



## Water and Sanitation Program

An international partnership to help the poor gain sustained access to improved water supply and sanitation services

# Profits from Waste: An NGO-led Initiative for Solid Waste Management in Lucknow, Uttar Pradesh, India

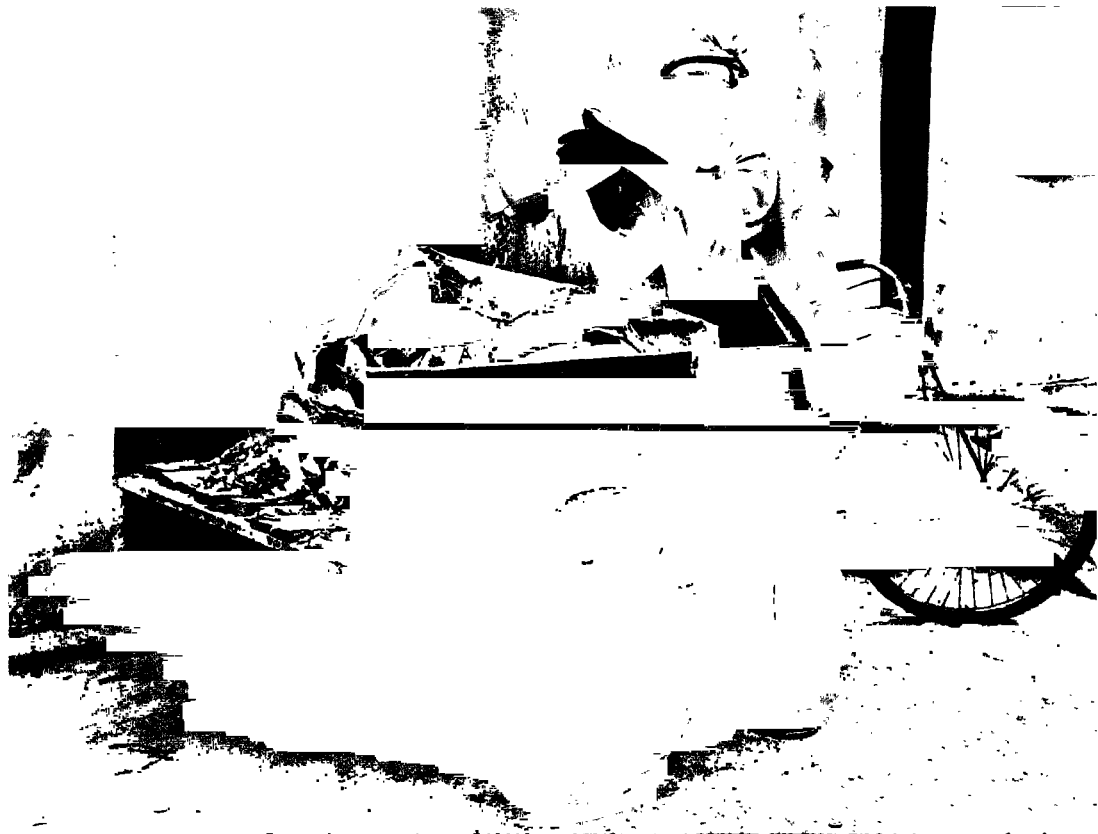
## South Asia Region

### SMALL PRIVATE INITIATIVES (SPI) IN THE WATER AND SANITATION SECTOR IN INDIA

In India, water and sanitation services are predominantly provided by Government and para-statal agencies. There are very few instances of large-scale formal private sector participation; where they exist they are mostly service contracts or management contracts.

However, a number of small-scale informal private initiatives have emerged to fill the gaps in the existing delivery system. Some of these private initiatives are in partnership with the Government, and others have come about on their own in response to demand from clients.

This series of Field Notes on Small Private Initiatives in the Water and Sanitation Sector in India is designed to document a few successful urban and rural experiences focusing on the poor.



*Household waste collection*

## SUMMARY

Lucknow, as in the case of most cities in India, is struggling with the problem of solid waste management. Muskan Jyoti Samiti is a Non-Governmental Organization which has been successfully providing comprehensive solid waste management services to a part of the city since 1994. Its operations include street cleaning, garbage collection, sorting, transportation, disposal and vermi-composting. It recovers the operation and maintenance cost from the households served. This field note profiles the work of Muskan Jyoti Samiti in Lucknow.

SPI Series: 3

## Introduction

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THE MUNICIPAL Corporation of Lucknow is unable to provide adequate and efficient solid waste management services to an estimated population of about 2.5 million for the year 1999. This has led to the emergence of a few non-governmental solid waste management initiatives. One such example is the Lucknow-based non-governmental organization (NGO) called Muskan Jyoti Samiti (MJS), roughly meaning 'society that spreads the light of happiness', which was established on 2 October 1994, the birth anniversary of Mahatma Gandhi. Currently, through its solid waste management (SWM) initiative called SWASTI, MJS serves a population of over 100,000 in nearly 20,000 households, which includes 20,000 persons living in 22 of the 460 slums in Lucknow city. MJS employs 235 people, including 215 garbage collectors and rag-pickers. It operates 250 handcarts, 210 rickshaw trolleys and 5 tractor trolleys.

In March 1999, MJS started a vermi-composting unit and a research center on a 65-acre site on the outskirts of Lucknow. The research center is experimenting with bio-farming, particularly to assess the extent to which alkaline or saline land could be reclaimed for cultivation using organic vermi-compost. MJS has also started SWM work in the cities of Kanpur, Allahabad and Varanasi. Apart from solid waste management, MJS is now diversifying into other activities, such as encouraging rural women to produce organic flour (*atta*) and lentils (*dal*), helping people set up and run small rural water supply projects in villages neighboring Lucknow, and assisting cycle rickshaw operators in Lucknow city to get bank loans. But SWM continues to be its flagship program, the one by which the local population identifies MJS.

## The Beginning

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JS FIRST started its SWM operations in Indira Nagar, an upper middle-class locality in Lucknow, with a few daily wage workers. It tried to convince the residents of the benefits of having their garbage removed regularly and paying for the service. This initiative did not meet with much success. Despite the fact that the Municipality

### PROFILE OF LUCKNOW CITY

LUCKNOW IS the capital of Uttar Pradesh State in North India. While the city grew at a moderate pace from 1951 to 1981, it experienced a high population growth and spatial expansion in the decade 1981-91. Lucknow is predominately a "services" city, providing employment in administration, trade and commerce, communications, storage and transportation. The main features of the city are:

Population, 1991	<b>1.7 million</b>
Projected population, 2001	<b>2.9 million</b>
Population growth, 1981-91	<b>66 per cent</b>
Area, 1991	<b>338 sq km</b>
Number of households, 1991	<b>280,000</b>
Low-income households, 1991	<b>100,000</b>
Employment in service sector, 1991	<b>71 per cent</b>

pal Corporation's service was not good, the residents considered garbage removal as the latter's responsibility and refused to participate in the NGO-led program. In October 1995, MJS abandoned Indira Nagar and moved to the neighboring lower-middle-class locality of Vikas Nagar, where it succeeded in establishing a base. MJS soon expanded its operations to cover selected slums after successful SWM work in a few middle-class localities.

## Mewalal THE INSPIRATION BEHIND MJS

AFTER 15 years of working as the Secretary of the Laborers' Cooperative Society in Lucknow, Mewalal was distressed by the working conditions of the cleaners and waste collectors he came across. One day he realized that he could address both the issues that worried him: (i) the plight of the cleaners and waste collectors; and (ii) the garbage that piled up all around the city. He also realized that these problems could not be solved by the existing municipal system, and, therefore, decided to form an NGO to take up the task of efficient garbage collection and disposal in Lucknow city. Success did not come easily to him. But with his vision, dedication, entrepreneurship and drive, Mewalal has now achieved what seemed an impossible goal when he started 5 years ago.

Entry in the slums was more difficult and required much more convincing. Women were targeted for the awareness campaign in these areas.

## Community Mobilization

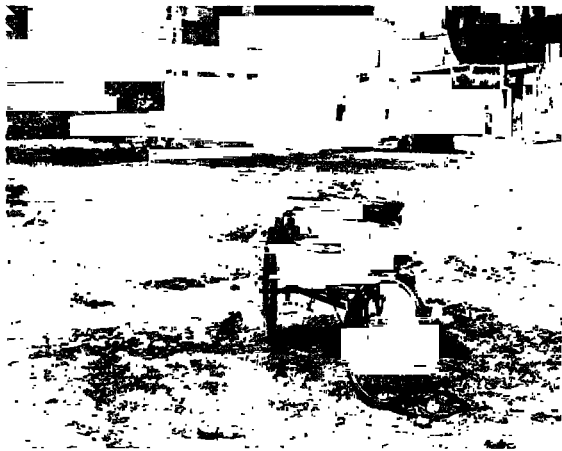
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GETTING THE community's agreement to participate is a crucial part of the MJS's waste collection and disposal program. When a residential locality is approached for the first time, MJS community mobilizers go from house-to-house, informing the residents about MJS, creating awareness about SWM, and requesting them to pay for garbage collection.

## THE STORY OF SABHAULI

SABHAULI VILLAGE, a slum bordering the low-income housing colony in Vikas Nagar, was in a pitiful state a year ago. Garbage was dumped in the open in a central area where several roads met, animals rummaged through the garbage, the stench of the rotting garbage was a part of life, and filthy water flooded

*The cleaned-up junction in Sabhauli*



After the awareness-building exercise, the residents who are willing to participate in the program sign an MJS form. When a minimum of 150 forms have been signed in a particular locality, MJS begins its operation. During the initial two-month period, the community mobilizers also advise residents to store garbage at their homes in plastic bins or bags which can be emptied directly into the MJS handcarts.

Solid waste collection is free for the first 2 months. Monthly charges are levied only in the third month, after residents have benefited from the door-to-door collection of garbage, as well as improvement in the cleanliness of their surroundings. According to the MJS founder, Mewalal, about 80

the streets when it rained. "Children used to fall ill frequently," says Chandrika, a resident of Sabhauli. The Municipal Corporation refused to remove the garbage, stating that the approach road was not wide enough for a tractor to go through.

Then the MJS community mobilizers arrived. Fed up with the stench and sight of uncollected garbage, the residents realized the benefits of the MJS offer and decided to participate in the program and to pay for the service. Today, the same road junction is free of garbage. The drains running alongside the houses are cleaned regularly. Women bring out their garbage to throw into the MJS handcarts that come to their houses.

To prevent the junction from returning to its earlier state, on the advice of the MJS community mobilizers, the residents have put up red flags on the site and have spread the word that a temple will be built there. No one throws rubbish in the streets of Sabhauli anymore.

per cent of the residents pay the monthly collection charge after the first 2 months of free service. Community mobilizers go around to the remaining households to inquire why

**Table 1**  
**Monthly Garbage Collection Rates of the MJS**  
(per household)

<b>Slum dwellers</b>	<b>Rs. 10</b>
<b>Economically-weaker households</b>	<b>Rs. 15</b>
<b>Middle-income households</b>	<b>Rs. 20</b>
<b>Higher-income households</b>	<b>Rs. 25</b>

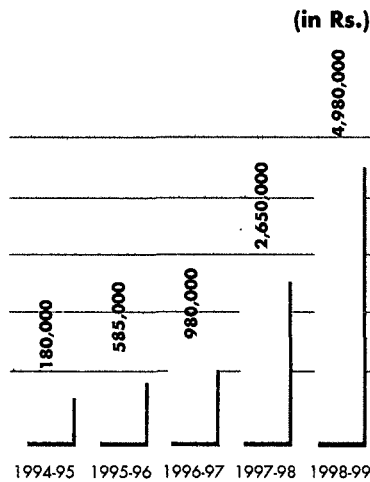
they have not paid and try to persuade them to contribute and participate in the program. At times, peer pressure from other residents in the locality helps in making the defaulting households pay the monthly rate.

## Financing of the Solid Waste Initiative

AN INITIAL investment of Rs. 25,000 from the personal savings of Mewalal was made by MJS for its waste collection and disposal program in Lucknow. MJS had a loss of Rs. 17,000 in the first year, but the situation improved when it secured Government support, expanded its operations, and improved the operation and maintenance (O&M) cost recovery from the households served. In the 5 years since the SWM operations started, MJS has not only recovered its initial losses but, in 1998-99, was also able to make an investment of Rs. 1.2 million in the vermi-composting unit from the surplus generated through the solid waste operations in the city. MJS has purchased 1 tractor trolley from its own savings. MJS has also been able to secure bank loans to buy 100 cycle trolleys in the name of individual trolley operators.

This turnaround would not have been possible for MJS without the land, capital and equipment provided by the State Government. The Uttar Pradesh Bhumi Sudhar Nigam (State Land Development Corporation) allocated 65 acres of land free of cost. The State Urban Development Authority (SUDA) gave them a grant of Rs. 124,000 for preparation of the vermi-composting beds and pits, plus 100 cycle trolleys worth Rs. 300,000 at current prices. The Lucknow District Urban Development Authority (DUDA)

**Table 2**  
**Annual Revenue Receipts**  
**from Solid Waste**



a cross-subsidy from the higher-income households.

The annual collection from the households has risen 24-fold since MJS started operations, from Rs. 180,000 in 1994-95 to Rs. 4,320,000 in 1998-99. Income from the sale of inorganic materials recovered from the collected waste has also been rising rapidly, reaching Rs. 660,000 in 1998-99 from Rs. 45,000 in 1995-96. There was no income from the sale of inorganic materials in 1994-95. Further, income from the sale of compost started accruing to MJS only in the year 1999. The total annual revenue receipts of MJS from solid waste collection and disposal in Lucknow, including income from household collections and sales, are presented in Table 2.

expands. A waste collector is paid between Rs. 1,200 and Rs. 1,500 a month, while a supervisor gets Rs. 2,000 per month. Waste collectors and trolley operators are also allowed to seek other day-time jobs after finishing their morning's work. Rag-pickers are paid Rs. 1,000 per month.

Although expenditure on staff salaries, vehicle maintenance, fuel and garbage bags has been rising over time, MJS has managed to keep its costs lower than the income. On an average, 85-90 per cent of the revenue is utilized to meet the cost of operations, while 10-15 per cent is the MJS's margin for assorted expenses and rolling capital for new equipment and expansion of its solid waste

*Street cleaning*

gave 4 tractor trolleys with a price tag of Rs. 236,000 each, plus 200 hand carts priced at Rs. 1,000 each.

Interestingly, MJS has not been able to get any support from the Lucknow Municipal Corporation, the organization responsible for garbage disposal in the city. MJS has been requesting the city Government to either give them land and capital, or 200 square feet covered sheds per 500 households for storing the garbage bags, hand carts and trolleys within the locality where they are working. This demand has not been met as yet by the Municipal Corporation.



The average monthly O&M cost for the waste collection and disposal is presently Rs. 20 per household. MJS charges monthly waste collection rates ranging from Rs. 10 to Rs. 25 per household, depending on the ability to pay. The lower-income households benefit from

The bulk of the MJS's expenditure in SWM is on salaries paid to the increasing number of workers. MJS almost continuously recruits new rag-pickers, waste collectors, trolley operators, supervisors and community mobilizers as their service network

operations. It must, however, be emphasized that MJS would not be able to show a surplus of revenue over costs if it had to make all the initial capital investment in land and equipment without receiving significant support from the Government.

# Waste Collection and Disposal

## Waste Collection

MJS workers collect waste 6 days a week. In the housing colonies served by MJS, they go from house-to-house in the morning, collecting the unsorted waste. The waste is transported by a hand cart to a cycle trolley where the primary sorting of organic and inorganic waste is carried out. The two large bags of sorted waste are then removed by the cycle trolley operator. The streets in these localities are swept once a week.

By about 11.00 a.m., the cycle trolley operators take the waste to a central point where MJS rag-pickers sift saleable material from the collected waste. The remaining waste is picked up from these central points by tractor trolleys and taken either to the landfill, or to the composting site in Rasoolpur Kayasth outside Luc-

know city. The last tractor trolley comes into the composting site at about 4 o'clock in the afternoon.

Once regular operations start, MJS supervisors are appointed to cover specific areas to ensure that weekly street cleaning and daily waste collection is done properly. They keep a record of payments made by the households. They also attend to the residents' complaints about irregular collection or accumulated waste in the nearby parks and streets.

## Waste Disposal

About 10 tons of garbage is collected every day by MJS from the residential localities and wholesale vegetable and fruit markets. Approximately 40 per cent of the waste is inorganic material, such as cardboard, paper, plastic, rubber, leather, textiles, metal, glass and bricks. Half of the inorganic waste, such as metal, glass, plastic and paper, is recovered

by the rag-pickers for resale by MJS while the remaining waste, mainly ash and soil, is sent to the landfill site outside the city.

The 6 tons of organic waste collected daily consists of waste from plants, fruits and vegetables, hay and cow dung. About 3 tons of organic waste is collected from the households and 2 tons is picked up free of cost from the wholesale vegetable and fruit markets. Cow dung is purchased by MJS from private dairies in the city whenever required. The organic waste collected is used to make compost and liquid fertilizer in the MJS's vermi-composting unit.

The MJS vermi-composting unit was set up with the assistance of the Institute of Research in Soil Biology and Biotechnology, located in Chennai. The Institute has also posted 2 of its scientists at the site in Lucknow to supervise the compost production process, and to conduct agricultural

*Vermi-composting*



research using vermi-compost. Two types of fertilizers are produced at the MJS vermi-composting unit:

- Dry compost, produced outdoors in pits.
- Liquid fertilizer, which is produced indoors in steel drums.

Both of these processes use the same organic waste as inputs but in different proportions.

The MJS plant can process up to 72 tons of organic waste at any given time. Every ton of organic waste produces about 250 kilograms (kg) of sieved ready-to-sell dry compost. At the end of every 6 months, the unit produces about 150 tons of compost, of which it sells 50 tons to the State Forest Department for use in its nurseries, uses 50 tons on its own farm, and keeps 50 tons in stock for sale. It costs about Rs. 2 per kg to produce, and is sold at an average price of Rs. 2.40 a kg.

## Key Issues and Lessons

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THE SWM program of MJS has made a good beginning in successfully providing solid waste collection and disposal services to selected localities and recovering the costs of the O&M. There are, however, a few problems which affect the smooth functioning of the system and the potential for its future expansion. The key issues and lessons emerging from this experience are:

**Relationship with the Government:** Although MJS has received help in the form of capital assets from different State Government agencies, it has got no support from the key Government player - the Lucknow Municipal Corporation. The latter has not only not entered into any institutional relationship with MJS, but looks upon its successful SWM operation as a threat to its own functioning.

Lack of support from the Corporation is one of the major barriers in the expansion of MJS operations in the city. Such NGO-led urban SWM initiatives could improve if there is an explicit relationship with the city Government.

**Capital for Expansion:** Even if the Lucknow Municipal Corporation encouraged MJS to expand the scope of its operation, the question of financing remains unanswered. Capital is required for acquiring land and new equipment for expansion. MJS has two options in this regard:

- Securing additional grants from Government agencies.
  - Borrowing funds from the market for capital expansion.
- While the latter option needs to be examined from the point of view of its viability, the former option could result in reduced autonomy for MJS and affect the price and quality of the service.

**The Strengths of NGOs:** This case of the MJS-led solid waste initiative in Lucknow demonstrates that NGOs can play an important role in urban solid waste management. NGOs have particular strengths in reaching communities, motivating them, creating awareness about problems of waste disposal, and in ensuring their participation in a user-fee-based waste disposal program. It is also possible for an NGO to acquire new skills, such as composting and product marketing, and provide an entire chain of services, from door-to-door collection to environmentally-friendly waste disposal.

**Peoples' Willingness and Capacity to Pay for SWM:** This example demonstrates the viability of providing a fee-paying SWM service in India's urban areas. Even the poorer households in Lucknow are willing to pay a significant amount as the monthly fee for good solid waste collection service to ensure a better living environment.

**Water and Sanitation Program  
- South Asia  
55 Lodi Estate,  
New Delhi 110 003  
India**

**Tel: 011-469 0488/9  
Fax: 011-462 8250  
E-mail: [wpsa@worldbank.org](mailto:wpsa@worldbank.org)  
Website: <http://www.wsp.org>**

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