

HELPING CITIES ACROSS ASIA-PACIFIC DEVELOP PRO-POOR, ENVIRONMENTALLY SUSTAINABLE AND PROFITABLE SOLUTIONS TO SOLID WASTE MANAGEMENT

Phase I of the project (2009-2012) focused on testing the IRRC model in various countries through pilot projects. Plants with a capacity of between 2 and 10 tons a day have been established in cities in Cambodia, Sri Lanka and Viet Nam and in the near future also in Pakistan. Phase II (2013-2015) is expected to promote the up-scale and further replication of the IRRC model.

Baseline studies and IRRCs in Asia-Pacific

Legend:

- 📍 **Baseline study**
- 📍 **IRRC and Baseline study**

6 Countries
17 Cities

📍 Kushtia, Bangladesh

Population: 102,988

Total waste generated/day: 40 tons

"The first IRRC co-composting facility that treats both solid waste and faecal sludge with an innovative and low-cost technology"

- 📍 Mardan, Pakistan
- 📍 Islamabad, Pakistan
- 📍 Karachi, Pakistan

📍 Matale, Sri Lanka

Population: 40,674

Total waste generated/day: 21 tons

"Three IRRCs of a combined capacity of 12 tons/day are able to treat all organic waste generated in the city"

📍 Rathnapura, Sri Lanka

Population: 51,665

Waste generation: 31 tons/day

- 📍 Ta Khmao, Cambodia
- 📍 Battambang, Cambodia
- 📍 Kampot, Cambodia

Population: 34,000

Total waste generated/day: 18 tons

"The IRRC is able to process all the organic waste generated from the city market and adjacent households"

📍 Ha Tinh, Vietnam

📍 Hoi An, Vietnam

📍 Kon Tum, Vietnam

Population: 150,767

Waste generation: 91 tons/day

📍 Quy Nhon, Vietnam

Population: 271,248

Total waste generated/day: 195 tons

"The IRRC is operated and managed by a cooperative of workers who share the profits of the plant"

📍 Probolinggo, Indonesia

📍 Malang City, Indonesia

📍 Malang Regency, Indonesia

📍 Jambi, Indonesia

PRO-POOR AND SUSTAINABLE SOLID WASTE MANAGEMENT IN SECONDARY CITIES AND SMALL TOWNS IN ASIA-PACIFIC

DECENTRALIZED AND INTEGRATED RESOURCE RECOVERY CENTERS

Don't let
opportunity
go to **waste**

Promoting Integrated
Resource Recovery Centres
in Urban Asia



Through the project "Pro-poor and sustainable solid waste management in secondary cities and small towns" the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), in partnership with Waste Concern, is helping cities in the Asia-Pacific region to effectively manage their waste in a pro-poor, environmentally sustainable and economically viable manner through the promotion of decentralized Integrated Resource Recovery Centers (IRRCs).

The IRRC model uses simple technology, is low cost and recovers value from waste by converting organic waste into fertilizer and valorizing recyclable waste, and provides livelihood opportunities to the urban poor. These centres are able to recycle up to 90 per cent of incoming waste, thereby considerably reducing the amount of waste going to landfill and its associated costs, which represent a great burden for local government financing.

For more information visit our website (<http://waste2resource.org/>)
or contact ESCAP's Sustainable Urban Development Section (e-mail: escap-edd-suds@un.org)

MUNICIPAL SOLID WASTE: A GROWING PROBLEM FOR DEVELOPING COUNTRIES...

The rapid urbanization and economic development taking place in the Asia-Pacific region is leading to increased solid waste generation, with the greatest increase to take place in low and middle income countries.

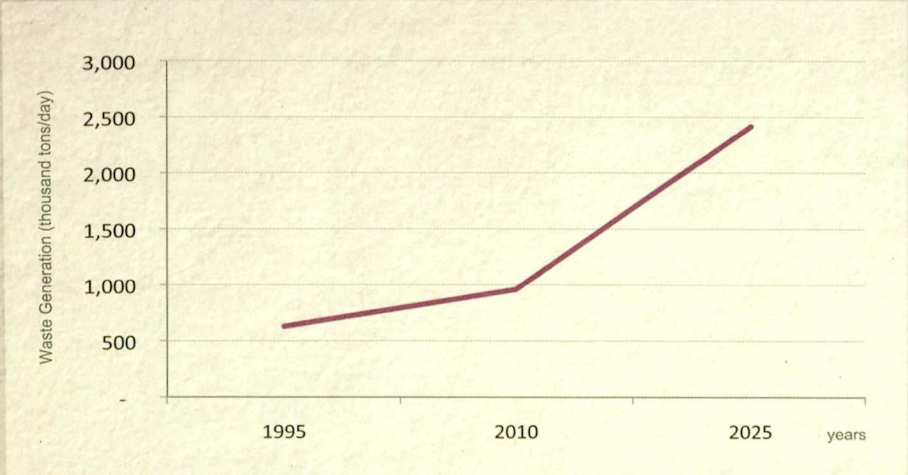


Figure 1: Solid Waste generation trends in low and middle income countries in Asia-Pacific (Source: ESCAP based on World Bank data)



...AND A GROWING BURDEN FOR LOCAL GOVERNMENTS...

Solid waste management is often the single largest budgetary expenditure for local governments in developing countries, which spend an average of 20 to 50 percent of their budget to collect and dispose of waste. Open dumping is the most common method for final disposal but this option is not sustainable as it creates severe health and environmental problems, and as existing landfills reach capacity.

...ESPECIALLY SMALL- AND MEDIUM-SIZED CITIES

Asia-Pacific is home to half of the world urban population with 1.76 billion people, 60% of which live in small and medium-sized cities, where the highest population growth is forecast.

THE PROBLEM CAN BE TURNED AROUND...

Only 10-15 percent of all waste in developing countries actually requires disposal in landfills given that it is mainly composed of organic matter (50-65%) and recyclable materials such as paper, glass, metals and plastics (25-35%).

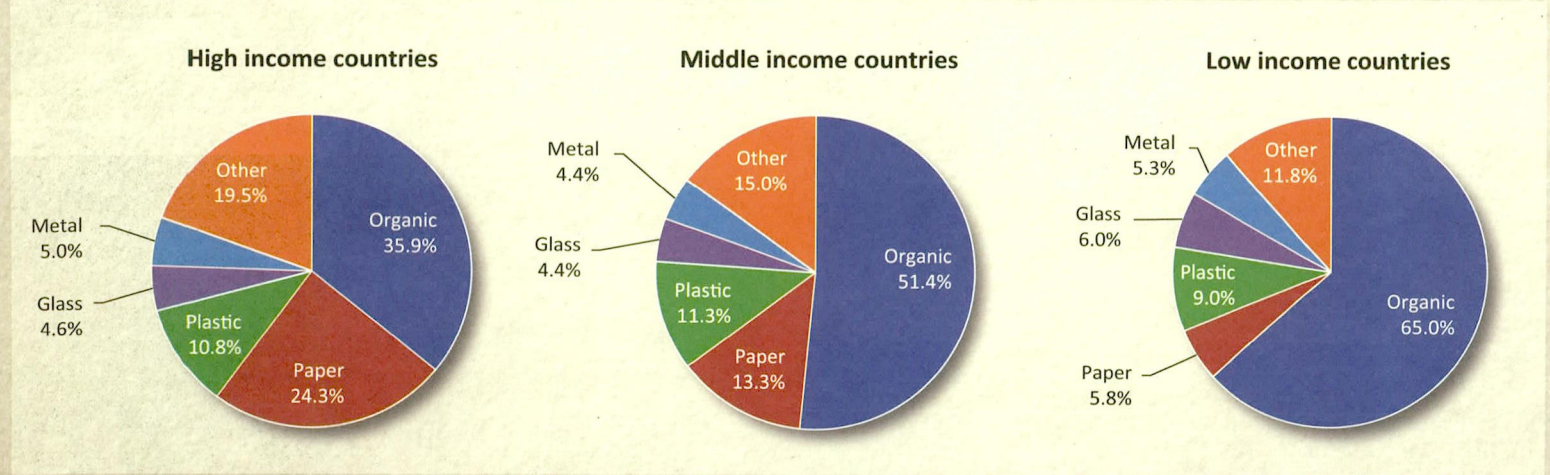


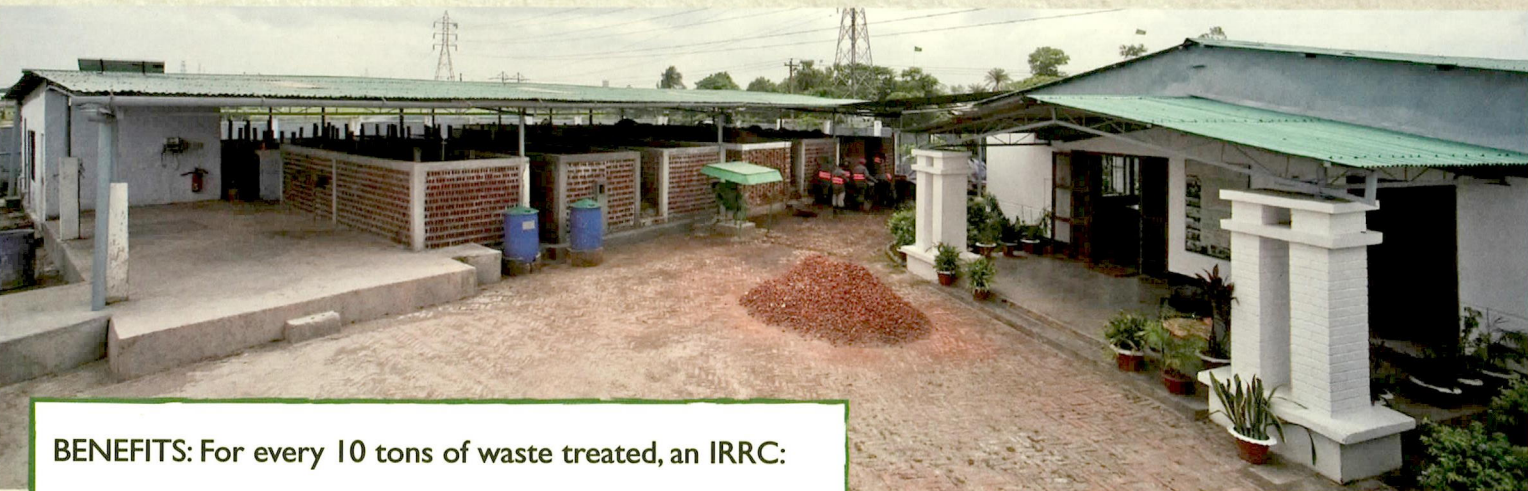
Figure 2 Municipal solid waste compositions in the Asia-Pacific region (Source: ESCAP based on World Bank 2012 and UNEP 2010 data)

....BUT REQUIRES CHANGING PERCEPTIONS AND SHIFTING APPORACHES

Traditional approaches focus on end-of-pipe solutions that are capital and technology intensive, and therefore expensive to build and difficult to maintain, and that overlook the opportunities to recover resources from waste.

INTEGRATED RESOURCE RECOVERY CENTRES: TURNING CHALLENGES INTO OPPORTUNITIES

- Integrated Resource Recovery Centres (IRRCs) turn waste into resources, through a combination of techniques, such as composting, anaerobic digestion, refuse-derived fuel (RDF) and recycling.
- Through their simple, non-mechanical technology, IRRCs can be built and operated at low costs. Using technology that requires minimal energy operation costs can be kept low and can be easily maintained. Simpler technology is also more labour intensive, thereby creating more job opportunities.
- The capacity to process waste can vary from 2 to 20 tons per day. IRRCs can be established within neighbourhoods, in several areas in one city or on the outskirts of the city.
- IRRCs directly benefit the urban poor, providing waste pickers with better, more stable incomes and safer working conditions.
- By limiting the amount of waste going to dumpsites the IRRCs supports environmental outcomes, but also promotes economic and social benefits.
- By reducing greenhouse gas emissions IRRCs contribute to climate change mitigation and can attract climate financing.
- IRRCs encourage changing attitudes towards waste by involving the whole community in solid waste management. Households, market vendors, restaurants and businesses are supported to separate organic and inorganic waste and to minimize the volume of waste generated.
- IRRCs can be initiated and operated by municipalities, private-sector enterprises and civil society organizations, or a combination of all three through different partnership models, thus strengthening governance at the local level.
- Through community involvement and partnership development IRRCs can act as catalysts for the development of ambitious city-wide solid waste management strategies.



BENEFITS: For every 10 tons of waste treated, an IRRC:

- Creates 20-30 new jobs with stable income and good working conditions for the urban poor
- Directly benefits 20,000-30,000 citizens
- Reduces 4,000 m3 of landfill space a year, equivalent to 2 Olympic-size swimming pools
- Produces 2 tons of high-quality organic fertilizer a day
- Generates between 400 and 800 m3 of biogas a year, enough to meet the energy needs of 222 households
- Avoids the generation of 1,300 tons of CO₂eq, equivalent to the annual emissions from 271 passenger vehicles
- Promotes cleaner and healthier urban environments and reduces the spread of vectors, diseases and odors.

