Massachusetts Institute of Technology

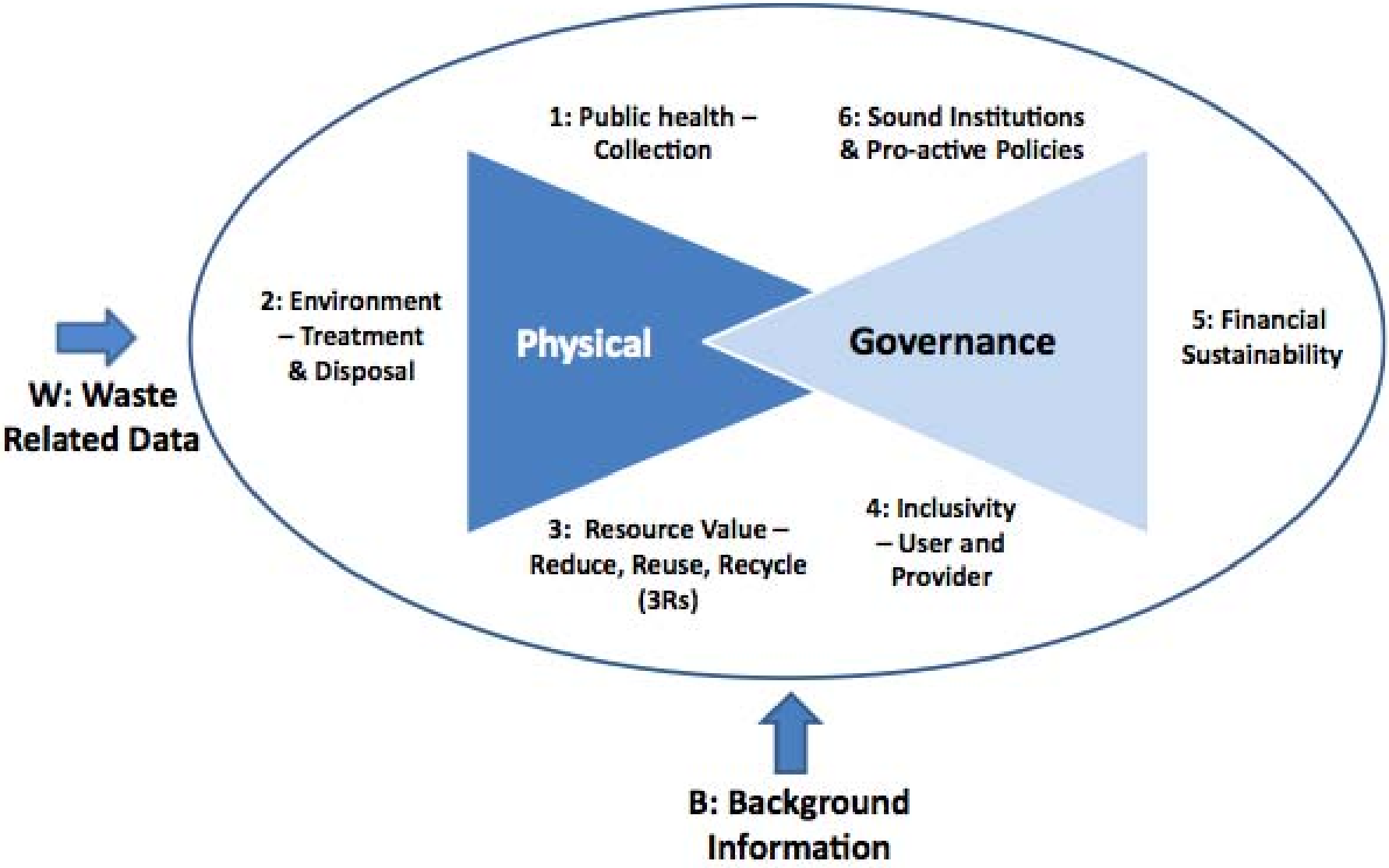
D-Lab

WASTE MANAGEMENT ACTORS

28 September 2015

Wilson, Rodic, Velis

INTEGRATED SUSTAINABLE WASTE MANAGEMENT



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

ISWM IN DETAIL

- Physical Components (Hardware)
  - Public health / waste collection service
  - Environmental protection / waste treatment and disposal
  - Resource value / the ‘3Rs’ – reduce, reuse, recycle

- Governance Strategies (Software)
  - Inclusivity / stakeholder input and benefit as users and service providers
  - Financial sustainability / cost-effective and affordable
  - Sound institutions and pro-active policies

Summarized from Wilson et al. – “‘Wasteaware’ benchmark indicators for integrated sustainable waste management in cities” – page 330

ACTORS

WM Service Providers

- Government
- Private sector (formal and informal)
- Community Based Organizations (CBOs)
- Non-government Organizations (NGOs)

WM Users

- Households
- Organizations

Government

Private sector

CBOs

NGOs

SERVICE PROVIDERS

GOVERNMENT

- Can be national, regional, local – municipal or county
- Roles:
  - Set and enforce laws and regulations within their **political and geographic jurisdiction**
  - Have formal (legal) responsibility for waste management
  - Use public resources
  - Finances dependent on taxes or fees levied and collected for a service
  - May manage/operate the waste services

TRENDS IN WASTE GENERATION

- Population growth in cities
- Per capita income increases impacts type and amount of waste generated
- More waste = government costs/oversight increases
  - By 2030:
    - MW in rich countries grow 1.3% a year (38% in all)
    - India's city-dwellers increase 130%
    - China's over 200% more (Muck & Brass)

PRIVATE SECTOR

- Informal vs Formal
- Roles:
  - Driven by income/market opportunities
  - Use private resources
  - Active in resource recovery

FORMAL PRIVATE SECTOR

- Registered organizations driven by the opportunity for profit
- Roles:
  - Driven by income/market opportunities
  - Use private resources
  - Often regulated/contracted by government

REVENUE GENERATION

- Tipping fees
  - In US, between 1985 and 2005, tipping fees rose from < $10/ton to $35/ton
  - In Europe, tipping fees range:
    - France - 74€/ton
    - Italy- 50€/ton
- Byproduct sales
  - Waste-to-energy
  - Refuse-derived fuel (RDF)
  - Material sales
- Long-term contracts

From Muck & Brass – Economist 2009

BIG WASTE?

- In Britain, between 1992 and 2001 the market share of the 15 biggest companies rose from 30% to 60%.
- Consolidation still in progress in the US

From Muck & Brass – Economist 2009

INFORMAL PRIVATE SECTOR

"Informal sector activities are not regulated or controlled by government agencies— they exist and operate because of market forces or other socio-economic factors"

- Ali, The Informal Sector: What is Worth? (1999)

INFORMAL PRIVATE SECTOR

- Self-employed recyclers or wastepickers involved in collecting, recovering, sorting, cleaning, etc.
- Roles:
  - Driven by income/market opportunities
  - Waste management as livelihood
  - Less likely to be recognized/contracted by government
  - May be excluded in modernization of WM
  - Often poor working conditions

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))

Source: Wilson, David C., and Ljiljana Rodic Dipl Ing."Integrated Sustainable WasteManagement 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 59.

COMMUNITY-BASED ORGANIZATIONS (CBOS)

- Group of community members that self-organize to improve/manage waste management in their area
- Role:
  - Organize community members
  - Collectively offer WM service or hire/contract a party that can offer WM service
  - Advocate for WM changes
- Example: The Ugly Indian

NON-GOVERNMENT ORGANIZATIONS (NGOS)

- Churches, universities, labor organizations, environmental organizations and lobbies
- Role:
  - Motivated by desire to improve a WM system in some way
  - Advocate for WM changes
  - Act as a magnet for external funding towards WM
  - Can be an intermediary between community and government (or other actors)

PUBLIC-PRIVATE PARTNERSHIPS (PPPS)

- Government and private companies assume co-ownership and co-responsibility for WM services
- Argument for PPPs
  - Private sector efficiency
  - Resource recovery
  - Experience/knowledge of private sector
  - Matched with public responsibility for waste management

Households

Organizations

WM USERS

HOUSEHOLDS

- Not all households are the same

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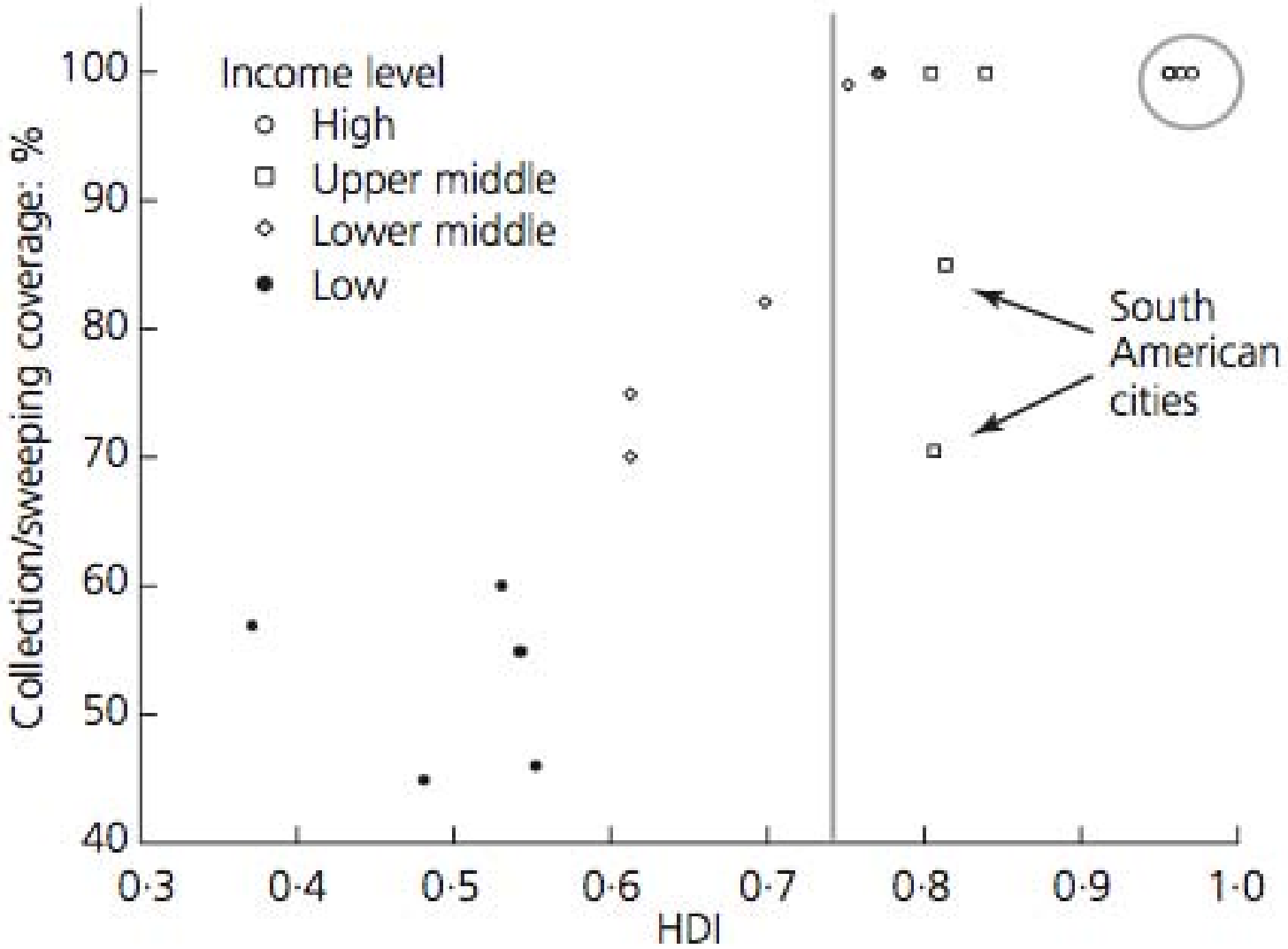
Courtesy of Trey Ratcliff on Flickr. CC BY-NC-SA. Used with permission.

HOUSEHOLDS

- Not all households are the same
- Socio-economic characteristics can influence amount and type of waste produced
- Income can influence ability to pay for WM services
- Physical location of household can influence WM service accessibility
- Household/citizen actions can shape a WM service



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

BANGALORE - 2012

ORGANIZATIONS

- Different organizations produce different types and amounts of waste
  - Bulk/Non-Bulk
  - Hazardous/Non-Hazardous
  - Others?

SUMMARY

- WM Users and Service Providers
- Different actors generate (or manage) different amounts and types of waste
- Varying capacities to pay for WM
- Varying incentives for improving WM practices
- Variety must be considered when analyzing WM services

NEXT UP

- Thurs, Oct 1 – Proposal for Final Project
- Fri, Oct 9 @ 1:30pm – Save That Stuff Tour
- Fri, Oct 9 – First paper due (technology; all)
- Tues, Oct 13 – Present first paper

Next class: Whose responsibility is WM?

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

FINAL PROJECT - DATES

- **Today** Discuss project ideas
- **Session 10** Submit Statement of Intention
- **Session 21** Verbal update in office hours
- **Session 32** Verbal update
- **Session 36** Final Presentations

  Report Submission two days after presentation

REFERENCES

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