



# An Assessment to Solid Waste Management System in the Rajshahi City Vodra Railway Slum Through Community Participation

Akanda Md. Raihan Gafur<sup>1,\*</sup>, Farhana Mahzabin<sup>1</sup>, Hafiza Nazneen Labonno<sup>1</sup>,  
A S M Mahmudul Hasan Rifat<sup>2</sup>, Mst. Nazneen Sultana<sup>3</sup>

<sup>1</sup>Department of Urban and Regional Planning, Rajshahi University of Engineering and Technology, Rajshahi, Bangladesh

<sup>2</sup>Department of Environmental Sciences, Jahangirnagar University, Dhaka, Bangladesh

<sup>3</sup>Department of Economics, National University, Dhaka, Bangladesh

## Email address:

raihanbuetiwm@gmail.com (A. Md. R. Gafur), raihanrue12@gmail.com (A. Md. R. Gafur)

\*Corresponding author

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**Abstract:** Better life is the first requirement of every people and for this a healthier environment is needed. Municipal solid waste is a serious environmental hazard and social problem in Bangladesh. But the Rajshahi city dwellers are not lucky for this because Municipal authorities acknowledge the importance of adequate solid waste collection and disposal as well as resource recovery. Therefore solid waste is indiscriminate by dumped on dumped in open spaces, streets, and drains, clogging the drainage system which causes serious health risks and degradation of the living environment. It has been found that about 170 tons of solid wastes of different types are being generated daily in Rajshahi. This paper aims to review the recent solid waste scenario in Rajshahi City Corporation. Finally, this paper will propose some probable measures for its management. Participatory Rural Appraisal approach (PRA) is applied to involve community people in solid waste management. This study to identify the existing condition of the solid waste management system by Resource map, Mobility map PRA tools and find out the problem by pairwise ranking matrix, cause-effect diagram PRA tools. There is also finding out possible solutions to a solid waste management system by SWOT analysis and Dream map. Findings from the study show that the Municipality, which is the sole provider of the solid waste management services neither performed this service efficiently nor fully involved the community to support it. This study thus underscores the importance of community participation by bringing together the Municipality and the local community in the participatory forum to discuss solid waste management problems and suggest appropriate solutions.

**Keywords:** Municipality, Community, PRA, Solid Waste, Environment, SWOT, Management

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## 1. Introduction

Despite the countless technological advancements that have been publicly chronicled, solid waste management is one of the major difficulties facing humanity in modern times. One of the effects of globalization is an increase in the volume of solid garbage. In 1990, around 1.3 billion metric tons of municipal solid trash were created worldwide [10].

Bangladesh is a densely populated country, with a

population of almost 17 cores expected by 2020. Municipal solid wastes generate an enormous environmental threat and a social concern in cities like Bangladesh. Every day, a vast amount of solid trash is generated in urban areas, and sadly, solid waste management is deteriorating day by day due to a lack of resources to handle the increasing rate of garbage generation [8].

Urban waste management is regarded as one of the most pressing and significant environmental issues facing Bangladeshi municipalities. Municipal governments are the

sole government agencies dealing with this issue. In the fields of culture and education, Rajshahi has a well-deserved reputation. It's an old city with a lot of interesting locations to visit. The city is growing in size as the population grows. Its territory was only 12.96 square kilometers in 1876, with a population of only 10,000 people; by 2012, it had grown to 96.72 square kilometers, with a population of over nine lacs. Citizens' amenities, on the other hand, are not upgraded to keep up with a population that causes pain to its residents. The legislative structure isn't backed up by prompt enforcement [5].

Rajshahi is a poor City Corporation in comparison to others, and one of the problems it faces is the management of municipal trash. Inadequate waste management is primarily to blame for the city's environmental pollution. Every day, the city's industries, factories, markets, health centers, and households generate massive amounts of waste. Due to a lack of labor and technology, the Rajshahi City Corporation is unable to carry out its operations of disposing garbage or properly storing them. People have developed the habit of strewing their trash around to save money, time, and effort. In Rajshahi City, approximately 350 tons of rubbish are created each day, with the number increasing to 400 tons during the summer, with 12 tons of hazardous waste being handled. Only 210 tons of the entire collected wastes are put in a landfill, while the remaining 140 tons are discharged directly into sewers, aquatic bodies, and open places [7]. The majority of these are dumped next to institutions without being properly managed. The vast majority of rubbish is gathered in an unorganized manner on the city's outskirts [5].

A major portion of the population do not get waste collection services and only a minor amount of the generated wastes is collected by door-to-door collection system introduced in the late '90s. However, the MSW management system is still in developing stage due to lack of motivation, awareness, commitment, expertise, as well as money and a considerable portion (40-60%) of wastes, are not properly stored, collected, or disposed [7].

A major portion of the population do not get waste collection services and only a minor amount of the generated wastes is collected by door-to-door collection system introduced in the late '90s. However, the MSW management system is still in developing stage due to lack of motivation, awareness, commitment, expertise, as well as money and a considerable portion (40-60%) of wastes, are not properly stored, collected, or disposed. Solid waste management at the community level is very important. Proper solid waste management is considered as an important function to determine the urban lifestyle. But, in the context of Rajshahi City Corporation, this essential service is not efficiently and properly performed by the local bodies and the people are not aware of this problem [7].

In countries like Bangladesh Municipal solid wastes creates an incredible environmental hazard and social problem in city lives [4]. A huge volume of solid waste is generated from day to day activities but unfortunately, the waste collection and management system is very poor in the

major cities. Door to door waste collection system has been initiated in the cities but it is not sufficient for overall waste management. Solid waste management at the community level is very important. If the solid waste of the individual community can be managed properly, the solid waste of the overall city will be properly managed automatically. But, in the context of Rajshahi City Corporation, this essential service is not efficiently and properly performed by the local bodies and the people are not aware of this problem [7].

The objectives were to identify the present status and problems of the solid waste management system, assessing the possible solutions to manage the wastes at the community level, finding problems regarding waste, and formulated recommendations with the involvement of local people. This study finds out the present status of solid waste management conditions and identifies the problem and possible solution in the context of Rajshahi City Corporation based on Participatory Rural Appraisal (PRA) approach. A small community of ward no 26 of Rajshahi City Corporation has been selected for this study. These selected study areas are prepared social and resources map. A historical timeline study is an important tool of Participatory Rural Appraisal (PRA). According to this tool, major historical community events are dated and listed. There are many resources available in this area. Among those resources, the mosque, ponds, shops, ponds, roads, drains are significant incorporate to resources map which are related to solid waste in the study area.

## 2. Literature Review

Community as a group of people who live in a certain geographical region, such as a village or district, and who share some shared values, may encounter comparable challenges, and share some common facilities, despite having varied backgrounds, experiences, and talents [11]. The concept of participation is widely used in the theory and practice of development but it is clear that perception of participatory approach varies considerably [12]; Toner and Cleaver (2005) argue that participatory and community-driven approaches are claimed to offer improved equity, sustainability, and effectiveness in development activity; specifically, they empower the power in collective activities which concern their lives [18]. World Bank (1994) defines "participation as a 'process, through which stakeholders influence and share control over development initiatives, decisions, and resources which affect them'. Participation involves a significant number of persons in situations or actions, which enhance their well-being. It is being often used synonymously with community work, community development, and community mobilization. It can represent both community-based organizations, operating as civil society non-profits, and also as a function of organizing within communities defined by geographical location, shared workspace, and/or shared experience or concerns. Community organizing is a democratic instrument to create sustained social change".

Solid waste management is a discipline concerned with the

management of municipal solid waste generation, storage, collection, transfer, processing, and disposal in accordance with the best principles of public health, economics, engineering, aesthetics, and other environmental issues [13]. In developing countries, solid waste management is considered to be one of the most serious environmental problems confronting most urban areas [16]. Maya and Thomas (2007) pointed out that different people according to their cultural context define community participation in communal activities differently [14]. This is emphasized more by Njau and Mruma (2004) who assert that community participation means involving people; men and women in the development process as active participants and not as passive recipients at all levels [15]. Peck and Scott (1998) also defined community participation as the process by which individuals and families understand the responsibility of their health and welfare of societies.

Participatory Rural Appraisal (PRA) is considered one of the popular and effective approaches to gather information in rural areas. This approach was developed in the early 1990s with the considerable shift in paradigm from top-down to bottom-up approach, and from the blueprint to the learning process.

Participatory Rural Appraisal (PRA) is one of the most widely used and effective methods for gathering data in rural regions. This method was created in the early 1990s, following a significant paradigm change from top-down to bottom-up thinking, and from the blueprint to the learning process. Participatory rural appraisal is a method of incorporating rural people's knowledge and opinions into the planning and implementation of development projects and programs. This resulted in a surge in the creation of tools that allowed rural residents to examine their problems, set their own goals, and track their progress. PRA brings together locals and visitors from various fields and disciplines. Locals benefit from outsiders' assistance in gathering and analyzing data, developing critical self-awareness, accepting responsibility, and sharing their knowledge of life and situations in order to plan and act. Mapping and modeling, transect walks, matrix scoring, seasonal calendars, trend and change analysis, well-being and wealth ranking and grouping, and analytical diagramming are examples of participatory methodologies. PRA applications include natural resources management, agriculture, poverty, and social programs, and health and food security [3].

MSW refers to the stream of solid waste (sometimes known as "trash" or "junk") generated by households, apartments, businesses, industries, and organizations. MSW includes materials including product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, paint, and batteries, among other things. It does not include hazardous or radioactive wastes from medical, commercial, or industrial sources, which must be handled separately [6].

Solid wastes are all wastes that are generally solid and are abandoned as worthless or unwanted as a result of human and animal activity. The quantity and complexity of garbage

generation has increased as a result of economic expansion, urbanization, and improved living conditions in cities. Rapid population increase and industrialization impair the urban environment and put significant strain on natural resources, undermining equitable and sustainable development. Due to a lack of passion, consciousness, loyalty, and money, municipal corporations in developing nations are unable to handle increasing volumes of trash, and a large amount of waste is not adequately kept, collected, or disposed of in the correct places for ultimate disposal. It is necessary to aim toward a long-term waste management system that is environmentally, institutionally, financially, economically, and socially sustainable. Integrated management and safe disposal of Municipal Solid Waste can be found in reference in less developed Asian countries [9].

Individuals and families realize their responsibility for their own health and the welfare of society through community involvement. The community should be sufficiently driven to solve its own problems. As a result, instead of being passive recipients of development aid, they might become active participants in their own development. [19]. Citizens' collaboration is critical to the success of any solid waste management system in any city. Citizens should be involved in proper garbage collection, storage, and disposal. The phrase "community engagement" in the context of solid waste management refers to the beneficiaries' active and meaningful involvement in solid waste management. The community's involvement is usually confined to activities related to the primary collection of domestic waste. Managing garbage within the family and removing it from the premises, lowering waste production, promoting recovery for the purpose of recycling, and keeping public spaces around the neighborhood clean are some of the most typical responsibilities that communities can play [17]. According to Howlett and Nagu (2001), one of the most important aspects of success is involvement. It has been linked to increased mobilization of policy and project ownership, increased efficiency, understanding, and social cohesion, more cost-effective services, greater transparency and accountability, increased empowerment of the poor and disadvantaged, and strengthened people's learning and acting capacity [22]. However, other actors such as municipal authorities, Community Based Organizations (CBOs), micro-enterprises, and local leaders have a role in the effectiveness of community participation in solid waste management. Municipal governments, in particular, play an important role because, in most developing countries, local governments are responsible for fundamental services such as garbage collection and disposal, as well as the implementation and enforcement of environmental legislation [21]. Community-Based Organizations can also engage in activities such as encouraging the reuse and recycling of materials, hiring waste collectors, collecting waste removal fees, and negotiating with local governments [20]. Local nongovernmental organizations (NGOs), community-based organizations (CBOs), or local associations such as Resident Welfare Associations (RWAs), Women's Associations, and

youth clubs are examples of these organizations. They frequently employ simple equipment and labor-intensive methods, allowing them to collect rubbish in areas where large-scale waste collection vehicles are unable to access; they may be begun by community members seeking to improve the immediate environment of their homes. Experiences from other parts of the world show that urban waste can be successfully recycled if properly planned and performed. In small-scale composting operations, cooperatives and non-governmental organizations are actively involved in trash collecting and separation. CBOs have emerged with a waste collection, separation, and composting component [10].

In Railway Vodra Bazar slum, a large portion of solid waste is generated from households and Bazar. These wastes are dump in mainly beside their houses. And these wastes are collected by municipal trucks. With the help of a mobility map tool, it will be easy to understand the waste collection system.

From the mobility map, it appears that waste is generated from households and Bazar. People are too much dependent on roadside dumping. People go each day to these places to dump their waste. Again household waste also dumps on open space, nearest house, and RUET boundary. But dependency on dumping waste on these places is low and frequency is one day in a week. Wastes of the roadside dumping are collected by municipal waste collecting trucks each day. But the wastes which are dumped beside the houses are not collected by anyone. Those wastes are not moved in any place.

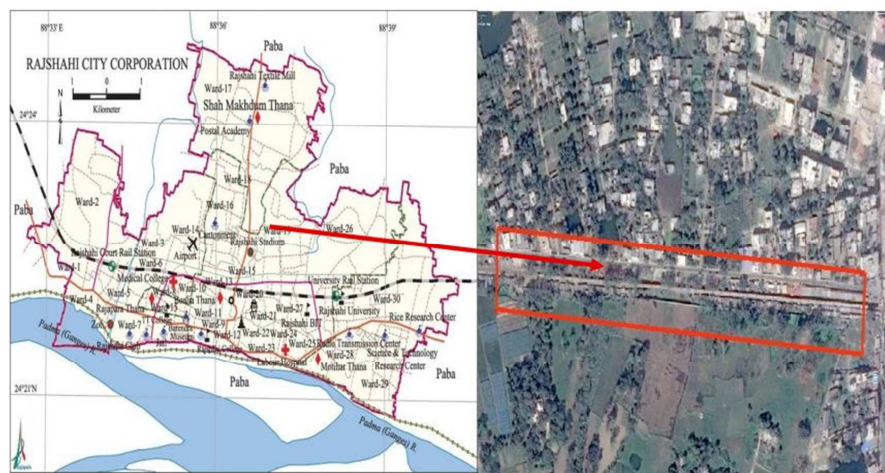
### 3. Methodology of the Study

Two types of data from both primary and secondary sources were collected for this study. The primary data are collected by using PRA tools are mainly maps. There are many PRA tools used in this study from a different perspective. These are Mobility Map, Pair Wise Ranking, Cause-Effect Diagram, and SWOT analysis. To know more

about problems a focus group discussion was made. After collecting all data, data was analyses. No software is used to analyses the data. The secondary sources were BBS, Google earth, a different type of policies, case studies, journals, etc. From the BBS mainly population size, density, and socio-economic condition data were taken and from Google earth mainly maps were taken. From the study, we will get information about problems related to solid waste management and some solutions to overcome the problems. In this study to identify the existing condition of the solid waste management system by Resource map, Mobility map PRA tools and find out the problem by pairwise ranking matrix, cause-effect diagram PRA tools. There is also finding out the possible solution of a solid waste management system by SWOT analysis and Dream map.

### 4. Study Area Profile

A major problem in Rajshahi City Corporation is solid waste management. This problem is the main problem in some ward of Rajshahi. Among them, ward 26 is one of them. The Vodra rail line slum area was selected as a study area. The latitude and longitude of the area are 24°22'36.32"N and 88°37'4.81"E, respectively [1]. The area is just beside the Padma Residential Area and RUET. The rail line goes through the slum area. On its north side there is Padma Residential Area, south side there is RUET and the Vodra Bus Stand. On the west side, there is the Vodra Kacha Bazar and Rajshahi Railway Station. The red marked area on the map is our study area. This area is on both sides of the rail line of about half km. In the Vodra railway slum of the ward, no 26 has an acute waste management problem such as open sanitation, disposal of wastes from the city corporation as well as the local wastes but no waste dumping. Yet no study has been done with this area. According to BBS, the population is increasing in this area which creates a large amount of solid waste. But the slum's condition is very worse and the management system is also very poor [2]. So this area is selected as the study area.



(Source: Google Earth)

**Figure 1.** Study area map of Vodra Rail line slum.

## 5. Result and Discussion

### 5.1. The Present Status of the Solid Waste Management System

#### 5.1.1. Solid Waste Generation

Vodra rail line slum is an area which is just nearby the Dhaka-Rajshahi railway. Again a kacha Bazar and a residential area are located in this area which is also a place of human activity. So a large amount of human activity takes place daily in this area. The generation of solid waste in urban areas is an obvious result of human activities. Solid waste is generated by different types of human activity.

Due to a huge human activity, a lot amount of waste is created here. This area is mainly residential. Household waste is the main source of solid waste generation. There is a kacha Bazar which is another source of solid waste. But its influence is low in Solid waste is created from mainly two sources. So the sources are household waste.

Household waste: The main sources of solid waste are houses. It is generally generated by our day to day activity. According to the key informant, about 90 percentages of solid waste is generated from the households of this area. Different type of organic and inorganic waste is generated from these houses. Among them kitchen waste is significant. Other wastes are cans, bottles, clothing, rubbish, newspapers, magazines, food packing, etc.

#### 5.1.2. Disposal Pattern

To analyses the disposal pattern, we use the PRA tools transect walk. From the transect walk, it is clear that no

dustbin is available in this area. Municipal waste collecting truck comes in the morning to collect waste. These trucks don't provide door to door services. The truck only goes through main roads. So people have to dump waste beside the main road. Sometimes people dump their waste beside the house. And the people living beside the boundary of Rajshahi Engineering and Technology University dump their waste inside the university. So it is found that waste dumping mainly occurs in two places. These are the home side, on the rail line dumping, dumping inside the university.

#### 5.1.3. Solid Waste Collection and Transportation System

In Vodra Bazar slum, a huge amount of solid waste is generated. These wastes are dump in mainly beside their houses. And these wastes are collected by municipal trucks. With the help of a mobility map tool, it will be easy to understand the waste collection and transportation system. Most of the waste is generated from households. People are too much dependent on roadside dumping. But dependency on dumping waste on these places is low and frequency is one day in a weak. Wastes of the roadside dumping are collected by municipal waste collecting trucks each day. But the wastes which are dumped beside the houses are not collected by anyone. Those wastes are not moved in any place.

### 5.2. Problems of a Solid Waste Management System

#### 5.2.1. Identification Problem and Ranking

It is stated that the area is affected by much solid waste management's related problems.

Table 1. Pairwise ranking matrix.

	Natural Disaster	Poverty	Awareness less	Poor Sanitation system	No drainage system	Lack of education	No particular disposal point	No dumping system	Frequency	Rank
Natural Disaster	×	2	1	4	5	1	7	1	4	3
Poverty	1	×	3	2	5	2	7	8	2	5
Awareness less	1	3	×	4	5	6	7	3	2	5
Poor Sanitation system	4	2	4	×	5	6	7	4	3	4
No drainage system	5	5	5	5	×	5	7	5	6	2
Lack of education	1	2	6	6	5	×	7	8	2	5
No particular disposal point	7	7	7	7	7	7	×	7	7	1
No dumping system	1	8	3	4	5	8	7	×	2	5

Source: Field survey, 2017

To find out the overall representation of the problems the participants, managed by the Community, The participants were asked to identify the solid waste management related problems in their locality.

Eight problems have been identified which are faced by the local peoples in their daily life. The problems identified are-

- Natural Disaster
- Poverty
- Awareness less
- Poor Sanitation system
- No drainage system
- Lack of education

g) No particular disposal point

h) No dumping system

After the identification of the problems each of the problems has been compared with one another and an overall ranking of the problems has been developed with the help of the participants. The problems and the ranking based on the frequency are then summarized in a pairwise matrix for better understanding. The ranking of the problems is as follows-

- No particular disposal point
- No drainage system
- Natural Disaster
- Poor Sanitation system

### 5.2.2. Cause and Effect of the Problems

To identify the ranking of the top four problems was discussed with the local participants and the causes and

effects of the problems were identified. The causes and effects of the problems are potted in the cause-effect diagram.

Table 2. Cause-effect diagram.

Effect	Water Logging	Poor livelihood	Non-hygienic Environment	Creation of bad odor	Breeding of insect	Not conscious about Environment	Discharge Creating in daily life	Gathering waste for a long time	Sickness
	↑	↑	↑	↑	↑	↑	↑	↑	↑
Problem	No Waste Management System								
	↑	↑	↑	↑	↑	↑	↑	↑	↑
Cause	Natural Disaster	Poverty	Awareness less	Poor Sanitation system	No drainage system	Lack of education	No dustbin	No particular disposal point	No dumping system

Source: Field survey, 2017.

The problem was having no waste management system in this area. So the number of cause-effect occurs in this area. Natural disaster main cause of the creation of solid waste. The problem was Natural disasters in the locality. When a natural disaster occurs then destructive house and property damage. As a result, many wastes have created This results in overall environmental degradation in the area. The effects of natural disasters are creating waterlogging and it also creates bad odor generated from the stored waste of several days in this community.

Poverty is another cause of a solid waste management system. The maximum people live below the poverty line. That's why they are living in poor livelihood. So they are not aware of the solid waste management system.

In this community, maximum people awareness less about particular places disposes of solid waste. They are scattered ways to dispose solid in this community. Due to creating a non-hygienic condition in the environment.

Poor sanitation systems one of the causes to create solid waste in this community. They are not properly using the latrine. As a result, many diseases occur in this community. It also creates bad odor generated from solid waste. The problem was about the tendency of poor Sanitation systems of household waste this is because of the lack of sincerity of Rajshahi City Corporation. Again there is a lack of space to establish sanitation in the area.

In this community maximum people illiterate. They have no knowledge about the solid waste management system. For this reason, they are disposing of waste open space and beside the house. They are not conscious of the environment.

The cause was having no dustbin in the area. Rajshahi City Corporation is not sincerity about solid waste management in the slum area. Again there is a lack of space to establish dustbin in the area. This problem results in frequent waste

dumping on the roadside and this also creates a problem while collecting the waste.

The cause was having no particular disposal point in the area. Basically, this is because of the lack of sincerity of Rajshahi City Corporation. Again there is a lack of space to establish a particular disposal point in the area. This problem results in frequent waste dumping on the roadside. For this reason, many wastes are gathering a long time in open disposal point.

The cause was about the open drainage system in the locality. There is no cover on the drains in this locality. This is because the drains are not designed and constructed in a planned way. Because of this, local people try to dump waste directly into the open drains and it creates drain blockage.

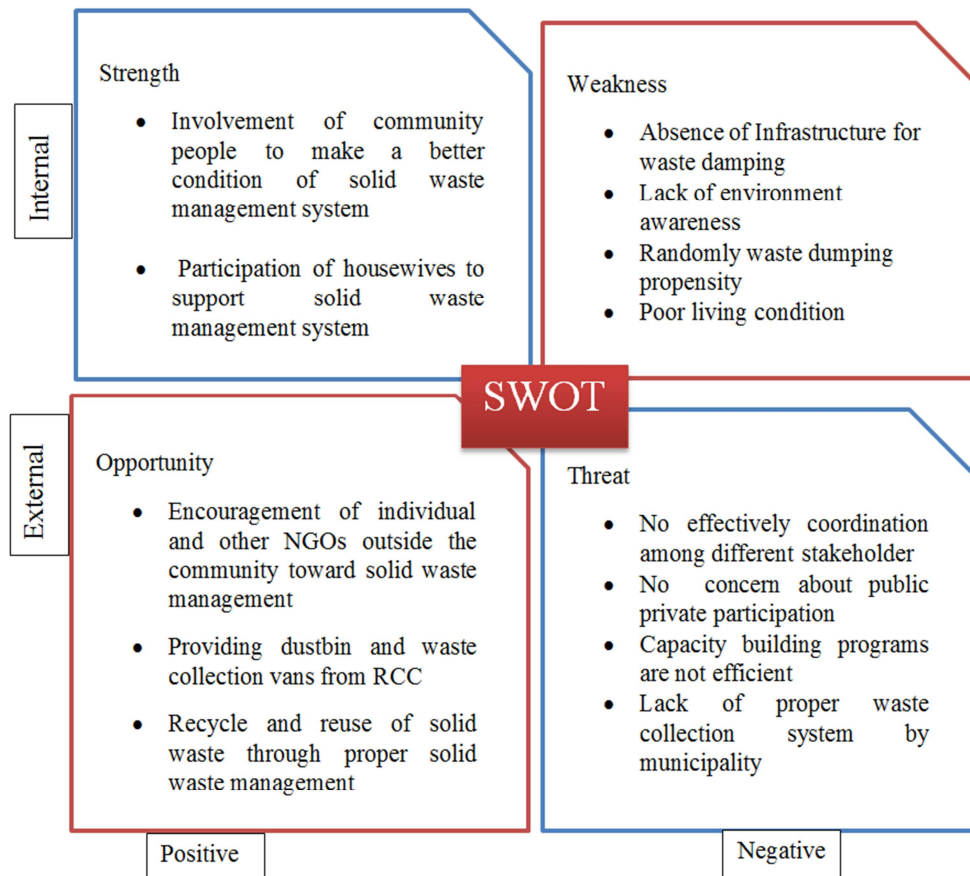
The cause was having no dumping system in this locality. The tendency of dumping of household waste into open space. Many houses in this locality have narrow access and thus municipality van cannot collect household waste from the houses. As a result, to reduce difficulty local people tend to dump their household waste directly beside their houses and RUET boundary. The reasons are the lack of consciousness of local people and difficulty in collecting household waste by the municipal waste-collecting van due to low accessibility. The ultimate results are created by environmental degradation.

### 5.3. Community-Based Possible Solutions to Manage Solid Waste

#### 5.3.1. Internal and External Factor

The internal and external factors to describe by the SWOT analysis tool. Participator's perception and facilitator's perception have been considered and the following SWOT analysis diagram has been developed.





Source: Field survey, 2017

Figure 2. SWOT analysis.

i. Internal influences: Internal strengths and internal weaknesses are described in the below-

*Strengths:*

a) Involvement of community people to make a better condition of the solid waste management system:

In this locality strong coordination among community people. They are working in the locality for any worst condition. Community people take initiatives for any kind of solid waste management. They can influence the better condition of the solid waste management system.

b) Participation of housewives to support solid waste management system:

In this locality participation of housewives are more concerned about solid waste management system. The housewives are very much interested to solve the solid waste-related problems in the locality. This can be a great strength while dealing with solid waste-related problems in the locality.

*Weaknesses:*

1) Absence of Infrastructure for waste dumping:

This is a major weakness in this locality. There is no particular dumping point for solid waste. The absence of proper solid waste management system related infrastructure for waste dumping in the locality.

2) Lack of environment awareness:

In this community people awareness less about

environmental degradation. They are scattered way dispose of solid wastes in this community. They are not properly aware of the environmental aspect of solid waste management. Their attitudes are also not favorable regarding to solid waste management to some extent.

3) Randomly waste dumping propensity:

Community people have the tendency to dump waste randomly through the community. Thus the consequence of roadside waste dumping, tube well side waste dumping, and beside house waste dumping is noticeable in the area.

4) Poor living condition:

The local people have poor living conditions in the locality. In this locality housing condition is very poor. They are waste dumping beside the house. They are not properly aware of healthy condition.

ii. External influences: External opportunities and threats are described in the below-

*Opportunities:*

1) Encouragement of individual and other NGOs outside the community toward solid waste management:

In this locality, many individuals and NGOs play a vital role outside of the community toward solid waste management. They have greater influences in any situation in the community. They can be great external opportunities in solid waste management related actions in the community.

2) Providing dustbin and waste collection vans from RCC:

In this locality providing dustbin and waste collection vans from RCC nearest to the study area. So it can be possible to the proper solid waste management system is established in the locality.

3) Recycle and reuse of solid waste through proper solid waste management:

If a proper solid waste management system is established in the locality, the solid wastes generated from the locality can be recycled and further reused. This can be a great opportunity.

*Threats:*

1) No effective coordination among different stakeholder:

There is no effective coordination among different stakeholders is noticeable in this community concerning solid waste management.

2) No concern about public-private participation:

There is no concern about public and private partnerships in the community. It is realized that the local government and other private organizations are concern about the problems in the locality and take some initiatives separately. But there is no combined approach between public and private concerning solid waste management is noticeable.

3) Capacity building programs are not efficient:

Capacity building programs are not efficient in this locality. It can appear to be taken by the local government or private organizations concerning solid waste management in the community.

4) Lack of proper waste collection system by municipality:

It is one of the major threats regarding solid waste management. Owing to the lack of sincerity of the Rajshahi City Corporation, waste is not collected frequently and effectively in the community.

### 5.3.2. Dream Map

In the slum area, there is wastage in everywhere. Moreover, there is no dumping point, no waste disposal site, no dustbin, or even no waste collection mechanism or van. The Rajshahi City Corporation is not aware of them because these are illegal settlements. For preparing the dream map, all the procedures are followed properly. It has taken about one hour to prepare the map. In the map the slum people draw some dustbin at several points in the slum area thus they can dispose of their wastes and City Corporation van can collect them regularly. There is a waste disposal point just beside the slum area. They want it well managed or replace the area to somewhere far from the slum area or if not possible then dump the waste regularly by the authority. They also dreamt that their slum area will be neat and clean, wastes will not everywhere. For this, they also draw a drain for liquid as well as solid waste.

## 6. Conclusion and Recommendation

### 6.1. Conclusion

The objective of this study was to assess the extent of community participation in solid waste management. Results indicated that the Municipality, which is the sole provider of solid waste management services, neither performed this

service efficiently nor fully involved the community to support it. The rest is not properly managed to point to the possibility of environmental and health problems. Results also indicated that at household and community levels, lack of collection and disposal facilities is a major problem. Solid waste management is largely perceived to be the responsibility of local government authorities. Most members are not aware of their role in SWM and their attitude towards participating in SWM is quite unfavorable. Results further suggest that underscores the importance of community participation by bringing together the Municipality and the local community in the participatory forum to discuss solid waste management problems and suggest appropriate solutions.

### 6.2. Recommendations

Some more recommendations were provided by the facilitators to solve the solid waste management problem in a better way. The recommendations are given below:

- 1) Efforts should be made to educate and sensitize members of the community about their responsibility in trash management. This will increase their involvement in waste management issues. Awareness builds up so that people do not discharge their solid waste here and there.
- 2) To increase engagement at lower levels, active and empowered environmental committees should be formed.
- 3) Municipal Authority and Non-Government Organizations (NGOs) should arrange information and capacity building programs.
- 4) Community waste management funds should be established to cover part of the costs of trash management, such as the provision of basic collection and storage facilities.
- 5) To improve community participation in trash management, a strong link/liaison between the community and local government agencies should be encouraged.
- 6) Through the employment of site-specific groups, an emphasis should be placed on promoting alternate approaches to solid waste management, such as composting and recycling.
- 7) Separated waste collection system for recyclable and non-recyclable waste should be imitated.

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