What's the End Goal of Waste Management?

21 September 2015

Zero Waste Inspiration
Bea Johnson

Courtesy of Bea Johnson. Used with permission.

ZERO WASTE

is the aim to eliminate direct
and indirect waste generation.

When achieved, having zero waste would
also eliminate waste management by
providing a closed-loop system.
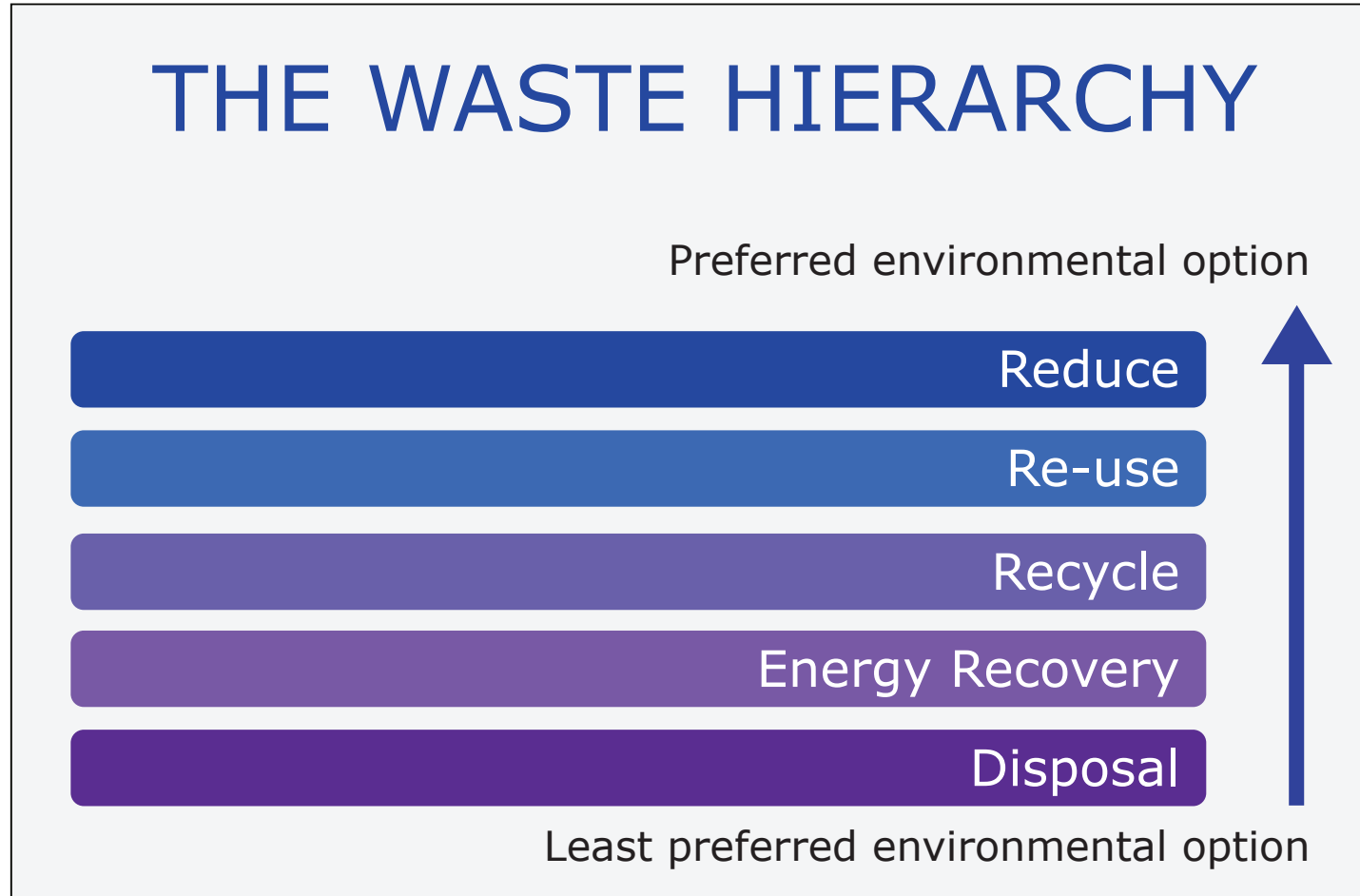
Waste Management Hierarchy

THE WASTE HIERARCHY

Preferred environmental option

Reduce

Re-use

Recycle

Energy Recovery

Disposal

Least preferred environmental option

Image by MIT OpenCourseWare.

Waste produced by Bea Johnson's family over one year (2014).

Courtesy of Bea Johnson. Used with permission.

Discussion Questions

1. Did reading about Bea Johnson's zero waste approach change how you view your own habits around waste?

1. Why does Bea Johnson believe a zero waste lifestyle is necessary?

1. Do you believe a zero waste lifestyle is possible? What factors would make it easier?

"Recycling depends on too many variables to make it a dependable solution to our waste problems"

- Bea Johnson

"Zero Waste Home: The Ultimate Guide to Simplify Your Life by Reducing Your Waste" (p 25)

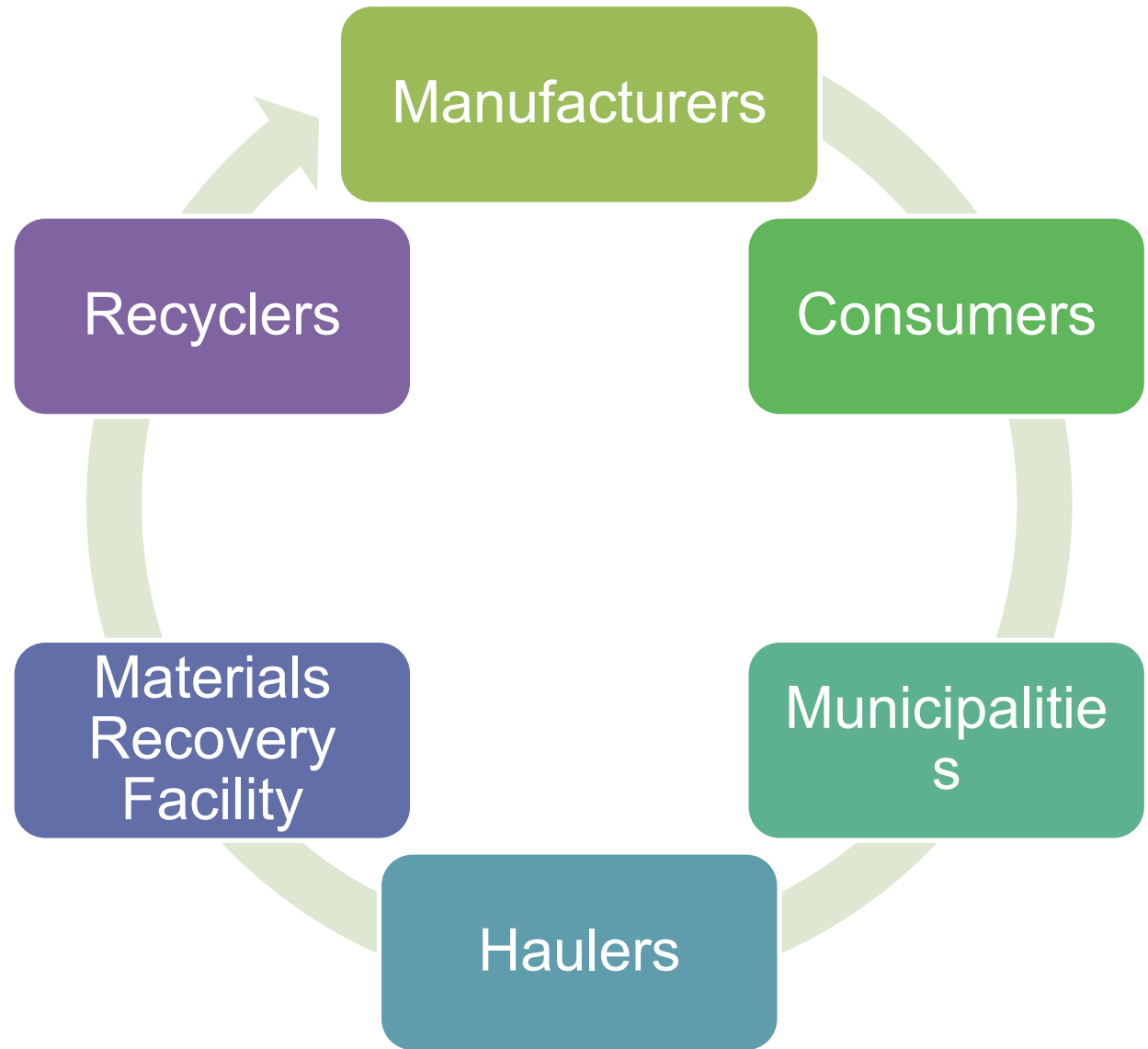**Recycling requires coordination between many actors**

Manufacturers → Consumers → Municipalities → Haulers → Materials Recovery Facility → Recyclers → Manufacturers

Image from: Bea Johnson, "Zero Waste Home: The Ultimate Guide to Simplify Your Life by Reducing Your Waste" (p 25)

Requirements for Recycling

- **<u>Manufacturers</u>** must "**communicate** with recyclers, **design** products that are durable but also highly recyclable…, and **label** their recyclability and recycled content accordingly"

- **<u>Consumers</u>** must "**be aware** of local recycling policies, to **recycle** responsibly, but also to **purchase** accordingly and **buy recycled** in order to create a market for recyclables"

- **<u>Municipalities</u>** must "**provide** curbside recycling and collection locations for hard-to-recycle items and **share** residents' education with haulers"

Bea Johnson, "Zero Waste Home: The Ultimate Guide to Simplify Your Life by Reducing Your Waste" (p 25)

Requirements for Recycling (2)

- **<u>Haulers</u>** must "**work with** municipalities in providing convenient and financially enticing service to residents …, receiving adequate training from MRFs … to **answer** customer questions"

- **<u>Materials recovery facilities</u>** (MRFs) must "**sort** effectively and **offer** the greatest quality of sorted materials (i.e., with the lowest rate of contaminants), to **answer** customer questions, and to **contract** local recyclers"

- **<u>Recyclers</u>** must "**communicate** with manufacturers, to **make** their products visible and widely available, and to **encourage** upcycling and recycling versus downcycling (i.e., made into an unrecyclable lesser kind of product) markets "

Bea Johnson, "Zero Waste Home: The Ultimate Guide to Simplify Your Life by Reducing Your Waste" (p 25)

Cover image of "Cradle to Cradle: Remaking the Way We Make Things" by William McDonough and Michael Braungart has been removed due to copyright restrictions.

"To eliminate the concept of waste means to design things – products, packaging, and systems – from the very beginning on the understanding that waste does not exist."

McDonough and Braungart, Cradle to Cradle, p 104

What Prompted the Demand for Cradle to Cradle?

- Products are designed with built-in obsolescence

- Systems are not currently built to recycle/reuse products

- Products are made with increasingly complex materials and combinations of materials

- Product designs no longer return material nutrients to where they were found

- Products are often not designed for a life beyond the product lifecycle

"Rather than seeking to minimize the harm we inflict, Cradle to Cradle reframes design as a beneficial, regenerative force—one that seeks to create ecological footprints to delight in, not lament. It **expands the definition of design quality to include positive effects on economic, ecological and social health.**

"Cradle to Cradle **rejects the idea that growth is detrimental to environmental health**; after all, in nature growth is good. Instead, it promotes the idea that good design supports a rich human experience with all that entails—fun, beauty, enjoyment, inspiration and poetry—and still encourages environmental health and abundance."

- [MBDC](http://www.mbdc.com/cradle-to-cradle/c2c-framework/)

Discussion Questions

1. What are the benefits of the Cradle to Cradle model? Limitations?

1. If all products were designed with a cradle to cradle model, does product consumption need to be limited? Would unlimited consumption of cradle-to-cradle-designed products be harmful to the environment?

Wilson, Rodic, Velis

INTEGRATED SUSTAINABLE WASTE MANAGEMENT

Includes both the physical and governance aspects of SWM. ISWM is at least partially a WM-focused response to sustainable development.

Sustainable development is

development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- the concept of **needs**, in particular the essential needs of the world's poor, to which overriding priority should be given; and
- the idea of **limitations** imposed by the state of technology and social organization on the environment's ability to meet present and future needs.

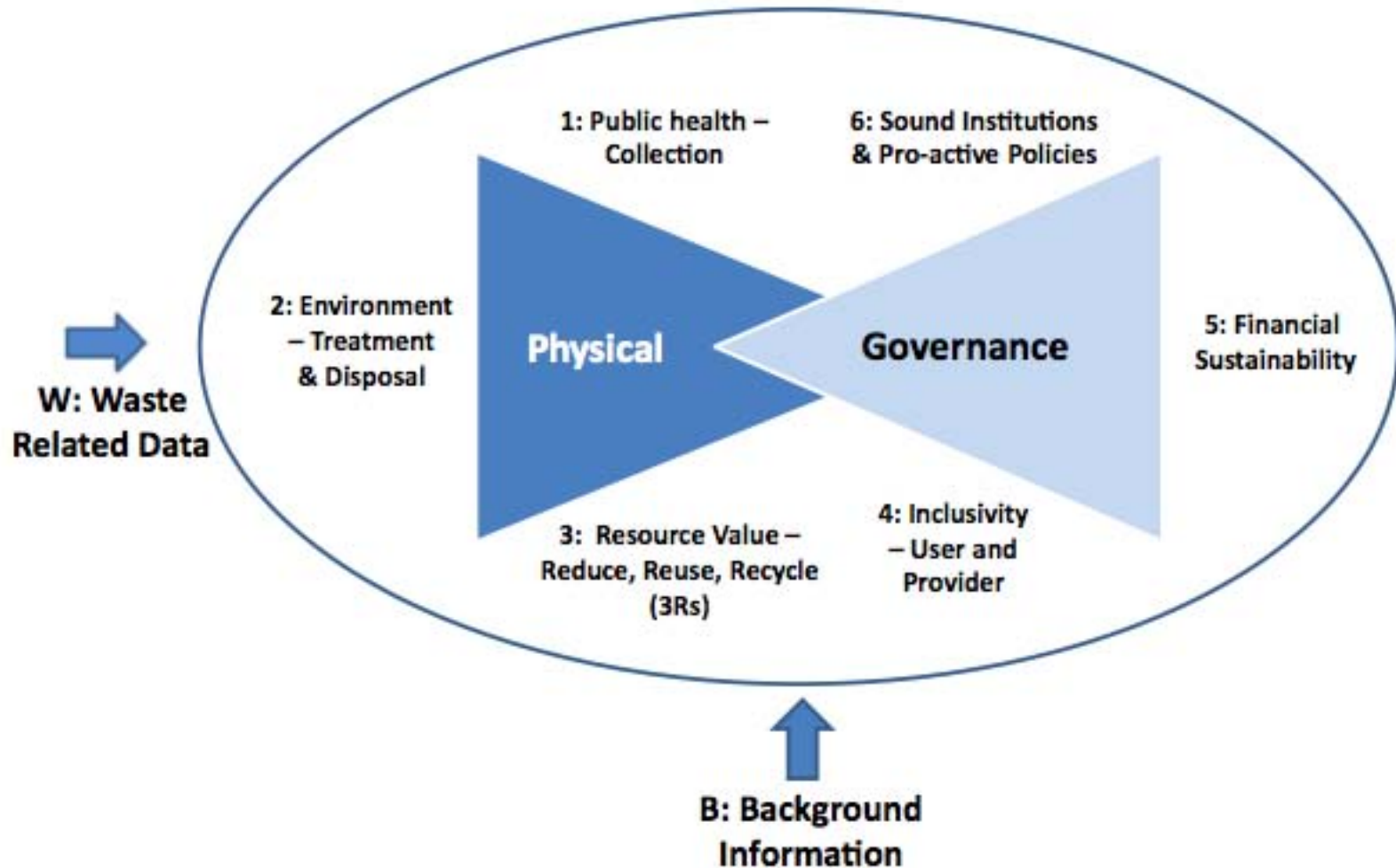- Our Common Future, Brundtland Report 1987

Sustainable development recognizes that **growth must be both inclusive and environmentally sound to reduce poverty and build shared prosperity for today's population and to continue to meet the needs of future generations**. It is efficient with resources and carefully planned to deliver both immediate and long-term benefits for people, planet, and prosperity.

The three pillars of sustainable development – economic growth, environmental stewardship, and social inclusion – carry across all sectors of development, from cities facing rapid urbanization to agriculture, infrastructure, energy development and use, water availability, and transportation.

- *The World Bank*

ISWM Framework

1: Public health – Collection

6: Sound Institutions & Pro-active Policies

2: Environment – Treatment & Disposal

Physical

Governance

5: Financial Sustainability

W: Waste Related Data

3: Resource Value – Reduce, Reuse, Recycle (3Rs)

4: Inclusivity – User and Provider

B: Background Information

Courtesy of Elsevier, Inc., http://www.sciencedirect.com. Used with permission.

Wilson et al. – "'Wasteaware' benchmark indicators for integrated sustainable waste management in cities"

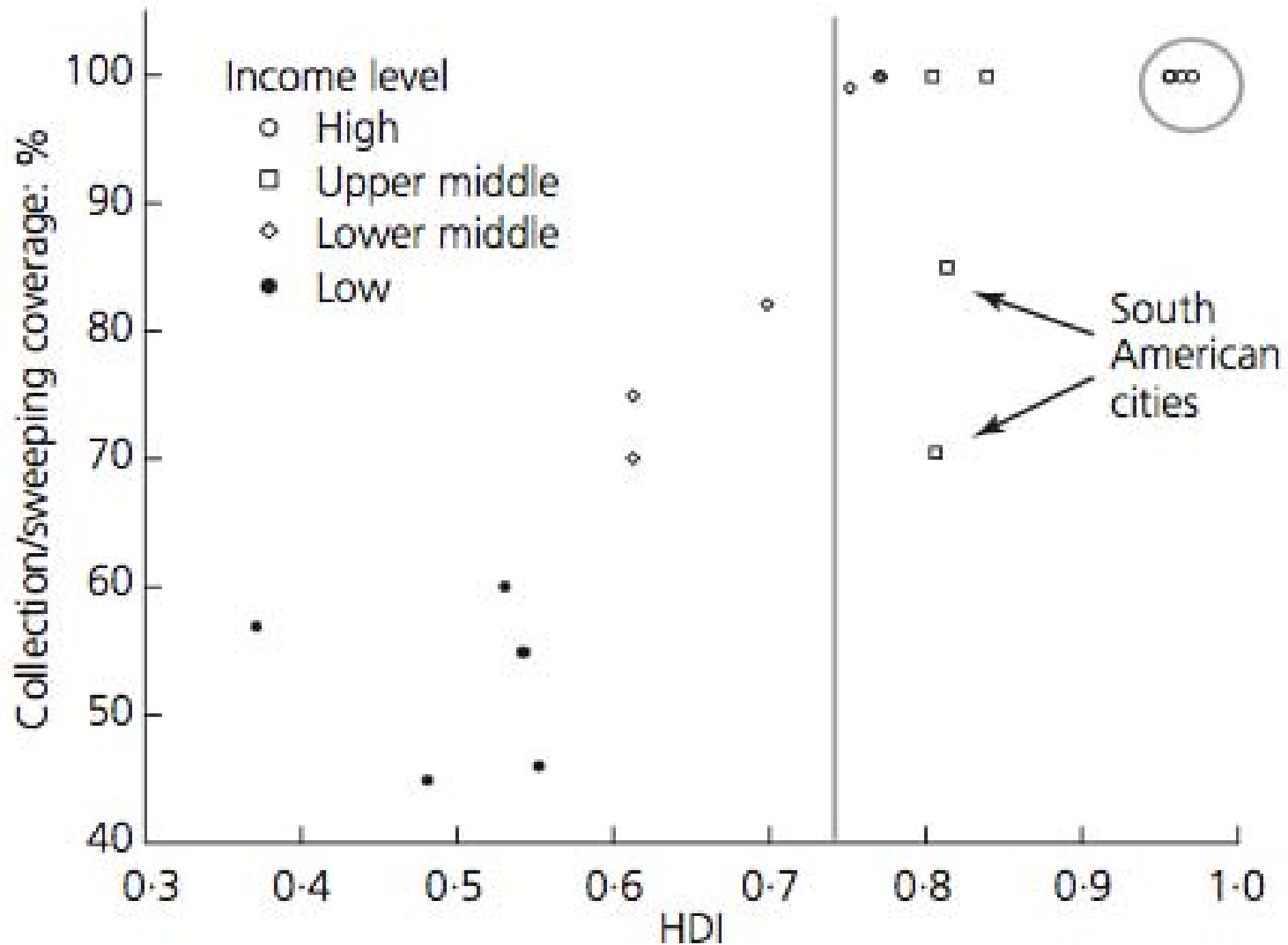# What drivers shape waste management?

History: Surat, India (1994)

"The people fleeing the affected zones are heading in all directions and taking the hysteria with them. With the discovery of three people afflicted with plague in a Bombay hospital, panic has gripped that city as well. Tetracycline, an antibiotic for plague treatment, has disappeared from chemist shops not only Bombay but also in Delhi."

- An excerpt from the newspaper 'The Hindu Universe'
dated 25 September 1994

Pallipparambil, Godshen Robert. "The Surat Plague and Its Aftermath" Accessed Sept 20, 2015. http://entomology.montana.edu/historybug/YersiniaEssays/Godshen.htm

What drivers shape waste management?

Source: Wilson, David C., and Ljiljana Rodic Dipl Ing. "Integrated Sustainable Waste Management in Developing Countries." Proceedings of the Institution of Civil Engineers 166, no. 2 (2013): 52. Courtesy of ICE Publishing. Used with permission.

Wilson, David C., Costas A. Velis, and Ljiljana Rodic. "Integrated sustainable waste management in developing countries." p 57.

Image from: Kate Mytty, documented in Muzaffarnagar, India. January 2015.

Recycle Rates Across 20 Cities

Income level	Range: %	Average: %	Average contributed by the informal sector: %
High	30–72	54	0
Upper-middle	7–27	15	15
Lower-middle	6–39	27	16
Low	6–85	27	26

Data collected in 2009

Table 3. Recycling rates across 20 reference cities (adapted from Scheinberg *et al.* (2010b), Wilson *et al.* (2010b) and Wilson (2011))
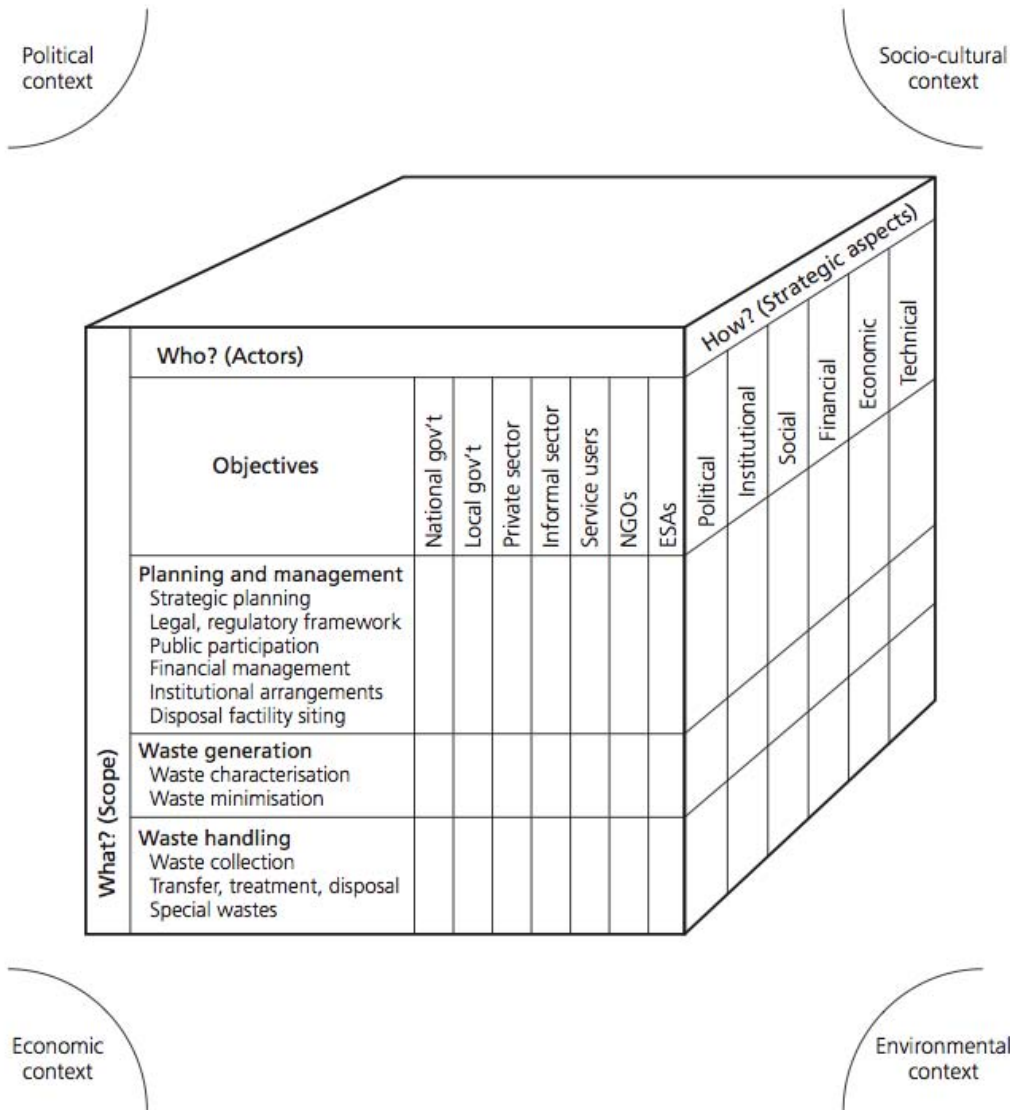
Waste Management Stakeholders

- Users and potential users

- Providers (city, informal and formal private sector)

- External agents (national government, regional governments, producer responsibility, etc.)

Financial Sustainability

- US$75 or more per capita in areas where city budgets are $1 – 10 per capita

- 3 to 15% of city budget spent on MSWM

- Cost recovery from users

Institutions and Policies

Source: Wilson, David C., and Ljiljana Rodic Dipl Ing. "Integrated Sustainable Waste Management in Developing Countries." Proceedings of the Institution of Civil Engineers 166, no. 2 (2013): 52. Courtesy of ICE Publishing. Used with permission.

Wilson, David C., Costas A. Velis, and Ljiljana Rodic. "Integrated sustainable waste management in developing countries." p 56.

Final Project

- Art

- Civic Engagement

- Technology

Final Project

Guidelines:
- Action-oriented project
- Incorporates class readings/discussions
- Builds off student interest
- Focuses on a waste-related topic (can be human, solid, etc.)

Assistance:
- Mentorship
- Connecting with other resources (readings, people power, etc.)
- Supplies

Evaluation:
- Engagement/involvement of stakeholders
- Implementation
- Thoroughness of project (research, design, evaluation and implementation)

Deliverables:
- Class presentation (~15 – 20 minutes)
- D-Lab Fall Showcase Presentation (1 minute) – Fri, Dec 4, 5:00 – 7:00pm
- Background report
- Project report/technology prototype/art installation

References

Cradle to Cradle Platform TW. Accessed Sept 20, 2015. http://www.c2cplatform.tw/en/c2c.php?Key=1

International Institute for Sustainable Development "What is Sustainable Development?". Updated 2013. Accessed Sept 20, 2015. https://www.iisd.org/sd/

The World Bank. "Overview: Sustainable Development Home". Updated 2015. Accessed Sept 20, 2015. http://www.worldbank.org/en/topic/sustainabledevelopment/overview#1.

McDonough Braungart Design Chemistry. "C2C Framework". Updated 2015. Accessed Sept 20, 2015. http://www.mbdc.com/cradle-to-cradle/c2c-framework/

Johnson, Bea. "Zero Waste Home: The Ultimate Guide to Simplifying Your Life by Reducing Your Waste." Simon & Schuster   (2013).

McDonough, William, and Michael Braungart. *Cradle to cradle: Remaking the way we make things*. MacMillan, 2010.

Mytty, Kate. Images from fieldwork in Muzaffarnagar, India. January 2015.

Pallipparambil, Godshen Robert. "The Surat Plague and Its Aftermath". Accessed Sept 20, 2015. http://entomology.montana.edu/historybug/YersiniaEssays/Godshen.htm.

Wilson, David C., Costas A. Velis, and Ljiljana Rodic. "Integrated sustainable waste management in developing countries."   *Proceedings of the Institution of Civil Engineers: Waste and Resource Management*. Vol. 166. No. 2. Thomas Telford,   2013.

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