will have to be invested over the next 5 years for the development of infrastructure, including sanitation and public health in India (Mahalingam 2010). There is a crucial role that PPP needs to play in the development of infrastructure in these sectors.

Stakeholders and Their Roles

The local self-government authorities, people, private service provider and policy-making authority are stakeholders in this process. One of the major reasons stated by the local authorities in developing countries is the lack of financial resources and skills needed to cope with the fast increasing need for solid or liquid waste management. This raises the important issue of delivering quality service while facing financial and human resource constraints of the public sector authorities. It is necessary to search for alternatives to the traditional service delivery mechanism, to keep the urban and rural areas healthy and liveable in the developing countries. It is often proposed that the solution lies in the private sector participation in delivering the solid waste management services. There are various modes of public and private sector participation, prevalent especially in the health sector and the infrastructure sector.

There is a need for a core funding by the government as well as support by the people to make the PPP model successful (Mahalingam 2010).

Since sanitation sector belongs to the individual and community, 'people' component along with public and private component is very important. People can contribute significantly to service delivery in sanitation sector. They can support private sector participation with payment of service charges. Also, monitoring of the process by the people through local level committees would enhance the quality of service. Yet, more importantly, they can play an active role in improving the accountability and service quality of both the public and private sector. However, this radical shift in people's role, from passive service receivers to active service partners, may not occur within a community (Ahmed and Ali 2006).

Case Study

A village named Manchar, located on Pune–Nasik Highway, was identified for the study.

Manchar is a village in Ambegaon Taluk, in Pune district, in Maharashtra State. It is located 11.4 km from its taluka main town—Ghodegaon, 64 km from Pune and 179 km from Mumbai. It is located on the Pune–Nasik Highway (state highway 50) and is an important commercial and educational centre in this region. Manchar is a village with a population of 24,000 and emerging as a residential hub. Its rapid growth is supported by availability of water from the Dimbhe Dam, proximity to an industrial area, special economic zone (SEZ), availability of educational infrastructure, accessibility to metro cities and developed agriculture market. Manchar can be considered as a semiurban village due to these characteristics. The Manchar Gram Panchayat is responsible for maintaining proper sanitation conditions in the village (The Maharashtra Gram Panchayat Act 1958). The Gram Panchayat has been implementing the TSC since 2001. At present, the Manchar Gram Panchayat is handling solid waste by collection and dumping on a nearby land. The process of solid waste management by the Gram Panchayat was studied. The data are collected by interaction with various stakeholders including the villagers, elected members and employees of the gram-panchayat, village officer, health workers and medical practitioners. Also studied were the sanitation arrangements under TSC. The economic details regarding the solid waste management are obtained from the Gram Panchayat records. Due to rapid growth of residential zone and population, lack of proper solid waste management in the village has now become a critical problem for the Gram Panchayat (Discussion with the sarpanch and the village development officer, Manchar, on December 22, 2011).

The 'SWaCH (Solid Waste Collection and Handling) Seva Sahakari Sanstha Maryadit, Pune' is India's first cooperative organisation owned by self-employed rag pickers, waste collectors and other urban poor. The organisation provides waste management services to the citizens of Pune, including a door-to-door waste collection service. The scope of work includes collection, resource recovery, trade and waste processing. At present, there are 2,150 members of SWaCH working in 15 municipal wards in Pune municipal corporation area (www.swachcoop.com, accessed 24 January 2013). The details regarding the working pattern of SWaCH were gathered from discussion with officials of the organisation (discussion with Smt. Malati Gadgil, Chief Executive Officer of SWaCH, 06 March 2012).

Results

The Gram Panchayat of Manchar is implementing TSC since 2001. The achievement in TSC components with reference to the base line survey in 2001 is shown in Table 3.4.

Table 3.4 Achievement in TSC components in Manchar (2001–2011) (Gram Panchayat Manchar NGP application 2011)

Sr. No	Component	Component-wise physical achievement		
		Target (as per baseline survey in 2001)	Achievement in 2011	Percentage
1	IHHL total	3,109	3,109	100
2	Sanitary complex	1	1	100
3	School toilets	14	14	100
4	Anganwadi toilets	9	9	100
5	Rural sanitary marts	NIL	NIL	2
6	Solid and liquid waste management	–	NIL	3

IHHL Individual household latrine

In 2001, the number of households registered with Gram Panchayat was 4,445. At present (2012), there are 8,732 households registered in Manchar. The present practice of solid waste and liquid waste management at the household level is using soak pits and establishment of kitchen gardens near the house. Presently, there are 376 kitchen gardens, 72 solid waste collection concrete bins and 117 soak pits, which are not sufficient. There are 2,600-m-long open drains constructed to carry the collected sewage. It is discharged into the local natural drain without any treatment.

In order to deal with household-level solid waste as well as community-level solid waste, the Gram Panchayat has purchased two tractors and one small waste collection vehicle (Ghantagadi) and employed five people for the solid waste collection with a salary of ₹ 1,500 per worker per month. These employees are appointed on a contractual basis. These vehicles have been given three different routes to collect solid waste from places where people dump the waste into these vehicles. The agriculture produce market committee in the village also collects 1–1.5 tonnes of biodegradable waste and dump at the same location without any treatment. The solid waste is collected without any segregation. A total of 12–14 tonnes of solid waste is collected every day. The collected solid waste is then dumped on open land, 1.5 km away from the village and partially incinerated by the Gram Panchayat workers. The local waste pickers are not willing to go to the dump yard due to distance and non-segregated waste. There is no treatment applied for the remaining solid waste. This has led to the solid waste accumulation in the nearby water drainage as well as the spreading of the solid waste in the nearby agricultural fields. The Gram Panchayat is not charging any fees for the waste collection service. The nearby residents and an educational institute near the dumping site are victims of bad odour and flies. They frequently complain to the Gram Panchayat officials to solve the problem.

On the other hand, SWaCH has 2,150 self-employed waste pickers to cover doorstep collection of waste from 390,000 households in Pune city. The organisation is

linked with 550 scrap shops in Pune. For the collection of the solid waste, the households need to pay ₹ 20 per month to the waste picker. Typically, two waste pickers cover 400–500 houses every day. They earn about ₹ 8,000 –10,000 per month from the households and ₹ 3,000 per month from selling of recyclable material and scrap. The solid waste management services provided by SWaCH are summarised as follows:

a. *Door to door collection* (DTDC): Daily collection of dry and wet waste from households, hotels and shops. No common dumping point is constructed by the municipal corporation.
b. *V collect:* Collection of unwanted household material that cannot be thrown in the daily garbage (e.g. sanitary napkins and diapers).
c. *U drop:* Fixed drop-off points where any kind of unwanted household goods can be dumped on certain fixed days (Scrap material).
d. *V-Compost:* Creating and maintaining compost pits for decomposition of organic waste.
e. *E-Collect:* Collecting electronic waste from households/shops separately.

SWaCH is working for the Pune Municipal Corporation in an urban area. Here, the approach of solid waste management is considered in both scenarios. In terms of quantity of solid waste collected, both the approaches could not be compared directly. However, the comparison highlights certain areas of solid waste management in which private service providers can definitely assist the rural administration in achieving the objective of TSC. A brief comparison of the solid waste management systems in Manchar and Pune is shown in Table 3.5.

The comparison in Table 3.5 indicates the scope of areas in the present solid waste management system in the semiurban village, where private service providers can support the rural administration in the following components:

1. Training of the Gram Panchayat employees for effective solid waste management.
2. Treatment of solid waste: Designing and implementation of 'collection-segregation–reuse–treatment' process in the village. The quantum of solid waste generated in semiurban areas, unlike that in the urban areas, is economically unattractive for the private entrepreneurs. However, the private service provider may act as a nodal agency for a cluster or a group of such villages. A central processing unit for solid waste can be managed by the private service providers.
3. Empowerment of the people for effective solid waste management.

Solid waste management strategy in rural areas would be effective if it is based on the reuse and segregation of waste (Unicef 2010). Many reuse projects remain at the pilot scale, unless they are subsidised (TARU 2008). A financial model for this private partnership in rural areas can be worked out separately. Funds from the Gram Panchayat and TSC component will help to launch such initiatives.

Table 3.5 Comparison of the solid waste management systems in Manchar and Pune

Sr. No.	Component of solid waste management	Gram-panchayat, Manchar	Pune Municipal Corporation
1.	Total quantity of the solid waste collected	12–14 t per day	1,300–1,400 t per day
2.	Collection and segregation of the solid waste	No door-to-door collection but any segregation of the collected solid waste.	Door-to-door collection and segregation of the collected solid waste through citizens and waste pickers.
3.	Scope of reuse and recycle of the waste	No reuse or recycle of the collected solid waste. Minimum at present. Efforts required at dumping site.	Due to segregation, it is possible at source and is practised by waste pickers.
4.	End treatment	Open dumping on land and, partial incineration.	Recycling, composting and incineration.
5.	People's participation	No fees charged to residents. Also people unaware about segregation of the solid waste. No contribution from people in the waste management.	People contribute through monthly service charge of ₹ 20 per month per family and participate in segregation of the waste process.
6.	Training of solid waste handling and management to labourers	Unskilled labourers are employed in the solid waste management without any incentive except salary.	Trained waste pickers with incentives.
7.	Financial support for the solid waste management and revenue generation	Gram Panchayat funds and funds received from the government. No revenue generation.	PMC support for initial infrastructure and supplementary grants; Revenue from fees, recycling and manure sale.
8.	Financial sustainability	Burden on budget of the gram-panchayat. Sometimes development funds needs to be curtailed to provide operational cost.	Adequate PMC support and revenue generation. So, better chances of becoming financially sustainable.

Conclusion

The solid waste management is now a crucial issue for the Gram Panchayats of the semiurban villages. It is necessary to pay more attention to these rural areas, where there is a rapid growth in population and changes in lifestyle. Collection and disposal by dumping in open land or incineration are the usual methods adopted by the Gram Panchayats. A systematic approach, such as the one adopted by a private service provider like SWaCH for the solid waste management in Pune, would help in improving the solid waste management scenario in these villages. Better utilization of the solid waste can be achieved in rural areas through such initiatives. Such initiatives for improvement in sanitation situation in these villages may help in retaining rural migrants in their homes and also prevent haphazard migration into urban areas. The economic viability of this participatory approach may be enhanced by the private entrepreneur working in a cluster of villages for solid waste

management. Financial support to this private participation is essential at the village level. The role of private service providers in training and empowerment of existing workers in the Gram Panchayat is also critical in improving the present solid waste management systems of the gram-panchayat. Sanitation not only is a technology and policy issue but also involves greater challenges of behavioural change of the stakeholders. Ultimately, a combined effort involving an active participation from the villagers (waste segregation) and professional management, provided by the private service provider (waste collection, recycling and disposal) and facilitated by the local public administration could hold the key to the successful TSC and clean villages.

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