Regional Workshop on Enhancing Urban Resource Efficiency and Circular Economy in Asia and the Pacific Waste Management

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IRRC Lessons Learned: Contribution to Urban Resource Efficiency, Circular Economy and Sustainability in the Asia Pacific Region

Presented by: Iftekhar Enayetullah

WASTE CONCERN

Presentation Outline

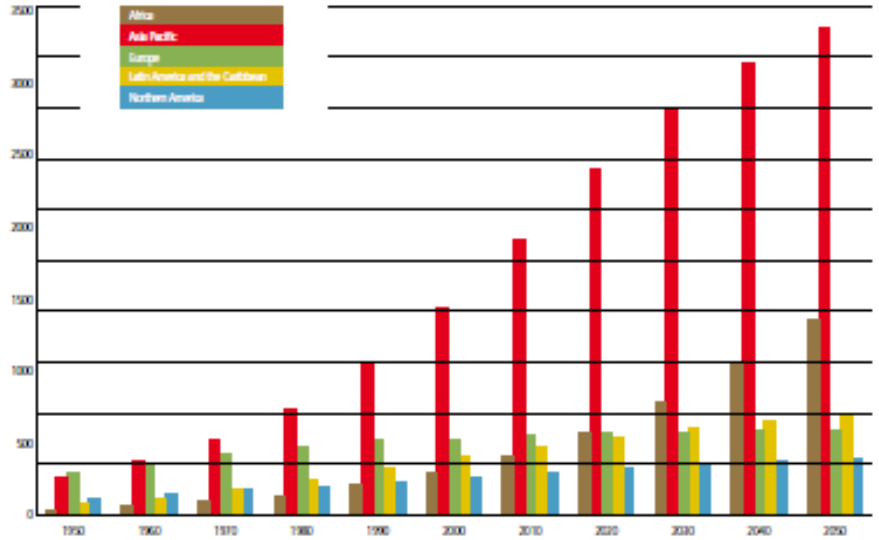
I. Current Practice of SWM in Asia and the Pacific Region
II. What is Waste to IRRC Approach?
III. Opportunities from IRRC Approach
IV. Sustainable Development Benefits of IRRC Approach
V. Keys Lessons from Implementation of IRRC Approach
VI. Way Forward

Context of SWM in Asia: Rapid Urbanization

- 60% of the global population lives in the Asia and Pacific.
- Asia is expected to reach 50% urbanization by 2018.
- Bulk of the Asia's urban population live in small and medium cities.
- Small and medium cities have limited human, financial and organizational resources

Source: State of Asian and Pacific Cities Report, 2015

1950 – 2050 Urban Population (in thousands)



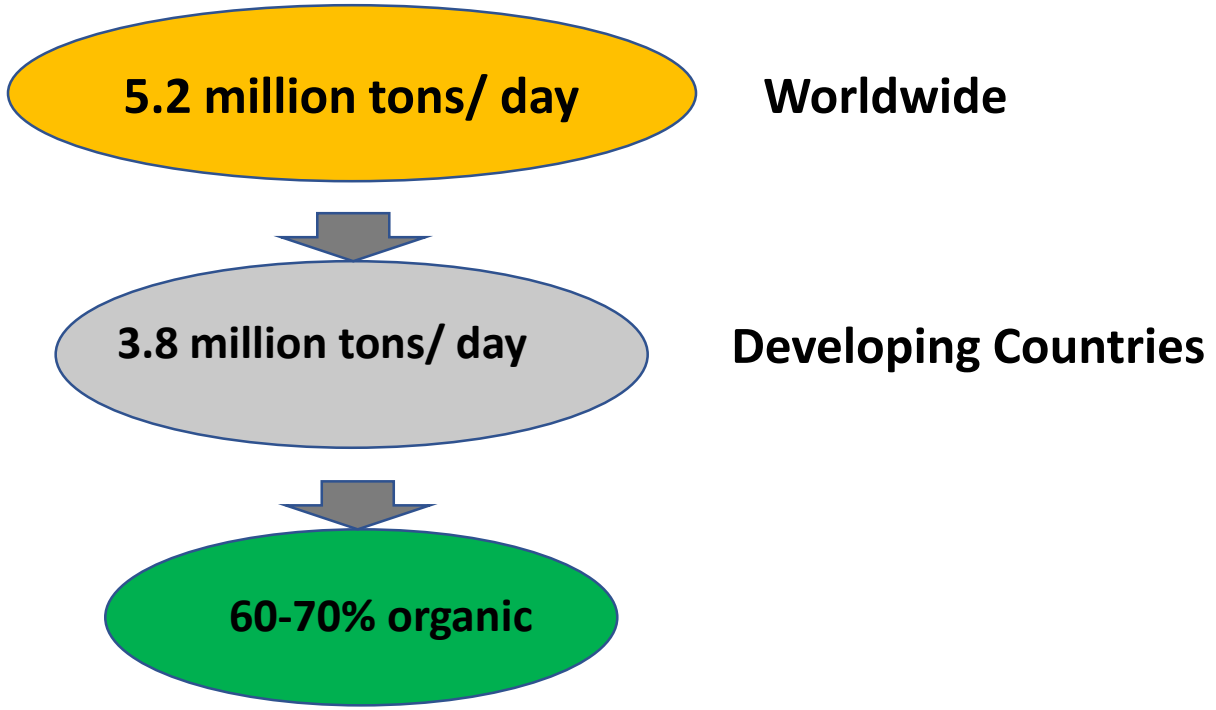
Source: State of Asian and Pacific Cities Report, 2015

Asia's Growing Urban Population

Source: State of Asian and Pacific Cities Report, 2015

Waste Generation Worldwide and in Asia Pacific Region

It is estimated that 5.2 million tons of solid waste are generated daily worldwide, of which 3.8 million tons are from developing countries



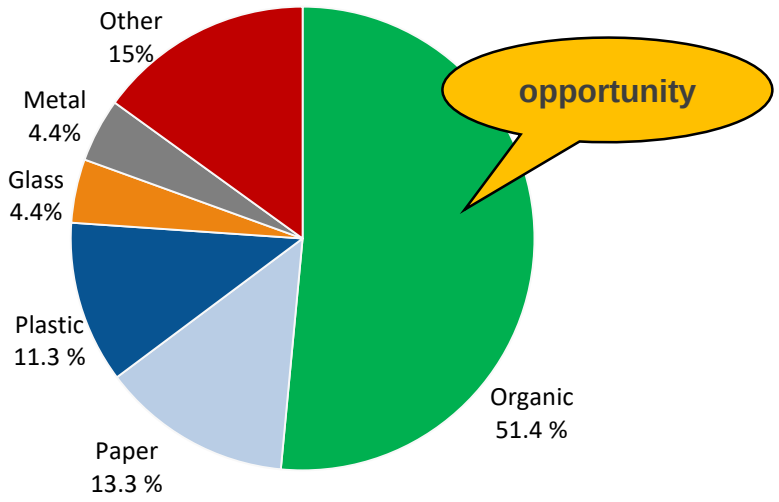
Source: ADB, 2011 & World Bank 2012, What a Waste

Turning Challenges to Opportunities

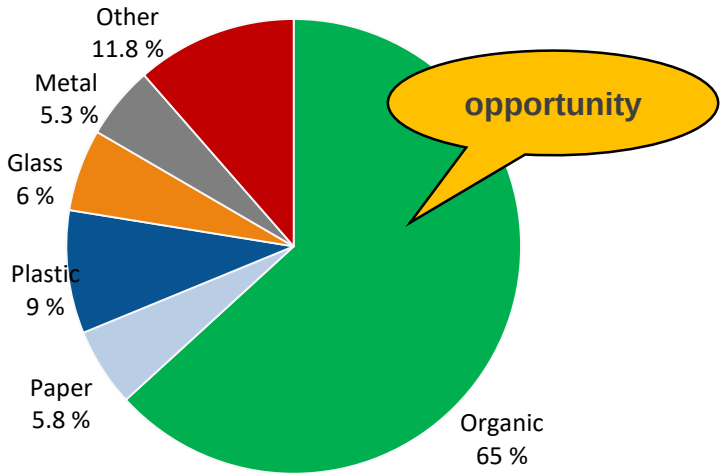
The current system of waste management is focused on end-of-pipe solution. It is not sustainable and overlooks the enormous potential of turning waste into resource.

The informal sector recovers some valuable materials downstream, but the majority organic waste does not have a chance to be recovered without leveraging appropriate technology and systems.

Middle Income countries

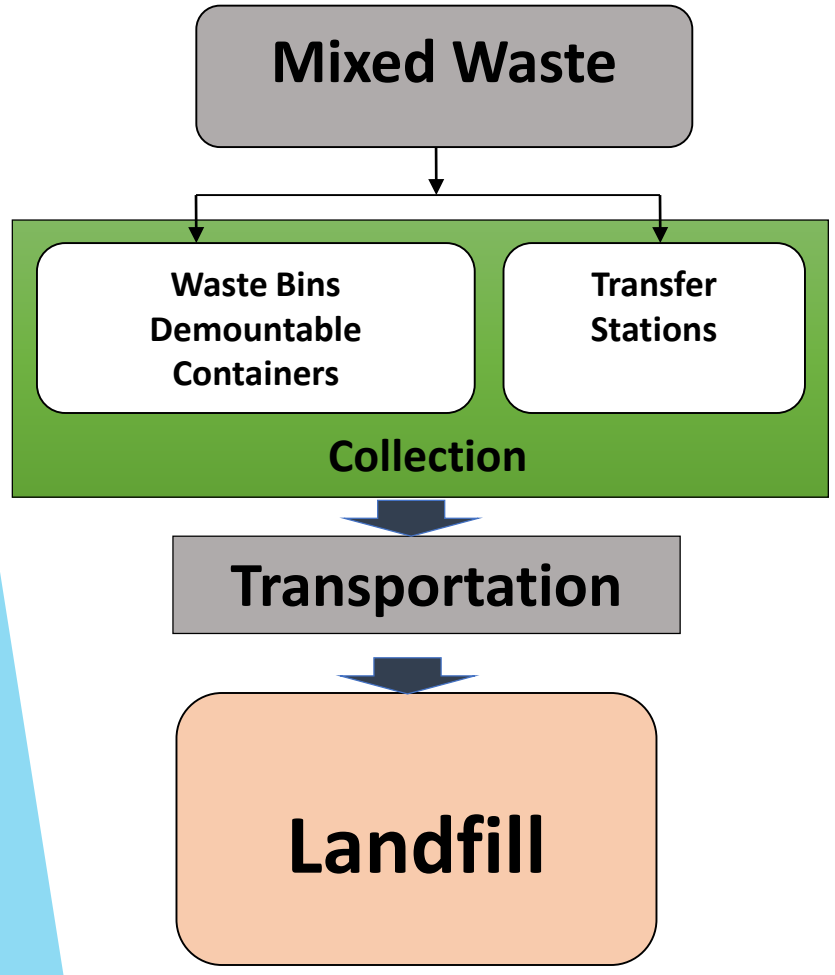


Low Income countries



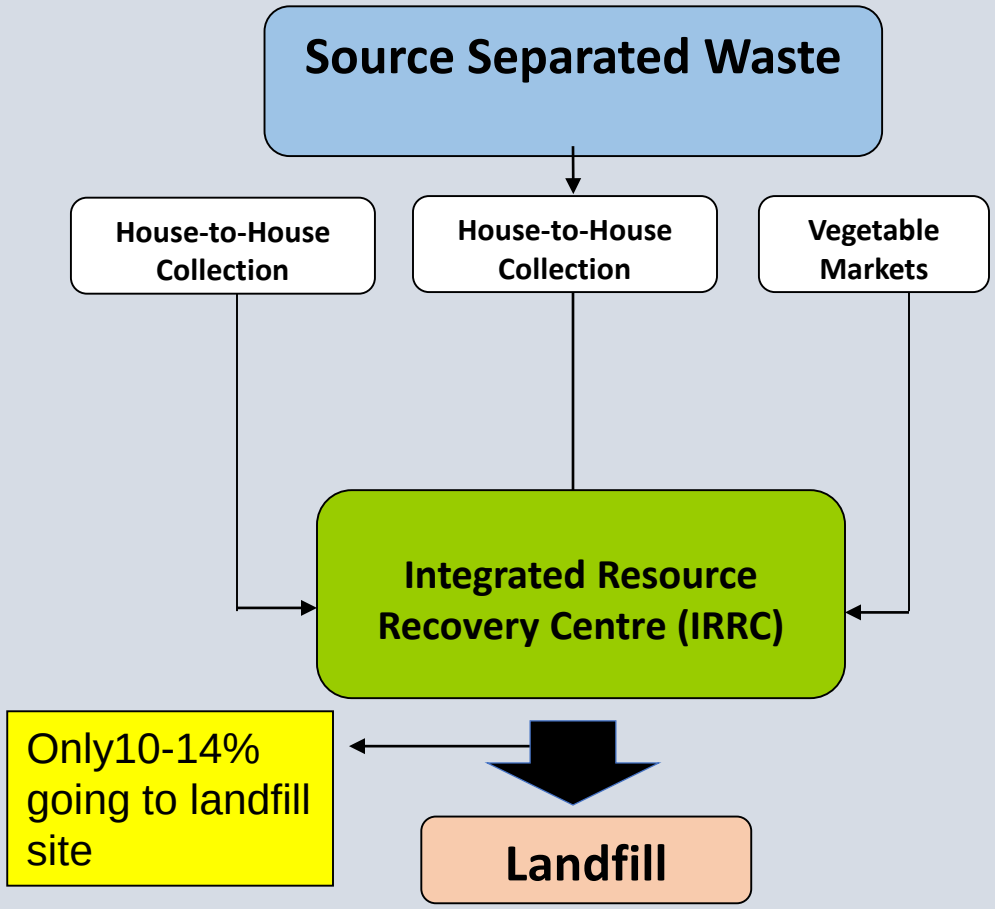
Approach to Waste Management

Conventional Approach
(End of Pipe Solution)



PROBLEMS

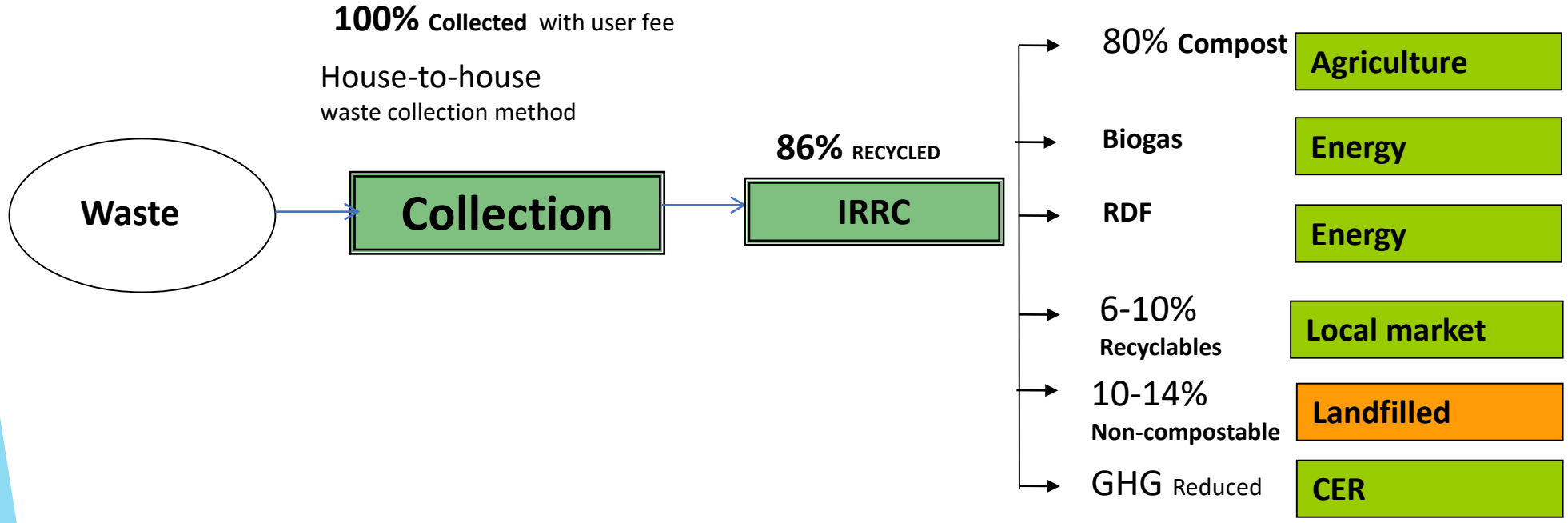
Approach of IRRC
(Resource Management)



OPORTUNITIES

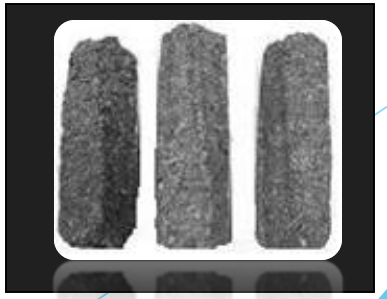
Integrated Resource Recovery Centers (IRRCs)

An **Integrated Resource Recovery Center (IRRC)** is a facility where a significant portion (80-90%) of waste can be processed in a **cost effective** way, in proximity to the **source** of generation, and in a **decentralized** manner. The IRRC concept is based on 3R principles. **It is suitable for small and medium sized towns**.

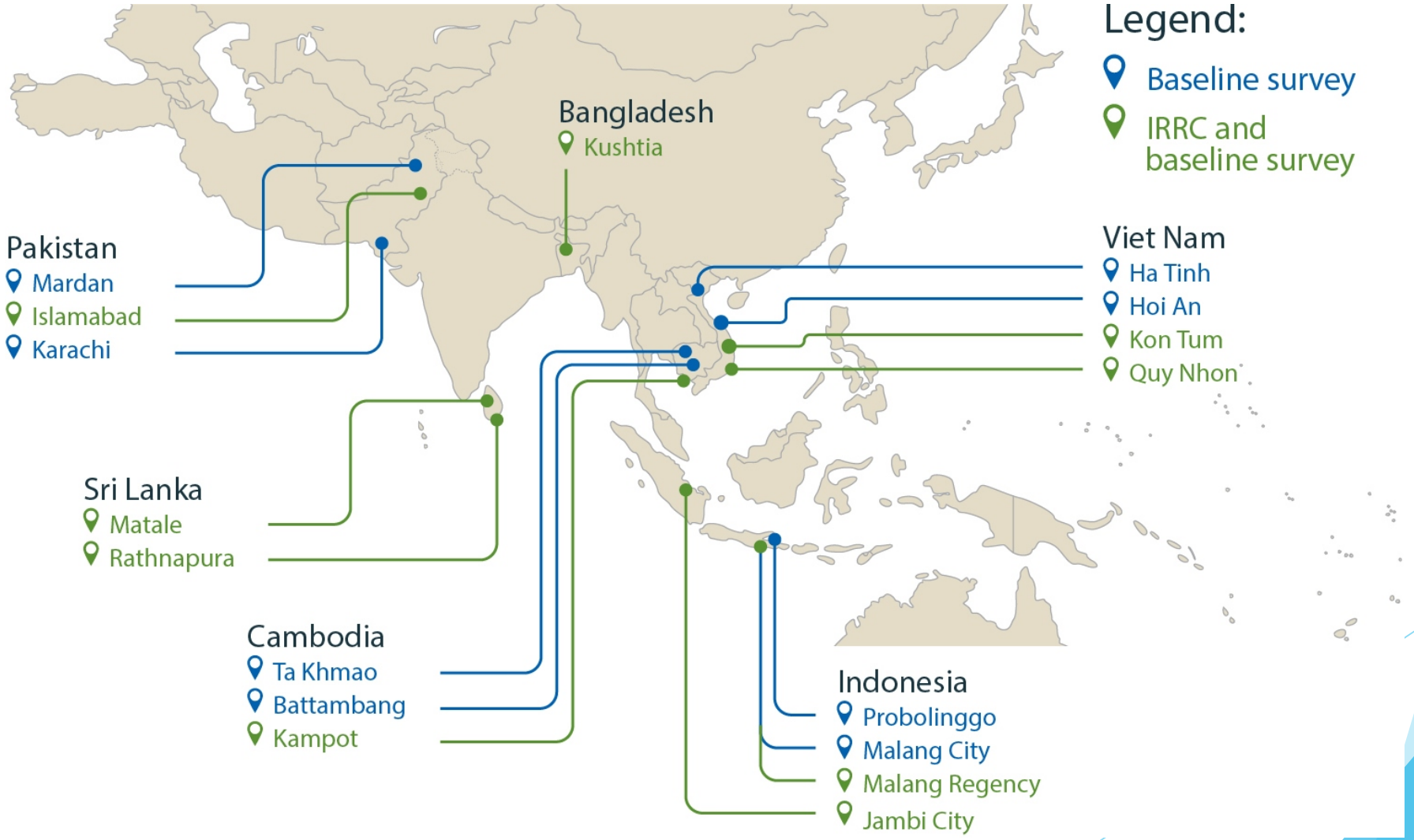








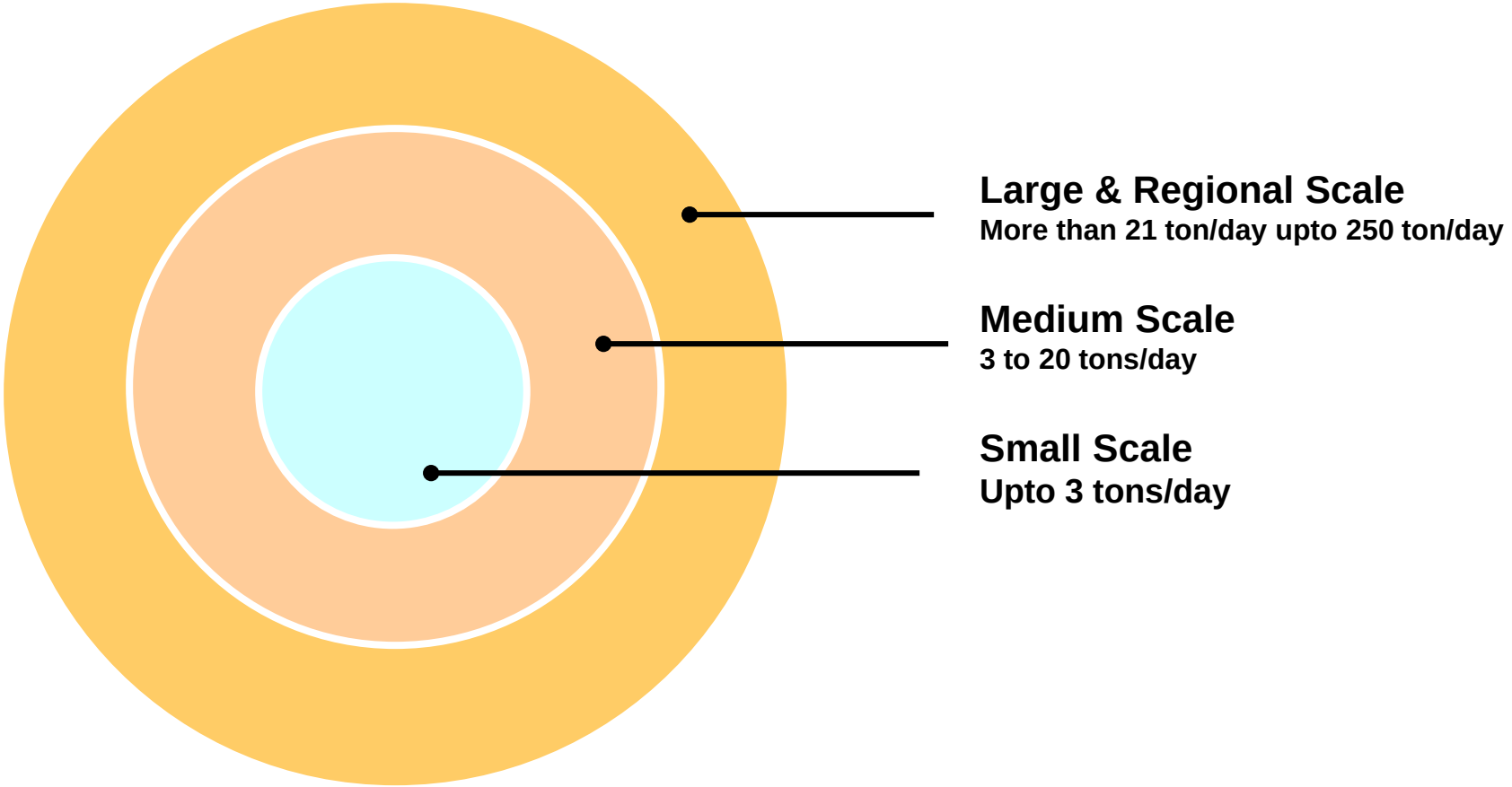
ESCAP & Waste Concern IRRC cities in 6 countries



Integrated Resource Recovery Centres (IRRCs)

- Based on 3R principles
- Recovers 80 percent of waste as resources (both organic and inorganics)
- Promote separation at source (organic/inorganic)
- Decentralized, close to generated waste
- Capacity can range from 2-20 tons/day (manual)
- Uses appropriate technologies
- Employs waste pickers and other urban poor
- Reduces GHG emissions

Different Scale of IRRC Model



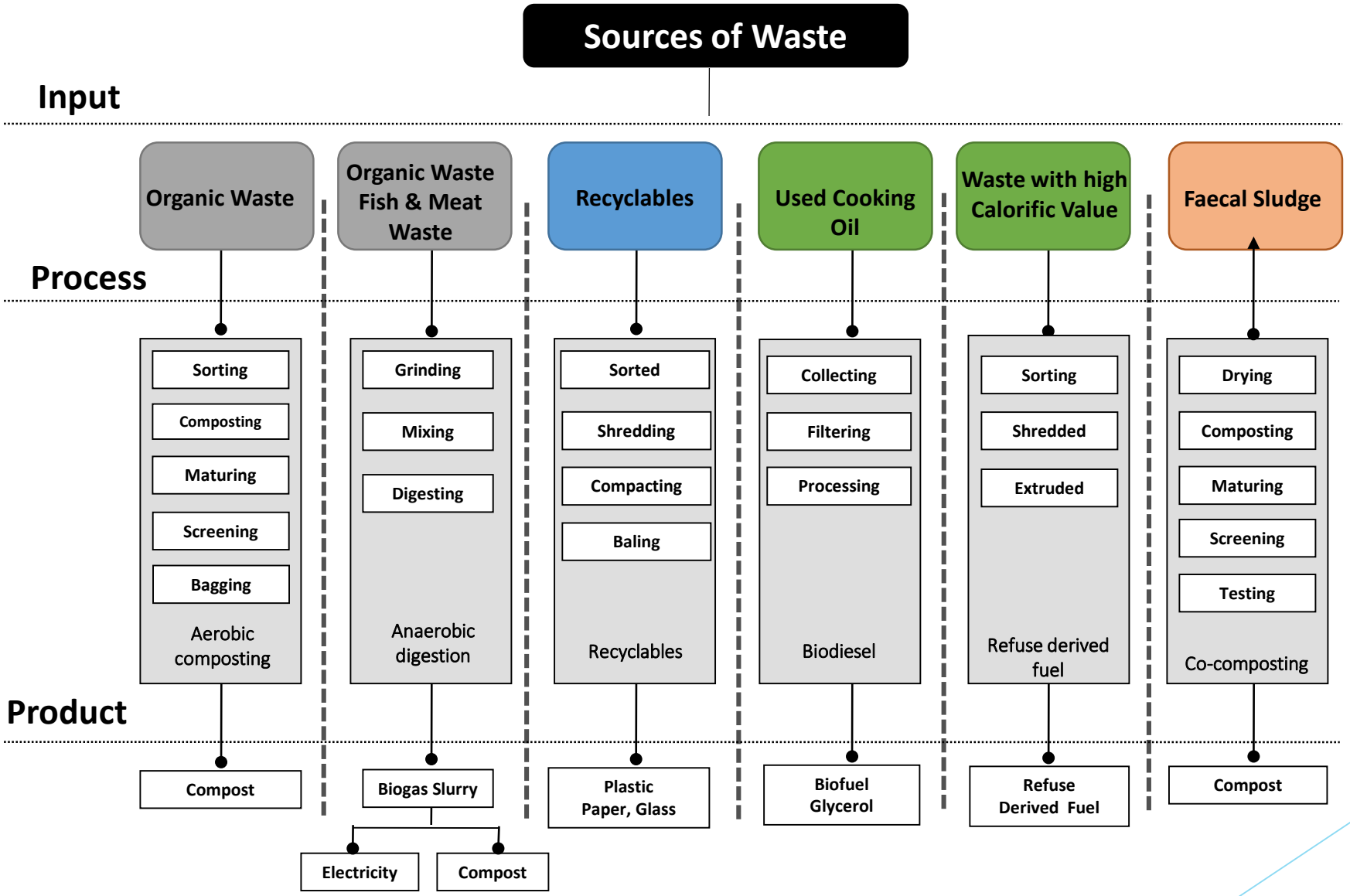
Large & Regional Scale
More than 21 ton/day upto 250 ton/day

Medium Scale
3 to 20 tons/day

Small Scale
Upto 3 tons/day

- **The flexibility of Waste Concern's IRRC model is such that it can be adapted to any situation both in urban and rural areas.**
- **Moreover, it can be implemented in slum areas. It can be implemented on a small scale, medium scale, or large scale. The small scale model allows for 3 tons of organic waste to be processed daily, while the medium scale model permits processing 3 to 20 tons of organic waste per day. More than 21 tons of organic waste can be processed daily using the large scale model.**
- ***Apart from Production of Compost/Biogas/RDF this model is reducing Green House Gas***

Recycling Options Used in IRRC Approach



Example of Recycling Training Center in Katchpur, Greater Dhaka Using IRRC Approach

Name of the Project:
Recycling Training Center (RTC) at Katchpur, Narayanganj, Greater Dhaka (2005)
Project Partners:
GoB, UNDP, UNESCAP, WASTE CONCERN
Land Area: 1440 sq.m
Capacity to Manage Waste:
-Municipal Waste: 10 Tons/day
-Biogas: 500 kg/day

MUNICIPAL OWN PRIAVATELY OPERATED: Co-Composting of Faecal Sludge with Solid Waste in Kusthia Municipality

Name of the Project:
Co-Composting of Faecal Sludge with Solid Waste in Kusthia Municipality
Project Partners:
UNCRD,UNESCAP, WASTE CONCERN, KUSHTIA MUNICIPALITY (2011-12)
Land Area: 4 Acres
Capacity to Manage Waste:
-Municipal Waste 2-3/day
-Faecal Sludge: 6M3/day

MUNICIPAL OWN PRIAVATELY OPERATED

Composting for Medium and Large cities (Large Scale)

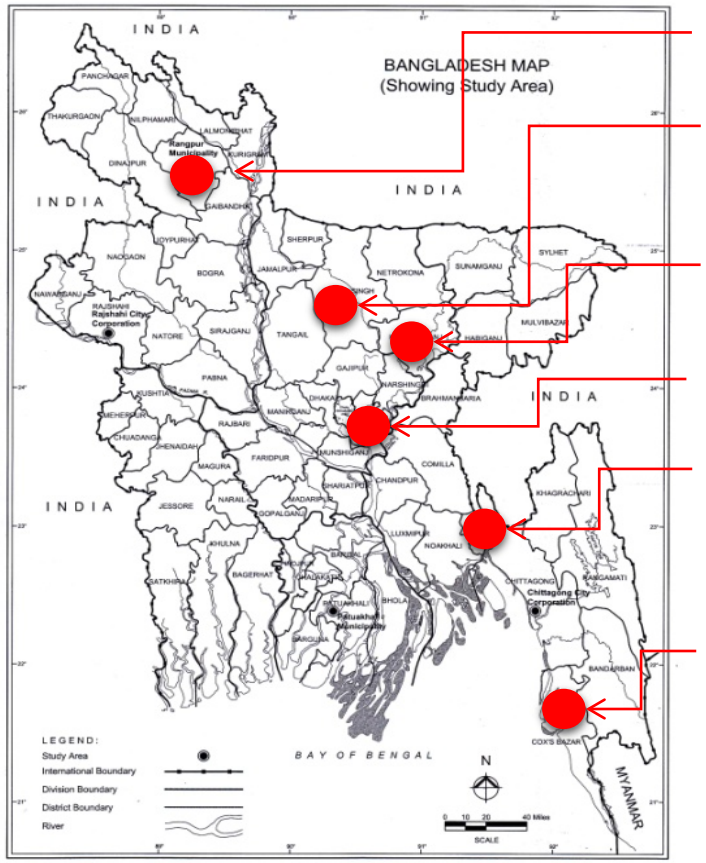
PRIVATELY OWN PRIAVATELY OPERATED

Name of the Project: Globally First CDM Based Composting Project (capacity 130 tons/day) In Dhaka (2008).
Project Partners: WWR Bio Fertilizer Bangladesh, WWR bv., Waste Concern.
Land Area: 1.4 Hectare
Capacity to Manage Waste:
-Municipal Waste: 130 Tons/day

Composting & AD Plants (IRRC) Implemented Under Government of Bangladesh Financed the Project

Programmatic CDM using Organic Wastes of Urban Areas Municipalities) throughout Bangladesh (in 64 Districts):

Government used its Climate Change Trust Fund.



Rangpur City Corporation
Capacity: 16 tons/day

Mymensingh Municipality
Capacity: 8 tons/day

Kishorganj Municipality
Capacity: 10 tons/day

Narayanganj City Corporation
Capacity: 22 tons/day

Feni Municipality
Capacity: 10 tons/day

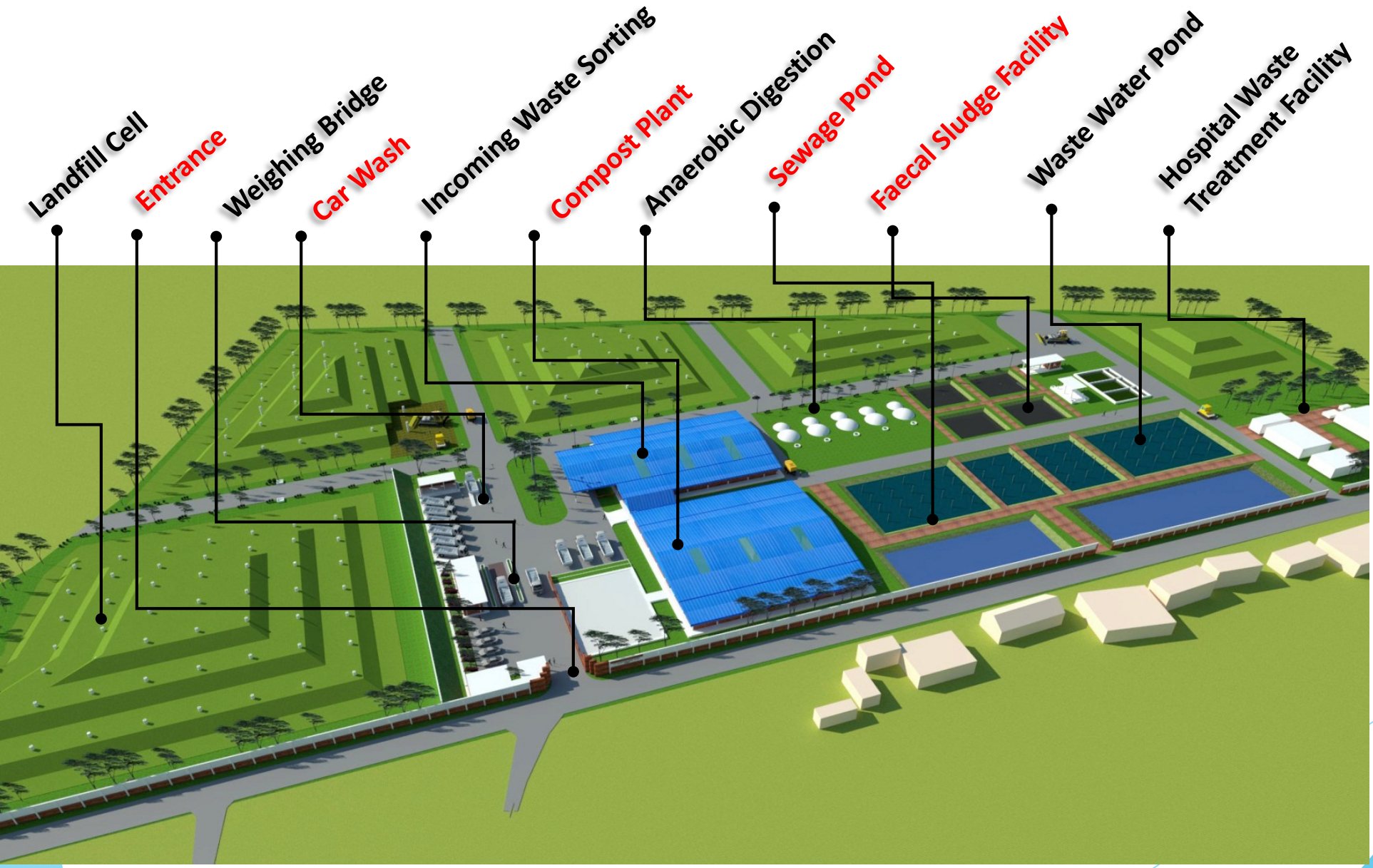
Cox's Bazar Municipality
Capacity: 12 tons/day

MUNICIPAL OWN PRIAVATELY OPERATED

Name of the Project: Programmatic CDM using organic Wastes of Urban Areas Municipalities) throughout Bangladesh (in 64 Districts)
Capacity to Manage Waste:
-Municipal Waste: 22 Tons/day
Status: Operated by Private Sector

Regional Approach: Integrated Landfill and Resource Recovery Facility for Jessore

MUNICIPAL OWN PRIAVATELY OPERATED



Name of the Project: Regional Integrated Landfill & Resource Recovery Facility At Jessore Municipality Under City Region Development Project

Project Partners: City Region Development Project

Implemented by LGED

Supported by ADB

Consultant: Waste Concern Consultants

Land Area: 13 Acres

Capacity to Manage Waste: 50 tons/day

Municipal Waste: 50 Tons/day

- Compost plant 20 Ton/day
- Biogas 20 Ton/ day

Faecal Sludge- 10M3/day

Status: Under Construction to be Operated by Private Sector

Estimated Date of Operation: March, 2018

Manage Waste in a Decentralized Manner in Sri Lanka

2007- **IRRC 01- Dole road ; Matale**

2010- **IRRC 02- MC road ; Matale**

2013- IRRC 03- Higgolla; Matale

Manage Waste in a Decentralized Manner in Sri Lanka







Manage Waste in a Decentralized Manner in Sri Lanka

Products of IRRC, Matale

Manage Waste in a Decentralized Manner in Sri Lanka

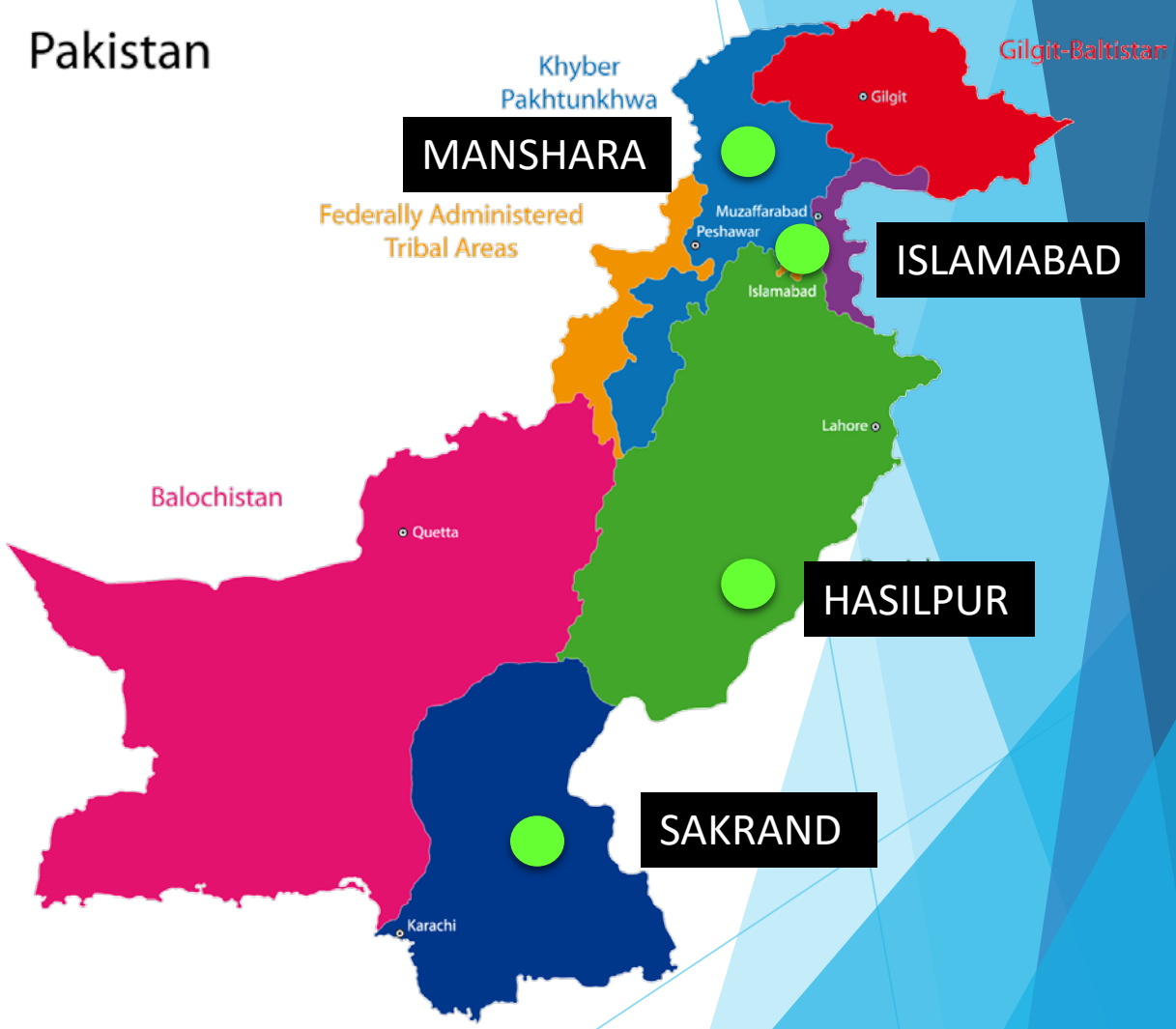
Manage Waste in a Decentralized Manner in Sri Lanka

Manage Waste in a Decentralized Manner in Sri Lanka

Existing Plant in Ratnapura

Scaling up by public financing

IRRCs in Pakistan

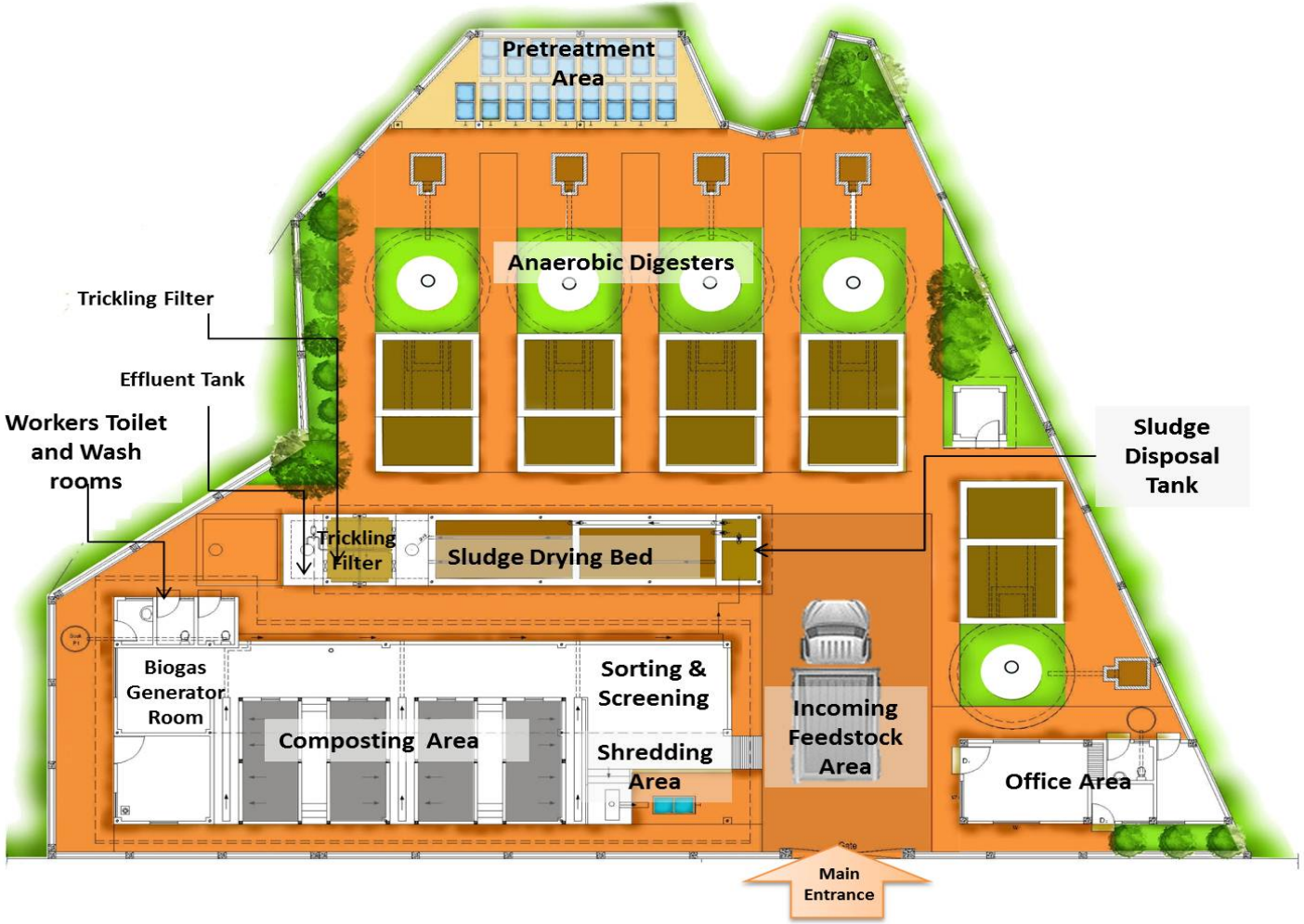


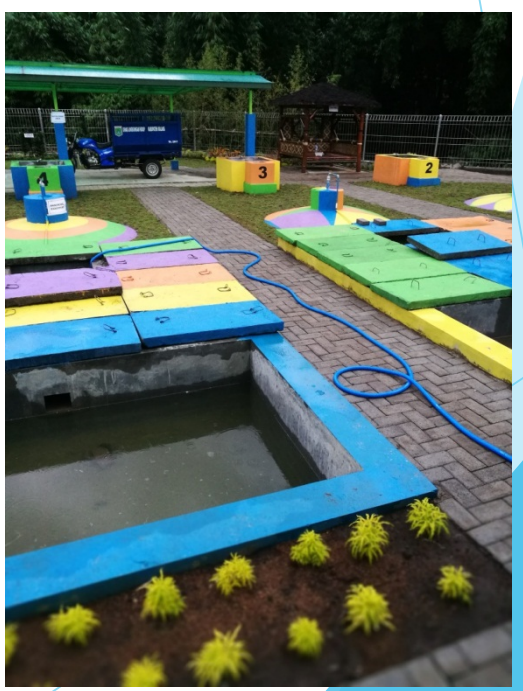
Public and Private Partnership

IRRCs in Vietnam

Picture 11: Activities in the first Waste Recycling Day in Quy Nhon City (taken on 24 May, 2014)

IRRC with AD and Co-composting facility





Minimum 1000 Sq. m space is required to accommodate all the required facilities inside an IRRC.

AD facility in Malang Regency, Indonesia

IRRC Replicated In Indonesia by UNESCAP with the Technical Support From Waste Concern

IRRC in Jambi, Indonesia

Environmental, Economic & Social Benefits from IRRCs

By recycling one ton of waste:

- ✓ Create **2 new jobs** for the **waste pickers**;
- ✓ Produce **0.25 tons** of **good quality compost**;
- ✓ Produce **40-80 cubic meter of biogas** (clean energy which can be used for cooking purpose or electricity generation)
- ✓ Save **1.1 cubic meter of landfill area**;
- ✓ Reduce **0.5 tons of green house gas emissions**
- ✓ Provide door-to-door service to **2,000-3,000** households
- Reduce the risk of **40 diseases** linked with unmanaged municipal solid waste;
- Increase **crop production between 25-30%** and reduce use of **chemical fertilizer by 35-40%** increasing food security;
- Contribute to both climate change **mitigation and adaptation**.
- Reduces risk of fire at landfills

Economic benefits from IRRCs

Reduced landfilling costs

Extended landfill life

Reduced subsidy for chemical fertiliser

Improved crop yields

Social benefits from IRRCs

Better job opportunities

Improved living conditions

Reduced disease

Improved environmental awareness

Environmental benefits from IRRCs

Reduced pollution

Reduced greenhouse gas emissions

Improved soil quality

Low-carbon fuel

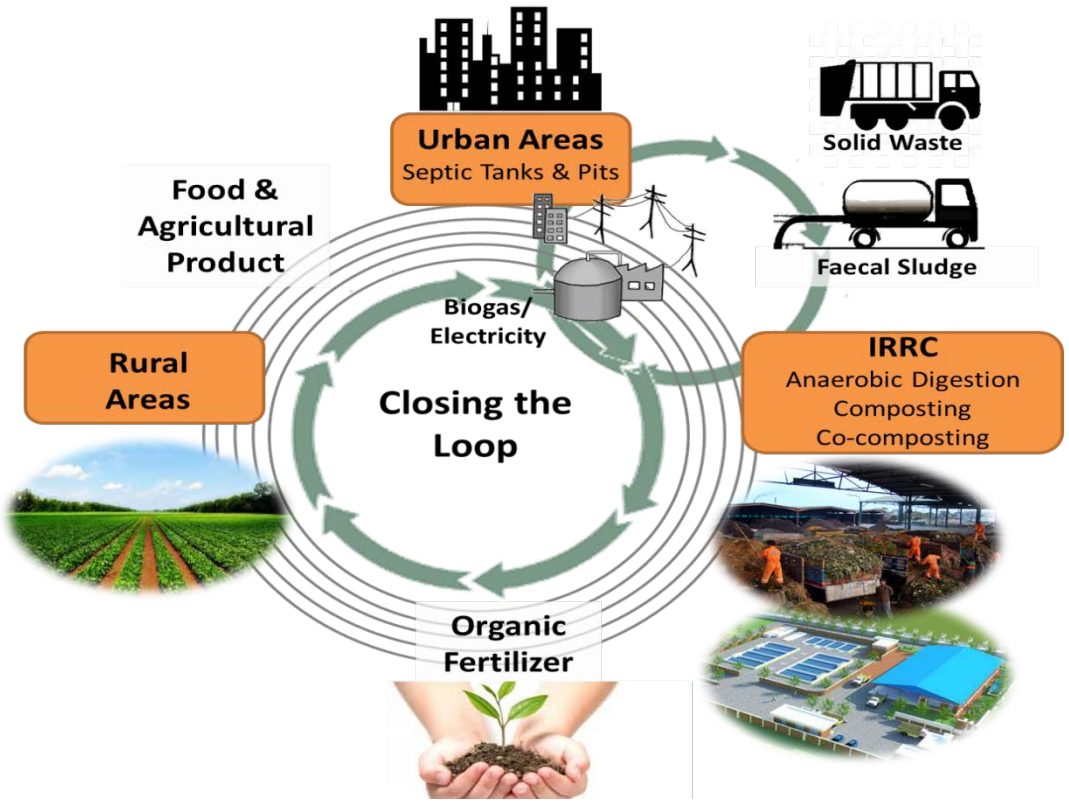

SUSTAINABLE DEVELOPMENT GOALS
17 GOALS TO TRANSFORM OUR WORLD
1 NO POVERTY
2 ZERO HUNGER
3 GOOD HEALTH
4 QUALITY EDUCATION
5 GENDER EQUALITY
6
7
8
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE
10 REDUCED INEQUALITIES
11
12
13 ACTION
14 LIFE BELOW WATER
15 LIFE ON LAND
16 PEACE, JUSTICE AND STRONG INSTITUTIONS
17 PARTNERSHIPS FOR THE GOALS
SUSTAINABLE DEVELOPMENT GOALS

Linear Vs. Circular Approach for Waste Management

Waste Bins Demountable Containers → Collection → Transportation → 
Landfill

PROBLEMS
- ✓ GHG Emission
- ✓ Pollution
- ✓ Health Hazards
- ✓ Land Required

Conventional Waste Management (Linear Direction)

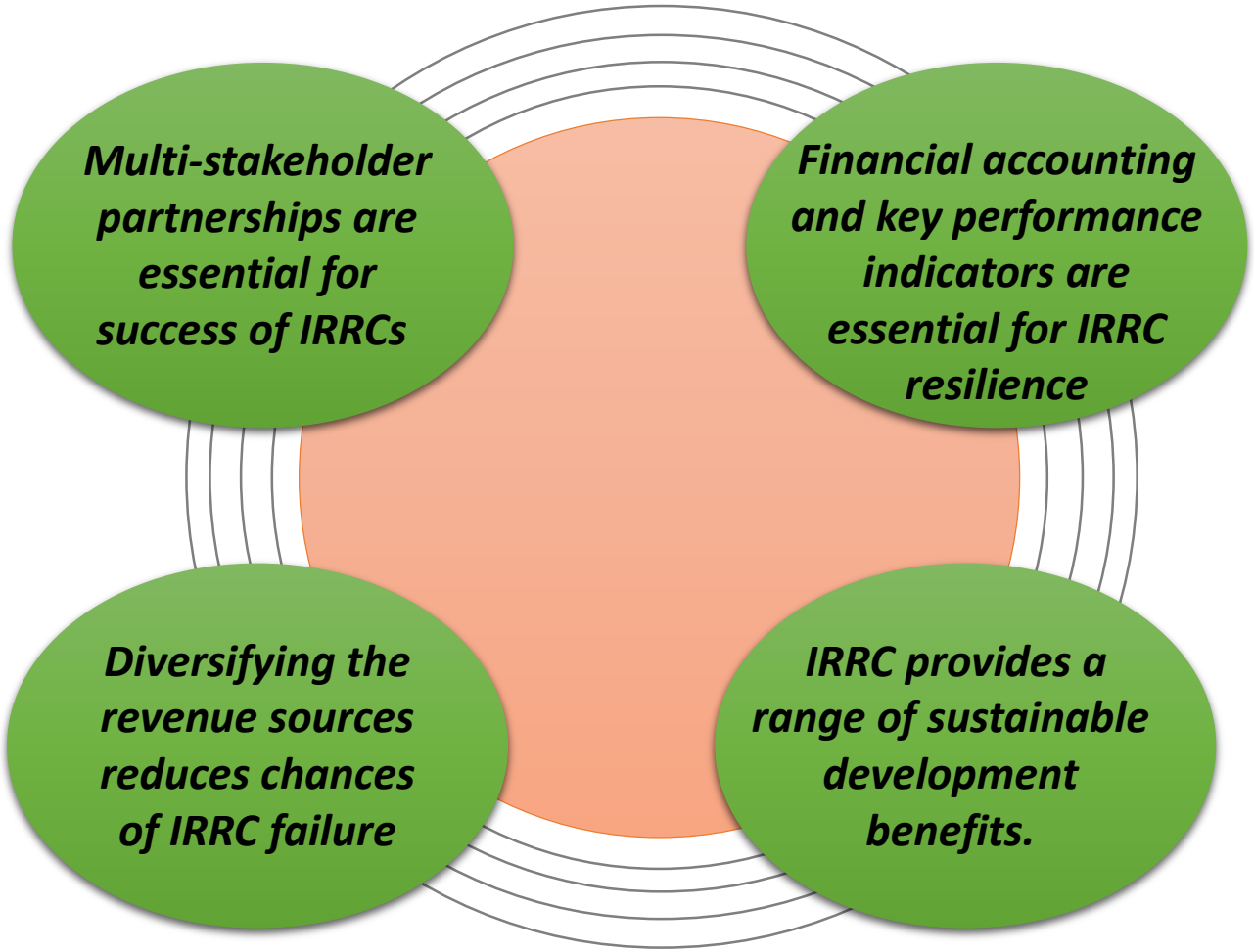


Biodegradable Waste

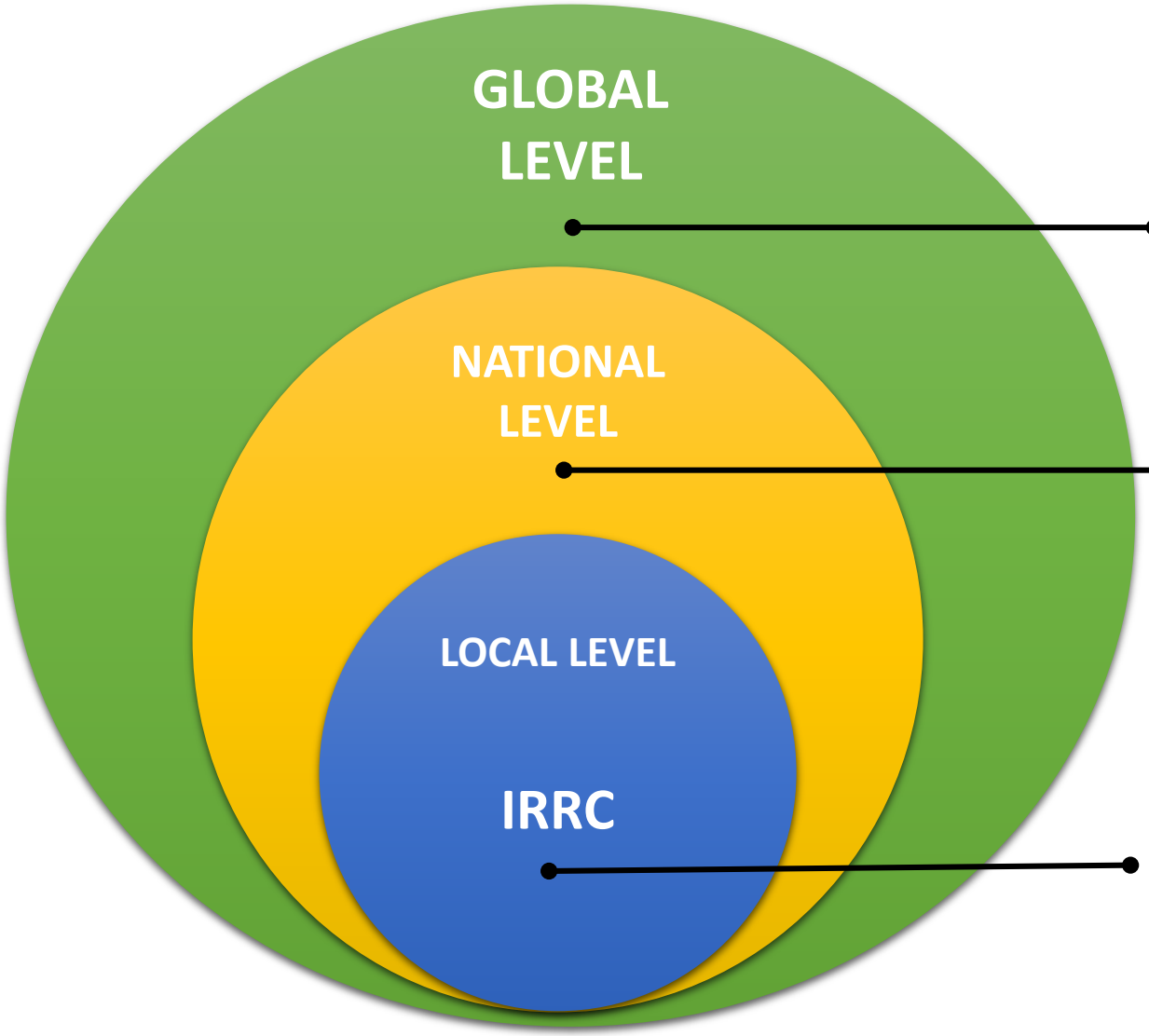
Non-biodegradable Waste

- *IRRC Approach is Suitable for Small and Medium Sized Towns.*
- *Clear government commitment for establishing an IRRC within integrated local plans and programs for sustainable development.*
- *Segregation of waste and the participation of waste producers in segregating waste at source is elementary for good quality IRRC outputs.*
- *The IRRC operations and management team should be technically trained.*
- *Sustainable development benefits of an IRRC increase when the IRRC implementation is integrated within the local sustainable development plans and programs*
- *Implementation of IRRC can be incremental*
- *Successful demonstration of IRRC model in several countries have shown public sector financing of replication and scaling-up of IRRCs.*
- *IRRCs can make operational profit and can be sustainable.*
- *IRRCs can help to achieve the goals of circular economy and SDG goals*

Other Important Dimensions of IRRC Implementation



Impact of IRRC



- ✓ **SDG Goals**
- ✓ **Paris Agreement**
  (emission reduction target)

- ✓ **SDG Goals**
  (8 out of 17 goals)
- ✓ **New Urban Agenda**
  (ensure environmental sustainability & resilient urban devt.)
- ✓ **NDC**

- ✓ **Environmental Benefit**
- ✓ **Social Benefit**
- ✓ **Economic Benefit**

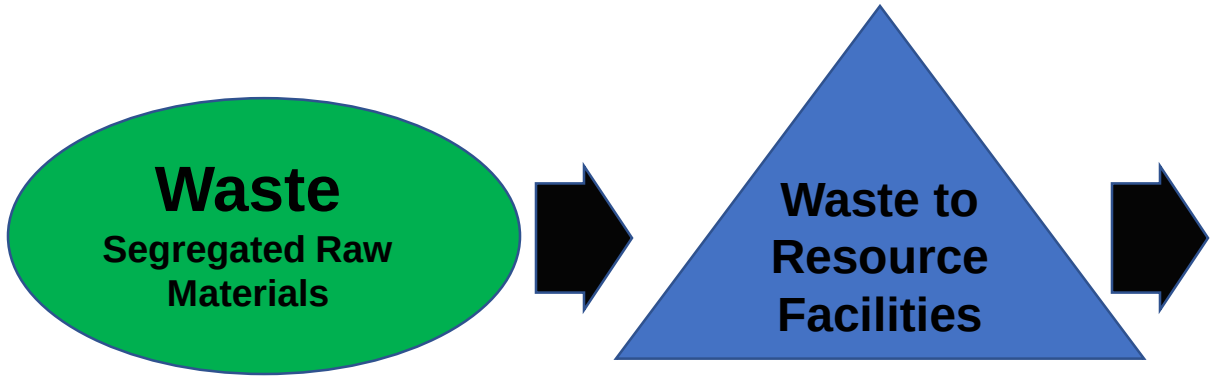
Issues for Scaling up IRRC Approach

	Actors	Activities
Policy/Rules/Strategy	• Ministry of Agriculture • Ministry of Local Govt. • Ministry of Urban Dev. • Ministry of Environment • Ministry of Energy •Relevant Ministries •Municipalities	• Promotion of resource efficiency and circular economy and 3Rs •Promotion of compost/ biogas/ appropriate technologies, RDF •Promotion of source separation of waste • Standardization products • Feed in Tariff/Support to Compost (subsidy) • Tipping fee/waste collection fee • Land for the Facility • PPP Rules
Fiscal Incentives	• Ministry of Finance • Central Bank • Tax Department • Local Banks	• Low interest rate financing • Less/ reduced tax for private sector operator • No VAT • Green Financing
Capacity Building/ Awareness Raising	• International Agencies • Government, Research Institutions (local & international, • Educational Institutions • International NGOs • Local NGOs and CBOs • Private Sector	• Operation & Maintenance of IRRC • PPP Agreement • Technology Selection • Monitoring of Emission Reduction • KPI development for IRRC

Way Forward to Sustainable Waste to Resource Solution

NATIONAL POLICY LEVEL

- Changing the Mindset/ Paradigm Shift
- High lighting Co-benefits and promotion of resource efficiency
- Updated Baseline Information
- Incorporation of 3R (reduce, reuse and recycling) in National Policy, Strategy & Action Plans related to waste
- Inter Ministry Co-ordination
- Independent Technical Committee for Technology Choice
- Incentives for Recycling initiatives

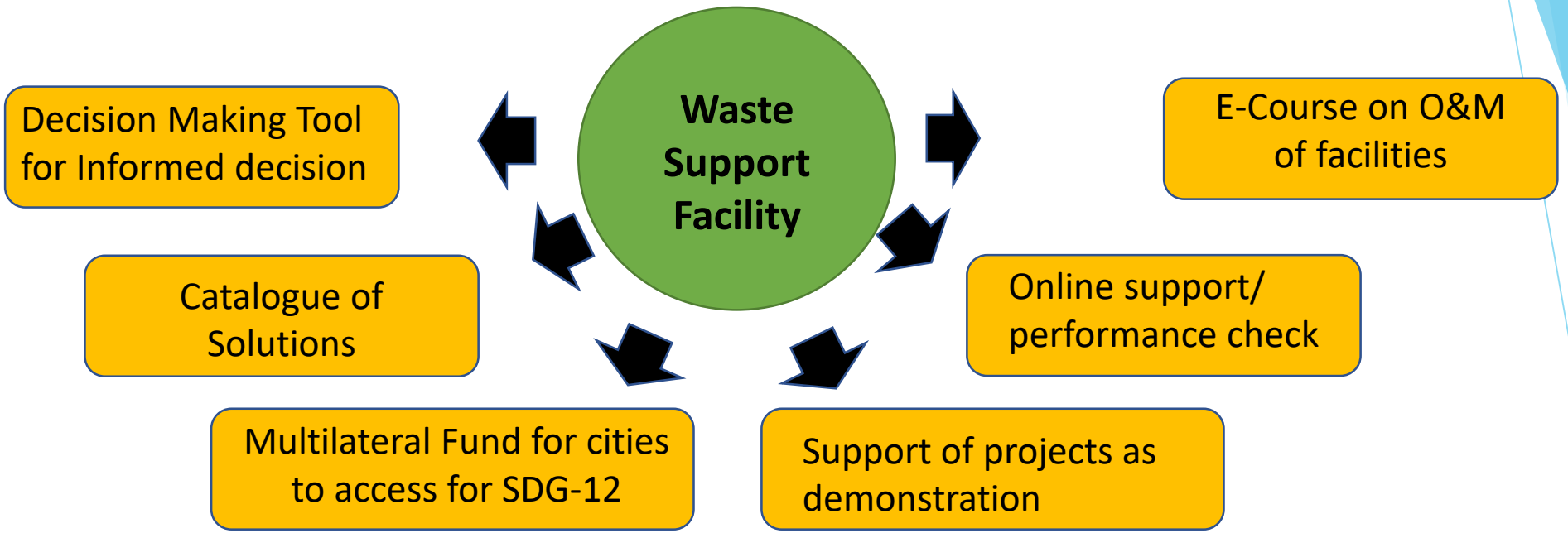


- Source Separation
- Mass Awareness
- Informal Sector

- Public Private Partnership
- Land Issue
- Soft Loan, TAX & VAT incentives)
- Free Delivery of Waste/Fee for collection of Waste by Recyclers.
- Technology Choice
- Informal Sector

- Level Playing Field
- Proper feed in tariff incentives (i.e., Subsidy in energy and compost)

Way Forward to Sustainable Waste to Resource Solution



1. Waste Management Decision Making Tool: for Informed decision making
2. Recycling Training Center
3. Catalogue of Solution (Design and BoQ)
4. E-Course on O&M of facilities(Certificate)
5. Few Scale-up of projects as demonstration
6. Multi lateral Fund for cities to access for SDG-12

- Design and due diligence
- Online monitoring/performance check of intervention

THANK YOU