

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)

< Bhutan >

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Bhutan is a small landlocked country in the Eastern Himalayas bordered by the People's Republic of China in the North and India on the other 3 sides. Bhutan has a population of 695,822 in the year 2010¹ with total land area of 38,394 square kilometers.

The landscape is characterized by rugged terrain and steep mountain valleys ranging from 150 meters in the sub-tropical valleys in the southern foothills, through temperate zone to heights exceeding 7000 meters in the alpine regions northern parts of the country.

Bhutan's economy is based mainly on agriculture, and forestry which provide the main livelihood for 80% of the population and account for about 40% of GDP. The major source of its revenue is the hydroelectric power. Other sources of revenue include tourism and minerals like coal, gypsum, cement production and ferro-chemicals. The nominal GDP at market is estimated at Nu. 61,223.5 million (Year 2010) and a per capita GDP estimated at Nu. 87462 equivalent to US\$ 1943 (year 2010). The GDP growth rate is around 6.7 percent per year.



¹ Source : National Statistical Bureau of Bhutan (www.nsb.gov.bt)

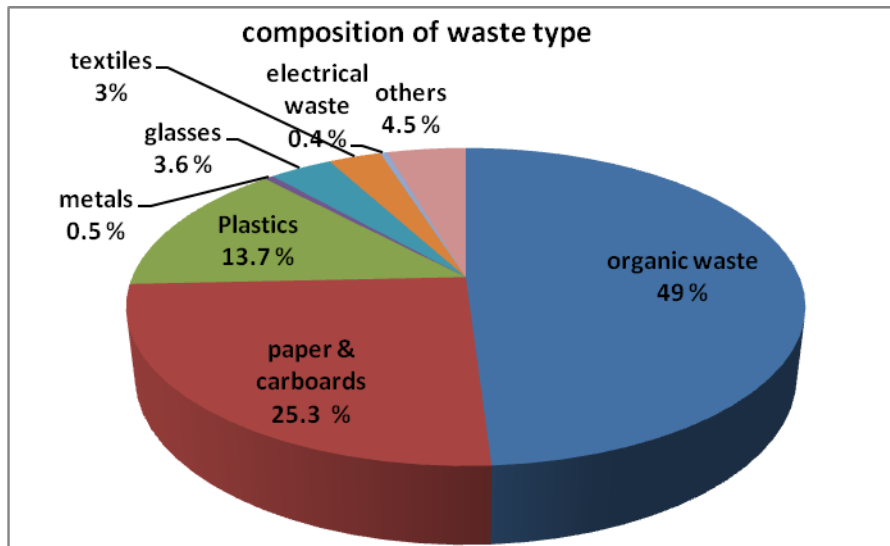
Solid Waste Management in Bhutan

Like any other developing country, Bhutan too is facing the challenges of rapid urbanization with more than 30% of the country's population living in the urban areas which is expected to increase in the next few decades. With the increase in the urban population came the issues of solid waste management due to insufficient infrastructure planning, municipal facilities and services. According to UNEF report 2001, garbage has been identified as emerging problems in the larger towns of *Thimphu and Phuentsholing*.



Recognizing importance of managing the solid waste, the Royal Government of Bhutan (RGoB) has initiated to collect more reliable solid waste generation and composition data in the year 2007. The main objective of this research survey was to study the waste generation rates from different sources and their compositions. The erstwhile Department of Urban Development and Engineering Services (DUDES) under the Ministry of Works and Human Settlement (MoWHS) carried out the survey in 10 selected towns with financial assistance from Danish International Development Agency (DANIDA) under the Environment and Urban Sector Programme Support.

The chart below shows the total quantity of each components of the MSW generated from the urban areas in 2007.



a) List major initiatives and achievements in the areas of 3R policies, programmes, and institutional measures.

For countries like Bhutan, the policy and institutional arrangement options of the 3Rs concept may be more cost-effective and for this the public awareness and education has to be a priority. Although, the concept of 3Rs has been known to Bhutan for a long time, the actual implementation of the 3Rs concept has been difficult due to lack of proper guidance, budget, human resource and public awareness. The Royal Government of Bhutan has strong commitment to the preservation of its environment and has enacted legislation such as the Waste Prevention and Management Act (2009) and Waste Prevention and Management regulations (2011), however enforcement remains a distinct challenge.

The “Waste Prevention and Management Act of Bhutan, 2009”:

This Act extends to all forms of waste whether solid, liquid, gaseous, hazardous, non-hazardous, organic, inorganic, from residential, agricultural, commercial, medical or industrial sources, produced by any person, including materials being stored for recycling or in the process of recycling, including the transportation of waste in any form, and import and export of waste in Bhutan.

The key goal of the Waste Prevention and Management Act of Bhutan, 2009, is to protect and sustain human health through protection of the environment by:

- Reducing the generation of waste at source;
- Promoting the segregation, reuse and recycling of wastes
- Disposal of waste in an environmentally sound manner; and
- Effective functioning and coordination among implementing agencies.

Waste Prevention and Management regulations-2012:

The Waste Prevention and Management Regulation, 2012 has the following mandate which has been adopted under Section 53 of the Waste Prevention and Management Act, 2009 mentioned above and within this regulation, each person or organization is required to comply and cooperate with waste segregation, reduction, reuse and recycling initiatives by an authority or authorized service provider under this regulation.

Institutionally, the National Environment Commission (NEC) is a high-level autonomous agency for RGOB mandated to look after all issues related to environment in Bhutan. Its responsibilities include the overall formulation and monitoring of environmental policy and legislation. Line Ministries, Dzongkhags and Gewogs (Province and Districts) and Private Companies are responsible for the implementation of environmental assessment and compliance with environmental regulations.

Public Private Partnership pilot project

The Public-Private Partnership pilot project aims to improve the solid waste management system through separation of wastes at source by supporting storage infrastructures and enhancing recycling of organic wastes through composting. Outsourcing of collection system is also expected to be experimented during this project. The reduced burden on the local government through outsourcing of such services means, they will have more time to focus on the delivery of other services. Waste segregation that will be encouraged through the project will highlight the effectiveness of the approach in reducing the volume of waste and also demonstrate that through recycling waste (as recyclable waste after segregation will be sold to waste / scrap collectors) trash can be converted into money. Through the project, engagement of community groups or private business enterprises to provide

services could generate employment opportunities to many unemployed groups in the capital city including youth and the poorest section of the society. If this pilot project is successful, then this project will be enhanced to cover whole Thimphu town and also to other Districts in the country.

b) *List major initiatives and achievements in promoting 3R technologies and infrastructure development*

Organic waste management:

As seen from the table above, 50% of the waste generated in the urban centres is organic waste and therefore it was felt necessary to install a compost plant. Organic waste is mainly composed of kitchen wastes such as vegetables, fruits, food remains, etc.

In Thimphu, a compost plant with capacity of handling 30 tonnes of organic waste per day has been installed recently which will strengthen business and employment opportunities, reduce waste and prevent methane generation at the landfill. This will be further replicated in other districts in the country after analyzing the success of the compost plant in Thimphu.

Plastic Waste Management:

Although, the uses of plastics for carry bags, package wrappers and pouches have been banned in Bhutan since 1999 through a government decree, plastic waste formed up to 12.73% of the total municipal solid wastes generated in the urban areas. Plastic wastes is composed mainly of packaging plastic products, hard and flexible plastic household items, PET bottles, Jerry can, etc. Plastic wastes especially packaging materials do not decompose and compact easily which is why it significantly affects transportation cost and landfill life.

The only facility that Bhutan possesses in terms of plastic recycling is shredding plant for PET bottles which when crushed and shredded to pellets can fetch better prices in export while reducing the transportation cost.



Saw Dust Briquetting:

Sawdust briquetting venture in the outskirts of Thimphu town addresses the sawdust problems from the saw mills in Thimphu and Paro. Until early 2005, sawdust generated from the saw mills has been a concern across the country and especially in Thimphu. Controversial water pollution and sawdust hindrance to the surrounding inhabitants during the windy season has pressured the government to search for alternative solutions. On the other hand, the high rate firewood consumption has depleted forest resources around Thimphu. Ultimately, through repeated research and trial, the Forestry Development Corporation Limited (FDCL) has managed to establish a sawdust briquetting plant in the outskirts of Thimphu. This plant substantially consumed sawdust generated in Thimphu and Paro and substituted the firewood supply, reducing pressure on the local forest resources.

c) List examples of specific policy initiatives or measures in dealing with new emerging waste streams such as e-waste, plastic in coastal- marine environment, chemicals and hazardous waste

As in the case for many countries e-wastes is an emerging environmental issue in Bhutan. Electrical and electronic wastes formed only 0.37% of the total municipal wastes and it consist mostly of printer cartridges from the offices and there are firms which recycles printer cartridges through re-filling.

It may be mentioned here that most modern electrical and electronic equipments such as TV, computers, etc. became popular only recently hence are expected to be used to its full life unlike in other developed countries where electronic and electrical equipments are often discarded due to changing fashion.

As in the case for most municipalities around the world, wastes disposed in municipal bins generally comprise mostly organic or biodegradable wastes that are not toxic. However disposal of small amounts of toxic and hazardous wastes such as e-wastes can contaminate most of the non toxic wastes in the municipal bin.

For the case of Bhutan most of the municipal landfills do not have leachate control mechanisms and this might led to contamination of soil and water in the vicinity. However, the scale of problem is relatively small and manageable but before the scale of problem becomes unmanageable, initiatives need to be taken to raise awareness on the hazards of e-wastes and proper disposal methods and mechanisms need to be put in place to enable safe disposal of e-wastes.

In Bhutan, amongst the hazardous waste, medical waste is considered major source of concern. Although, the relevant health officials are well aware about the negative social and environmental impacts of improper disposal of health care wastes, the actual implementation of safe disposal methods has been difficult so far due to lack of funds for establishing the required structures and technical facilities for treating waste or disposing them off safely. Only two functioning autoclaves exist in the entire country. Hence, it is possible to treat the infectious wastes generated from the two hospitals (Thimphu JDWNRH and Mongar hospital) with the autoclaves only. Deep pit burial is the predominant method of disposal of health care wastes throughout the country. However, the pits are ordinary earthen pits without any protective lining, hence making it easy for the chemical and other liquid wastes to leach out into the soil and nearby water bodies. Though all district hospitals have pits with well sealed roofs the BHU's mostly have ordinary open pits in the ground. Hence, serious efforts need to be made to raise funds for enabling safe health care waste disposal and management in the country.

Strategic Approach for International Chemicals Management (SAICM) – As part of the Global Policy Framework support, Bhutan is currently undertaking the SAICM project with the following objective:

By 2020, Chemicals should be produced and used in ways that lead to the minimization of significant adverse effects to human health and the environment.

The project is also aimed at strengthening national capacities for sound management of priority carcinogenic chemicals in the country in addition to the following:

- National Profile developed ;
- Agreed priorities on chemical management;
- Actions to be taken to strengthen the country's capacity to address the chemicals related issues;
- Improved knowledge on about chemicals; and
- Awareness and understanding of other chemical conventions.

d) List specific policy initiatives or strategies for promotion of 3Rs in industry and business sectors, including small and medium size enterprises (SMEs)

The small and medium –sized businesses entrepreneurs are involved in collecting and segregating paper, glass, bottles, plastics, metals, PET bottles and other recyclables, either directly or in combination with purchasing these from other waste collectors and in transporting them to the recycling plants in India.

Greener Way, ReCiti and Druk Waste Collection are examples of emerging independent private sector businesses.

Greener Way has been operating in Thimphu since March 2010 and it first started collecting paper waste, especially from large government institutions and thereafter expanded to door-to-door (D2D) waste collection services where it collects recyclables such as paper, plastic and metals. Furthermore, the because of the lease of the PET crushing plant and other pressure equipments by the local government which allowed significant increase in waste densities and decrease in transportation costs, the Greener Way has been able to provide competitive price to waste collectors.

ReCiti started business in 2010 and is an example of business initiative that did not succeed.

Druk Waste Collection is another emerging entrepreneur and was set up in Paro in 2009 and collects both biodegradable and recyclable materials which are further segregated in its “waste- recovery centre”.

e) List specific policy initiatives or strategies for promotion of 3Rs in agriculture and rural sector in support of rural livelihood generation

The waste Prevention and Management Act (2009) and its Regulation (2012) has specific provisions in support of 3R and has also identified through a consultative process monitoring authorities and implementing agencies in both the agricultural and rural sectors. However, due to lack of resources and manpower constraints, effective enforcement and monitoring remains a challenge.

National Strategy on Integrated Solid Waste Management (NSISWM): In addition to the provisions made in the Waste Act and its Regulation, and to close the gaps, the NSISWN is being proposed with the objective to strengthen and improve the waste management in both urban and rural centers. The strategy document shall supplement the existing waste management rules and other implementation gaps and is expected to be completed by mid of 2013.

References:

- Studying municipal solid waste generation and composition in the urban areas of Bhutan, 2009
- Managing Hazardous wastes Inventory report, 2008.
- Draft National Strategy on Integrated Solid Waste Management
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- Waste Prevention and Management Act, 2009
- Waste Prevention and Management Regulation, 2012