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A REPORT ON
SOLID WASTE MANAGEMENT OF THE KATHMANDU VALLEY

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ENGINEER

ELITE BUILD CONSULTANCY
KALIMATI, KATHMANDU

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THE KATHMANDU VALLEY

SUBMITTED TO: CHIEF ENGINEER
THE KATHMANDU METROPOLITAN

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PREFACE

Solid waste management is an increasingly pressing issue in many urban areas, and Kathmandu Valley is no exception. With a population of over 2.5 million people, Kathmandu Valley generates a significant amount of waste each day, including organic and inorganic waste as well as hazardous waste. Unfortunately, the city's waste management system is inadequate, leading to many environmental and health problems.

As a result of inadequate infrastructure, insufficient funding, and a lack of public awareness, Kathmandu Valley's waste management system has struggled to keep up with the city's growing population and waste generation. Waste collection and transportation systems are often unreliable, leading to piles of trash in the streets and unsanitary conditions. The city's landfill sites are also overwhelmed, leading to air and water pollution, as well as other environmental and health problems.

The consequences of improper solid waste management in Kathmandu Valley are severe. Air and water pollution can lead to respiratory and other health problems for residents, while wildlife and ecosystems can suffer as a result of contaminated waterways and soil. Economic impacts, such as lost revenue and increased costs for waste management, can also be significant.

This report aims to provide an overview of the current state of solid waste management in Kathmandu Valley and offer recommendations for improvement. The report will discuss the types and amount of waste generated in the city, the current waste management system, and the challenges and issues faced by the city in managing its solid waste. Additionally, the report will address the environmental, health, and economic impacts of improper solid waste management.

The report will conclude with recommendations for improving solid waste management in Kathmandu Valley. These recommendations will include increasing public education and awareness, improving infrastructure and technology, and implementing stricter regulations and enforcement. By taking action to improve solid waste management.

ACKNOWLEDGEMENT

At first, we wish to express our gratitude to SAGARMATHA ENGINEERING COLLEGE for providing us an opportunity to make report on SOLID WASTE MANAGEMENT OF KATHMADU VALLEY with collaborating with Elite Build Consultancy.

It would be difficult to list and thank the many people who lent me encouragement and from whom we have learned so much through informal conversations, conference discussions, and writings—published and unpublished.

We must begin by thanking Aayush Das for his foresight and encouragement. His support and guidance first made it possible for me to work toward the goal of solid waste management.

We would like to express my deepest appreciation to all these who provided me the possibility to complete this report. A special gratitude, I would like to give our final year project Manager Mr. Subodh Pandit, whose contribution in stimulating suggestion and encouragement helps me to coordinate my project especially in writing this report.

Likewise, we would also like to acknowledge with much appreciation the crucial role of the staff of Raman consultancy who gave the permission to use all the equipment necessary to complete our task solid waste management of Kathmandu valley and helped me to assemble the parts and gave the suggestion. My special thanks go to mine teammate Shivam, Kamal, Mustak who helped me to complete my task at last my thanks go to head of the project Er. Niroj Thakur who has invested all effort in guiding the team in achieving the goal. I have to appreciate the guidance given by other supervisor as well as presentation that has improved our skills.

ABSTRACT

Solid waste management is a significant environmental and public health issue in Kathmandu valley. The population growth, rapid urbanization, and changing lifestyle have resulted in an enormous amount of waste generation, which poses a severe threat to the environment and public health. The existing waste management system is inadequate and inefficient to handle the volume of waste generated daily. The improper disposal of waste in open spaces, rivers, and landfills has led to air, water, and soil pollution, causing various health hazards and environmental degradation.

This report focuses on the current situation of solid waste management in Kathmandu valley, Nepal. The study employed a qualitative research method, and data were collected through literature review, field observations, and interviews with stakeholders involved in waste management. The study found that the existing waste management system lacks proper infrastructure, inadequate collection, transportation, and disposal methods, and a lack of public awareness and participation. The study recommends that the government and local authorities should implement an integrated waste management system that focuses on waste reduction, segregation at the source, proper collection, transportation, and disposal, and promote public awareness and participation.

The report also suggests the involvement of private sectors, civil society organizations, and other stakeholders in waste management to achieve sustainable solid waste management in Kathmandu valley. The findings of the study provide insight into the current solid waste management situation in Kathmandu valley and serve as a basis for further research and policy development.

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1. INRODUCTION

Solid waste is a byproduct of human activities and comprises various types of non-liquid waste materials such as paper, plastic, glass, metal, and organic waste. As populations continue to grow and urbanize, solid waste management has become a critical issue globally. Improper disposal of solid waste can lead to environmental pollution, health hazards, and damage to natural resources. Effective management of solid waste is essential for protecting public health and the environment, conserving natural resources, and promoting sustainable development.

The current solid waste management system in the Kathmandu Valley is primarily the responsibility of the respective municipal governments, which are responsible for collecting, transporting, and disposing of waste. The system involves door-to-door collection of waste from households and businesses, which is then transported to a landfill site outside the city. However, the system is far from adequate, with many households and businesses relying on informal waste collectors to dispose of their waste, resulting in uncontrolled dumping and burning of waste in public spaces.

The lack of appropriate infrastructure and resources for waste management is one of the major challenges facing the Kathmandu Valley. The existing landfill sites are quickly reaching their maximum capacity, and there is a lack of proper facilities for managing hazardous waste. The inadequate waste collection system, coupled with the lack of public awareness and participation in waste management, exacerbates the problem.

In Nepal, limited studies on solid waste management being carried out. Even such a survey revealed that waste in urban areas are generally much higher than recommended International Standards. According to a report by the Solid Waste Management Technical Support Center (SWMTSC), the daily amount of waste generated in the Kathmandu Valley is approximately 1,200 metric tons. However, this amount is likely to be underestimated due to the presence of informal waste collection and disposal activities that are not officially recorded.

The SWMTSC report indicates that approximately 62% of the waste generated in the Valley is organic, while the remaining 38% is non-organic.

4. CONCLUSION

The objective of the SWM baseline survey was to conduct a systematic and comprehensive study to quantify MSW and its composition, and to compile factual information on the state of SWM in 58 municipalities of Nepal. The total sample size of 3,233 households from the 58 municipalities gave an average household waste generation rate of 170 g/capita/day. The household waste generation rates varied depending on economic status and climatic conditions. The average daily waste generation of institutional wastes was at 4.0 kg per school and 1.4 kg per office. Similarly, the average daily waste generation of commercial waste was at 1.4 kg per shop and 5.7 kg per hotel or restaurant. Household waste is estimated to contribute about 50%–75% of the total municipal MSW generated, which was estimated at 317 g/capita/day. Based on these per capita waste generation figures and the population in 2011, the total MSW generation from the 58 municipalities was estimated at about 1,435 tons/day and 524,000 tons/year.

The analysis of waste composition showed that organic matter accounted for the highest fraction, making up 66% of household waste and 43% of commercial waste; while the largest fraction for institutional waste was paper and paper products at 44%. The survey showed that there is great potential to promote composting of MSW in all municipalities. The households in predominantly rural areas of municipalities practice traditional household composting, but those in urban areas, where less land is available, generally do not use this method. Community or municipal composting plants are observed in some municipalities. Only 6 municipalities dispose of waste in sanitary landfill sites, and as many as 45 municipalities dump waste on riverbanks, roadsides, or other low-lying lands, or in open pits or temporary open piles. Municipalities are unable to manage MSW effectively and efficiently because of the lack of technical and human resources, statistical records, and proper planning, as well as insufficient budget and lack of political leadership.

5. RECOMMENDATION

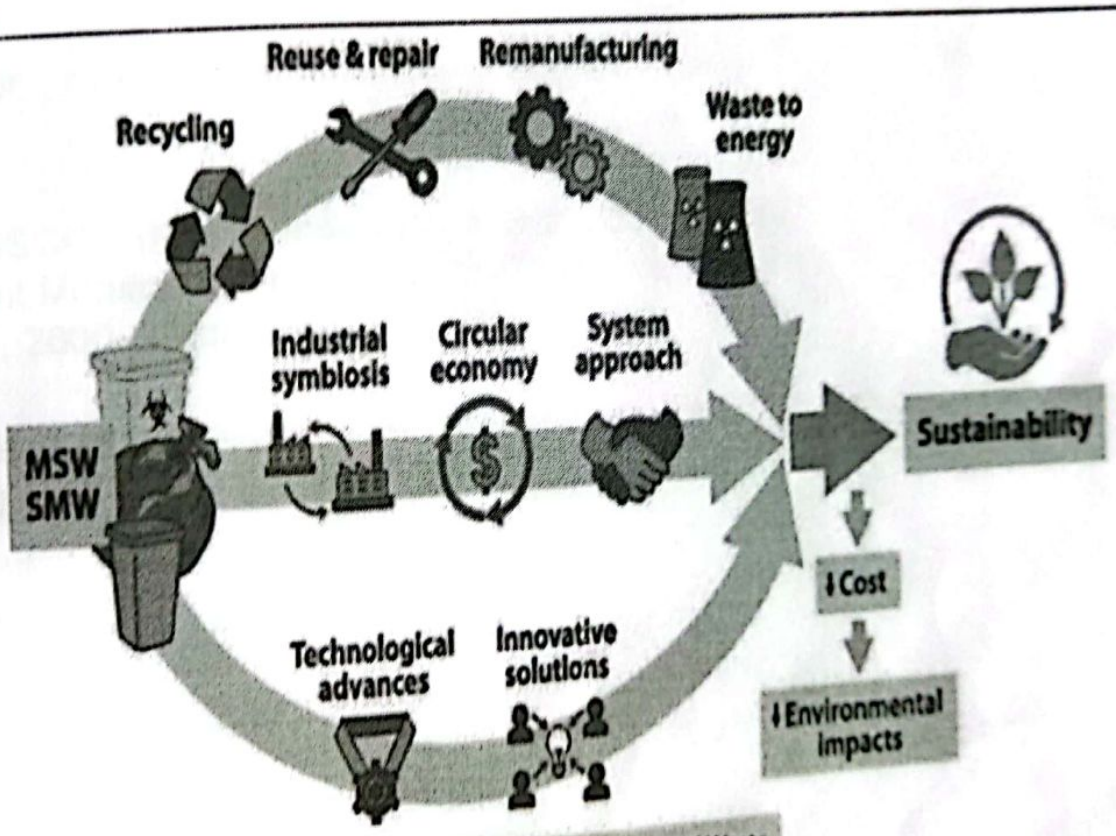
Develop a Comprehensive Solid Waste Management Plan: A comprehensive solid waste management plan that considers the entire waste management process, from waste generation to disposal, is necessary. The plan should include strategies for waste reduction, recycling, and composting, as well as plans for waste collection, transportation, and disposal.

Improve Waste Collection and Transportation: Waste collection and transportation systems in Kathmandu Valley need significant improvement. Opportunities for improvement include expanding collection services, implementing efficient transportation systems, and increasing the capacity of waste collection and transportation facilities.

Promote Recycling and Composting: Recycling and composting can help to reduce the amount of waste sent to landfills and promote sustainability. Opportunities for improvement include expanding recycling and composting programs, improving public education about recycling and composting, and providing incentives for recycling and composting.

Develop Hazardous Waste Management Systems: Hazardous waste poses significant risks to human health and the environment. Opportunities for improvement include developing hazardous waste management systems, improving monitoring and enforcement of hazardous waste regulations, and providing training and education for hazardous waste management professionals.

6. APPENDIX



MSW: Municipal Solid Waste; SMW: Solid Medical Waste

7. REFERENCES

Ackerman, F., 2000: Waste Management and Climate Change. *Local Environment,* 5(2), pp. 223-229.

WHO/UNICEF/WSSCC, 2000: Global water supply and sanitation assessment: 2000 Report. WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation, ISBN924156202 1, 2000. <http://www.who.int>

World Bank and IMF, 2006: Global Monitoring Report 2006: Ensuring Environmental Sustainability Target 10. World Bank and International Monetary Fund, Washington, D.C.

www.adb.org

https://www.google.com/search?q=diagram+of+cause+of+effect+solidwaste&tbm=isch&ved=2a h

8. GLOSSARY

olid waste: Refers to any non-liquid waste material generated by human activities, ıcluding household, commercial, industrial, and construction waste.

ındfill: A designated area for the disposal of solid waste, typically involving burying /aste in the ground and covering it with soil.

ecycling: The process of converting waste materials into new products or materials, educing the amount of waste that is sent to landfills.

omposting: The process of breaking down organic waste, such as food scraps and yard /aste, into nutrient-rich soil.

Vaste reduction: The practice of reducing the amount of waste generated by ninimizing unnecessary consumption and implementing strategies such as recycling ınd composting.

Hazardous waste: Waste materials that are potentially dangerous or harmful to human ıealth or the environment, such as chemicals, batteries, and medical waste

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