

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

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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

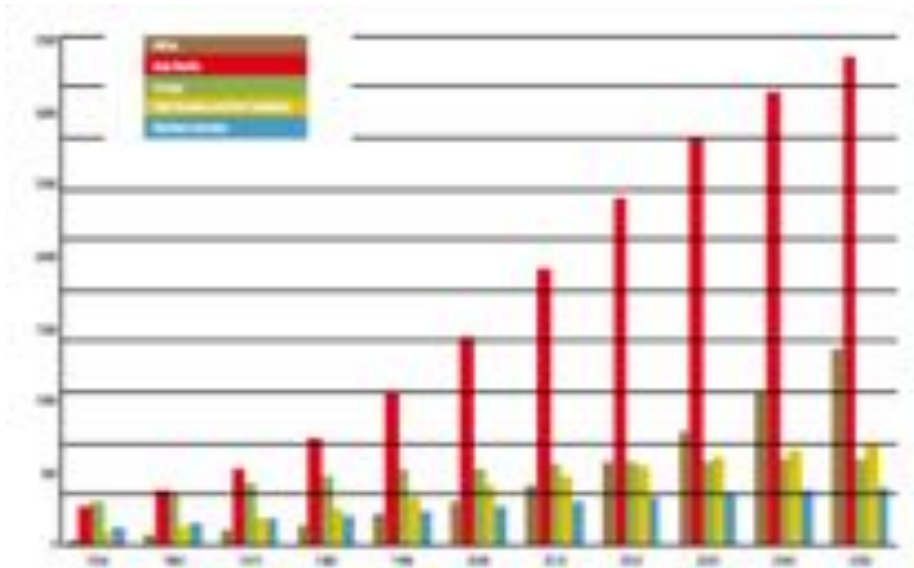
- I. Current Practice of SWM in Asia and the Pacific Region
- II. What is IRRC Approach?
- III. Opportunities from IRRC Approach
- IV. Sustainable Development Benefits of IRRC Approach
- V. Linkage of IRRC with Circular Economy
- VI. Key Lessons from Implementation of IRRC Approach
- VII. Way Forward

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

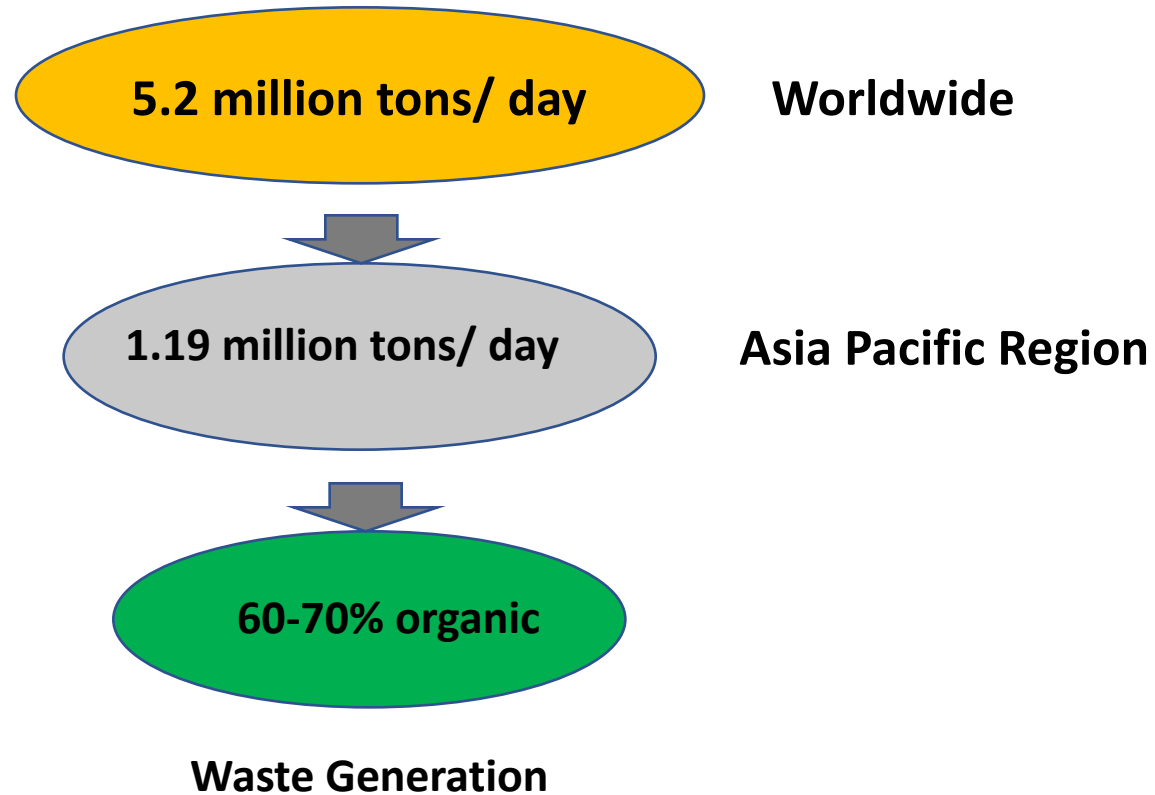
Asia's Growing Urban Population



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 1.19 million tons are from the Asia Pacific region.



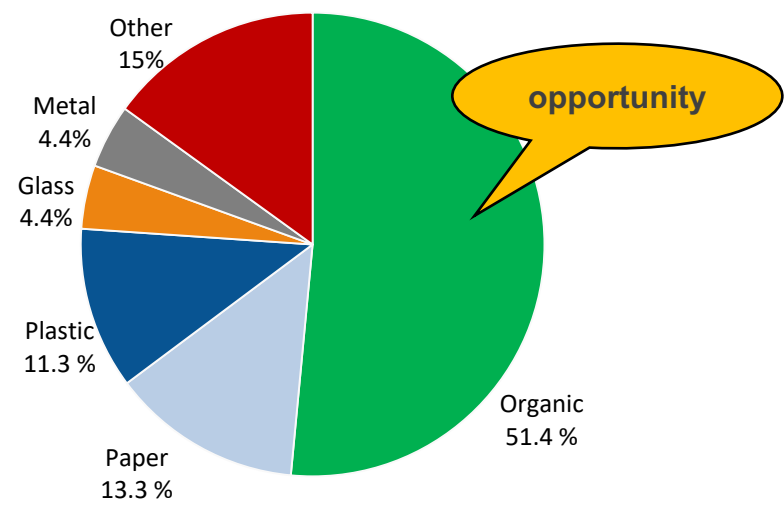
Source: ADB, 2011 & World Bank 2012, What a Waste

Turning Challenges to Opportunities

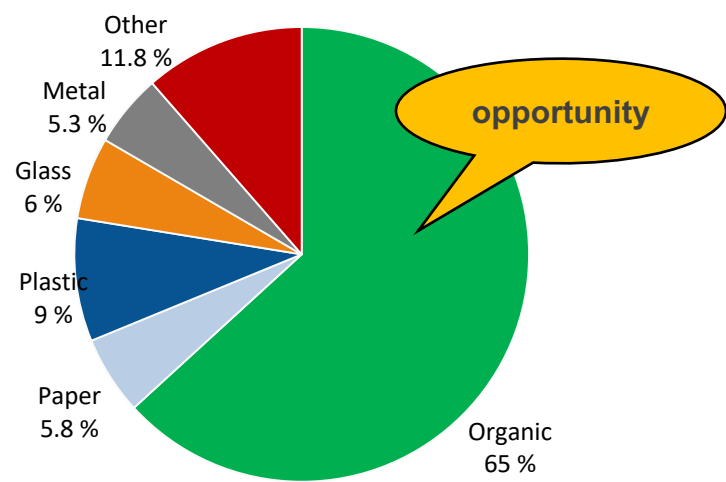
The current system of waste management is focused on end-of-pipe solution. It is not sustainable and overlooks the enormous potential of turning waste into resource.

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

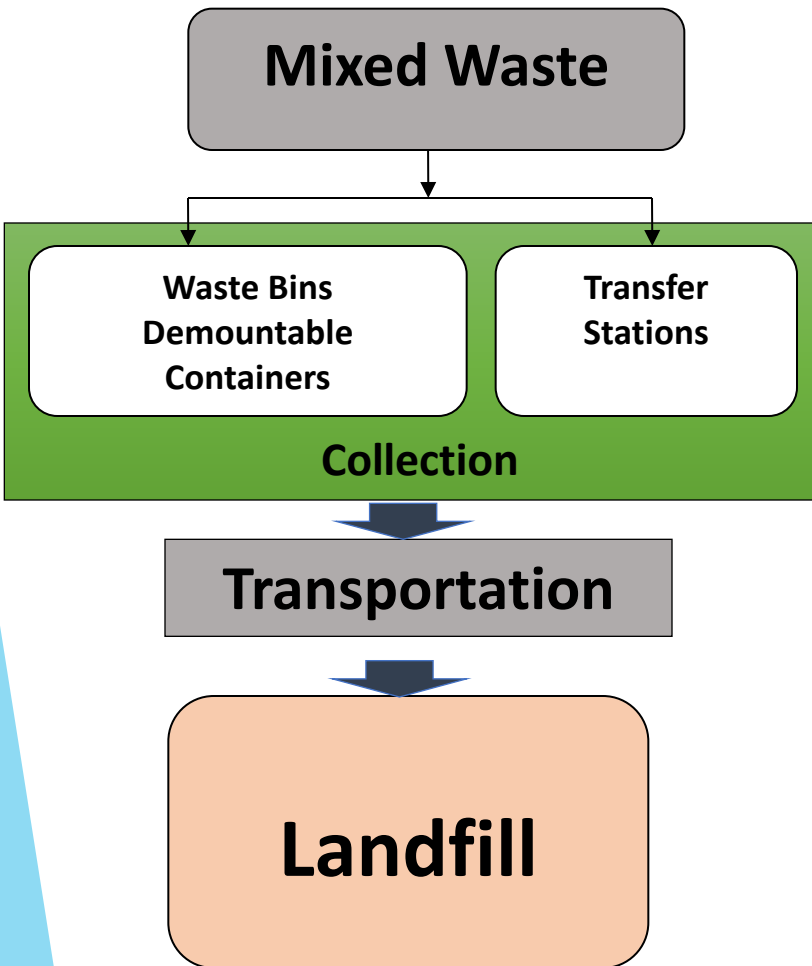


Low Income countries



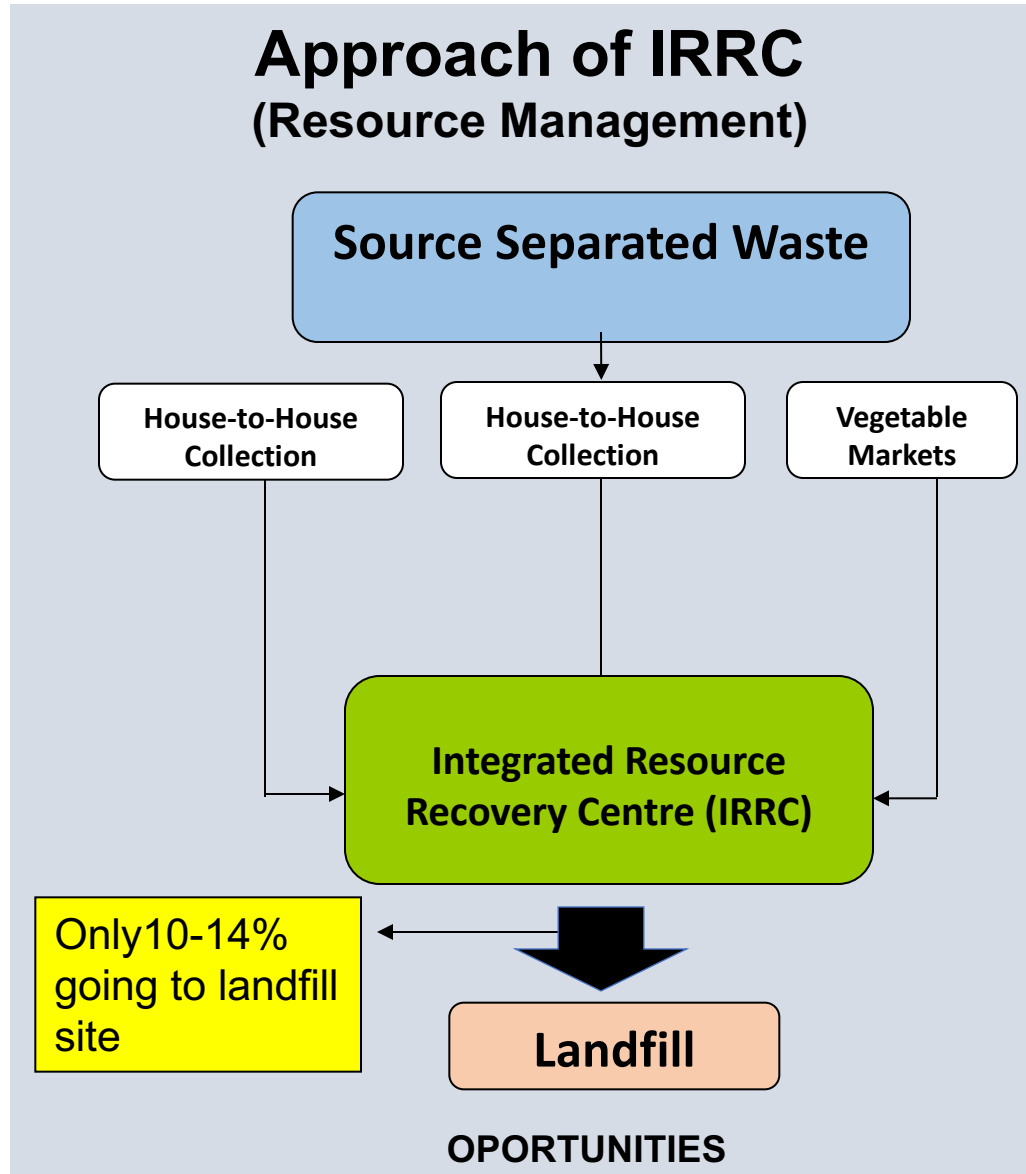
Approach to Waste Management

Conventional Approach (End of Pipe Solution)



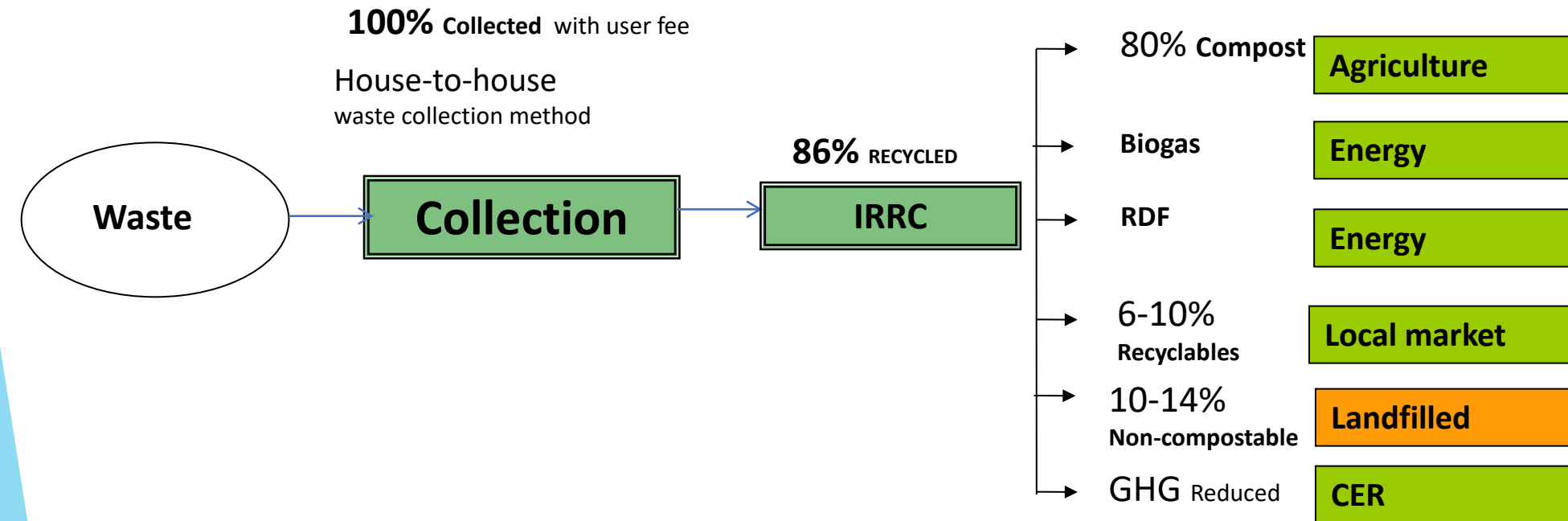
PROBLEMS

Approach of IRRC (Resource Management)

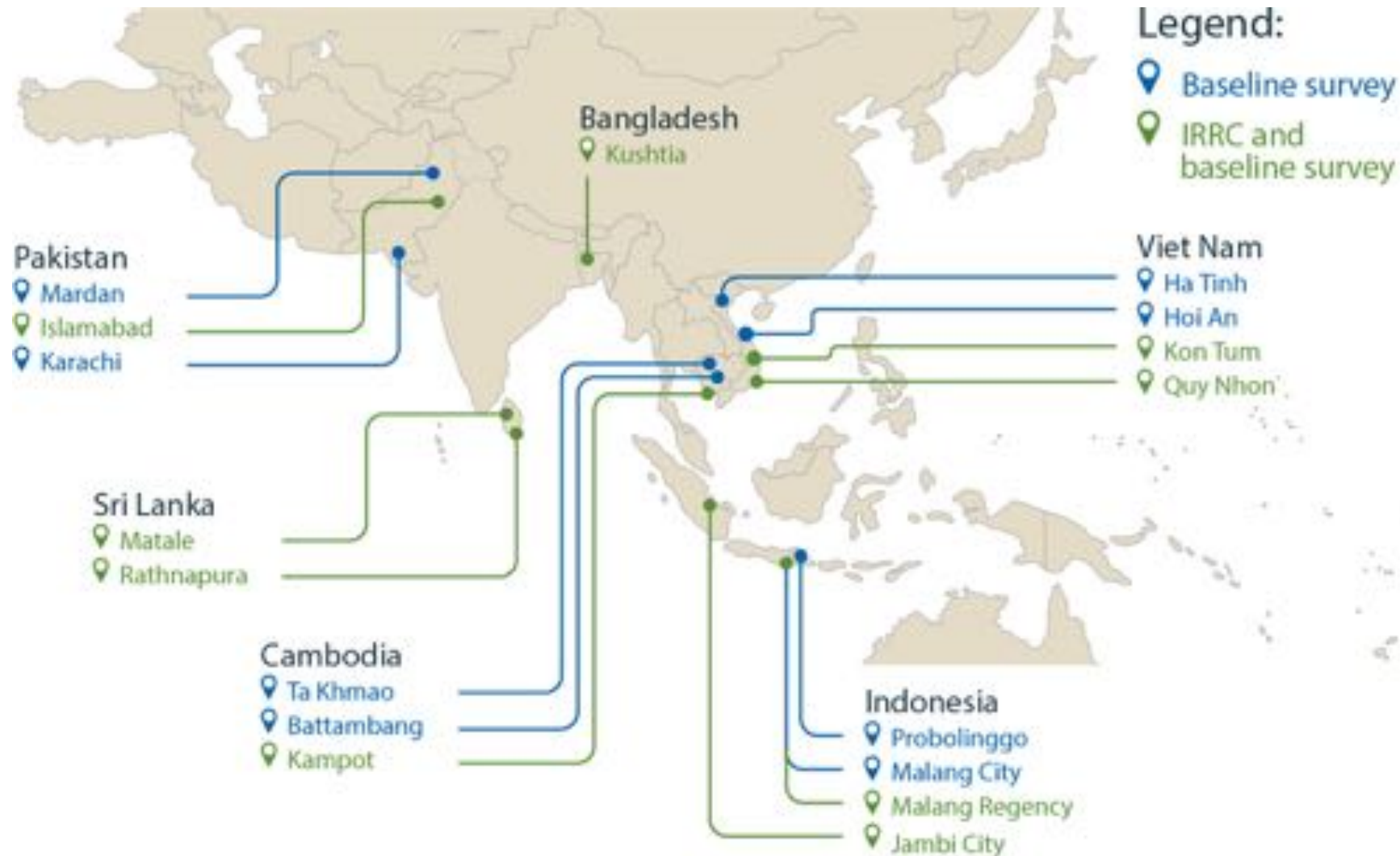


Integrated Resource Recovery Centers (IRRCs)

An **Integrated Resource Recovery Center (IRRC)** is a physical 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

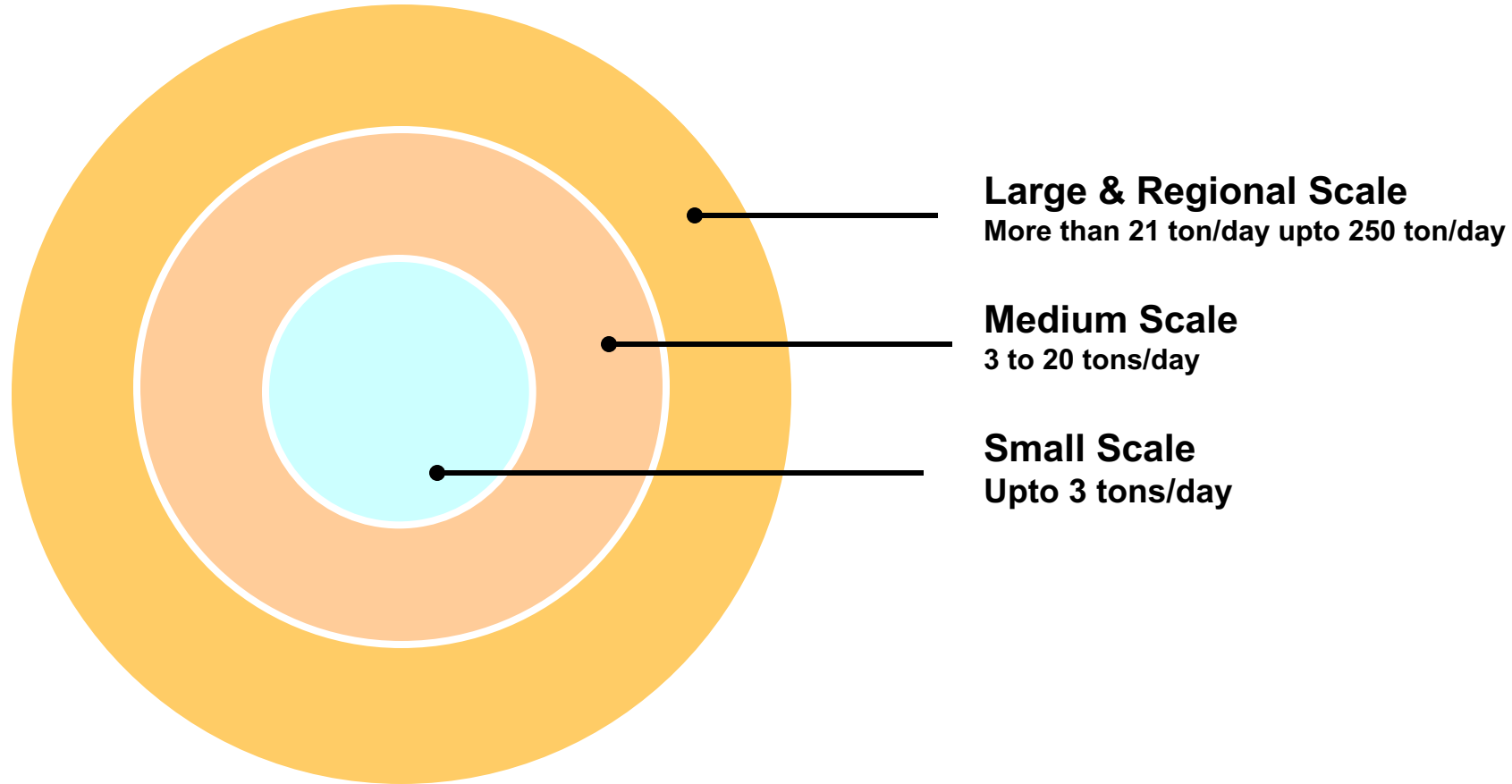


Integrated Resource Recovery Centres (IRRCS)

- ❑ Based on 3R principles
- ❑ It is a physical facility integrated with social system
- ❑ 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

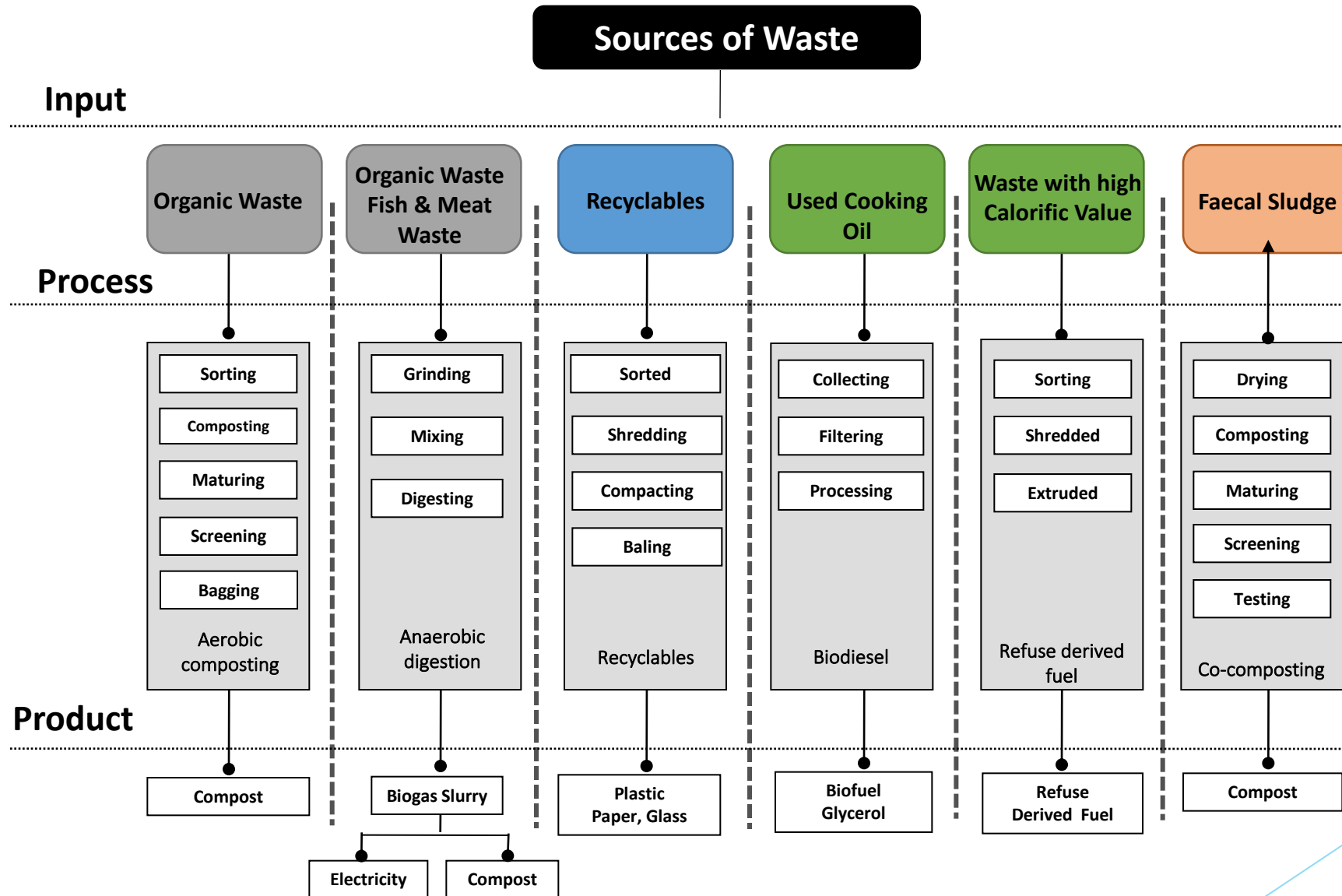


Different Scale of IRRC Model



- 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



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

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)

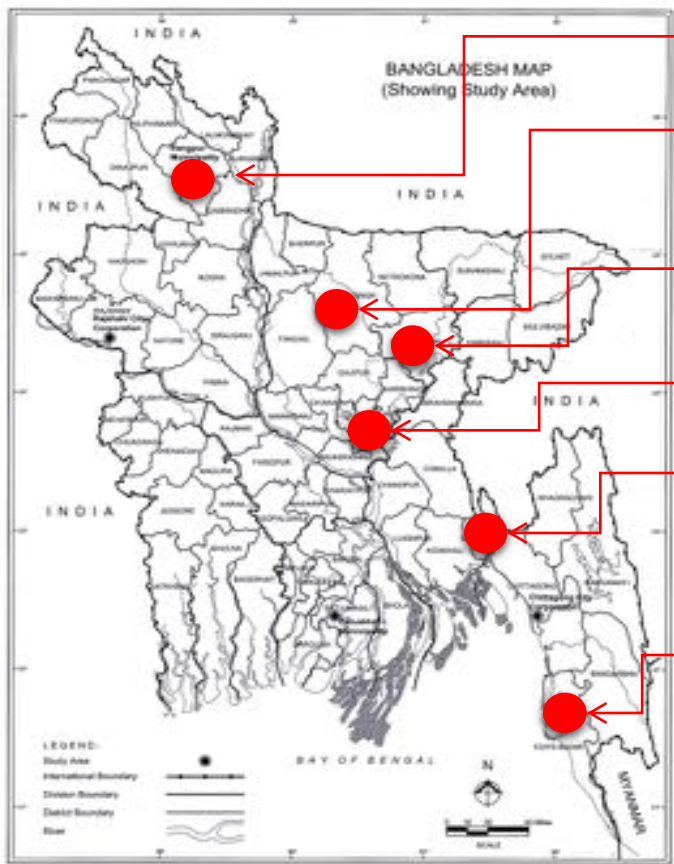
Land Area: 4 Acres

Capacity to Manage Waste:
-Municipal Waste 2-3/day
-Faecal Sludge: 6M3/day

MUNICIPAL OWN PRIVATELY OPERATED

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 PRIVATELY 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 PRIVATELY 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:
April, 2018

Composting for Medium and Large cities (Large Scale)



PRIVATELY OWN PRIVATELY 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



2007- IRRC 01- Dole road ;



2010- IRRC 02- MC road ; Matale



2013- IRRC 03- Higgolla; Matale



Replication by public financing

Manage Waste in a Decentralized Manner in IRRC Sri Lanka



Manage Waste in a Decentralized Manner in IRRC Sri Lanka



Products of IRRC, Matale

Manage Waste in a Decentralized Manner in IRRC Sri Lanka



IRRC in Ratnapura, Sri Lanka

Manage Waste in a Decentralized Manner in Sri Lanka



Manage Waste in a Decentralized Manner in IRRC Sri Lanka



IRRC in Ratnapura with ESCAP Support



Scaling up by public financing



IRRCs in Pakistan

Pakistan



Public and Private Partnership



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



AD Facility in Malang Regency, Indonesia



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

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**



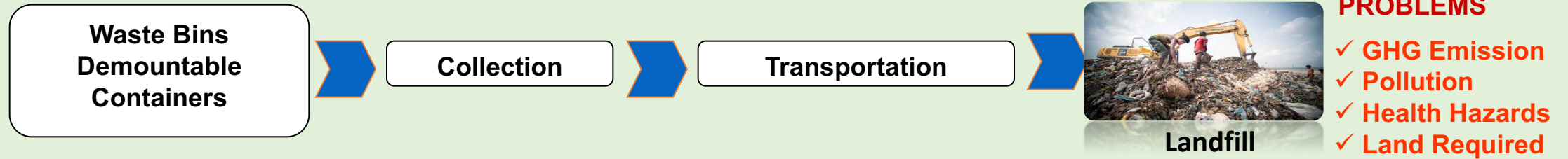


SUSTAINABLE DEVELOPMENT GOALS

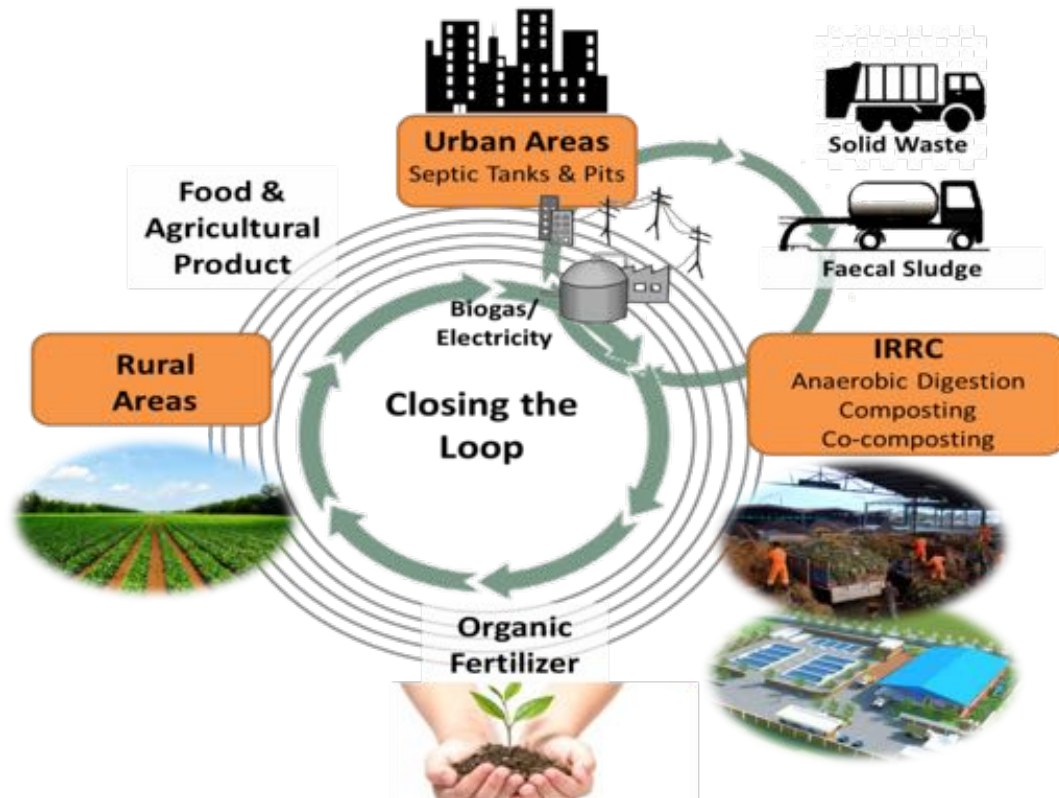
17 GOALS TO TRANSFORM OUR WORLD



Linear Vs. Circular Approach for Waste Management



Conventional Waste Management (Linear Direction)



Biodegradable Waste



Non-biodegradable Waste

Key Lessons

IRRC Approach is Suitable for Small and Medium Sized Towns.

Clear government commitment is essential 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

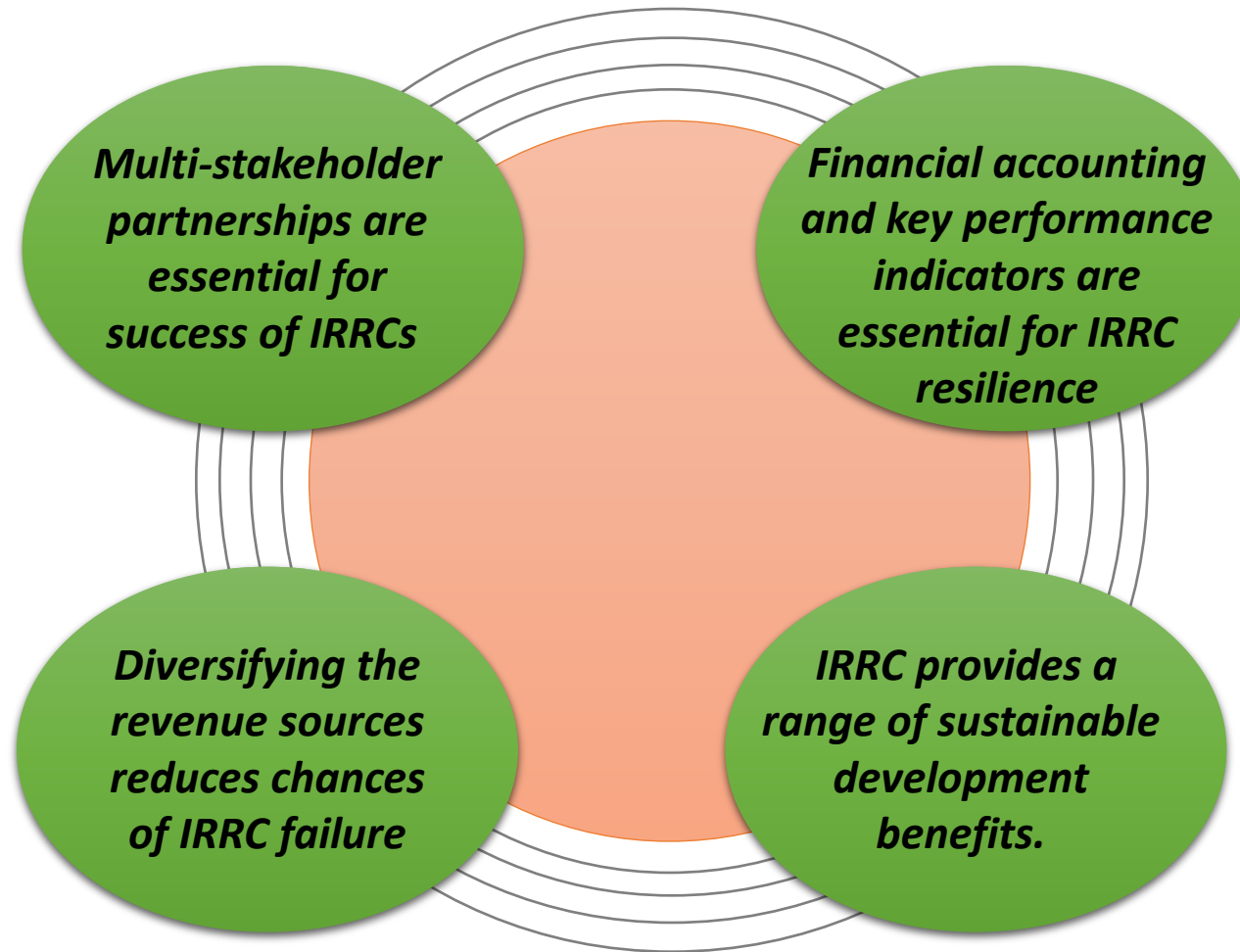
Implementation of IRRC can be incremental

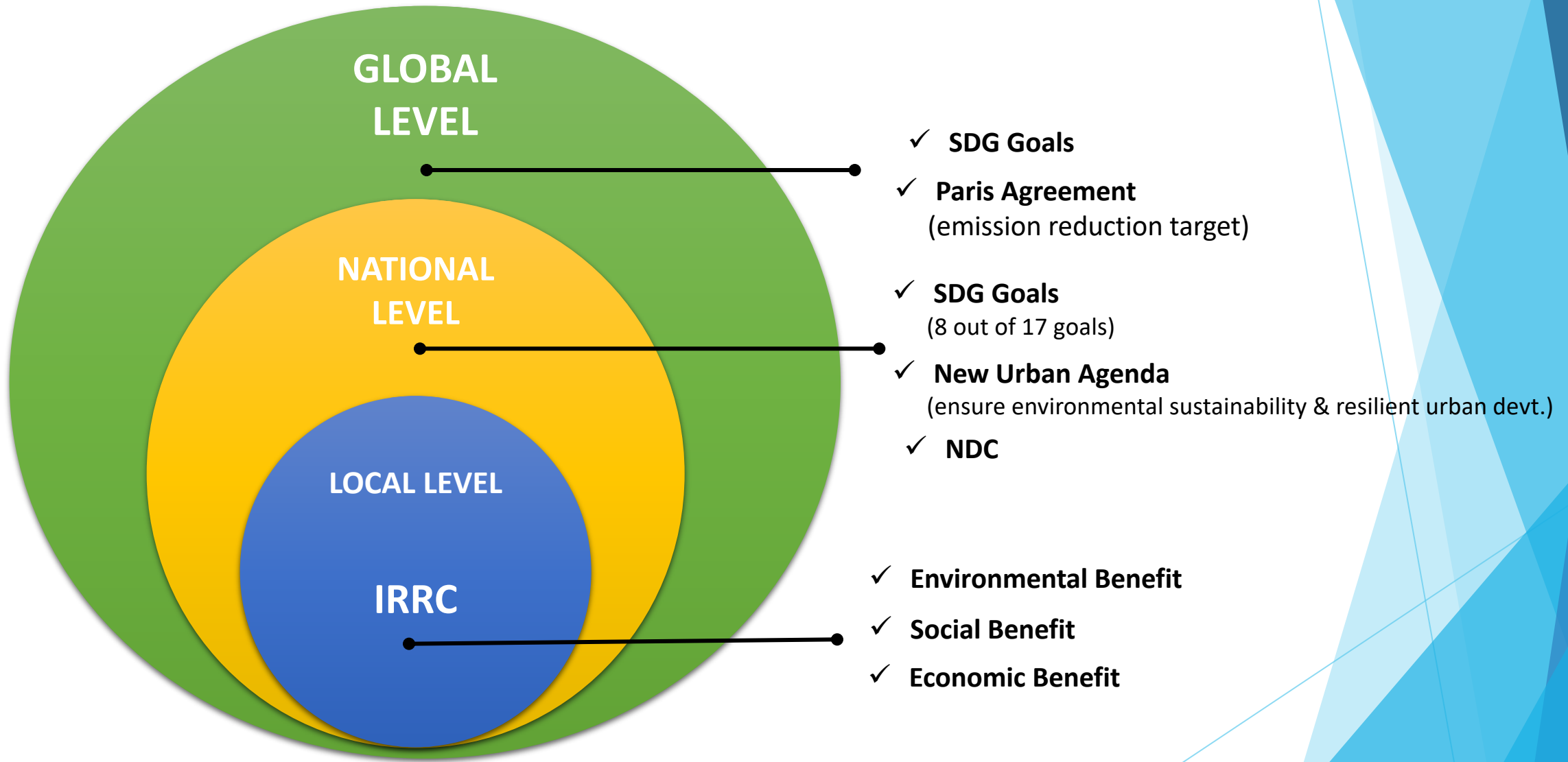
Successful demonstration of IRRC model in several countries have shown public sector financing of replication and scaling-up of IRRCs.

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





Issues for Scaling up **IRRC Approach**

Policy/Rules/Strategy

Actors

- Ministry of Agriculture
- Ministry of Local Govt.
- Ministry of Urban Dev.
- Ministry of Environment
- Ministry of Energy
- Relevant Ministries
- Municipalities

Activities

- Promotion of resource efficiency and circular economy and 3Rs
- Promotion of compost/ biogas/ appropriate technologies, RDF
- Promotion of source separation of waste
- Standardization products and green procurement
- 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

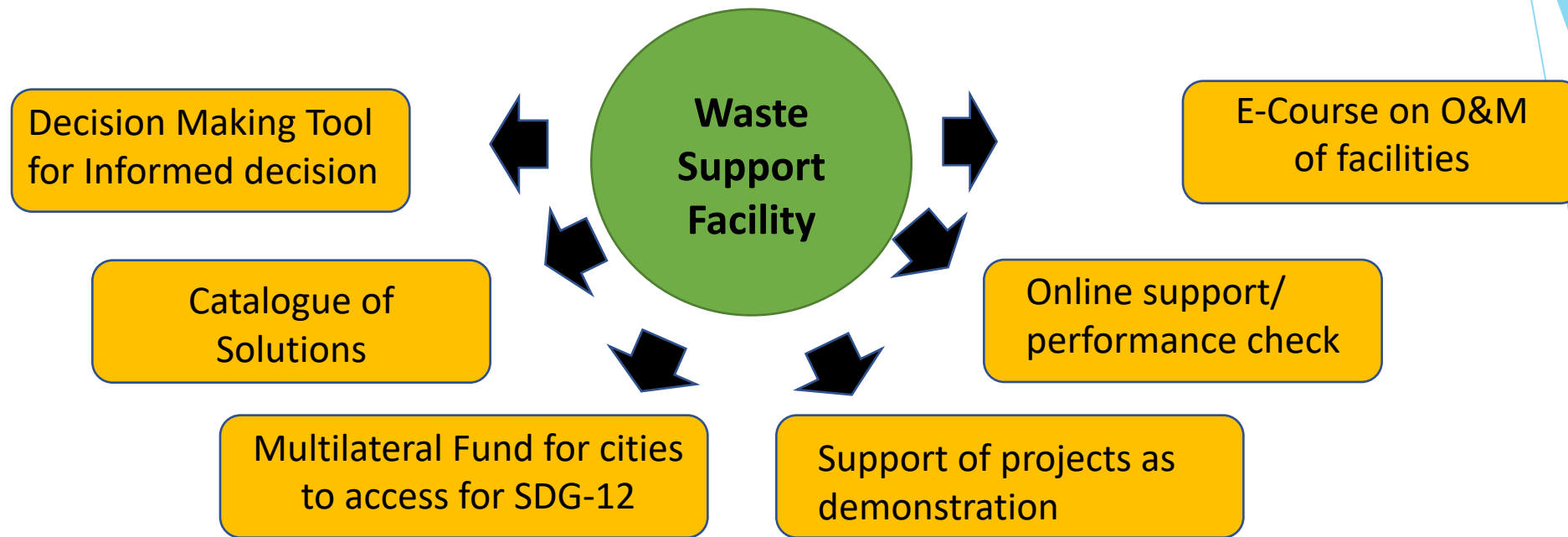
- Low interest rate financing
- Less/ reduced tax for private sector operator
- No VAT
- Green Financing

Capacity Building/ Awareness Raising

- International Agencies
- Government, Research Institutions (local & international,
- Educational Institutions
- International NGOs
- Local NGOs and CBOs
- Private Sector

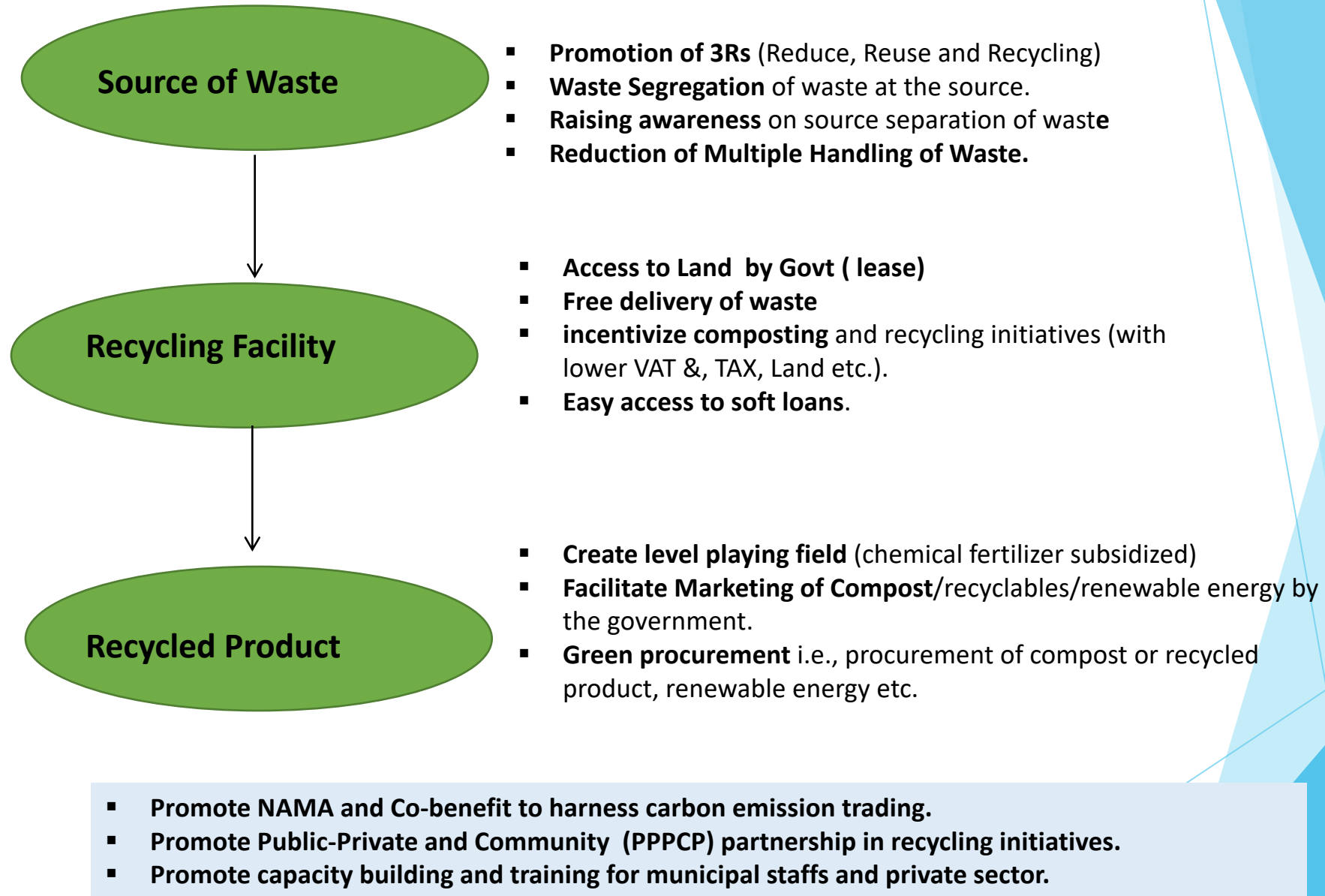
- Operation & Maintenance of IRRC
- PPP Agreement
- Technology Selection
- Monitoring of Emission Reduction
- KPI development for IRRC

Way Forward to Sustainable Waste to Resource Solution



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



Way Forward to Sustainable Waste to Resource Solution

NATIONAL POLICY LEVEL

- Changing the Mindset/ Paradigm Shift
- Highlighting co-benefits and promotion of resource efficiency and circular economy
- 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

