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SOLID WASTE MANAGEMENT: A CASE STUDY OF BHADERWAH TEHSIL

PAYALDEEP KOUR

ABSTRACT

The growing problem of solid waste generation is noticeable not only in urban area but also in rural areas where the waste is not well managed. Although the waste generated is in small quantity, its impact is large. The term solid waste is defined as demolition waste, industrial waste, mining residue, municipal garbage, sewage sludge etc. A material becomes a waste when the owner or generator of the material discards it without expecting to be compensated for its inherent value. The present paper attempts to understand the pattern of solid waste management in four villages Thnala, Sungli, Chinta and Khellani of Bhaderwah tehsil of Doda district of Jammu and Kashmir by using primary data. Different problem can be seen in these villages related to solid waste.

KEY WORDS: Solid waste management, dumping, hazardous waste etc.

INTRODUCTION

The growing problem of solid waste generation is noticeable not only in urban area, where large quantities of wastes are produced due to overcrowding of population and rapid industrialisation but also in rural areas where the waste is not well managed. In such a case, although the waste generated is in small quantity, has its great impact. The term solid waste is defined as demolition waste, industrial waste, mining residue, municipal garbage, sewage sludge etc. A material becomes a waste when the owner or generator of the material discards it without expecting to be compensated for its inherent value. In the early days, before the advent of industrial revolution, the major constituents of solid wastes was domestic refuse which was biodegradable in nature
The term "waste" has been defined differently by various scholars and thinkers such as-

Kharbanda and Stallworthy have mentioned that the term waste is partly of French origin "wast" and based on Latin word 'Vastus" which means- unoccupied, uncultivated. They have given the different meaning of the word such as desert, to municipal waste etc.

P.K. Patrick defines solid waste as any refuse or waste material, including semi-solid sludge, produced from domestic, commercial or industrial premises or processes including mining and agricultural operations and water treatment plants etc.

Types of solid waste-

There are mainly three types of solid waste-

-Municipal waste -Hazardous waste -Hospital waste

Municipal waste includes household waste, sanitation residue, waste from streets, agricultural waste etc. This waste is generated mainly from residential and commercial complexes.

Hazardous waste includes- a) Industrial waste as they may contain toxic substances in the form of chemicals, paper, rubber dye etc. b) Certain types of household wastes are also hazardous such as old batteries, shoe- polish, paint-tin etc. c) Hospital waste include contaminated chemicals.

Hospital waste includes sharp solid waste, disposable anatomical waste, disposable syringes, discarded medicines etc.

SOLID WASTE MANAGEMENT:

Solid waste management is a term that is used to refer to the process of collecting and treating solid wastes. It also offers solutions for recycling items that do not belong to garbage or trash.

Solid waste management

As long as people have been living in settlements and residential areas, garbage or solid waste has been an issue. Waste management is all about how solid waste can be changed and used as a valuable resource. Solid waste management should be embraced by each and every household including the

business owners across the world. Industrialization has brought a lot of good things and bad things as well. One of the negative effects of industrialization is the creation of solid waste.*According to Britannica,* "Solid-waste management, the collecting, treating, and disposing of solid material that is discarded because it has served its purpose or is no longer useful. Improper disposal of municipal solid waste can create unsanitary conditions, and these conditions in turn can lead to pollution of the environment and to outbreaks of vector-borne disease—that is, diseases spread by rodents and insects."

OBJECTIVES OF THE STUDY:

The objectives of my study are as follows:

- To study the nature and extent of solid waste generated at the household level in the Bhaderwah tehsil.
- To study the various methods of solid waste management in the village Thanala, Sungli, Chinta and Khellani of Bhaderwah
- To study the quantity of solid waste management generated per day in the study area.

DATABASE AND METHODOLOGY:

The quantitative information about any element is known as data. It is expressed in numerical form. There are two types of data-

- Primary data– which are collected for the first time and all thus original in characteristics.
- Secondary data-which are collected by some other agency and are available in publications such as journals, books, census etc.

Methodology is a systematic, theoretical analysis of the methods applied to a field study. Methodology used in the solid waste management and its impact on public health can be classified in two ways-

- Methodologies for data collection.
- Methodologies for data analysis.

Data collection:

Thnala, Sungli, Chinta, Khelleni villages of Bhaderwah are selected for this study. This survey was based on primary as well as secondary sources collected from field research in the village and the district census handbook respectively. An interview schedule with close ended was used to know lifestyle, attitude and perception of the local people towards waste, its management and their role in it. It also tried to know about how government is involved in waste management.

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Data analysis:

First of all sampling of the households was done.56 households were selected by random sampling method.
To collect information on various aspects of solid waste management local residents were interviewed.

For data analysis, statistical methods have been used which will provide empirical evidences for the study. In such method, percentage of each attribute has been calculated which can give a better picture of the whole scenario.
Multiple response analysis has also been used in my study.

ABOUT STUDY AREA BHADERWAH

Bhaderwah is a town in Doda district in the state of Jammu and Kashmir. Bhaderwah valley is located in the foothills of the Himalayan mountains. The town is endowed with natural beauty which tends to its nickname **Mini Kashmir.** Apart from having picture perfect scenic beauty due to beautiful forests the town contains many small streams flowing through its various parts. Bhaderwah is blessed with the pristine natural beauty which needs to be placed before the world to explore. Bhaderwah also known as **Nagon ki bhoomi** means **land of snakes**.

Bhaderwah Location Map

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Bhaderwah is enclosed with the hilly district Chamba of Himachal Pradesh from East, in the South lies tehsil Basholi and Ramnagar:in the west rests ,the Doda and Ramban tehsil which is divided from Bhaderwah boundary by famous river Chenab and in the north lies hilly tehsil of Kullu.

Data analysis:

Solid waste management is a term used to refer to the process of collecting and treating solid waste. Solid waste management has become one of a major concern in environmental issues. It is particularly true to urban areas where population is rapidly growing and amount of waste generated is increasing.

In context of solid waste management in the study area, we can say that due to its nearness to the urban area, the outlook of the village represent developed infrastructure with proper waste management but as we move in depth we can see the real image of the village Thanala, Sungli, Chinta and Khellani. The very basic necessity of every household i.e toilet is absent in many of the households. Further open defecation is very common in the village Thanala, Sungli, Chinta and Khellani. The role of government in terms of solid waste management is also negligible.

From the socio-economic survey conducted at village Thanala, Sungli, Chinta and Khellani, following observations have been made-

For waste collection different types of containers can be used such as plastic containers, open container etc. In village Thanala, Sungli, Chinta and Khellani the percentage of different types of containers used for waste collection has been shown by the following table-

VILLAGE WISE DUMPING PRACTICES WITHIN HOUSE IN BHADERWAH TEHSIL

VILLAGE	CLOSED CONTAINER	OPEN CONTAINER
THANALA	22.22%	77.78%
SUNGLI	70%	30%
CHINTA	61.54%	38.46%
KHELLANI	75%	25%

SOURCE: FIELD SURVEY, 2018

From the table it is clear that different villages used different dumping practices within the house. In Thanala only 22.22% of houses use closed container while in Chinta village maximum people use closed container i.e. 61.54% and only 30% households uses open container in Sungli. Whereas in Khellani village maximum 75% households use closed container. The variation in dumping practices is because in Thanala village maximum people were illiterate and due to lack of government initiatives. Sungli, Chinta villages condition were better than Thanala village. Khellani village was more developed and people were aware about the solid waste management.

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VILLAGE WISE DIFFERENT DUMPING PRACTICES OUTSIDE THE HOUSE IN BHADERWAH TEHSIL

VILLAGES	IN OPEN AREAS	IN DUMPING SITE	BURNING THE WASTE	OTHERS
THANALA	22.20%	0.00%	22.20%	100.00%
SUNGLI	0.00%	0.00%	70.00%	60.00%
CHINTA	0.00%	30.77%	53.85%	23.08%
KHELLANI	0.00%	0.00%	100.00%	45.83%

SOURCE: FIELD SURVEY 2018

From the above table it is clear that in Thanala village 100% households throw their garbage in water bodies, While in Sungli maximum 70% households burn their waste. In Chinta minimum 30.77% households dump their waste in dumping site. In Khellani maximum 100% households burn their waste. The reason behind this is lack of door to door services, lack of government involvement. In Chinta army has made a common dumping site for the villagers where they burn their waste.

VILLAGE WISE QUANTITY OF WASTE GENERATED PER DAY IN BHADERWAH TEHSIL

VILLAGE	0-2 KG	3-5 KG	MORE THAN 5 KG
THANALA	20.00%	15.00%	65.00%
SUNGLI	22.00%	19.00%	59.00%
CHINTA	17.00%	30.00%	53.00%
KHELLANI	26.00%	16.00%	58.00%

SOURCE: FIELD SURVEY, 2018

From the above table it is clear that in village Thanala maximum 65% households generated more than 5 kg waste. In Sungli and Chinta maximum 59% and 53% households respectively generates more than 5 kg waste. In Khellani minimum 16% households generates 3-5 kg of waste. The reason behind this is the size of families.

VILLAGE WISE TIME PERIOD FOR DUMPING THE WASTE CONTAINER IN BHADERWAH TEHSIL

VILLAGES	ONCE A DAY	ONCE IN 2 DAY	MORD THAN 2 DAYS
THANALA	66.67%	33.33%	11.11%
SUNGLI	40.00%	60.00%	0.00%
CHINTA	46.10%	46.00%	7.69%
KHELLANI	58.33%	41.67%	0.00%

SOURCE: FIELD SURVEY, 2018

From the above table it is clear that in Thanala village maximum people emptied their garbage from house once a day i.e. 66.67% people. In Sungli a minimum of 40% people emptied their waste once a day. In Khellani minimum 41.67% people emptied their waste once in 2 days. In Chinta maximum 60% people emptied their waste once in 2 days. The variation is due to different size of the household. Some families were nuclear while some were joint.

VILLAGE WISE SEPARATE DUSTBIN FOR KITCHEN IN BHADERWAH TEHSIL

VILLAGES	YES	NO
THANALA	0.00%	100.00%
SUNGLI	70.00%	30.00%
CHINTA	61.54%	38.46%
KHELLANI	75.00%	25.00%

SOURCE: FIELD SURVEY , 2018

From the above table it is clear that maximum 100% household does not use separate dustbin in kitchen while in Sungli and Khellani 70% and 25% household respectively doesnot have dustbin in their kitchen while here maximum people use separate dustbin in their kitchen. While in Chinta maximum 61.54% household use separate dustbin for kitchen, it is due to the difference in income level, unawareness of people which is responsible for this variation.

VILLAGE WISE SEPARATE DUSTBINS FOR DIFFERENT TYPES OF SOLID WASTE IN BHADERWAH TEHSIL

VILLAGE	YES	NO
THANALA	0.00%	100.00%
SUNGLI	40.00%	60.00%
CHINTA	15.38%	84.62%
KHELLANI	4.17%	95.83%

SOURCE: FIELD SURVEY, 2018

From the above table it is clear that maximum 100% households of Thanala, 60% households of Sungli, 84.62% households of Chinta village doesnot use different dustbins to separate biodegradable and non- biodegradable waste. In Khellani minimum 4.17% households separate the waste materials. The reason behind this is due to financial condition, lack of awareness among people, lack of government involvement etc.

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VILLAGE WISE TYPE OF WASTE MATERIALS RECYCLED IN BHADERWAH TEHSIL

VILLAGE	ALUMINIUM CAN	NEWSPAPER	PLASTIC CONTAINER	PLASTIC BAGS
THANALA	0.00%	0.00%	0.00%	0.00%
SUNGLI	70.00%	100.00%	80.00%	30.00%
CHINTA	30.77%	92.31%	53.85%	0.00%
KHELLANI	16.67%	87.50%	62.50%	8.33%

SOURCE: FIELD SURVEY, 2018

From the above table it is clear that no household is involved in recycling process in village Thanala. In Chinta maximum 92.31% households recycle newspaper. While in Sungli minimum 30% households recycle plastic bags. In Khellani maximum 87.50% households recycle newspaper. The reason behind this people awareness and government involvement about recycling in villages Chinta, Sungli, Khellani. While in Thanala village the scenario is totally different. Here lack of presence of kabadiwala, illiteracy among people and lack of government initiatives are the reasons behind this scenario.

VILLAGE WISE TYPE OF WASTE MATERIAL REUSE IN BHADERWAH TEHSIL

VILLAGE	ALUMINIUM CAN	NEWSPAPER	PLASTIC CONTAINERS	PLASTIC BAGS
THANALA	66.67%	11.11%	55.56%	33.33%
SUNGLI	10.00%	70.00%	70.00%	50.00%
CHINTA	15.38%	69.23%	69.23%	76.92%
KHELLANI	25.00%	75.00%	91.67%	66.67%

SOURCE: FIELD SURVEY, 2018

From the above table it is clear that maximum 55.56% households of Thanala reuse plastic containers. While maximum 70% households reuse newspaper and plastic containers in Thanala village. In Chinta minimum 15.38% households reuse aluminium can. While in Khellani maximum 91.67% households reuse plastic containers. The reason behind this is the awareness of people towards reuse of waste material.

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VILLAGE WISE SATISFICATION LEVEL OF SOLID WASTE MANAGEMENT IN BHADERWAH TEHSIL

VILLAGE	GOOD	AVERAGE	BAD
THANALA	0.00%	33.33%	66.67%
SUNGLI	0.00%	60.00%	40.00%
CHINTA	0.00%	76.92%	23.08%
KHELLANI	8.73%	75.00%	16.67%

SOURCE: FIELD SURVEY, 2018

From the above table it is clear that maximum people i.e. 66.67% people evaluate the solid waste management condition as bad in their village. While in Sungli maximum 60% people evaluate the condition as average. In Chinta 23.08% people evaluate it as bad. While in Khellani minimum 8.73% people evaluate it as good. The variation in the villages is due to different solid waste management practices, lack of government initiatives towards solid waste management. Also different development level in villages lead to different solid waste management condition in the villages.

VILLAGE WISE CHANGE IN ATTITUDE AFTER SWACHH BHARAT ABHIYAN IN BHADERWAH TEHSIL

VILLAGE	YES	NO
THANALA	0.00%	100.00%
SUNGLI	30.00%	70.00%
CHINTA	100.00%	0.00%
KHELLANI	100.00%	0.00%

SOURCE: FIELD SURVEY, 2018

From the above table it is clear that in Thanala village 100% households doesnot notice any change in the attitude among people. While in Chinta and in Khellani village maximum 100 % household notice change among people. The reason behind this is due to the unawareness among people regarding government schemes like Swachh Bharat Abhiyan and there not equally implementation of the schemes.

VILLAGE WISE AWARENESS REGARDING THE BANNING OF POLYTHENE BAGS IN BHADERWAH TEHSIL

VILLAGE	YES	NO
THANALA	0.00%	100.00%
SUNGLI	40.00%	60.00%
CHINTA	92.31%	7.69%
KHELLANI	87.00%	12.50%

SOURCE: FIELD SURVEY, 2018

From the above table it is clear that in Thanala village 100% people were unaware about the banning of polythene bags by government. While in Sungli 40% people were aware about the banning and in Chinta maximum 92.31% people were about the banning. In Khellani 87% people were about the banning of polythene bags. The reason behind this is that Thanala was the remotest area in Bhaderwah while other villages were more developed also lack of government and people participation in solid waste management.

CONCLUSION:

Our field study reveals that the characteristics of solid waste generated between different households in the study area does not vary to a great extent. The contents and components of solid waste generated are directly related to the socio-economic conditions and therefore the standard of living of the people. The area has capability to use modern equipment for maintaining and management of solid waste.
Following are the main conclusions that are drawn from the field survey:

- There is lack of proper management of solid waste.
- Lack of awareness among people regarding solid waste management.
- Narrow minded people and have traditional thinking.
- There is no municipal cooperation in the village. People have to manage the waste generated by them.
- There is no support from any government institution regarding waste management.
- Remoteness of the study area.
- Gram Panchayat do not aware local people regarding any health related policy and other policies.
- Even local people have lack of interest in the management of waste produced. They are ready to blame the government for not managing the waste but they also do not adopt the easy, economic methods for waste disposal such as construction of pits for dumping waste or to develop a waste collection site.
- Many peoples were unaware of the schemes launched by government like Swachh Bharat Abhiyan.
- Village Khellani peoples were educated and also they were involve in a group namely "UMMED" which also promote "SWACHH BHARAT ABHIYAN".

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2.9 PLATES:

Fig: Closed Container in Sungli

Fig: Open Container in Chinta

Fig: Waste Disposal in open area in Thanala Thanala

Fig: Waste Disposal in water bodies in

Fig: Contaminated water body in Sungli

Fig: Burning waste practice in Chinta (made by army)

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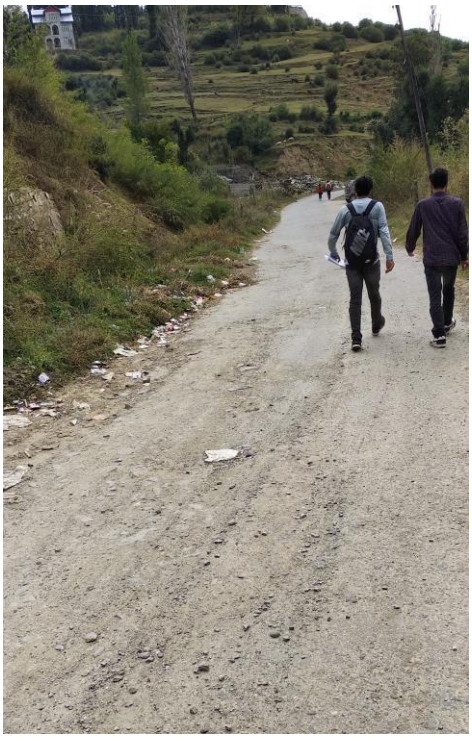

Fig: Open dumping on road in Sungli

Fig: Cleanliness in Khellani