

# Designing pathways to successful waste management in India and beyond

By Bryan Boyer & Justin W. Cook

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**Helsinki  
Design  
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## Basics

### Client

Private individuals, housing organizations, and businesses

### Core Design Team

The Daily Dump

### Stakeholders

Households, municipalities, kabadi-wallahs, Base of Pyramid workers, rural craftsmen, schools, teachers

### Sector

Waste management

### Start date

January 2006

### Status

Ongoing

### Project cost

₹,000

10,000

₹,000

₹,000,000

## Key individuals

### The Daily Dump

Poonam Bir Kasturi,  
Founder

Beulah Y.,  
Administrative Head

Ashraf N.,  
Support Staff

Kalappa,  
Support Staff

Anupama Abhijith

Trupti Godbole

Swetha Shettar

Savita G. V.

Vinita

## By the numbers

### 10M-25M

Tons of organic waste generated per year in India. *Source: National Environmental Engineering Research Institute*

### 583M

Expected number of people comprising India's middle class (the Daily Dump's target market) by 2025. *Source: McKinsey Global Institute*

### 1,300

Compost pots sold per year by Daily Dump directly. *Source: Daily Dump*

### 10

Clones currently operating worldwide (as of 2010). *Source: Daily Dump*

# Overview

1. Daily Dump created a range of products, services, and educational materials to enable individuals to manage their organic waste by composting.

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2. Their approach is decentralized and designed for growth in contrast to centralized systems which have a history of failure in Bangalore. ➤ *Redefining the boundaries of a problem is often a precursor to successful design of a solution.*

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3. Availability of new products and services was not enough, Daily Dump also had to build awareness by creating educational materials and opportunities. ➤ *Not all customers will be lead users: social enterprises need solutions that enable broader community participation.*

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4. Starting at a modest scale with consumers and local suppliers, Daily Dump was able to prototype a robust solution that could provide income for further development. ➤ *Local sourcing and an iterative approach to product development provided a rapid innovation cycle.*

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5. Daily Dump traded direct market share for an expanded ecological impact by allowing for clones of the business. ➤ *A network of clones provides research and development to each other, freely sharing knowledge generated from their own developments.*

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6. The Daily Dump product appeals to self interest as well as civic duty in order to make the impact greater and more lasting.

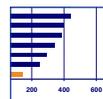


## Case narrative

With a background in entrepreneurship, and experience cofounding one of India's leading design schools, Poonam Bir Kasturi was no stranger to big challenges when she began to take note of the amount of waste filling Bangalore's streets. Running a business and even creating a new school from scratch were successful projects built on Kasturi's creativity and intellect, but as structural challenges, they were known quantities—familiar institutions for which many models existed. To address her growing interest in Bangalore's waste, Kasturi would have to redefine the boundaries of the problem, while also designing the right kind of approach to the challenge.

With the ultimate goal of improving India's ability to manage its waste, Kasturi created the Daily Dump, a business that offers composting and recycling products and services actionable on an individual level, yet primed for coordination in a larger network of action. In the wake of failures left by many top-heavy, centralized approaches to waste management, The Daily Dump's bottom-up, instant on solution is a powerful alternative.

Following the predominant trend in the world's advanced economies, with wealth comes waste. India is no exception and waste is becoming a problem in its cities. With a population approaching 1.5 billion, India is home to three of the world's mega-



—Figure 1  
p. 16

cities. And while less than one third of India's citizens currently reside in urban areas, the sub continent's cities contribute more than two thirds of the country's GDP and approximately 90% of the government's revenue.

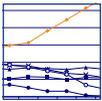
The prosperity of India's great cities has increased the personal wealth of many citizens, leading to greater spending, consumption, and—invariably—trash. Meanwhile, a significant population remains below the poverty line, searching for any economic opportunity available. For the workers at the base of the pyramid, from rag pickers to lorry drivers, the recyclable materials mixed within India's 35-45 million tons of waste per year<sup>1</sup> represents an important income source. Indians participating in both the formal and informal economy stand to benefit from the effective management of waste by reducing municipal governments' waste collection and storage cost burden, allowing those funds to be applied to other areas in need. For India and people the world over, mitigating the impact of waste through effective composting, recycling, and management is an environmental imperative.

This challenge is set against the rich and dynamic backdrop of India itself: a vast nation with 29 languages<sup>2</sup>, many cultures, a rapidly expanding economy, and a thriving informal sector. Numerous waste management projects at every scale from the national to the neighborhood have been attempted but problems persist. This is the context that The Daily Dump chose to accept as a basic fact of their work: something to be designed into the solution.

## The Euphoria of Accessibility

Compared to more developed economies, India's overall rate of waste creation is relatively low, but cities are disproportionate producers and India's cities are numerous, large, and rapidly expanding. In the next twenty years, the number of Indian cities with a population of more than one million is expected to double, meaning "an entirely new urban India will be built again."<sup>3</sup>

Although India currently produces relatively little waste, cities are disproportionate producers. As India's megacities continue to expand waste volumes are expected to skyrocket.



—Figure 2  
p. 16

1—Hanrahan, David et al. *Improving Management Of Municipal Solid Waste In India: Overview And Challenges*. New Delhi: The World Bank, 2006.

2—2001 Census of India

3—Tiwari, Geetam. "Innovations for an Urban World." Lecture. Columbia University, New York City. Web. 10 Apr. 2010.

As the country's economy grows, so too does the income of its citizens, yielding greater household spending matched by local production activity catering to the urban middle class. Based on The World Bank's estimate for the growth of India's urban population, the country's waste generation may expand by more than 300% to a total of 150 million tons of waste per year by 2025.<sup>4</sup> Critics have referred to these recent changes in India's economy as producing a "euphoria of accessibility" to consumer goods that is pushing waste levels ever higher, in the model of American and European cities.

But unlike the metropolises of Europe and North America where consumer culture is deeply engrained, Indian cities produce waste with a high level of organic content (between 30% and 55%).<sup>5</sup> Households produce much of this organic waste from food preparation. Acting on this waste at the source by composting can reduce upstream handling needs while also making the upstream journey more efficient by enabling easier reclamation of recyclable materials. Manual segregation of recyclables is a job that currently employs a significant population of the poorest urban dwellers for whom trash is cash.

Urban poverty is a fact of life in India. An ideal approach to waste management would design-out the role of rag pickers and other dangerous jobs currently occupied by bottom of the pyramid workers. But the difficult reality is that recycling and other waste-related jobs form an important economic opportunity for some who lack the skills necessary to participate in India's rapidly growing economy. Structural changes must take into account the deep intermingling of formal and informal economies and thus provide a transitional pathway of sustainable improvement.

### **Attitude, Practices, and Services**

At a basic level, the efficacy of waste management depends on three key factors: the attitude of individuals, the practices that those individuals engage in, and the extent to which municipal services enable and support these practices and attitudes. Failure in any one of these areas damages a community's ability to manage their waste. Similarly, isolated accomplishments within one part of the system

4—Hanrahan, David et al.

5—Kumar, Sunil. "Municipal Solid Waste Management in India: Present Practices and Future Challenge."

will not yield significant results without coordinated accomplishments on the other factors.



—Figure 3  
p. 16

The current reality in many Indian cities is that municipalities are not offering effective Municipal Solid Waste (MSW, commonly referred to as household waste) management services. Problems include incomplete garbage collection, open lorries that leak garbage, a paucity of properly managed dumpsites, corrupt contracting, and ineffective oversight. At the municipal level there is often a lack of funds and the ability to coordinate services capable of handling the sheer volume of waste, particularly in the largest cities. Furthermore, without sustainable funding for investments in the physical infrastructure of waste management, upgrades are often sporadic and ill-maintained, further contributing to an overall perception of waste being an insurmountable problem.<sup>6</sup>

NGOs have been quite active in providing waste management assistance through community-based programs in India, but such projects developed with external assistance are often unprepared for the complex cultural, economic, and political dynamics of India. This can be seen as the delivery of practices without a sufficient investment in fostering awareness and attitude. As with the failure of municipal-level projects, community based solutions that prove unsustainable or poorly managed leave a wake of suspicion that is difficult to overcome.

Whether operating in a top down or bottom up fashion, effective education, information, and communication action plans help foster an accepting attitude within the community which is essential to the success of any MSW project. Nevertheless, awareness on its own is not enough to produce real change in behavior. If individuals do not perceive improved MSW practices as being viable significant participation will not follow. As told by Kasturi during a visit to the Daily Dump's headquarters, people of Bangalore lost a lot of faith in the city when it promoted segregation of recyclables at home but visibly collected mixed waste and recyclables in the same garbage trucks.<sup>7</sup>

## The Limits of Centralized Systems

The Daily Dump was born out of recognition that Bangalore was a messier city for all of its growth and that the municipality

6—Hoorweg, Daniel et al. *Urban Waste Management: Composting and Its Applicability in Developing Countries*. Washington, DC: The World Bank, 2000.

7—Kasturi, Poonam Bir. Interview by Bryan Boyer. March 2009.

and various NGOs attempting to fix the situation were stumbling. Due to evident corruption and bureaucratic sluggishness, efforts to enhance the centralized waste infrastructure were deemed by Kasturi as an important long-term effort, but one in need of a more immediate counterpart.

In her own words, "there is a limit to how much big, centralized systems can help. [There's a] little bit you have to do and a little bit the community has to do and a little bit the large systems have to do, but it can't be that everything is done by the large systems. Actually, you can make a big difference."

With municipal services faltering, Kasturi's focus turned to attitudes and practices. The Daily Dump was established as a for-profit social enterprise in order to give the organization a high degree of flexibility in pursuing their goal of improving urban waste management in India. Free from any obligation to donors, the organization is able to change tack quickly to act on opportunities as they emerge. Using the market as a persistent reality check, the growth of the Daily Dump comes at a relatively slow pace but is fundamentally durable and road tested.

From the outset, the Daily Dump was designed as a business with three critical aspects: it would promote waste management generally rather than its own products, it would provide education in addition to tools, and it would offer a "clone" model which allows like-minded parties to duplicate the business.

## Learning by Doing

**"A mechanism is needed where households and other establishments can be made to segregate their waste into biodegradable and non-biodegradable material"**

*Velusamy Ponnuraj,  
Deputy Commissioner of Dakshina Kannada quoted in  
The Hindu on 6 January 2010*

Acting on the opportunity provided by the high organic content of Indian household waste, The Daily Dump chose composting as its first inroad to changing attitudes and practices relating to waste. Using design ethnography, materials research, and prototyping, The Daily Dump set out to specify their first offering, the Kambha composting pot.

Kasturi was no compost expert when she began The Daily Dump. Rather, she used a learning-by-doing approach to explore



—Figure 4  
p. 17

different methods of composting in her own home, enabling her to evaluate possible productization options while learning the process. As an act of unilateral choice that can be made within an individual household, at-home composting became a clear forerunner for the first Daily Dump product.

Through in-home interviews with housewives who were identified as the typical household champions of composting, The Daily Dump was able to identify "make or break" issues for the product's success such as concerns about cleanliness and ease of use. These interviews led to the development of accessories such as an apron and educational material that clearly explained the process. The Daily Dump also regularly follows up with new customers two weeks after they receive their composting pots to help troubleshoot any problems. These conversations form a feedback loop that was used to tweak the product offerings during the first years of the business. Sourcing the main composting products from a rural village in shipments of approximately 20 allows The Daily Dump to enjoy a rapid product innovation cycle.

Kasturi also surveyed existing bottom-up composting processes, organizations, and tools. Originally the Daily Dump explored the possibility of designing a Nature Mill composter for the Indian Market. However, its reliance on electricity makes the Nature Mill a poor choice for locations with an unstable power grid, nor does the Nature Mill fit comfortably into the scenery of the typical Indian home.

## Material Matters



— Figure 5  
p. 17

After materials research exploring plastic and other options for the compost container, The Daily Dump chose terra cotta pottery due to its ability to naturally aerate and its resonance with the decorative crafts of Indian culture. Although it took six months to establish a working relationship with a reliable potter, manufacturing in a rural village keeps manufacturing costs down, creates a new income stream for the village, and allows The Daily Dump an iterative product design cycle.

## Scaling up the Business

As revenue from the composting pots and related accessories grew, the Daily Dump expanded to add parallel product lines addressing other issues of waste management. The Harm-Less

Home line, for instance, offers customers a 100% organic, natural, and non-toxic alternative to laundry detergent.

While the composting pots are a profitable revenue stream, their value is increased as lead users convert others into advocates, leading to new customers and expanding the commitment to the "waste is a resource" philosophy. In addition to benefitting from customer referrals, many of the Daily Dump's staff members were customers first.

With a healthy business selling composting pots to residents of single family houses, The Daily Dump is now beginning to offer solutions to a new scale of compost customers with a modular composting unit designed for 12-300 families. Apartment, condominiums, and other multi-family housing buildings are one important market, but the modular unit will also allow The Daily Dump to access restaurants, hotels, offices, schools and other settings that benefit from a single decision maker who, in effect, represents a large volume of aggregated waste.



—Figure 6  
p. 18

### **"From Yuck To Cool"**

Recognizing that not all customers will be lead users, the Daily Dump's product line is complimented with a composting service and a wide variety of communications tools aimed at helping customers transition towards being more waste conscious and thus likely to compost and recycle. Together these supplementary products and services create a pathway towards attitude change where the goal is lifting waste from "yuck to cool."

Designed for those who support the Daily Dump philosophy but are not ready to commit to a new daily routine, the composting service will dispatch a trained staff member to tend to the compost pot in the home of a customer for a small weekly fee equivalent in cost to a dinner out at a restaurant.

A collection of illustrated books, posters, online videos, and other materials are aimed at a broader audience who may not even be aware of waste as an urban issue. With a special focus on a younger audience of ages 4-14, these materials aim to inform the viewer about the invisible consequences of their decisions.

The book series "5 Disgustingly Cool Books For Kids" is currently in use at three schools in India while curriculum materials are being refined and will be made available online via a micropayment scheme. Although the Daily Dump designs these materials for use without any further involvement from themselves, staff



—Figure 7  
p. 18



—Figure 8  
p. 19

members frequently host school groups at the headquarters and make presentations on the topic of waste management at local schools.

The Daily Dump thinks very broadly about communication and treats any possible area of hesitation on the part of potential customers as a design challenge. After hearing complaints that composting is a dirty endeavor, The Daily Dump designed and fabricated a colorful apron. Avoiding the green and brown colors of typical garden attire, this bright yellow apron proudly communicates the civic spirit of the person wearing it.

### **Extending The Impact: From Households, to Communities, to Cities**

**“[Designers] should be trained not only to solve problems—but what is more important—they should be trained to help others solve their own problems.”**

*Charles and Ray Eames in their India Report*

For all of the impact that the Daily Dump is having on the city of Bangalore, the ambition was always to improve waste management across India. To achieve this goal a robust and durable approach will need to adapt to the many languages, cultures, and regions of the country.

Rather than mount a heroic effort to span these disparate conditions, The Daily Dump sought a path of least resistance and offered the opportunity to "clone" their business. In an effort to lower the barrier to entry as much as possible so that better waste management practices may spread more quickly, The Daily Dump invited interested parties to copy their business model, use their promotional material, and even replicate the core product. Unlike a franchise, these clones are completely free to establish their own for-profit business under their own name with no dues or fees. They may set their own prices and even alter the products as they see fit.

At the time of this writing (March 2010) ten clones have popped up in India, as well as one each in Dubai, Florida, and Chile. As a testament to the commitment that The Daily Dump has made to being truly open, there's even a clone in Bangalore – not too far from the Daily Dump's headquarters. Not all of these clones have thrived or even survived, but even cases of failure contribute

to the collective pool of knowledge – and at zero cost to The Daily Dump.

Through wholesale sales of terra cotta pots, accessories, and printed materials The Daily Dump earns a small income stream from each clone. Should they choose, clones are free to source their own terra cotta pottery using the Daily Dump's designs. Clones interested in selling the modular Manthan composting unit will buy directly from the manufacturer in Bangalore who will then pay a royalty to The Daily Dump.

As the number of clones expands, a network effect is being realized. The clone network encounters new issues and designs new solutions at a rate faster and more robust than the Daily Dump could on its own. With a spirit of openness, these findings are shared with the other clones through an email list and gatherings such as the November 2009 "Clone Meet" in Goa. Knowledge transfer within the network ranges from issues as discrete as the best size for vent holes on a clay pot to larger issues of business strategy such as how best to approach a new class of clients.

### **Applying the Same Approach to Recycling**

With an expanding product line and a growing clone network, Kasturi and the Daily Dump team are now beginning to look beyond the scale of the home to consider waste at the scale of the city with a special focus on recycling. An intricate mesh of formal and informal actors participate in urban recycling in Indian cities, making the system difficult to understand without careful investigation. The Daily Dump is mapping the flow of the material economy in Bangalore with special attention to the exchanges from one party to another with two parallel goals:

1. Reduce the "leakage" which is a result of corruption, ineffective processes, improper equipment, or unfit dumping sites.
2. Maximize earning potential for the Base Of the Pyramid workers who rely on recycling activity for their income.

The Daily Dump is approaching this work the same way that they did composting: a process of stakeholder interviews in the field, analysis of existing conditions, careful observation, and speculation about what points of leverage will yield the best results first.



—Figure 9  
p. 19

As of February of 2010 a coordinated range of solutions was in development. Although the Daily Dump has generated improvement and redesign ideas for elements including better street trash cans and garbage trucks, the early focus is on awareness and education of workers who handle recycled items in addition to the consumers who 'produce' them, including household staff such as maids and cooks. By illustrating ways to maximize financial gain through self-interest, The Daily Dump hopes to engender a more durable commitment to recycling than appeals to civitas alone could generate.

## **Driven by Design**

Facing the immense scale and complexity of the municipal solid waste problems in urban India, The Daily Dump has created a number of easy to implement, individually achievable solutions that coordinate towards the goal of reducing waste volumes and toxicity. Recognizing that current centralized waste collection systems are ineffective, The Daily Dump's efforts have turned to distributed and networked approaches. However due to their focus on handling waste in the home, the Daily Dump's efforts do not preclude the possibility of future integration with effective centralized waste management capability. The net effect of this work is an enabled citizenry that can make choices about how they create and manage waste, and reduce their waste footprint.

For Kasturi and the Daily Dump, every decision implicates multiple bottom lines. This is most evident in the choice of terra cotta as the preferred material for the Khamba composting unit. By using local sources for manufacturing not only were rapid innovation cycles possible, but it also helped catalyze new economic opportunities for craft-oriented villages. This approach is poetically summarized by Kasturi when asking of each decision, "how much shade can it provide?"<sup>8</sup>

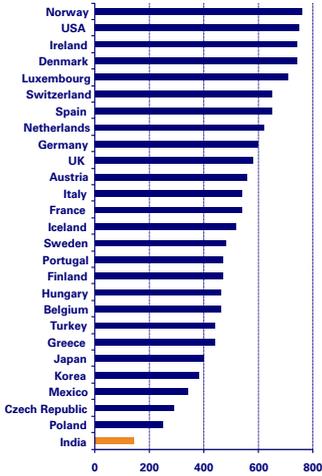
Taking the courageous step of allowing others to "clone" their business, The Daily Dump has expanded its impact at little to no cost. From a theoretical position, the Daily Dump has given up potential market share to their clones, but the immense size of the Indian market makes this an irrelevant argument. The clone model has given the Daily Dump access to multiple sites that are now working together in a collaborative fashion to collectively benefit

**8—Kasturi, Poonam Bir. Interview by Bryan Boyer. February 2010.**

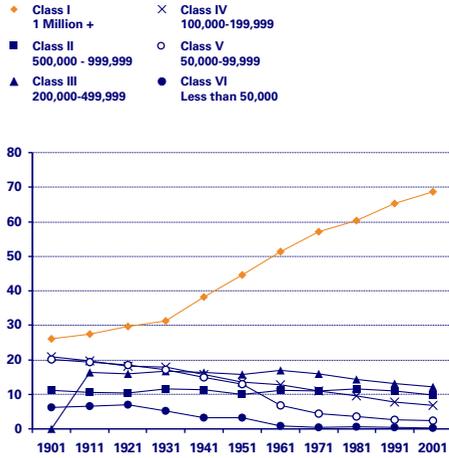
from experiences in their own unique social, cultural, and business contexts, further strengthening their product's ability to survive in the diversity of the Indian market. As the clone network continues to expand and knowledge transfer increases, this initially risky decision has proven its strategic value by acting as a zero-cost R&D system. The Daily Dump remains confident that their rapid innovation cycle paired with a research-based approach to new product development will continue to provide their primary competitive advantage, even if clones impinge on their product line in the Bangalore market.

At the core of their research methodology is Kasturi's commitment to design ethnography which she has been honing since her first waste-related design project as a student in the 1980s at the National Institute of Design. By interviewing stakeholders at every organizational level of the problem, observing users at each touch point within the system, analyzing analogous projects, and learning by doing, the Daily Dump is able to map out new problem spaces and position themselves to better assess the "shade" that new product ideas can generate.

As with all projects of such high ambition as reducing waste across an entire country, a true measure of the Daily Dump's success will only be possible decades from now. The early growth of the business shows a small but adaptable business model able to achieve impact and easily expand. Will the Daily Dump be India's next big business success story? Perhaps not—but it is poised to provide a lot of shade.



**Fig. 1** Kilograms of municipal solid waste per capita, 2005. Sources: OECD Environmental Data Compendium 2006-2008 and EU-India Waste Forum 2005



**Fig. 2** Growth of India's cities, especially the largest ones. Source: "Urbanisation in India" by the Indian Statistics Institute, 2006.



**Fig. 3** Centralized waste management, such as this disused community compost center, have proven difficult to sustain due to lack of secure funding and poorly devised solutions. Source: The Daily Dump, photographed in Bangalore on February 19th, 2008



## Figures



**Fig. 4** After early experiments adapting electronic composting units from abroad The Daily Dump was unable to find a solution that was suited to the Indian market. Prototyping indicated the opportunity to create a local solution. Source: The Daily Dump



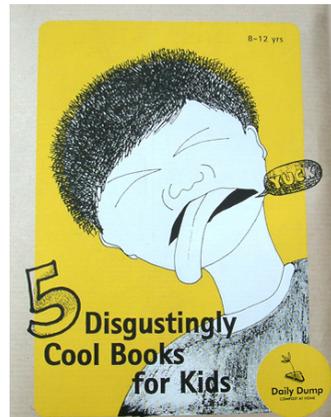
**Fig. 5** Choosing terra cotta enabled The Daily Dump to source their manufacturing in a nearby craft-oriented village. By ordering in small lots they gained a rapid innovation cycle, enabling quick evolution of products. Source: The Daily Dump





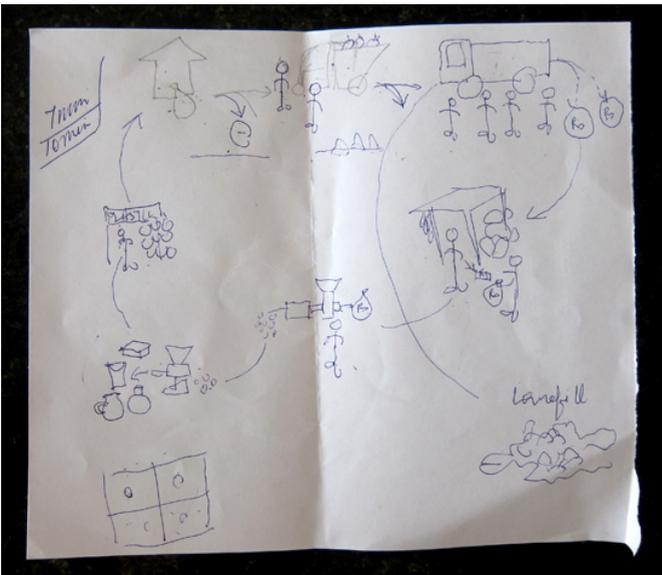
**Fig. 6** The Daily Dump's offerings span from products to accessories and educational materials, all of which coordinate to enable home-based waste management.

**Fig. 7** A variety of communication and curricular materials are available to help expand the impact of the Daily Dump's work. Photo: The Daily Dump





**Fig. 8** In addition to products, The Daily Dump is committed to increasing awareness about waste as a problem in urban India. They regularly host school groups and make presentations to residence associations. Photo: The Daily Dump



**Fig. 9** Having grown a sustainable business around composting, The Daily Dump are now adding recycling to their area of research. Investigations into the roles and broad network of actors involved in recycling (pictured) in Indian cities will form the basis for subsequent projects with an eye towards creating opportunities for Base of the Pyramid workers.

# Credits & contacts

## Credits

### **Thinking Big By Starting Small**

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Governments and other public institutions face tremendous transformation challenges to maintain effectiveness in the future. Today we see the need to redesign the context and conditions under which decisions are made to, in effect, create a new culture of public decision-making. This includes redesigning both the boundaries of complex problems and the ways that institutions deliver solutions. Helsinki Design Lab is Sitra's platform for understanding, experimenting, and reflecting upon the new practices of design that this sea-change implies.

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In this case study...

A group of designers in Bangalore, India create a social enterprise that offers products and services to enable citizens to deal with their own household waste. We see how they practice strategic design, discovering along the way that:

**Redefining the boundaries of the problem uncovers opportunities for innovation**

**Communications and education are integral aspects of the work of a social enterprises**

**Local sourcing and an iterative design method enable rapid innovation**