Fourth Regional 3R Forum in Asia
"3Rs in the Context of Rio+20 Outcomes – The Future We Want"
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Country Analysis Paper

(Draft)

< Singapore>

This country analysis paper was prepared by Singapore as an input for the Fourth Regional 3R Forum in Asia. The views expressed herein do not necessarily reflect the views of the United Nations.

FOURTH MEETING OF THE REGIONAL 3R FORUM IN ASIA
COUNTRY ANALYSIS PAPER (SINGAPORE)

Introduction

Singapore is a highly urbanized and industrialized small island nation with a land area of 710 km^2 and a population of 5 million.

Solid waste in Singapore increased 6-fold from 1,200 tonnes per day in 1970 to 7,600 tonnes per day in 2000. To cope with the waste, Singapore has invested billions of dollars to set up a comprehensive waste management system and constructed waste disposal facilities. Today, there are four waste-to-energy plants and an offshore sanitary landfill for the disposal of non-incinerable waste.

However, if the growth of waste is not curtailed, Singapore would need to build a new waste-to-energy plant every 5-7 years and a new landfill every 25-30 years to cope with the waste generated. This is not sustainable. The sustainable solution is to reduce waste through waste minimization and recycling.

Waste Management

The National Environment Agency (NEA) is responsible for formulating and implementing strategies and programmes to reduce waste. NEA's goal in solid waste management is to strive "Towards zero landfill" and then "Towards zero waste". To meet this goal, the NEA has formulated three strategies:

a) Waste Minimization
b) Waste Recycling
c) Waste-to-Energy

Strategy 1: Waste Minimization

Singapore Packaging Agreement

The Singapore Packaging Agreement (SPA) is a joint industry-government initiative to promote voluntary packaging waste minimization efforts. Signatories include industrial associations, individual companies, government and non-governmental organizations. The SPA provides a

platform and structure for industries to share knowledge and best practices in reducing waste, and to collaborate to adopt cost-effective waste reduction solutions.

The first SPA, which commenced in 2007, achieved a reduction of 10,000 tonnes of packaging waste with an estimated S$22 million in savings over a five-year period.
To strengthen voluntary partnerships, a second SPA was launched in Jul 2012 with new targets to reduce packaging waste by 6,500 tonnes annually, and to bring on board a total of 315 signatories by 2015.

Mandatory Waste Reporting
Measures targeted specifically at large commercial premises will also come into effect to enhance the 3Rs. Hotels with more than 200 rooms and shopping malls with retail space of more than 50,000 square feet are required by law to report waste data and submit waste reduction plans (including setting of targets) from 2014. Such a reporting exercise would help build greater awareness among building managers to improve their premises' waste management systems.

Strategy 2: Waste Recycling

Waste recycling is targeted at two sectors, viz. industries and community.

<u>Waste Recycling in Industries</u>

Since the early 90's, industries have been encouraged to recycle waste. Cost saving by reducing waste is the main driving force for industries to reduce waste, as industries have to pay for waste disposal.

The waste recycling industry in Singapore currently has the capability and capacity to recycle and process electronic waste, food waste, wood waste, horticultural waste, copper slag, construction and demolition waste, ferrous waste, plastic waste, etc.

Waste Statistics and Recycling Rate for 2012				
Waste Type	Waste Disposed of (tonne)	Total Waste Recycled (tonne)	Total Waste Output (tonne)	Recycling Rate (%)
Food waste	618,100	85,100	703,200	12%
Paper/Cardboard	555,300	696,700	1,252,000	56%
Plastics	721,300	82,100	803,400	10%
Construction Debris	9,100	1,282,700	1,291,800	99%
Wood/Timber	107,800	236,000	343,800	69%
Horticultural Waste	139,800	108,000	247,800	44%
Ferrous Metal	54,800	1,331,200	1,386,000	96%
Non-ferrous Metals	25,200	97,300	122,500	79%
Used Slag	9,800	358,000	367,800	97%
Sludge	160,200	0	160,200	0%
Glass	55,400	19,500	74,900	26%
Textile/Leather	141,000	18,300	159,300	11%
Scrap Tyres	2,300	16,100	18,400	88%
Others (stones, ceramics & rubber	333,800	4,600	338,400	1%
Total	2,933,900	4,335,600	7,269,500	60%

Funds

To promote the development and adoption of innovative technologies and sustainable development, NEA established the “Environment Technology Research Programme (ETRP)” and “Innovation for Environmental Sustainability (IES)” Fund.

The ETRP assists companies, organizations and institutes to undertake Waste-to-Resource Recovery and R&D of mixed and dedicated waste streams, as well as Special Waste Treatment R&D. The objectives are to increase recycling yield and product value through better sorting technology and decrease the unit cost of waste disposal through improving thermal and operational efficiencies. The IES Fund assists Singapore-based companies in test-bedding innovative environmental technologies.

To encourage organisations in Singapore to undertake waste minimisation and recycling projects, NEA developed the 3R Fund, a co-funding scheme for projects which can result in

reduction of solid waste generation or increase in solid waste recycling. Higher priority is given to projects with innovative concepts and which target waste streams with low recycling rates.

Voluntary 3R Programme

NEA has worked with the Singapore Hotel Association (SHA) to launch the 3R Programme for Hotels in Jul 2011 to encourage more hotels to implement recycling programmes. To date, 42 hotels have joined the programme. NEA plans to work with the industry to start similar 3R programmes with the MICE (meetings, incentives, conventions and exhibitions) sector and shopping malls. Under these voluntary programmes, the commercial premises would set internal waste reduction and recycling goals, conduct waste audits, set up recycling programmes, establish systems to review their existing practices to see where they can reduce/reuse waste, and collect and report waste data.

Waste Recycling in the Community

National Recycling Programme

In April 2001, NEA launched the National Recycling Programme (NRP) to provide a convenient means for residents in public housing estates and private housing estates to recycle waste. Under the NRP, recycling bins are distributed to households for residents to deposit recyclables such as paper, plastic and glass bottles, metal containers and old clothing.

Public Recycling Bins

To supplement the NRP, recycling bins have been placed at public places with high human traffic. Such places include locations outside several mass rapid transit stations, bus interchanges, pedestrian walkways along Orchard Road and Chinatown, etc.

Recycling Corner Programme in Schools

In Sep 2002, the Recycling Corner Programme for schools was launched with the aim of educating and inculcating 3R habits in the young. Recycling bins for paper, drink cans and plastic bottles are placed at Recycling Corners located within the school premises. Students decorate the Recycling Corners and put up interesting information and display on waste minimisation and recycling. These activities help to generate interest and build a sense of responsibility and ownership.

Activities with recycling themes are organised regularly to sustain interest. Activities include 3R (Reduce, Reuse & Recycle) competitions, annual environmental camps, fieldtrips, workshops, etc.

To build greater ownership of the recycling programme, students are offered training to be Environmental Champions in their schools. These Champions will then conduct talks and assist in planning, organizing and running recycling/environmental activities in their schools.

Grants are given to Environmental Clubs and associated clubs to encourage schools to carry out environmental related activities.

3P Partnership and Public Awareness

NEA has been promoting 3P Partnership to build a sense of ownership of the environment (3P stands for People, Private and Public sectors). A sustained educational and awareness campaign aimed at the community, schools and in the workforce is the way to inculcate the habit of waste recycling in the population as a part of everyday living. One such awareness campaign is Recycling Week, which is held annually. The aim is to bring recycling to the community and involve the schools, community and industry partners.

Strategy 3: Waste-to-Energy

As far as possible, waste minimization and recycling is promoted to maximize resource recovery and minimize environmental impact. Non-recyclable and incinerable waste is disposed of at the 4 waste-to-energy plants (90% of waste disposed of). Incineration reduces the volume of waste by 85-90% and the heat from incineration is recovered to generate electricity. In addition, ferrous metal is recovered from incineration ash to be recycled. The incineration bottom ash and the remaining 10% of non-incinerable waste is disposed of at Semakau Landfill, Singapore's only landfill.

To optimise the use of limited land and landfill space and address the scarcity of land for waste facilities, NEA is planning the development of an Integrated Waste Management Facility (IWMF) to optimise resource and energy recovery from waste.

Conclusion

To move towards achieving the vision of "Towards Zero Landfill" and "Towards Zero Waste" in the long run, Singapore recognizes the importance of adopting best practices, creatively exploiting technologies and adopting innovative solutions to reduce waste. As a land and resource scarce country, it is critical for Singapore to maximise land productivity and resource efficiency.