

# Integrated Resources Recovery Centre Brief

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## Background

The rapid economic and urban population growth in Asia-Pacific has resulted in a corresponding increase in the volume and complexity of solid waste. In order to solve the problem it is imperative to shift from the conventional end-of-the-pipe waste management system (focused merely on collection and disposal) towards a resource management approach. To tackle this challenge, the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) in partnership with Waste Concern, Bangladesh, is implementing the project “Pro-poor and sustainable solid waste management in secondary cities and small towns”. The project contributes to this goal by setting up Integrated Resource Recovery Centers (IRRCs), which are facilities that enable cities to turn waste into resources through composting, recycling and bio digestion, thereby diverting municipal solid waste from landfills or open dump sites. IRRCs typically process 80-90% of waste streams, in proximity to the source of generation, and in a decentralized manner. Plants with a capacity to process between 2 and 10 tons of municipal solid waste per day have been established in cities in Cambodia, Sri Lanka and Viet Nam and, now in Pakistan.

## What is an Integrated Resource Recovery Center?

Integrated Resource Recovery Centers, IRRCs, aim at recovering valuable resources from waste. Three major activities can be carried out by the IRRC: collection of segregated waste, processing of waste and sale of the resources generated. The main focus of IRRCs is on

organic waste, which typically comes from kitchens, restaurants, and wholesale vegetables or fruits markets.

Inorganic waste –mainly paper, packaging materials made of plastic, glass, tin, aluminum, etc. –can also be collected and stored on an IRRRC, for subsequent sale, when market rates are at its most favorable. One of the distinctive features of IRRCs is that they use simple mechanical technology. Local organizations can quickly become familiar with this technology and adapt it to the local context. Using technology that requires little energy keeps operation costs low and equipment breakdowns are minimal. Besides, simpler technology is also more labor intensive, thus creating more job opportunities for the poor. Through the processing of organic waste, IRRCs produce high-quality compost. For this to happen, the segregation of waste at source is a key success factor. As such, for an IRRRC to function properly, the close involvement of the surrounding communities is a must, as households are trained on how to separate organic and inorganic waste.

With adequately sorted organic waste, IRRCs apply the aerated box composting method to produce good quality compost.

IRRCs are designed to be run as businesses, and therefore they aim to achieve, at a minimum, a revenue-cost balance. To ensure profitability, the proponent of an IRRRC must formulate a business plan before starting the work, which should prove that the IRRRC can be financially sustainable. IRRCs can be initiated and operated by municipalities, private-sector enterprises and civil society organizations, or combination of all the three through different partnership models.



An IRRRC can deliver the following benefits

### **Economic Benefits**

Value can be derived out of waste by converting waste into resources, while reducing and/or avoiding costs associated with end-of-pipe solutions.

### **Environmental Benefits**

Reduction of greenhouse gas emissions by treating the organic fraction of waste; avoids the formation of leachate water and the spread of bad odors.

### **Social Benefits**

- creation of jobs for the urban poor, including waste pickers

- reduction of diseases from untreated waste
- Increased community awareness to 3R principles.

## Integrated Resource Recovery Center in G-15

Dr. Akhtar Hameed Khan Memorial Trust has set-up the first IRRC in Pakistan, which is located in Islamabad's sector G-15. This IRRC will have the capacity to process 03tons of municipal solid waste per day. It will treat the waste generated in the JKCHS houses and gardens. 800 sq meters Land is allocated by society, technical map was designed by waste concern Bangladesh. Initial Environmental Examination (IEE) has taken place approved by EPA. UN-Habitat approves the construction Tender to Beig engineering services Construction has been completed in month of August 2015. IRRC would operate after formal inauguration (19 Aug 2015)



The IRRC in sector G-15 is a pilot project that will test the feasibility of this model in Pakistan and its potential for replication into other cities of Pakistan.

## Stakeholders Role

UN-ESCAP have been adopting a multi-stakeholder approach for initiating IRRC, and the participation of the Ministry of Climate Change could be instrumental in the successful implementation of this model, as well as in capitalizing from the climate benefit of setting-up decentralized solid waste management systems, through IRRCs, in Pakistan.

## UN-Habitat

Provision of overall facilitation in implementation of IRRC

- Prepared the necessary land survey and soil reports needed for the design and construction of the IRRC.
- Conducted an Environmental Impact Assessment, including stakeholder consultation (UN-Habitat)
- Provided a detailed budget for construction and Bill of Quantities for the IRRC.
- Tendered out the construction works with the support of in-house engineers oversee the construction of the IRRC.

## JKCHS

- Provided land and utilities for IRRC construction.
- Ensured the collection of solid waste collection from households for five years through signing agreement

## AHKMT

- AHKMT signed agreement with JKCHS including land provision agreement for primary collection system.
- Coordinated with EPA for EIA
- Conducted Pilot separation at source, and launch Zero waste campaign with engaging NUST students
- Developed Communication materials
- Measure the quality of the raw compost ensure it adheres to the standards set by the relevant ministries.(in partnership with the Arid Agriculture of Rawalpindi)
- Develop and implement a marketing plan for the sale of compost.

## e-guard

- Arranged a system for the disposal of rejects from the IRRC, and for the collection of waste from the market if required
- Organized door-to-door collection of waste from households in sector G-15
- Depending on the results of the pilot, up-scale source separation activities to all households in sector G-15 that are targeted by the project.
- e-guard will be ultimately responsible for the day-to-day operation of the IRRC. It will strive to make the centre self-financing according to business plan.

## Climate Change and Decentralized Solid Waste Management

One of the envisaged objectives of an IRRC is to achieve financial sustainability, i.e. that the revenues produced from waste recovery can outweigh the operational costs incurred. In order to improve the financial robustness of an IRRC, it should be possible to leverage carbon financing, considering the greenhouse gas emission reduction potential from treating the organic component of waste. Until recently, the Clean Development Mechanism (CDM) has been the vehicle of choice for tapping into carbon financing for these projects. However, the recent sharp decline of carbon emission reduction prices

prompted UN-ESCAP and UN-Habitat to look into alternative climate financing avenues. Among those, Nationally Appropriate Mitigation Actions (NAMAs) have been found to hold the greatest promise. UN-ESCAP and UN-Habitat has been conceptualizing a NAMA-approach derived from the IRRC model and consultations are in process with the stakeholders under the leadership of Climate Change Division of Pakistan. Having as a starting point some of the core principles of this model, the NAMA program would hinge in the promotion of 3R principles, the avoidance of end-of-pipe solutions, and the biological treatment of the organic fraction of waste. Such program would be backed-up by international support in terms of finance, technology and capacity building.

### **IRRC as Training Center**

IRRC would manage as training centre. Different groups would train in IRRC. These national/international groups might be government or CBO workers, Investors or businessmen or might be academia. Any other person who is considers waste as resource or initiates it as business could train.

IRRC training cost from Bangladesh is comparatively expensive and some of the things are not applicable in Pakistan. Therefore it is best solution to manage a training centre locally in Islamabad.