

Waste Recycling and Green Jobs

IPLA Global Forum 2013 on Sustainable Waste Management for 21st Century Cities
Building Sustainable and Resilient Cities through Partnership
City of Boras, Sweden
9-11 September, 2013

Prof. C. Visvanathan

Environmental Engineering and Management Program
Asian Institute of Technology
Thailand

Email: visu@ait.ac.th

URL: <http://www.faculty.ait.ac.th/Visu/>, www.3rkh.net

Dr. Prasad Modak

Executive President
Environmental Management Centre LLP
India

Email: prasad.modak@emcentre.com

Blog: <http://prasadmodak.typepad.com/prasad-modak/>

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Waste Management Market



MILLENNIUM INSTITUTE
a sustainable future for Earth is possible

Waste to landfill to reduce from 22% to 5% by 2050

Average yearly
US\$ 83 to US\$141 billion of
investment to green waste sector

2 -2.84 million additional jobs by
2050 in formal sector

Recycling market : US\$ 160 bn
MSW market : US\$ 125 bn
Non-hz Industrial waste : US\$ 147 bn

World's waste market is worth US\$
410 bn

- Segment made up of recycled plastics is expected to reach nearly \$1.6 billion in 2014.
- Global e-waste management market to reach \$21 billion in 2020
- Waste-to-energy (WTE) market will see global revenue of \$13.6 billion in 2016 .

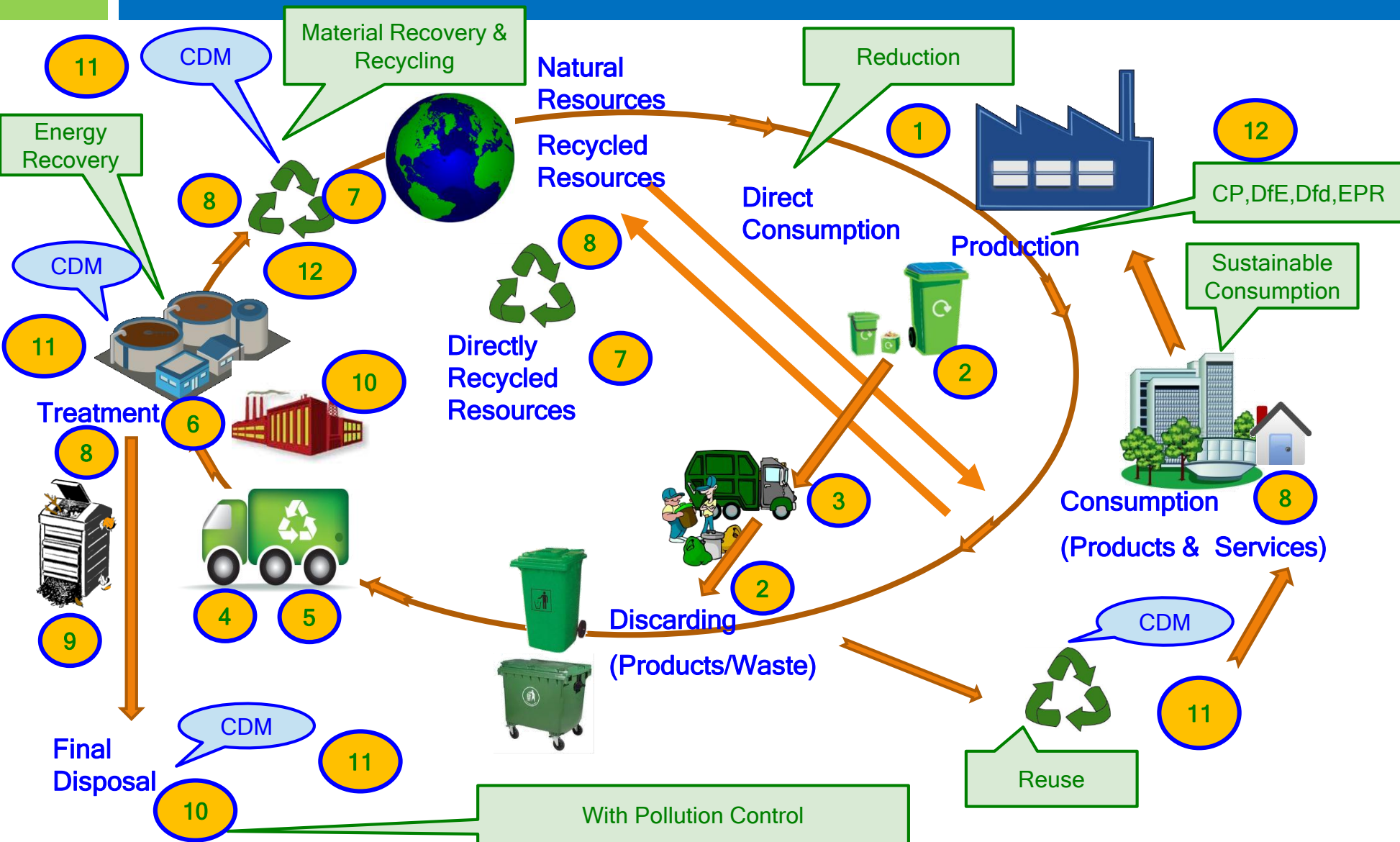
FROM WASTE TO RESOURCE
An abstract of
"2009 World Waste Survey"



 **VEOLIA**
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SERVICES

Waste Management Market is Growing

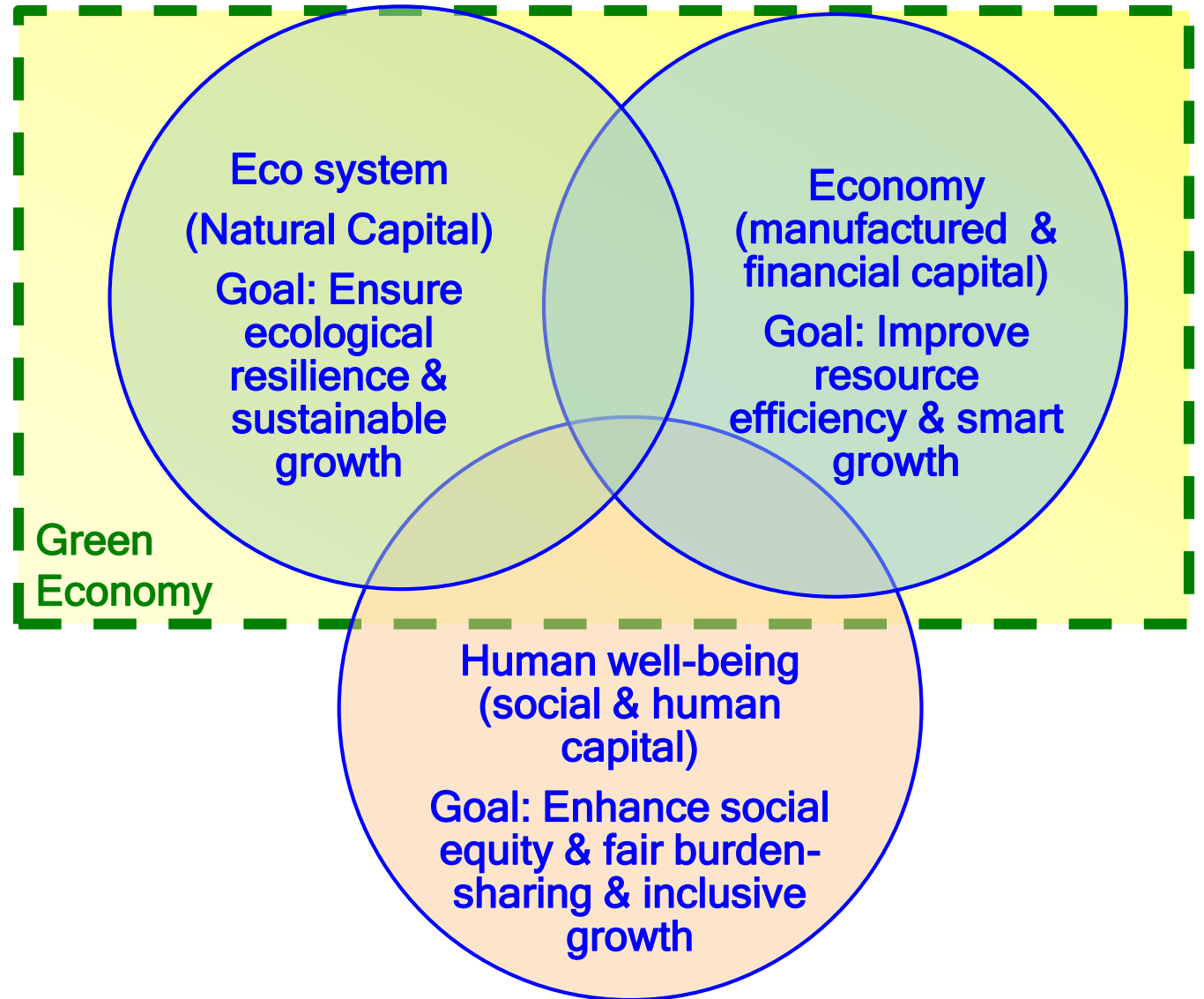
Waste Management Business Opportunities



- | No. | Opportunity |
|-----|---|
| 1 | Waste Mgmt & Consulting |
| 2 | Bin & Container suppliers |
| 3 | Waste collection services |
| 4 | Automotive suppliers |
| 5 | Waste transportation services |
| 6 | Equipment suppliers |
| 7 | NGOs and CBOs formalizing rag pickers |
| 8 | Opportunities arising from 3R activities |
| 9 | Operating Composting Units |
| 10 | Operating Biogas, Incineration, landfill facilities |
| 11 | Revenue from Carbon Credits |
| 12 | Innovative Product Designers & Resource Managers. |

Green Economy and Green Job

- A **green economy** is one that results in improved human wellbeing and social equity, while significantly reducing environmental risks and ecological scarcities.
- **Green jobs** can be generically defined as direct employment created in different sectors of economy and through related activities, which reduces environmental impact of those sectors and activities, and includes “decent” work environment that help to reduce consumption of energy and raw materials, de-carbonize economy, protect and restore ecosystems and biodiversity and minimize production of waste and pollution.



Recycling and Job Creation

Recycling contributes to a green economy in numerous ways:

- Enhancing resource efficiency
- Reducing environmental impacts from raw material extraction
- Shifting from a linear economy to a circular economy
- Decoupling material and energy use from economic growth
- Generating green jobs

Employment opportunities in recycling sector include:

- Low-skilled work (waste picking, collection)
- Medium- and high-skilled jobs (material sorters, dispatchers, recycling/process engineers, technology developers, chemists/scientist, and recycling product designers manufacturing new products using recycled content)
- Indirect/induced (new businesses) jobs (transporting-truck drivers, sales representatives of recovered materials as well as recycled products, recycling researchers)

Recycling and Job Creation Cont.



Dumping 10,000 tons of waste in a landfill

6 Jobs



10,000 tons of waste
if recycling

36 Jobs

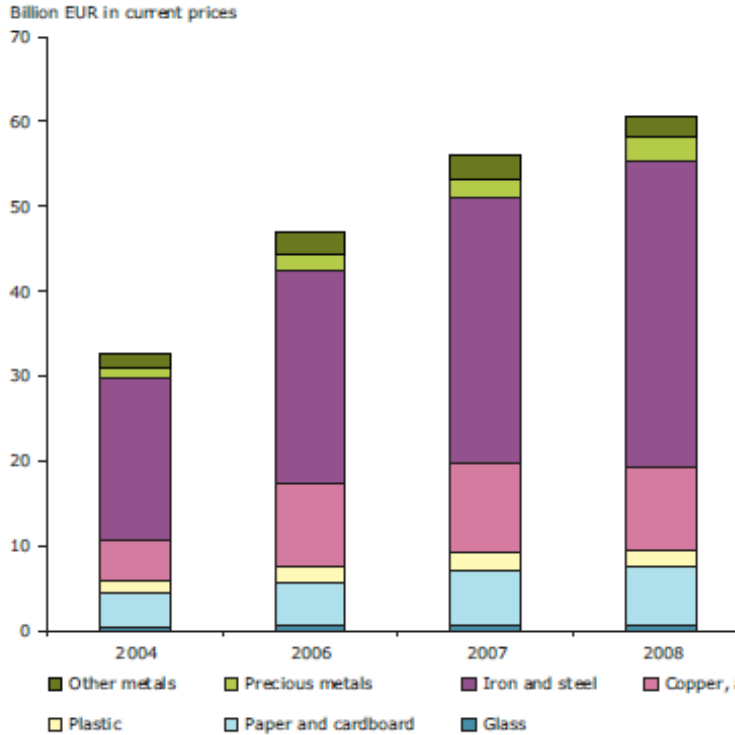
Recycling generates more jobs (at higher income levels) than other forms of waste management

Decent Work?

- Decent work is relative and country-specific because countries differ socially and economically.
- **ILO Definition:** “opportunities for women and men to obtain decent and productive work in conditions of freedom, equity, security and human dignity, in which women and men have access on equal terms”.
- Decent work combines adequate income from productive work with
 1. Respect for and protection of basic human rights at work
 2. Promotion and creation of opportunities for full productive and remunerative employment
 3. Broad social protection
 4. Sustained social dialogue among social partners: workers, employers and private business, and government.
- Freedom of association and effective recognition of collective bargaining rights
- Elimination of all forms of forced or compulsory labour
- Effective abolition of child labour and right of children to learn and develop rather than work
- Elimination of discrimination in respect of employment and occupation.

Green Job = “Decent work”

Recycling and Green Jobs in Europe



Turnover of seven core groups of recyclables almost doubled from 2004 to 2008.

Table 2.2 Employment growth in EU eco-industry sub-sectors in the period 2000–2008

	Employment (2000)	Employment (2008)	Employment: annual growth rate (%)
Waste management	844 766	1 466 673	7.14
Water supply	417 763	703 758	6.74
Wastewater management	253 554	302 958	2.25
Recycled materials	229 286	512 337	10.57
Others	129 313	193 854	5.19
Renewable energy	49 756	167 283	16.37
Air pollution	22 600	19 067	2.10
Biodiversity	39 667	49 196	2.73
Soil and groundwater	14 882	18 412	2.70
Noise and vibration	4 176	7 565	7.71
Total	2 005 764	3 441 102	6.98

Source: Ecorys, 2009.

6.98 % annual growth rate

EU employment related to recycling of materials increased by 45 % between 2000 and 2007

Recycling and Green Job Potential in Europe

On a European level, if a target of 70% for recycling of key materials is met, across EU27

- Total potential employment creation could reach 563,000 net new jobs.
 - Up to 322,000 direct jobs could be created in recycling
 - 160,900 new indirect jobs
 - 80,400 induced jobs.

Drivers: Regulatory pressures and legislative support for source segregation

Drivers: Growing public concern

Drivers: Legislative shift from waste disposal to waste recycling

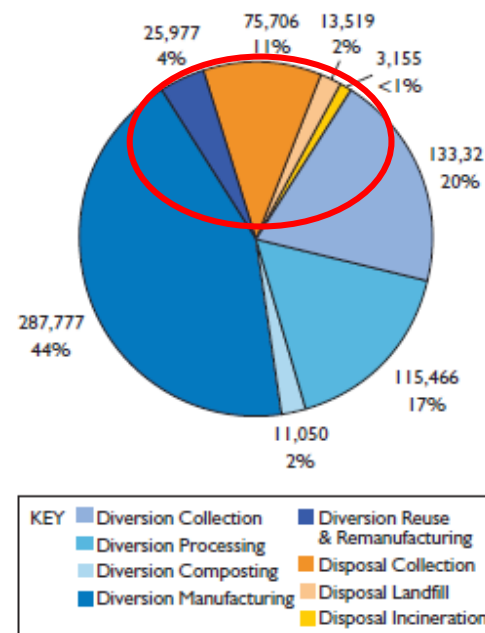
Drivers: Increasing demand for secondary raw materials (especially from Asian economy)

Recycling and Green Jobs in US

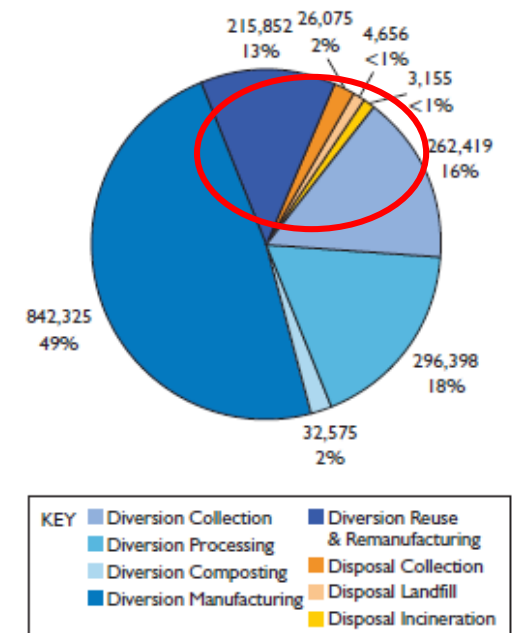
- Recycling industries include activities such as curbside collection of materials, deconstruction of buildings and products, processing of recycled materials, composting, repair and reuse businesses, and manufacturing of new products using recycled content.
- Recycling industries generate an annual payroll of nearly \$37 billion and gross over \$236 billion in annual revenue.

If U.S. recycling rate is to be of 75% by 2030, it would create 1.1 million new jobs

U.S. Jobs by MSW Management Activity, 2008
(Total jobs=665,971)



U.S. Jobs by MSW Management Activity, 2030 – Green Economy Scenario
(Total jobs=1,683,456)



Source: More Jobs, Less Pollution

How Green is Recycling Activity?

Pollution from crude recycling technology/ processes

- Low-end technologies causing air, water, noise, odour problems
- No pollution control mechanisms in place
- Small and scattered operations of informal recycling is often a problem for Governments to enforce pollution control regulations unlike big recycling companies



Are all Recycling Jobs “Green”?

- Typically, 1% of urban population in developing countries is involved in informal scavenging, most of whom are women and children.
- Despite fact that so many jobs are created by waste recovery and recycling, “ Many recycling or waste management related jobs cannot be considered green as they do not match basic requirements of decent work”.
- **Green jobs should**
 - Eliminate child labour
 - Increase and improve occupational safety and health measures
 - Provide social protection and freedom of association (various forms of organizations of workers such as unions, local associations and cooperatives)
 - Provide decent and equal wage opportunity for women



Not all Recycling Jobs are Green Jobs

Are all Recycling Jobs “Green”?



Recycling and Green Jobs in Asia

- Waste recycling in Asia is a Livelihood opportunity for poor and marginalized people
- Waste picking is usually first available jobs for rural migrants who are unable to find regular jobs.
- Recycling in low income countries are done by informal sector (24%), and 3% by formal recycling
- Some recycling jobs are neither recorded nor can be considered green/decent jobs , because of
 - Poor and unsafe working conditions
 - Involvement of child labour
 - Use of primitive technologies and skills
- However, formal private sectors' investment in recycling activities opens door for green recycling economy and jobs



Overall low recycling rate due to low source segregation of waste (except Japan, Taiwan, Singapore)

**No data/study unlike Europe
Unstructured/unorganized sector**

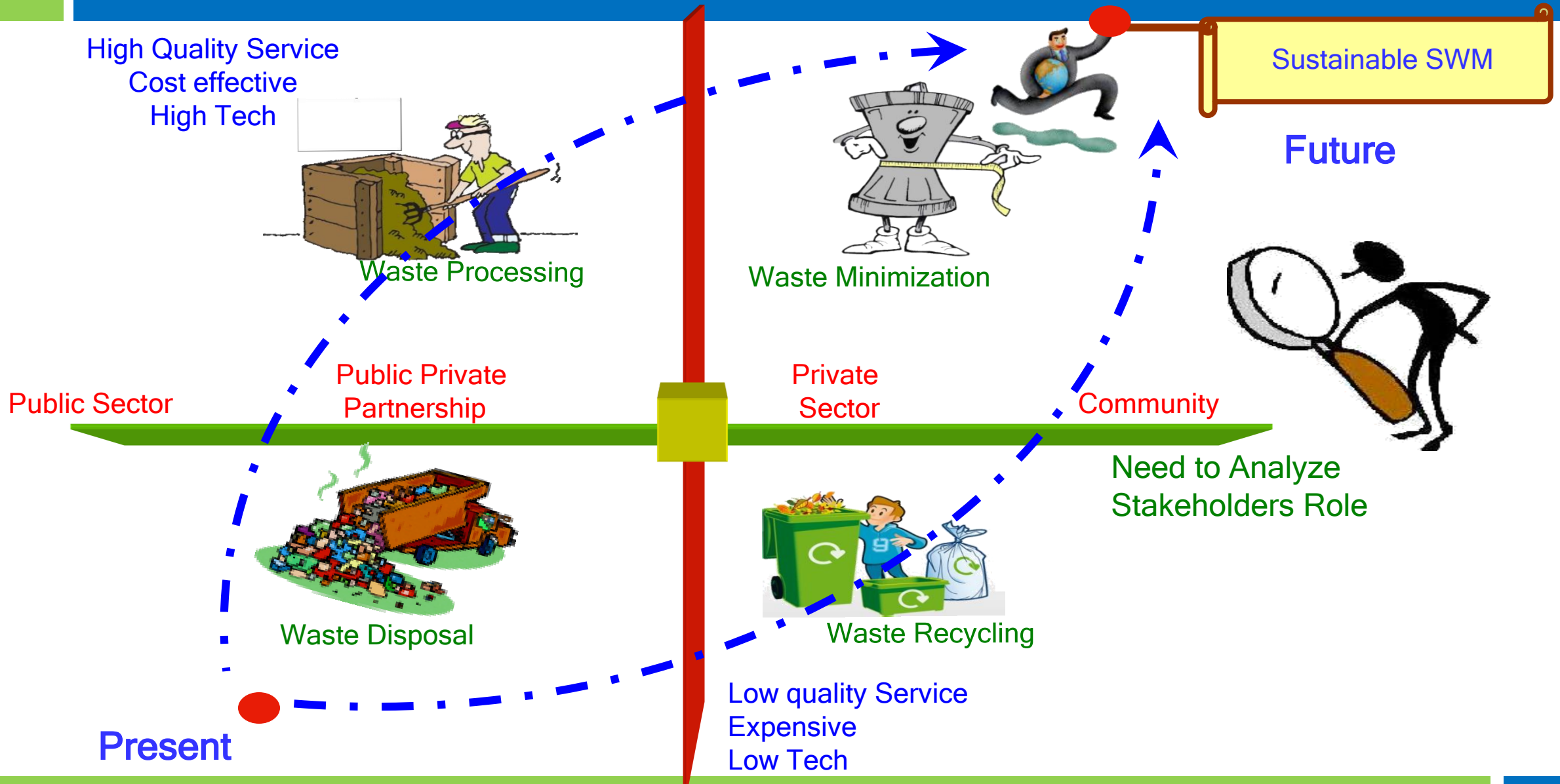
Making Asian Recycling Jobs Green- Integrating Informal Waste Sector (IWS)

Modernization of waste management does not mean leaving out informal sector

Formalization of Informal Waste Sector is premise for integration into formal waste management system

- **Policy inclusion for informal sector:** converting 'invisible' status of informal sector into a legitimate stakeholder through policy recognition of informal sector
- **Integration through institutionalization:** into a co-operative, micro enterprises, NGO, or any registered unit that helps to bring scattered informal actors into one system.
- **Fostering partnership /shared recycling between informal and formal private sector:**
 - Integration of informal waste sector with formal private sector to promote recycling as a shared business.
 - Employing waste pickers into formal recycling plants

Calls for a Partnership...



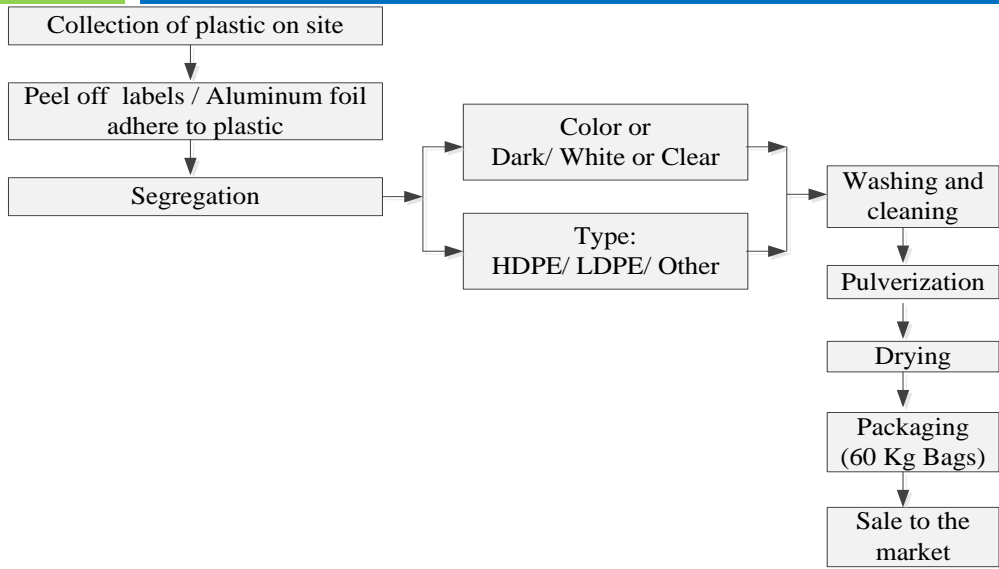
Example 1: Working with Formal Recyclers

Banda Ache Plastic Recycling, Indonesia

- Recycling capacity: 400kg/day
- Employers: 17 (10 female and 7 male)
- Workers are registered members to recycling association “Yayan Dawus Ulan Sampah”
- Waste pickers are employed and trained enough to identify category of plastic based on its packaging application
- **Workers benefits from:**
 - Clean and better environment such as toilet, temporary shed, clean drinking water, protective gears while working at work space.
 - Free elementary schools, job security, holiday entitlements, and regular and steady salary without fierce competition with fellow waste collectors, and middlemen’s brokerage for sale of recyclables.
- **Recycling company benefits from:**
 - Trained and cheap labour



Banda Ache Plastic Recycling, Indonesia



Plastic Recycling Process

Example 2: Private Sectors Investment-Vietnam

- National policies of Vietnam is favorable for FDI
- 100% Foreign Direct Investment (FDI) from a private American company, Lemna International Inc.
- Strong policy on promotion of 3R & is set to achieve a recycling rate of 70% from total MSW's by year 2015



Vietstar Joint Stock Company

Example 3: Private Sector Recycling- Wongpanich, Thailand

- Recognized as a model for recycling business in Thailand and neighboring countries
- Provides important benefits such as
 - Poverty reduction
 - Create job opportunities
 - Market value for waste
 - Educate people
 - Increase awareness within community



Wongpanich Waste Recycling Factory, Thailand



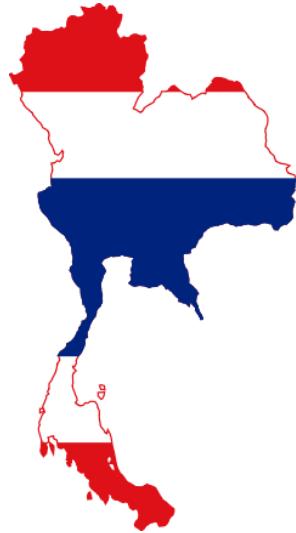
Factory Building



Recyclable transportation



Storage of Separated & Cleaned Plastic Containers



Example 4: IWS Recycling Supporting Poverty Alleviation/Community Development (Zero Baht Shop)

- Trash for Grocery: A wide range of grocery items available- rice, vegetable oils, snacks, drinks, toiletries
- Licensed as “Zero Baht Shop” in 2012-Organized & Registered under Thailand Institute of Packaging and Recycling Management for Sustainable Environment (TIPMSE)



Operation of Zero Baht Shop



Sellers bring recyclables



Recyclables are weighed



Staffs records the weight of wastes



Sellers get the invoice



Shop attendant calculates money equivalence



Customers exchange with daily grocery product

PROCESS FLOW

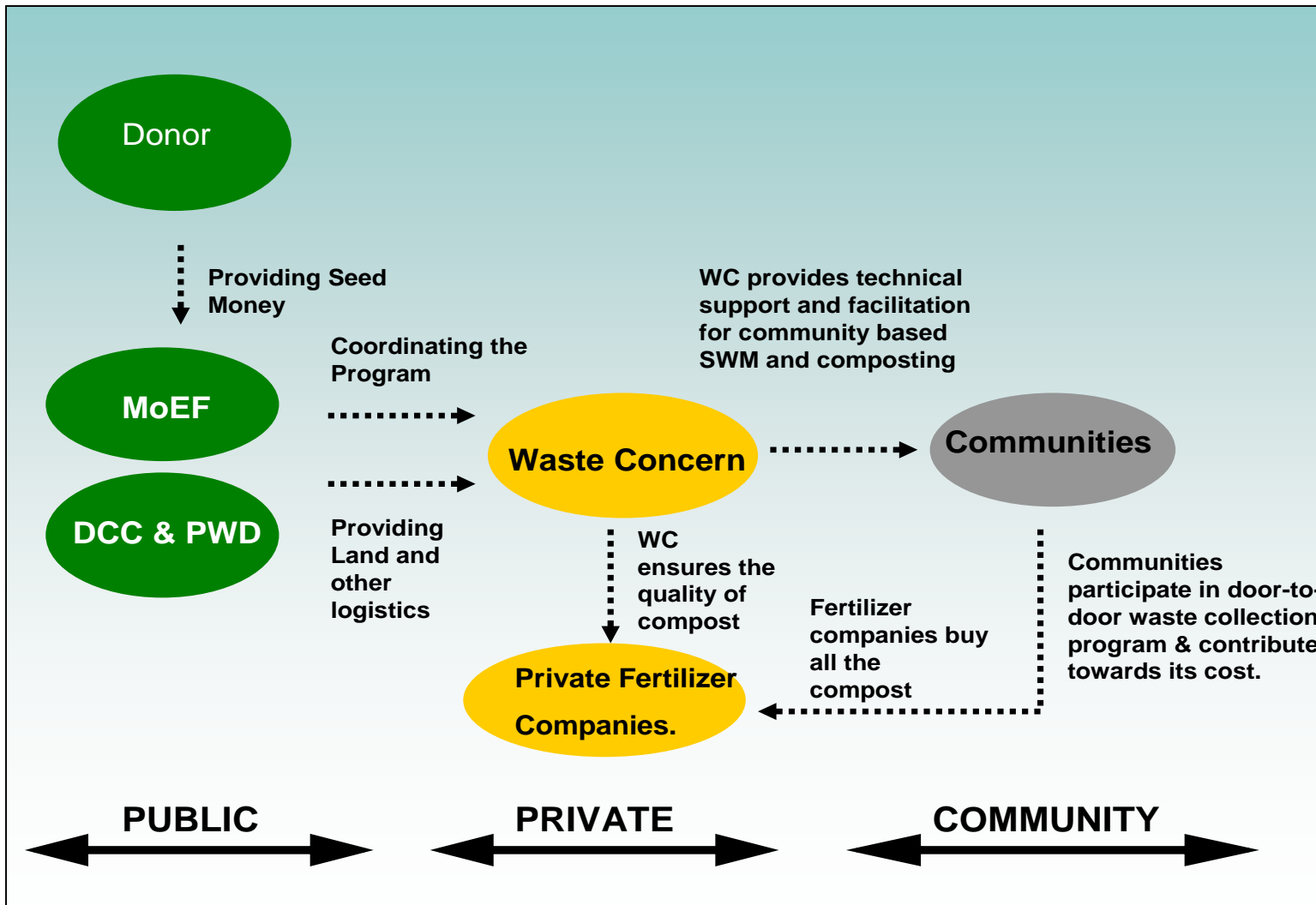
Collected recyclables are cleaned, sorted, stored and sold to junk wholesalers

Formalization of informal sector activity by:

- Registering as formal/licensed entity
- Legal Recognition to Waste Picking Occupation
- Poverty alleviation- Garbage Bank/Welfare Fund
- Bank deposits savings from community members into a welfare fund.



PPP Model for Centralized Community Based Composting in Dhaka



- In Dhaka, Bangladesh, a program was introduced to turn organic waste into compost.
- This project created 800 jobs.
- They process 50 000 tons of compost every year.
- Workers have access to health insurance, day care, and a free meal each day.

Other Examples

- Cities which have pioneered in PPPs in SWM include Bangalore, Chennai, Delhi, Chennai, Rajkot, Hyderabad, Ahmadabad, Surat, Guwahati, Mumbai and Jaipur.
- Alliance of Indian Waste Pickers (AIW) is a national network of 35 organizations, waste pickers and/or itinerant buyers in 22 cities.
- ExNora in Pune, Stree Mukti Sangathana in Mumbai, SEWA in Ahemadabad and Chintan in New Delhi
- Mumbai waste pickers involved with 'Tetra pak' for segregation and in Delhi with Coca-cola for shredding PET units



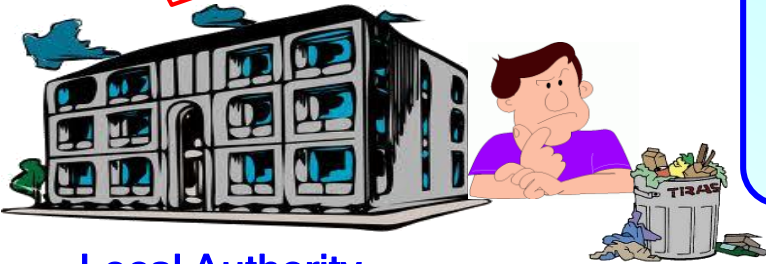
Stree Mukti Sanghatana
(Womens Liberation Organization)



CHINTAN
ENVIRONMENTAL RESEARCH
AND ACTION GROUP

IPLA Facilitates the Partnership

Information
Technology
Finance



Local Authority

IPLA Vision: Promoting/ facilitating meaningful collaboration with a wide range of partners such as governments, business, finance and civil society.

IPLA aims to:Promote "green jobs" and stimulate "green investments" in waste management;.....

Where to Invest



Private Sector

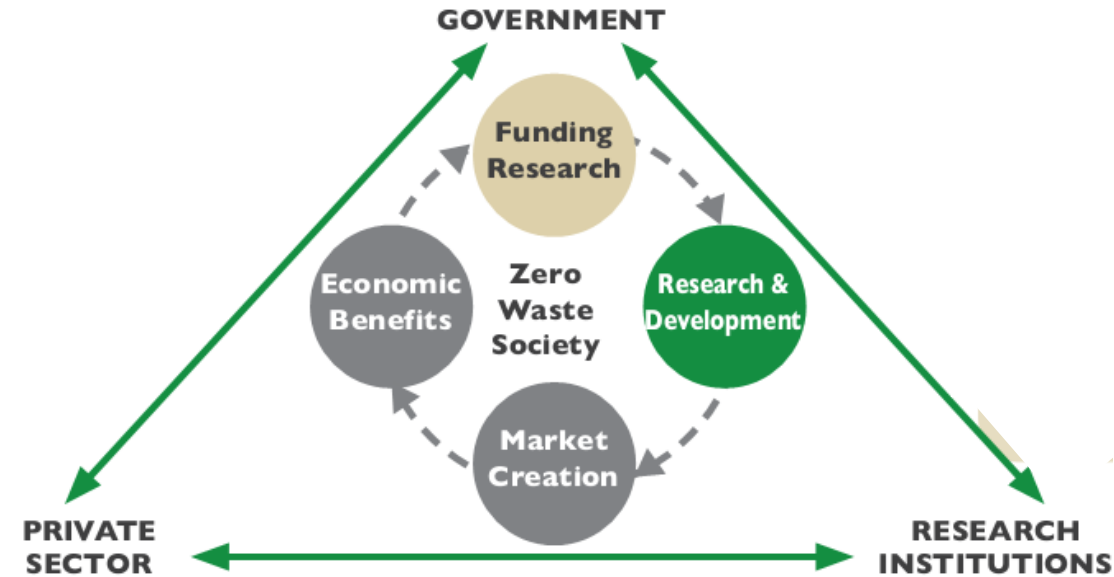
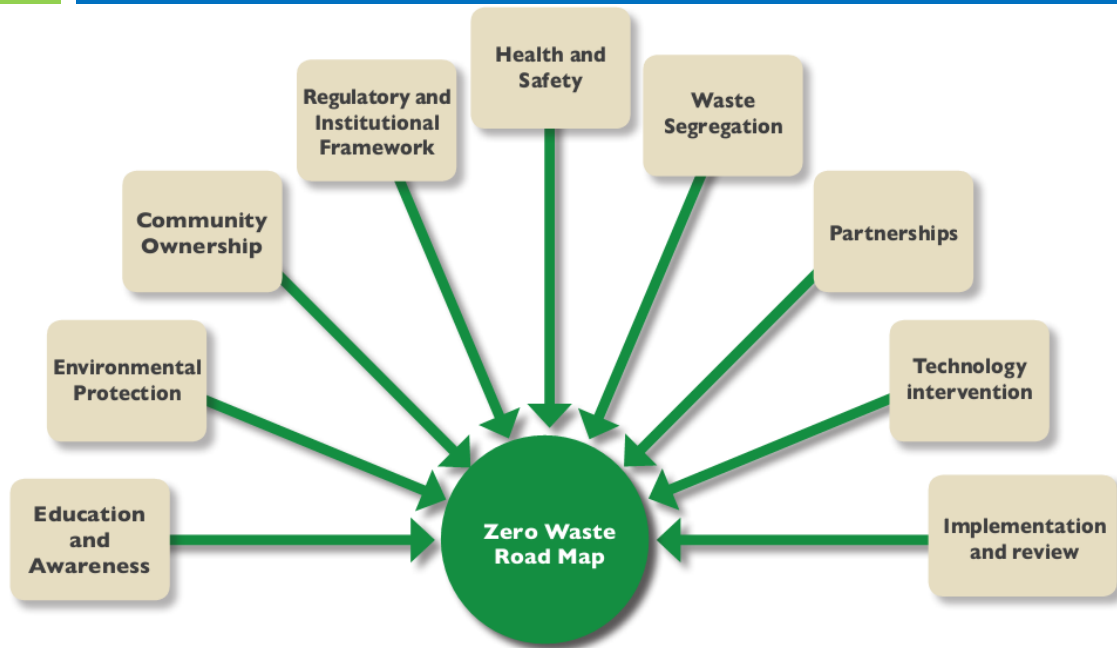


- Public private partnership (PPP) and financing and investment opportunities

- Facilitating LAs and private sector



IPLA is Facilitating Zero Waste Ahmedabad



- IPLA aims is foster partnerships to achieve sustainable waste management.
- Road Map for Zero waste Ahmedabad is prepared with assistance from the UNCRD IPLA,
- Ahmedabad Municipal Corporation (AMC) has become one of the first metropolitan cities from the developing world to adopt a zero waste goal.
- AMC calls upon all relevant key stakeholders, including Government Departments, private and business sector, scientific and research institutions, NGOs, financial institutions, informal sector, and citizens to actively cooperate with AMC in achieving zero waste goal.

- **Focus Area: partnerships and collaborations**
- **Strategic Action 22:** Work with other arms of the government and Industry groups to promote business assistance programs for industry with a focus on lean manufacturing, cleaner production and waste recovery.
- **Strategic Action 23:** Work with the manufacturing industry, business
- Community and financial institutions to facilitate the creation of strong and sustainable markets for recyclables and green jobs

Barriers to Realize Green Job Opportunities

Investment Barriers

- Investments on Waste Management Infrastructure & Services are low. Presently, global averages hovering close to 0.1%

Non-alignment of informal sector

- Largely informal nature of sector in many parts of world undermines much of work to establish safe and modern waste management systems.
- Need for recognition, partnerships.
- Technical/financial assistance and community involvement

3R - Economics & or issues

- Economic returns on practicing 3Rs not still understood and widely demonstrated and shared
- Market for recycled products is highly volatile.
- Resistance in industrial & public attitude to view waste as a resource
- Public concerns emerging on health & safety issues in using a recycled product

Conclusions

- Increasing national recycling rate is a direct and economical way to quickly create significant numbers of jobs.
- Utilizing maximum potential of green jobs in waste recycling sector however requires strict source separation of waste, enabling legislative and policy, finance, technology support and public participation
- **Facilitation required to bridge LAs and private sector for PPP possibilities- Role of IPLA**
- Not all recycling jobs (especially in Asia) is safe/decent or green jobs
- To make recycling jobs “Green” 3R activities should explicitly
 - **Link informal sector with formal sector**
 - **Provide job opportunities to local population**
 - **Develop recycling jobs from unskilled jobs to high skilled jobs**
 - **Invite private sector investment in appropriate technologies**
 - **Provide safer working environment**
 - **Build institutional capacity**

Key Messages

US and Europe

1. Drivers are legislation
2. Growing public concern
3. Structured reporting on recycling and green job statistics/future potential/expansion areas

Asia

1. Lack of source separation
2. Lack or weak implementations of legislation
3. Lesser public participation
4. Recycling jobs are not seen as green job opportunities (yet a low-end job)
5. Investment barriers- bringing private sector into waste management/recycling market



THANK YOU...

