

Analysis and Effect of Plastic and Biomedical waste on Rajouri Town, Jammu and Kashmir, India

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ABSTRACT: Increasing population levels, improved living standards in the community and growth of hospitals and health centers have led to the generation of biomedical waste in Rajouri Town. But due to carelessness and backwardness among some people plastic waste is generated to a great extent. Management of Biomedical and Plastic wastes is one of the major environmental problems of Rajouri town. Improper management and no proper study of these wastes have caused hazards to inhabitants. 90-95% of the waste is disposed of carelessly in open dumps, thus creating problems to the public health and environment. Present study aims at the analysis and effect of these wastes on Rajouri town. This paper aims at analysing the situation of pollution in this area; some remedial measures to control the pollution have also been suggested. Beside this, paper will also aware people of the area about the effect plastic and biomedical waste can have on the environment so that they can protect themselves accordingly. The study will also be useful for the authorities to improve the present system and help in the development of the Rajouri town

KEYWORDS: Plastic, Biomedical, Rajouri, Waste, Pollution, Management.

I. INTRODUCTION

Plastic have become an indispensable part of over daily life. Development of plastics has come from the use of natural plastic materials like chewing gum, shellac to the use of chemically modified natural materials like rubber nitrocellulose, collagen and finally to completely synthetic molecules e.g Bakelite, epoxy and polyethylene. On the other hand Biomedical waste refers to any waste which may be solid or liquid including the container and immediate product generated during diagnosis or treatment of human beings or animal or during research involving testing of organisms.

Plastic becomes waste because of lack of collection and management. The throw away culture of plastic have resulted in polluting the environment to a great extent. The biomedical waste is even dangerous. As per WHO (1998[1]) report 5000 people per year die due to infectious diseases. (Chaurasia et al 2009[2]) states that most of the Indian hospitals don't follow the rules framed by Indian Government for Biomedical waste. These wastes are released from hospitals and health centers. Since hospitals and solid wastes are growing at a faster rate, the numbers in death rate could increase.

Present study aims at the analysis and effect of these wastes on Rajouri town. This paper will be useful in analysing the situation of pollution in this area; some remedial measures to control the pollution have also been suggested. Beside this, papers will also aware people of the area about the effect plastic and biomedical waste can have on the environment so that they can protect themselves accordingly. Figure 1 and Figure 2 shows the biomedical waste plastic and respectively.

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Fig (1): Biomedical waste



Fig (2): Plastic waste

II. STUDY AREA

Rajouri used to be part of Poonch district but on 22 September 1967 it was separated from Poonch district and on 1st January 1968 it was officially declared as the separate district covering an area equal to about 2630 sq km. Rajouri town covers an area of 386 km². As per survey of India Rajouri lies between latitudes 33°00'00" & 33°03'20" North and longitudes 74°00'00" & 74°04'30" East. It is located at an elevation of about 562-4800m above mean sea level and is surrounded by famous Pir-Panjal hills. Rajouri town is the head quarter of the Rajouri district. Rajouri district is located in the south western part of state of Jammu and Kashmir. Rajouri town is located on the Jammu Poonch highway, 154km away from Jammu and about 85 km away from Poonch district. Rajouri is bordered by Poonch, Mirpur (Pakistan occupied Kashmir), Udhampur and Jammu districts. The river flowing through Rajouri town comes from Darhal and Thanamandi, meeting each other near Darhali Bridge at Kheora. Rajouri town also experiences snow fall in Dec 2012. Temperature on the average varies from 7 degree Celsius to 40 degree Celsius. The average annual rainfall is 769 mm. Figure 3 shows Map of Rajouri town.

Plastic is dumped carelessly mostly near the water bodies or side of road or sometimes even near the houses. Biomedical waste is generated from the hospitals and health centers. In all Rajouri have one district hospital located at Kheora area of Rajouri town, this hospital was constructed recently. Old hospital is also functional to some extent located at Gujjar mandi area. A health center in Jawahar Nagar area has also been established. Few testing laboratories are also in function in this area. Population of the town as per census 2011 was 41,552. In this paper district hospital Rajouri was chosen for the data observation of biomedical waste and plastic waste impact was studied in different areas

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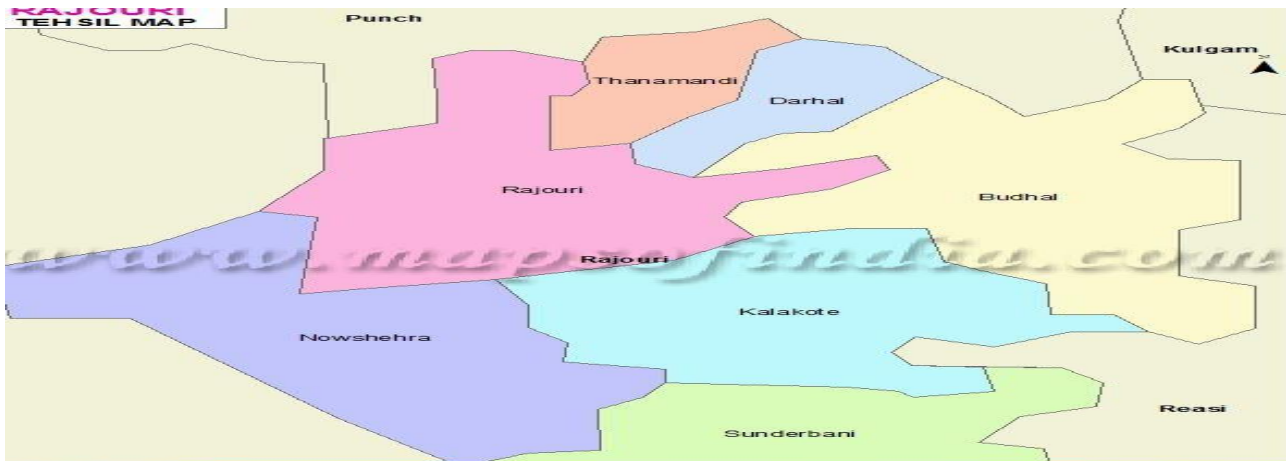


Fig (3): Rajouri and its adjoining areas

III. WASTE DISPOSAL

Following are methods commonly adopted for disposal of Biomedical and plastic wastes:

Landfills: Land filling is one of the most common and economical method adopted at a particular site for the disposal of any solid waste. Careless and unsatisfactory land filling is being practiced in many countries which are at developing stage (S. Goorah, et. al[3])

Waste piles: - This method is used when insoluble and non flowing hazardous waste gets accumulated. Piles serve as temporary or final disposal.

Incineration: - It is a controlled combustion process for burning wastes in presence of excess oxygen at high temperature of more than 1000°C to produce gases and residue containing non-combustible material. Advantage of this method is that original Combustible waste is reduced by 80-90%. This method is mostly adopted for disposal of biomedical waste.

IV. DATA COLLECTION AND ANALYSIS

Samples of waste from district hospital were collected and analysed for three months. Wastes were collected from all the rooms of hospitals including operation theatre, children ward, ENT, blood bank, casualty ward, General wards, x ray rooms etc. After that they were separated into biodegradable and non biodegradable waste and then were weighted. The average solid waste generation per bed in a ward was also calculated and sampling was done after one week in 3 months.

Plastics are mostly dumped on the sites. They were collected randomly near the road sides and near the houses and were weighted in a spring balance. The purpose for weighing plastic was to get an idea as how much plastic was disposed carelessly per kg/2 day in the town and how much plastic was there near the water bodies. Plastic near the water bodies was weighed separately

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V. RESULTS AND DISCUSSIONS

1. PLASTIC WASTE

The plastic waste collected from different sites of the town was weighed using a weighing Balance and has been shown in figure 4

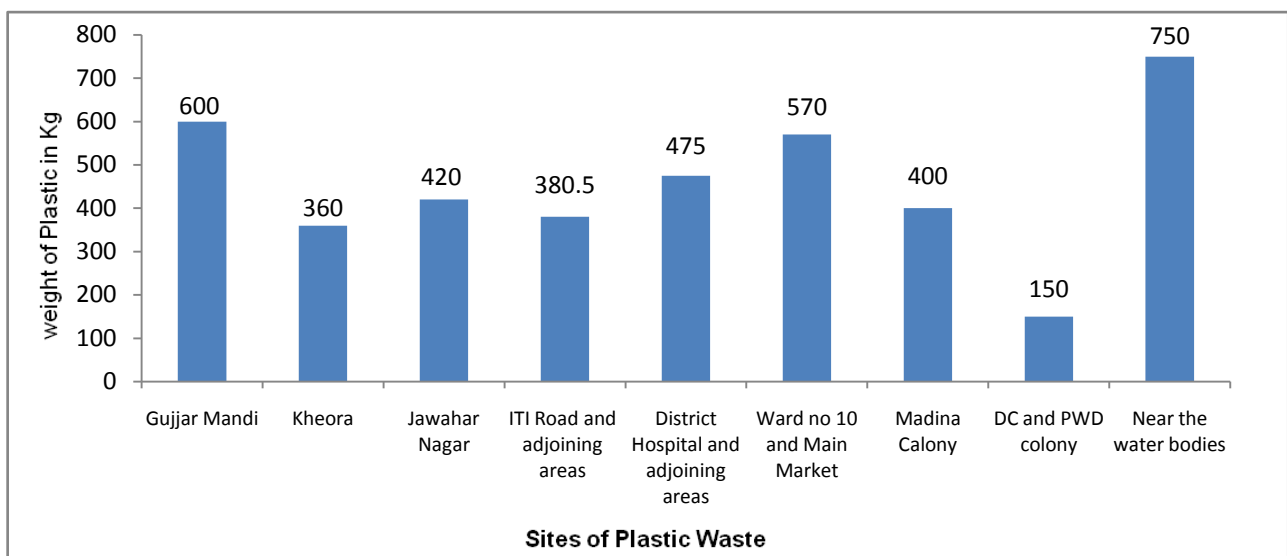


Figure 4: Showing plastic waste kg/ 2 day in different areas of Rajouri town

It was found that waste was maximum near the water bodies because most of the waste is disposed off into the water bodies. As a result water becomes polluted and is unfit for use. After that plastic waste was dominant in Gujjar mandi and market area, this is so because it is a commercial area. Since hospital is a public area and it was not far behind from the area being polluted as a result of plastic waste. Since DC colony and PWD colony is administrative area and people living over there are educated and aware of the consequences plastic waste can have on the health.. Understandably waste disposal in this area is low. Plastic Waste has affected this area a great deal. Littering of land by plastic bags has presented an ugly and unhygienic scene. It also has reduced the rate of rain water percolation resulting in lowering water table levels. Aquatic life have been affected a lot, as fish and other aquatic animals swallow plastic garbage mistaken as food items because most of the plastic waste is disposed in an unsatisfactory manner in water bodies. Animals have died eating carry bags. Soil fertility has been deteriorated as plastic bags form part of manure and remain in soil for longer period of time. Environment have been polluted as polythene bags if burnt release highly toxic gases like phosgene, carbon monoxide, chlorine, sulphur dioxide, nitrogen which effect environment oxide beside deadly dioxins

2. BIOMEDICAL WASTE:

After carrying out three months analysis of district hospital Rajouri, solid waste on the average generated per bed/day was 350. 54g and solid waste generated per bed/month was 10000.63g. Out of the biomedical solid waste generated 62.37 was biodegradable and 37.63 was non biodegradable shown in figure 5. Most of the biomedical waste is dumped in open sites in this area as there is no proper waste management. Biomedical waste. A report by the U.S. Agency for Toxic substances and Disease Registry (1990[4]) concluded that the general public is not likely to be adversely affected by biomedical waste generated in the traditional healthcare setting. They found, however, that biomedical waste from those settings may pose an injury and exposure risks via occupational contact with medical waste for doctors, nurses,

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and janitorial, laundry and refuse workers. Since the waste is not disposed of in an efficient manner all the living beings of the area are affected (S. Gray[5])

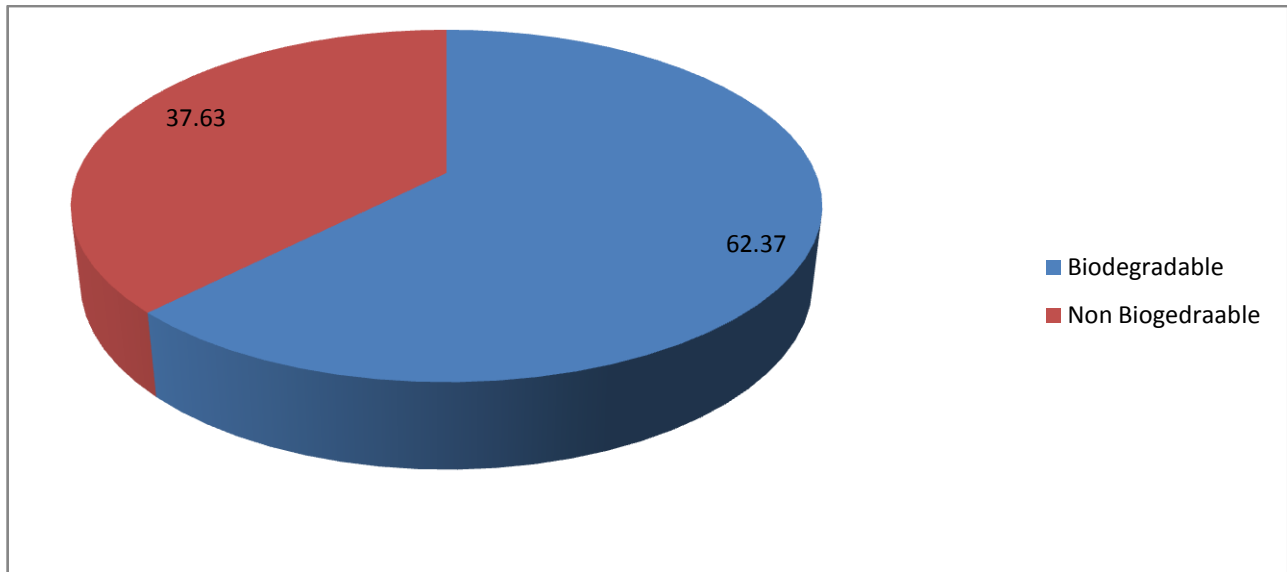


Fig (5): Biodegradable and Non Biodegradable biomedical waste

VI. RECOMMENDATIONS AND SUGGESTIONS

Biomedical waste must be properly managed and disposed of to protect the environment, general public and workers. Handling must give the waste secure for consequent management and dumping. There are numerous management methods that can complete these goals. The goals of biomedical waste management are to eradicate the waste's hazards, and usually to make the waste unrecognizable. Treatment should render the waste safe for subsequent handling and disposal. There are several treatment methods that can accomplish these goals. Incineration is the method which should be used to dispose of the biomedical waste. A proficient incinerator will annihilate pathogens and sharps. Supply resources are not decipherable in the ensuing cinders.

As far as plastic waste is concerned land filling is the best method for its disposal provided it is done in an efficient way. A landfill should be located far away from town centre and waste should be collected thrice in a week and be disposed of there in a scientific way. Government agencies and district administration should also aware the uneducated people about the affect these wastes can have on human health. One such landfill be proposed on Poonch Rajouri highway near thandi kassi.

VI. CONCLUSIONS

About 62.37 of the biomedical waste were biodegradable and 37.63 was non biodegradable. Since it is found to be dangerous for health, hospital breeding biomedical wastes should net essential running amenities to guarantee suitable management of wastes so as to curtail risk of disclosure to employees, patients and the public to biomedical dangers. Protected and efficient supervision of bio medical waste is not only a official requisite but also responsibility of general public. Incineration is the method suggested for disposal of biomedical waste.

Plastic waste was dominant in Gujjar mandi and market area, this is so because it is a commercial area. So a landfill need to be constructed away from the main town center in order to make the town pollution free. If this is followed plastic being recycled material can be used for many purposes.

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