



Solid Waste Generation and Management in Commercial units of Patnitop, J&K

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Abstract

In present study attempt has been made to assess the generation and management of solid waste in commercial units of Patnitop a famous tourist site of Udhampur district in Jammu province of J&K state. Patnitop is well known for its pleasant weather even in summer. The overall compilation of solid waste generation data revealed that total solid waste generation on an average was observed to be 24156.7g/day (24.2 kg/day) . Study of the present scenario of solid waste management at different sites of Patnitop revealed that due to lack of proper waste management strategy in the study area, tourist and owners of the different commercial units usually used to dump their waste in open surrounding which effect the surrounding environment of the study area.

Key words - solid waste, management, commercial units

Introduction

Solid waste management is the collection, treatment and disposal of solid materials at reasonable costs so as to have least impact on environment. The improper disposal of solid waste result in unsanitary conditions which lead to pollution and spread of various infectious diseases thereby resulting in outbreaks of vector-borne disease i.e. diseases spread by rodents and insects.” It is one of the major challenges faced by many countries around the globe. Inadequate collection, recycling or treatment and uncontrolled disposal of waste in dumps can lead to severe hazards such as health risks and environmental pollution. As the Legislative steps towards the Solid waste Management are concerned the Central Government notified the Municipal Solid Wastes (Management & Handling) Rules 2000 under Sections 3, 6 and 25 of the Environment (Protection) Act 1986 for the purpose of managing municipal and urban wastes/garbage in an environmentally sound. Every municipal authority is responsible to develop a system for scientific disposal of garbage through composting and engineered landfill. Rampal and Salaria (2001) studied the role of waste collectors in recycling of solid waste in Jammu. Rampal *et al.* (2002) studied

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manner. Solid waste generation in Government Hospitals of Jammu City . Rampal and Sharma (2003) studied the Generation & disposal of solid waste at tourist site Bagh-e-Bahu complex of Jammu. Rampal and Kour (2005) studied the generation and disposal of solid waste in the Jammu city. Generation of solid waste/capita/day and average solid waste/day along with qualitative estimation of solid waste was worked out with certain shortcomings in disposal system. In India, the solid waste is disposed off by open dumping posing environmental threat and health hazards. Moreover, most of the dumping sites are saturated and therefore, it will be inevitable to search for technological options which are sustainable for its proper management. The Waste-to-Energy plant can be a solution for this growing problem for metropolitan cities. In India, the waste is processed without segregation, due to which most of the recyclable materials goes to dumping site, which adversely affects the recyclable material market. The new Solid Waste Management Rule 2016 provides segregation of waste at source and implementation of waste to energy project that will bring a new platform for discussion related to various issues of waste management among the experts, entrepreneurs, technology developers and waste managers of the Urban Local Bodies, researchers and academicians and will certainly have coverage on best suited and viable option for



municipal solid waste management. Gupta *et al.* (2011) vermicomposted sugarcane trash using local earthworm species of Jammu Attri and Rampal (2014). assessed daily variation in solid waste generation in households of Kathua J&K. Sharma and Rampal (2014) studied the generation and management of Biomedical waste in Police Hospital Jammu (J&K). The major challenge of environmental concern is tourism-related waste at the global scale, at tourist places solid waste generated is greater than other areas and its disposal is not done in proper way, it is useful to evaluate the order of magnitude from the perspective of total weight for example every international tourist in Europe generates at least 1 kg of solid waste per day .In fact, tourists from developed countries probably produce more (up to 2 kg/person/day for the United States - EPA, UNEPA/Infoterra). Based on these data in 2001 the world's 692.5 million international tourists are likely to have generated no less than 4.8 million tons of solid waste, 58% of this total in Europe alone. In considering the total weight of waste generated by tourism one also needs to take into account the impacts of domestic travelers. In France, there seems to be no significant difference between international and domestic tourists in terms of waste generation, although individuals seem to create more waste when on vacation than in everyday life. In most tourism facilities guest rooms, kitchens, restaurants, laundries, offices, gardens and conference rooms generate large volumes of solid waste which can result in negative ecological, disease and aesthetic impacts (if not properly managed). In many destinations there is an urgent need for hotels, guesthouses, restaurants and golf courses to reduce waste, protect the environment and meet a growing customer demand for environmentally-friendly facilities. In present study attempt has been made to assess the generation and management of solid waste in commercial units of Patnitop a famous tourist site of Udhampur district in Jammu province of J&K state. Patnitop is one of the most attractive tourist place of Jammu division, it is well known for its cool and pleasant weather even in summer fall under the jurisdiction of patnitop development authority share its border with district Doda, Ramban and Udhampur .The Patnitop Development Authority (PDA) came into existence on 26th of March, 1992 vide notification SRO- 69 dated

26.03.1992 under section 4 of the J&K Development Act 1970. Patnitop is under the jurisdiction of Patnitop Development Authority (PDA) which has jurisdiction over an area of 285 Sq. Km. spreading over two districts, Udhampur and Doda. The geographical location of the PDA area is between co-ordinate 33^o 2' 47" N & 75^o 16' 46" E to 33^o 7' 45" N & 75^o 18' 42" E and elevation ranges from 600 m to 3000 m from sea level.. The average rainfall of the study area is 95cm per annum (PDA official website Kud Udhampur) .

Materials and Method

Study area

The study was carried out in Patnitop from January 2017 to May 2017. The study area was divided into four sites for assessment of solid waste generation as follows:

Site-1: Green Top Area having 6 Hotels and 14 Huts, 2 Restaurant and 5 Dhabas, 4 Fast food and tea stall, 1 Vegetables shop and 3 Provision stores, 1 Dry Fruit shop and 2 Cycle vender (kulcha) and 52 Small dust bin have been installed in this area .

Site-2: Padora Chowk Area having 7 Hotels and 17 JKTDC Huts, 2 Restaurant and Dhabas, 5 Fast food 3 Tea stall, 2 Provision stores, 2 Art and Emporium shops, 1 Gift houses, 3 Fruit sellers, 3 Cycle vender (kulcha), 2 Corn seller and one dust bin .

Site-3: Naag Mandir Area having 10 Hotels, 5 Restaurant and Dhabas, 16 Fast food and Tea stall, 1 Vegetables shop ,5 Provision stores, 17 Art and Emporium shops, 10 Gift houses, 2 Fruit sellers 2 Cycle vender (kulcha), 2 Dryfruit shop, 2 Corn seller, 1 Cosmetic store, 1 Medicine store, 1 Ration store, 1 langar. 1 Mobile repairing 1 Bakery shop 1 Tailor shop 2 Dust bin.Site-4: Karlah Dangri area. having 10 Hotels and Huts, 3 Restaurant and Dhabas, 2 Fast food and Tea stall, 1 Vegetables shop, 3 Provision store.

The sampling of solid waste was done thrice in each commercial unit of each site. During each sampling solid waste generated during 24 hours was collected, segregated into Biodegradable waste (paper, food waste, fruit waste, vegetables waste), Non-Biodegradable waste (Plastic waste, Metal, Glass waste) and Inert waste (dust and debris) and weighed separately using digital balance model SF-400 and spring balance. From three sampling of



Table I: Qualitative and quantitative composition of solid waste in commercial units at different sites of Patnitop.

Name of site	Solid waste generation g/day										Total solid waste generation g/day
	Paper waste	Food waste	Fruit waste	Vegetable waste	Textile waste	Plastic waste	Metallic ware	Glass ware	Polythene	Inert	
Green top	89.6	1757.4	66.9	663.9	6.3	221	7.7	2133	36.3	105	5087.1
Padora chowk	130	3056.9	411.8	289.2	1.9	360.4	3.3	1280.4	32	124.5	5690.4
Naag Mandir	108.8	3262	36.5	937.2	12.4	318.2	7.1	1963.5	36.5	133.3	6815.5
Karlah Dangri	91.2	2440.5	18.6	685.2	2.1	355.2	0.2	2838.1	26.9	105.7	6563.7
Total g/day	419.6	10516.8	533.8	2575.5	22.7	1254.8	18.3	8215	131.7	468.5	24156.7

Table II: Average solid waste generation g/day at different sites of Patnitop.

Name of site	Average solid waste g/day			Total solid waste generation g/day
	Biodegradable waste	Non Biodegradable Waste	Inert	
Green top	2584.1	2398	105	5087.1
Padora chowk	3889.8	1676.1	124.5	5690.4
Naag Mandir	4356.9	2325.3	133.3	6815.5
Karlah Dangri	3237.6	3220.4	105.7	6563.7
Total g/day	14068.4	9619.8	468.5	24156.7

The total solid waste generation at study area in a day = 24.2kg/day

The total solid waste generation at study area in a week = 169.4kg /week).

The total solid waste generation at study area in a month = 726kg /month).

The total solid waste generation at study area in a year = 8833 Kg /year).



solid waste generation average solid waste generation (g/day) was calculated at each site.

Result and Discussion

The critical analysis of qualitative and quantitative generation of solid waste at different sites of study area revealed that out of biodegradable waste at all the sites food waste was maximum followed by vegetable waste and textile waste was minimum. Out of non biodegradable waste at all the sites glass ware waste was maximum followed by plastic waste and metallic waste was minimum. Table I. Shimshiry and Yahaya (2017) while studying the qualitative and quantitative characteristics of solid waste in tourism region Langkawi island Malaysia also found that Raw material and food waste was ranked first and comprised 26.68% of solid waste. Paper and then plastic bag waste ranked second and third highest group (18.15% and 17.04%). The analysis of data of solid waste generation at different sites of Patnitop revealed that Naag Mandir area exhibit the maximum solid waste generation of 6815.5g/day of the solid waste comprising 4356.9g/day of Biodegradable and 2325.3g/day of Non-Biodegradable and 133.3 g/day of the Inert waste and minimum of 5087.1g/day solid waste generation was exhibited by Green Top site comprising of 2584.1g/day of Biodegradable and 2398g/day of Non-Biodegradable and 105 g/day of the Inert waste. The Padora and Karlah Dangri area of Patnitop exhibited the values of solid waste generation in between these two extremes (Table: II). The overall compilation of solid waste generation data revealed that total solid waste generation on an average was observed to be 24156.7 g/day (24.2 kg/day) at this rate of generation average solid waste generation per

week, per month and per year was calculated to be 169.4kg /week , 726kg /month and 8833kg/year respectively. Study of the present scenario of solid waste management at different sites of Patnitop revealed that due to lack of proper waste management strategy in the study area, tourist and owners of the different commercial units usually used to dump their waste in open surrounding which effect the surrounding environment of the study area and very occasionally the waste is collected by the Patnitop development authority by means of vehicle for transportation to the disposal site. At present there is no treatment plant and disposal site allotted for the waste disposal. Patnitop development authority has also installed dust bins at different location of the study area but majority of tourist do not use dustbins they litter their waste in open. Patnitop development authority used to collect waste from the study area after 3 to 4 days and carry to Udhampur near Jakahni where it is disposed off along the roadside, so there is dire need for the proper waste management on scientific basis. In order to protect the fragile ecosystem of the study area it is also necessary to established awareness campaign regarding the harmful impact of open dumping waste.

During the present study it has been also noticed that most of the general public is not well acquainted with selective collection, recycling and composting The waste generated from different commercial units must be properly segregated into Biodegradable and Non-biodegradable waste, so that proper remedial measures can be taken for proper management of solid waste otherwise if proper steps for the solid waste management are not taken then this would be able to create harmful impact on the surrounding environment.

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