



Solid waste generation in the urban centers of Bhutan.

PRESENTER – PEMA CHEZOM
MBARM08- (2019-2021)
ENROLLEMNT NO: 0072

Outline

- ▶ Background
- ▶ Objectives
- ▶ Methodology
- ▶ literature review
- ▶ Results and discussion
- ▶ Conclusion
- ▶ Recommendations
- ▶ References



Background

- ▶ Waste management has become an issue in the country due to its developmental activities taking place on daily basis.
- ▶ The production of the solid waste in the city centers of Bhutan has increased over the past century due to urbanization, (Phuntsho et al. 2009).
- ▶ The ordinary assessed amount of Municipal Solid Waste (MSW) created is 1.7 to 1.9 billion metric tons for each day (UNEP 2010).
- ▶ Educating school going children with regards to the importance of environmental issues will instill the right behavior in school going children will have positive impacts on the behavior of their families, (Rada et.al. 2016).

Objectives

- ▶ To identify the sources, scale and composition of community solid waste generated in the urban centers of Bhutan.
- ▶ To review its social, environment and economic impacts.
- ▶ Identify areas where education can contribute in tackling the problem of urban solid waste.

Methodology

- ▶ It was based on qualitative approach.
- ▶ The research is literature based.
- ▶ Reviewed the existing research, studies and statistics obtained from published reports on waste, research and statistics from government organizations and agencies such as Municipal Co-operation of Bhutan, National Environment Commission, National Statistical Bureau, Royal Society Protection Nature.

Literature Review

- ▶ The increasing quantities of municipal solid waste generated is one of the most daunting challenges that municipalities have been facing, (Aleluia 2016).
- ▶ Globally municipal solid waste generation exceeds 2 billion tons per year, which is a primary threat to the environment.
- ▶ The major types of MSW are food wastes, papers, plastics, metals, glasses, including electric powered bulbs, batteries, discarded medicines and parts of automobile, (Magutu et al. 2010).
- ▶ Effective management of solid waste has become environmentally and economically mandatory due to the amplify of environmental problems.

Conti...

- ▶ The MSW production rates in the urban centers of Bhutan were 0.53 kg per capita per day, which consists mainly of organic waste, papers, plastic waste and other domestic wastes.
- ▶ Thimphu and Phuentsholing the two biggest urban centers of Bhutan collect 36.7 and 24.7 tons of MSW in a day individually at the landfill sites, (Phuntsho et al. 2009).
- ▶ Municipal solid waste management is one of the fundamental topics for environmental protection in existing days and in the future.

Result and discussion

► **Why high generation of solid waste?**

- Rise in population
- Development of the country
- Lack of awareness
- Financial Barrier



Impacts of the waste



❖ *Environmental impacts.*

The inappropriate management of the solid waste can pose risks not only to the humans and animals but also to the water, soil and plants.

❖ *Economic impact*

Waste is by-product of economic activities and management of waste has economic implication.

❖ *Social impact*

Waste causes especially impact on social health of people in the community.



Conclusion



The proper management of the solid waste may reduce the environmental problems, generally resulted due to improper disposal of waste



The presence of a Waste Management Plan (WMP) in educational establishments can lead to decrease in generation of waste and promoting income generation for people involved with recycling chain.



Recycling program in school will not only shape current waste management, but also has the potential to influence and improve waste reduction in future.

Recommendation

- Education and knowledge are regarded to be one of the most effective drivers for sustainable development.
- ▶ Waste need to be recycled and re processed.
- ▶ Educational projects associated with waste management is vital steps for promoting the sustainability concept.
- ▶ The waste environmental education programme must be encouraged.

References

- ▶ National integrated solid waste management. 2014. Royal government of Bhutan.
<http://www.nec.gov.bt/nec1/wp-content/uploads/2017/11/ISWM.pdf>
- ▶ Norbu, and Dilokwanich, S. (2010). Municipal Solid Waste Management in Phuntsholing City, Bhutan.
- ▶ Phuntsho, S., et al. 2009. "Studying municipal solid waste generation and composition in the urban areas of Bhutan." Waste Management & Research 28(6): 545-551.
- ▶ Rada, Elena Cristina, Chiara Bresciani, Eleonora Girelli, Marco Ragazzi, Marco Schiavon, and Vincenzo Torretta. 2016. "Analysis and Measures to Improve Waste Management in Schools." Sustainability 8 (9): 840.
- ▶ Aleluia, João, and Paulo Ferrão. "Characterization of Urban Waste Management Practices in Developing Asian Countries: A New Analytical Framework Based on Waste Characteristics and Urban Dimension." Waste Management 58 (2016/12/01/ 2016): 415-29.
- ▶ CBS, (2004). Gross National Happiness and Development. In Proceedings of the First International Seminar on Operationalization of Gross National Happiness. Thimphu: The Centre for Bhutan Studies.

Conti...

- ▶ Economic Development Policy, 2010 Royal Government of Bhutan Thimphu: Bhutan
- ▶ Gyelmo, D. (2018). As Bhutan's economy grows, so does its waste problem. Retrieved from <https://www.thethirdpole.net/en/2018/04/06/as-bhutans-economy-grows-so-does-its-waste-problem/>
- ▶ Kuensel. 2017. Thimphu grapples with mounting waste. Retrived from <http://www.kuenselonline.com/thimphu-grapples-with-mounting-waste/>.
- ▶ Malgorzata Grodzinska-Jurczak , Agata Bartosiewicz , Agata Twardowska & Roy Ballantyne
- ▶ (2003) Evaluating the Impact of a School Waste Education Programme upon Students', Parents' and Teachers' Environmental Knowledge, Attitudes and Behaviour, International Research in Geographical and Environmental Education, 12:2, 106-122,
- ▶ Magutu, O. P., Mbeche, M. I, Nyamwange, O. S., Mwove, M., and Ndubai, E. R. (2010).