

CO-BENEFITS OF WASTE MANAGEMENT IN DEVELOPING COUNTRIES

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WASTE MANAGEMENT IN DEVELOPING COUNTRIES

- Two Major Problems:
 - * Insufficient Collection
 - * Inadequate Final Disposal
- Most Cities do not Collect all Wastes Generated (<50%)
- Uncollected Waste is often Thrown into the Streets, Vacant Lots, Bodies of Water, or Burned

WASTE MANAGEMENT IN DEVELOPING COUNTRIES

- **Open Dumping is the Most Common Waste Disposal Method**
- **Open Dumps Pollute the Air, Water and Land**
- **Wastes Pose Significant Risks to Human Health and the Environment**







WASTE COMPOSITION IN DEVELOPING COUNTRIES

■ High Organic Content:

* Jakarta	74 %
* Indian Cities	75 %
* Ibadan, Nigeria	76 %
* Kathmandu	80 %
* Dhaka	84 %

■ Organic Waste Presents Problems and Opportunities

WASTE MANAGEMENT AND CLIMATE CHANGE

- Decomposition of Organic Waste in Dumps and Landfills (Anaerobic Conditions) Generates Methane
- Methane is about 20 Times Stronger than CO₂ as a GHG
- Landfills Account for about 11% of Anthropogenic GHG Emissions

OPPORTUNITIES

- Recycling (Energy Savings)
- Diversion of Organic Waste from Dumps and Landfills:
 - * Pig Farms
 - * Composting

RECYCLING

■ Energy Savings from Recycling:

* Glass	4 - 32 %
* Paper	23 - 74 %
* Steel	47 - 74 %
* Aluminum	90 - 97 %

- Energy Savings: Fewer Power Plants, Less Burning of Fossil Fuels → Reduced GHG Emissions

RECYCLING IN DEVELOPING COUNTRIES

- Relies on the Informal Recovery of Materials from Waste: Scavenging
- World Bank: 1% of the Urban Population: up to 15 Million Worldwide, with an Economic Impact of 100s of Millions
- Scavengers Traditionally Poor, Ignored, Exploited, or Repressed

SCAVENGERS

- **When Scavengers get Organized / Supported:**
 - * **Create Jobs**
 - * **Reduce Poverty**
 - * **Conserve Natural Resources**
 - * **Protect the Environment**
 - * **Improve Industrial Competitiveness**
 - * **Save Cities Collection, Transportation and Disposal Costs**
 - * **Extend the Life of Disposal Sites**

SCAVENGERS

- In Beijing, Scavengers can Earn More than College Professors
- Cardboard Collectors on the US-Mexico Border Earn up to 10 Times the Minimum Wage
- Informal Refuse Collectors in Mexico City Earn 7 Times the Minimum Wage

SCAVENGERS

- **Linis Ganda Program in Manila employs 1,500 former scavengers who recover 4,000 tons of recyclables / month, earning US \$ 5-20 / day**
- **More than 100 scavenger cooperatives exist in Colombia, recovering over 300,000 tons of recyclables / year**
- **In Brazil, Scavengers Recover 90% of Materials Recycled by Industry. They Organized a National Movement, with 500 Cooperatives and 60,000 Members**

Mexican Cardboard Collectors in the US



Linis Ganda Program in Manila



“Grito dos Excluídos” in Brazil



Processing of Recovered Materials



PIG FARMS / COMPOSTING

■ Benefits:

- * Can Reduce Substantially the Volume of Wastes for Disposal
- * Extends the Life of Disposal Sites
- * Prevents Pollution at the Disposal Sites
- * Prevents Generation of Methane (GHG) → Fight Global Warming

COMPOSTING

- **Benefits:**
 - * **Produces a Product Useful in Parks, Agriculture, and Horticulture**
 - * **Can Create Jobs**
 - * **Can Reduce Poverty**

PIG FARMING



PIG FARMING



PIG FARMING



PIG FARMING



HOUSEHOLD COMPOSTING



COMMUNITY COMPOSTING



COMMUNITY COMPOSTING (1)



COMMUNITY COMPOSTING (2)



COMMUNITY COMPOSTING (3)



COMMUNITY COMPOSTING



WASTE CONCERN BANGLADESH

- First Composting Project Using CDM
- Reduction of 90,000 tons of CO₂ equivalent per year
- Will Create 1,000 Jobs



Description: Collection of Waste



Description: Collection of Waste

CONCLUSION

- **Low-Tech, Low-Cost, and Labor-Intensive Systems can Render Social, Economic, and Environmental Benefits**