

## **Waste Management in Areas along the Kathmandu Valley Ring Road in Nepal**

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### **ABSTRACT**

Solid Wastes are discarded wastes and are generated from different sources such as sludge from a waste water treatment plant, water supply treatment plant or air pollution control facility and other discarded materials, business and industries, agricultural and community activities. Similarly, urban slums are the result of the rowing pace of urbanization and lack of affordable housing. Managing solid waste in the urban slum area is a major issue concerning Municipal Solid Waste Management. Poor sanitation, drainage and garbage disposal systems degrade the environment which results in hazards both to the physical and mental health of people living in slums area. The research was conducted during the period of 20 Slums areas within the ring road of Kathmandu Valley of Nepal. Field observation, In-depth interviews, focus group discussion and Questionnaire survey were the major instruments used during the investigation. The problems caused due to improper solid waste management in a slum area within the ring road of Kathmandu city have increased in loss of aesthetic beauty and tourism industry, people's attitude and behaviors and as well as flooding/inundation during monsoon season (RII=0.71) for the people living there. The cause of an inadequate number of waste-collecting vehicles is the insufficient budget (RII=0.71). The cause of the loss of aesthetic beauty is due to the dumping of solid waste in the streets and bank of rivers (RII=0.71). The cause of negative impact on public health is due to the dumping of solid wastes in streets and on banks of rivers, with no strict action for open dumping and burning of the wastes (RII=0.71). The cause of the emission of greenhouse gases is due to methane release from landfill sites (RII=0.72). The study would like to suggest that the government should come up with proper plans and policies along with the enforcement and strict monitoring of the prevailing rules and regulations. Planning should be conducted at every stage and tracking should be done.

**Keywords: Waste Management; Waste Segregation; Recycling and Reuse.**

## INTRODUCTION

Squatters grow and form in many different parts of the world. According to the United Nations Human Settlements Program (UN-HABITAT), around 33 per cent urban population in the developing world in 2012 lived in squatters. The world's population lives in urban areas is more than half and by 2030 it is projected that over half of residents in low- and middle-income countries (LMICs) will reside in cities [1]. The UNDP (2014: p. 27) states that poverty is rising in urban areas, and results in declining of poverty in rural areas. As rural residents move to urban areas in the pursuit of happiness and prosperity. The search for a better life brings a huge number of poor people to the urban areas in the pursuit of happiness and prosperity and also for a job. As a result, villages are overtaken by expanding urban areas, and many low- and middle-income countries are increasingly concerned with the urbanization of poverty [2]. Squatters are an outcome of the rapidly increasing growth of the urban population which poses an imbalance in urban growth. Squatters are one type of settlement that is illegally occupied houses and create a nuisance of environmental pollution grown on public land in urban areas. It generally grows near Airports, Railway stations, river floods and near market areas, etc. Population living in squatters is the proportion of the urban population living in squatter households. The main reasons for squatter development are industrial revolution after independence. Before 1950 squatters were predominantly found around mills, factories etc. They were mostly industrial workers in one-room tenements [3]. Among of total municipalities budget, 10% is used for SWM, 60%–70% is used for street sweeping and collection, 20%–30% for transport, and the rest for final disposal [4]. Individuals living under the same roof lacking one or more of the following conditions: access to improved water, access to improved sanitation, sufficient living area, housing durability, and security of tenure”.

Squatters have risen dramatically. Globally population living in squatters (% of the urban population) constitute 29.244. The squatter population in urban areas is increasing day by day, has increased in absolute numbers from 1.2 million in 1990 to 3.1 million in 2009, and reduced again to 2.8 million in 2014 [5]. In 2005, Kathmandu city's 137 squatter neighborhoods are identified with 6,985 households and 31,463 people. In Nepal such as Kathmandu and Pokhara, as well as in urban areas such as Dharan, Birganj, Bharatpur and Mechinagar are fast-growing areas. In 1985, the Kathmandu Valley 17 squatter settlements increased to 64 by 2003 [6]. UNHABITAT (2010: p. 9) states that in 2010, Kathmandu city has there 40 squatter's settlements with over 12,000 squatters, and an additional estimated 40 per cent of squatters around 20,000 are occupying public buildings. In 2012, 29 riverside squatter settlements with 2031 households, and 17 settlements in other locations with 467 households are in Kathmandu city. However, Kathmandu Valley is the hub of Nepal's urbanization among all the urban centers in Nepal. The total population of Kathmandu city is over 1 million and recorded alone

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the highest density of 19,726 persons per sq. kilometer in 2011. In alone there are 63 squatter and squatter settlements. For the rural residents' people, the city is expensive compared to a village. So, it is difficult for the urban poor to live in cities by lacking minimum basic amenities. So, they need protection and care from the state [7].

## RESEARCH ELABORATIONS

The study considers the Kathmandu Valley within the ring road which is located in the central part of the country that falls under province no 3. The total surface area of Kathmandu is only 665 square kilometres in the Bagmati zone. It has 3 million of the population in 2010. There are three cities in the valley. These are Kathmandu, Lalitpur and Bhaktapur. There are many squatters' areas in Kathmandu Valley but the following settlements have been selected for this study. Shankhamul, Balkhu, Thapathali and UN Park, Gairigaun, Sinamangal, Jagriti Nagar, Shanti Nagar, Chandani Tola, Prayag marg, and Kalimati dol

Analysis based on problems of solid waste management in squatter areas within ring road of Kathmandu city. There were nineteen options for ranking. The value of Loss of aesthetic beauty and tourism Industry as a problem received the highest rank ( $RII=0.71$ ). Similarly, people's attitude and behavior, emission of Greenhouse gases and Flooding/inundation during monsoon also received the highest rank ( $RII=0.71$ ) whereas a smaller number of Inadequate waste collection and disposal of wastes received the lowest rank ( $RII=0.67$ ).

## RESULTS AND DISCUSSIONS

Analysis based on effects of Inadequate number of wastes collecting vehicles There were seven options for ranking. The options for unable to reach in a squatter area, causing respiratory diseases, leading to air pollution and loss of aesthetic beauty were ranked the same ( $RII=0.70$ ) whereas the lowest value was for bad smell ( $RII=0.67$ ). The hierarchy of the graph from the highest to lowest for the effects of Inadequate number of wastes collecting vehicles has been arranged

Analysis based on Causes of Loss of aesthetic beauty and tourism Industry There were five options for ranking. The highest value was for dumping of solid wastes in the streets and the bank of the rivers ( $RII=0.71$ ) whereas the lowest value was for Inadequate collection and disposal of solid wastes ( $RII=0.67$ ).

Analysis based on Effects of Loss of aesthetic beauty and tourism There were four options for ranking. The highest value was for unpleasant environment ( $RII=0.71$ ) whereas the lowest value was for decrease in national economy ( $RII=0.68$ ).

## CONCLUSIONS

In squatters, solid waste management practices such as storage and disposal practices were unsatisfactory, and separation and composting were minimally practiced. Solid waste has made a huge impact in Kathmandu Metropolitan City. Based on the findings of the study the conclusion is summarized and presented here under. The major problem caused by these issues are increased in loss of aesthetic beauty and tourism industry, people's attitude and behavior's, emission of Greenhouse gases and Flooding/inundation during monsoon season. Negative impact on public health is caused due to the dumping of solid wastes in streets and on banks of rivers, with no strict action for open dumping and burning of the wastes. The causes of emission of Greenhouse gases are due to methane release from the landfill gases which leads to global warming. The cause of an inadequate number waste-collecting vehicles is the insufficient budget which results unpleasant environment.

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