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Research Article

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Solid Waste Generation Status: Management Strategy and Possible Energy Source

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Abstract Solid waste generation is comprehensive problem for the highly populated cities in Bangladesh. This study was investigated the real scenario of waste generation, management approach, possible source of energy and existing problematic site at savar upazila in Bangladesh. The study was found that, 50.4 ton d^{-1} solid wastes generated per day in the study area. Population growth and slum dwellers are major affecting factors of solid waste generation in the investigated area. The result was found that environment, human health and also urbanization are seriously affected by solid waste generation and improper management strategy. Public health and pulchritude of urbanization is significantly influenced by environmental crisis. In addition, the negative consequences of solid waste is seriously affected to the total physical and mental activities of urban people. Unplanned waste management revealed that, regional structural and nonstructural development would be the major fact of sustainable environment. Results showed that, solid waste collection, recycling and reuse strategy were not sustainably organized and/or well-arranged to reduce the health and environmental risk at the study area. Regarding with the people perception, waste burden and its negative impacts are gradually increasing owing to unexpected growth of resource consumption and improper management of solid waste. According with the compositional materials, it would be the sustainable way to reduce waste burden through using solid waste to produce energy. The utilization of solid waste to energy produce it might be the new era to ensure sustainability for the social development and environment.

Keywords Solid waste generation, management strategies, environmental and human health, urbanization

1. Introduction

Solid waste is considered to be useless materials which is produced and its production rate depends on resource consumption and economy. Non-liquid and non-gaseous materials produced by anthropogenic causes that is defined as Solid waste [1]. The Environmental Protection Act (1986) defines waste as "Any materials or object which the holder discards or intends to discard". [2]. Mainly, solid waste consists of plastics, glass, papers, irons, sewage sludge, dead animals, ash, fine earth particles and others hazardous metals. Solid waste generates from industrial, biological, domestics, commercial and institutional usages. Solid wastes are bio-degradable and non-biodegradable in nature. Bio-degradable wastes as a paper that is degraded by rotting bacteria and virus. Non-biodegradable wastes are including plastics and metals that not fully degraded or rotted by the help of bacteria and virus. Some of SW is hazardous, non-hazardous, infectious, and radioactive. Somehow, solid waste generation is enhancing gradually that pose risk on human life and environment as well as climate change by emission of toxic gases.

Solid waste generation is a major problem in the developed and developing countries over the world. High population density in the developing countries are more vulnerable to solid waste generation. According to per capita income waste generation rate increased nearly three-fold over last two decades and may increase in five-fold by the year 2025in the developing countries [3]. Bangladesh is a developing and populated country and also

more vulnerable to waste generation rate in the aspects of improper management approach. It is an emerging phenomenon among the major cities of Bangladesh- Dhaka, Chittagaon, Rangpur, Khulna, Barisal, Sylhet and Rajshahi and later also other small cities as Tangail, Mymensingha etc. Solid waste generation is massively impressed by the unplanned urbanization and fast growing slum in the major six cities in Bangladesh- Dhaka, Rajshahi, Khulna, Chittagong, Barisal and Sylhet [4]. Dhaka is the capital of Bangladesh, is enhancing rapidly population growth at the rate of around 6 percent a year and turns it into a mega city [5]. Solid waste generation is one of the most formidable problems at Savar in the Dhaka city. Solid waste which is covered 30% among the different types of waste that is generated from industrial, residential and household sector. It is all about two to three times higher than Asian neighboring countries [6]. Due to population growth, unplanned urbanization and lack of consciousness solid waste is being generated faster in Savar Upazila. Everyday domestic, industrial and commercial wastes are being dumped in different places. Odor pollution occurs from these throwing materials for the degradation by micro-organisms. Different health impacts as well as respiratory diseases are common among the residents who have been living for the several years in those places where hoard solid waste. Unconsciously, people throw useless materials as-plastic can, pot, basket, bottle, window glass, cartons, papers and steels in the market and road or in the side of road that's are frequently polluting environmental components. Maximum solid wastes throw in the open air and the side of dustbin or on the water drainage line that lead to contamination of water, air and land. Water, land and air pollution are represented by the insufficient gathering and inappropriate disposal of solid waste that create major risk in health and environment [3]. Different toxic gases escaping from solid waste degradation lead to more health problems which turn into serious diseases later. The residents of Savar in the Dhaka city are going to facing hazardous condition owing to the waste crisis. Their standard life style is disrupted by solid waste burden. For living peacefully at Savar in Dhaka city solid waste management is an essential action in aspect of sustainable development. The study has been tailored and targeted to enquiry solid waste generation, management, possible source of energy and negative consequences to human and environmental health at the Savar Upazila in Dhaka District. It also dealt with some vital aspect of solid waste like its characterization, compositional assessment, suitability and existing management strategy along with urban crisis.

2. Research Methods

2.1. Study area

This study was performed at the savar upazila which is located the northwest of Dhaka City in Bangladesh (Fig. 1). It is positioned at the closest point of heartiest capital city. A large number of peoples are living permanently and also a major part of total population frequently visit at the study area. It is clearly stated that, population growth and their unused materials take into consideration as waste. The rate of population growth and resource consumption is directly coincided with the total aggregation of waste like inorganic and organic waste.

2.2. Research Strategy

However, waste is consider to be a major threats for the Bangladesh. Now its improper management is appeared as devastating sector for the environmental pollution. This research was carried out depending on situation environmental crisis owing to unlimited load of solid waste generation and lack of managerial technique. On the basis of research objectives, concentrated research approach indicate to categories solid waste like paper, plastic, iron, Brass (pitol) and copper (Tama). While plastic and paper likely to be a great problematic site of the study area. It was performed based on quantitative and qualitative research technique by using structural feedback form, focus group discussion (FGD). The informal dialogue technique was also applied to figure out the real point of views on solid waste generation, recycling approach, locally management strategy and, possible environmental and health impact. The feedback form was divided into four section; part-1: consisted of demographic information; Part-2: solid waste generation approach to collection and marketing system on the basis of study area; Part-3: contained management strategy depending on categorize of solid waste generation and collection and Part-4: possible and existing environmental and health crisis while it implies to probable recommended outline. However, questionnaire was surveyed among the ferrewalla[1] and solid waste buyer e.g.

[1] **Who collect waste from different places through exchanging money**

shop owner. A total number of 200 feedback form was filled up by the structural way of formulated question. In addition, total number of shop was divided into two categories whereas one is large shop (300) and another is small shop (100). But total number of ferrewalla was calculated using the views of ferrewalla and shop owner (e.g. who are involved to collect solid waste from ferrewalla). FGD were performed among the local respondents and ferrewalla. This technique were very much effective to figure out the situational case in terms of environment and human health. Most of the question were made on overall scenario of waste, generation source, generation rate, types of waste, management approach, existing knowledge, future impact and their recommendation. Maximum number of participant were too much congenial and cooperative to the discussant and interviewer. Informal dialogue is significant technique to visualize the real cause and effect of a specific study. It was designed on the basis of more clarification to signify the evaluation value. Informal dialogue was carried out among the street hawker, street people, shop keeper and floating local people. Evaluated information was recorded as a written document in extra sheet. Later, recorded information was analysis and tried to make comparison between FGD and feedback form evaluated information. In the holistic approach, it was more significant to establish a good data set for the qualitative research.

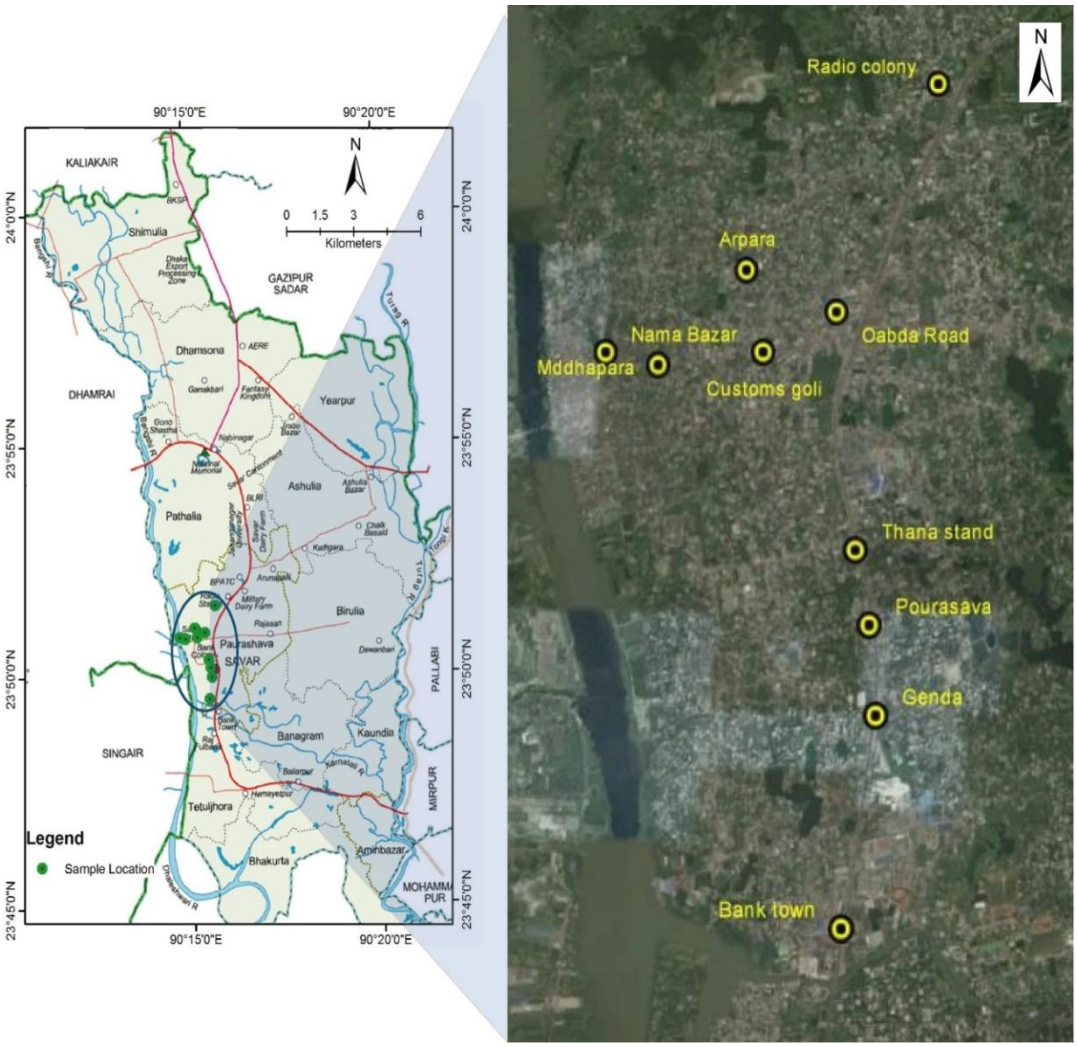

Figure 1: Shows the location map of the study area

3. Results and Discussion

3.1. Solid waste generation and Marketing

Solid waste generation is increasing day by day with the development of human life style. In the past, about 12 billion tons of solid waste was annually generated in 2002 which will be reached about 19 billion tons in 2025 around the world [7]. Savar Upazila is also aristocrat city within Bangladesh. But solid waste generation is now

consider to a great concern for the city dwellers. Total amount of 50.4 ton waste was accounted which has been collected 28 Kg d^{-1} solid waste by each Feriwalla (Table-1). A total number of large and small shops were recorded 300 and 100 respectively in different palces in the study area. Among the total number of ferriwalla, 1500 and 300 ferriwalla were directly involved as well solid their collected solid waste in large and small shops respectively. Each ferriwalla were able to quantify their collected solid waste in different fragments like 20 Kgd^{-1} paper, 5 Kgd^{-1} plastic, 2 Kgd^{-1} iron, .5 Kg d^{-1} brass and .5 Kgd^{-1} copper respectively. The feriwalla was fraquently sold their collected waste to the waste collecting shop on daily basis. Among the total amount of solid waste, 36 ton d^{-1} solid waste was collected by the local Feriwalla as well waste picker. A number of ferriwalla has been increased because of population growth, unemployment, illiteracy and worsen socioeconomic condition. On the other hand, solid waste generation rate leads to unplanned urbanization, resource consumption, ignorance, lack of government initiatives, lack of awareness and lack of community perception.

Feriwalla involved to collect different waste from household door to door way through exchanging money as papers, irons, brass and copper. Sometimes, Feriwalla call for waste purchasing near to door or in the side of road. Most of them were purchased at lower price like paper 12 Tk kg^{-1}, plastic 20 Tk kg^{-1}, iron 18 Tk kg^{-1} from different sources and household. Including some valuable metal waste were found to be purchased at higher price like brass 250 Tk kg^{-1} and copper 450 Tk kg^{-1} (Table-2). But least amount of brass and copper like only .5 Kgd^{-1} were found to be collected by waste collector in a day (Table-1). All waste collector tried to sell collected waste to the shopkeeper at higher price to get enough profit. Actually, its market price depends on some special factors like market demand, availability, resource types, reuse or recycling status, total number of waste collecting shop and its purposive using sector.

In addition, collected waste by shopkeepers were tried to purchase from Feriwalla at high rate of price as paper 22 Tk kg^{-1}, brass 260 Tk kg^{-1}, and copper 460 Tk kg^{-1}. But these shopkeeper try to make a direct linkage with waste recycling factories owing to sell as per collecting waste in a week or month. However, the recycling factories were purchased from shopkeeper at high rate of price than mentioned Feriwalla to shopkeeper as paper 27 Tk kg^{-1}, brass 265 Tk kg^{-1}, copper 466 Tk kg^{-1}. A number of factories were involved to recycle the waste and to produce new product. If the cost of byproduct and demand become high then its market demand and selling rate will decline. On the other hand, as a new product of solid waste recycled byproduct cost try to keep remain in reasonable price then it would be highly appreciated to the local customer.

Table 1: Calculation of solid waste generation

Solid waste	Collected By Per Ferrywalla, kg/day	Collected By Per Shop Owner, Ton/day
Paper	20.00	36.00
Plastic	05.00	09.00
Iron	02.00	03.60
Brass (Pitol)	0.50	0.90
Copper (Tama)	0.50	0.90
Total	28.00 Kg	50.40 MT

Table 2: Trade and commerce of solid waste

Solid waste	Purchasing Feriwalla from household and other sources in BD TK[2] /kg	Purchasing by Shop Owner form Feriwalla in BD TK/kg	Purchasing by factories from shop Owner in BD TK/kg
Paper	12.00	22.00	27.00
Plastic	20.00	30.00	34.00
Iron	18.00	28.00	32.00
Brass (Pitol)	250.00	260.00	265.00
Copper (Tama)	450.00	460.00	466.00

[2] 1 USD= 77.75 BDT (date: 28-12-2016)

3.2. Source and Characterization of Solid Waste

Different types of solid waste generates in the study area from varieties of sources. A number of sources including industrial, household and agricultural, commercials and institutional wastes. Residential waste is a corpulent sources of solid waste where industrial and institutional development trends not so good like urban area. In Dhaka city, domestic waste generated about 1718 tons /day at a percentage of 49.08 % which is a massive portion for waste generation [8]. Medical waste is also vital for infectious to human health. In addition, some of wastes are biodegradable and non-biodegradable and also inert materials. Inert material consists of dust and hair wax etc. [2]. The study reported from Feriwalla that 65% of waste biodegradable, 30% of waste non-biodegradable and 5% of waste inert materials. But out of 30% non-biodegradable waste, majority portion is owned by plastics material. Consecutively, Most of plastic materials include bottles, pots, cover, can, jug, and basket etc. Otherwise, large portion of biodegradable waste consists of papers materials including industrial papers, offices papers, books, newspapers, magazine, worn papers etc. The numbers of sources are increased by building more industries for better urbanization. According to the observation, waste types and generation rate indicate to its (i.e. Source) specific development, income and materials using pattern. However, develop countries institution uses a large portion of resource and also generate large volume of waste per day but their management strategy well equipped and arranged. On the other hand, developing countries scenario for solid waste management capacity is just placed at the behind position for the crisis of financial well-being, skill human resource, technological improvement and modern management strategy.

3.3. Factor affecting Causes of Solid Waste Generation

Major five factors influence the solid waste generation at Savar in the Dhaka city. Major five factors include population growth, enhancing slum dwellers, lack of technologies, and lack of awareness and want of legislative and strengthening solid waste management policy (Fig. 2). Here, population growth is a vital factor that affects the solid waste generation. Solid waste generation is proportionally related to population growth in a region. High population density accelerates to the waste generation and pollution.

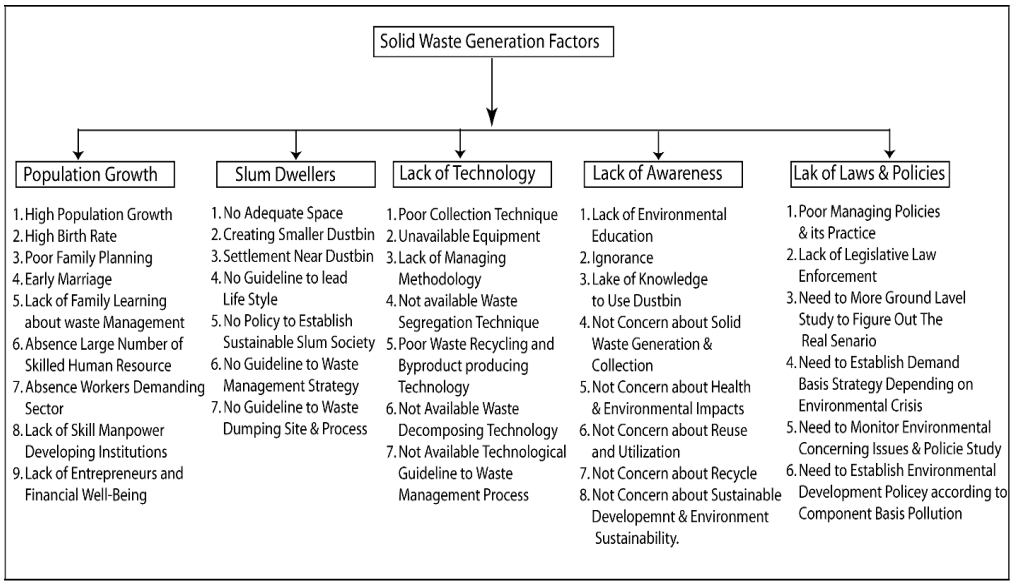

Figure 2: Shows the factor affecting causes of solid waste generation

High birth rate without family planning and early marriage can also be an ultimate cause of solid waste generation. Owing to these causes population growth and density has been accelerated and make some unbearable mental and physical stress. Slum dwellers of cities have not appropriate knowledge about solid waste generation and its management strategies. The per capita of solid waste generation is influenced by lack of environmental education, income and social status [1]. Slum dwellers of cities have not sufficient environmental knowledge and better social status and they create dustbin anywhere for throwing waste. Improper technologies and management policies of solid waste generation are also major cause of waste generation in the cities. Policy make and its enforcement is very essential for the city dwellers to follow the

rules and regulations to keep net and clean. Appropriate technologies of waste collection, managing methods and equipment of waste are pre-requisite criteria for the solid waste generation and management.

4. Existing Solid Waste Management Approach

Management of solid waste is a vital task for peacefully living in the future world. It is impossible to reduce health diseases without reducing environmental pollution and solid waste generation rate. Environmental degradation and pollution would be minimized if sustainable ways or methods is applied for the treatment as well management strategy. In addition, a number of processes are applied for the solid waste management but till now it is not sustainable and environment friendly. But some of those processes are consider to significant pathway of waste management sector like waste collection, reuse and recycle and thermal treatment. In addition, develop country is more advance and develop a number of technique for recycling of solid waste and its derivatives than developing countries [9]. In the develop countries, High tech operation is frequently using for the recycling purpose but have no environmental impacts like Japan [10].

4.1. Solid waste collection system

Suitable waste collection technique is a pre-requisite condition for the solid waste management. Now-a-days, amount solid waste load is gradually reducing by collecting of industrial, commercial, domestic and institutional waste from different dust places; dustbin and dust drain and pile up point from open places. But it is not sufficient to make clean the environment polluting components. Government and non-government organization should take some initiatives to make aware the local people and community professionals. Consecutively, community participation is also essential for the waste management work. The management of solid waste in Dhaka city is neither community based nor community participated [11]. People of the Dhaka city throw waste anywhere mainly depend on user own habits. A number of labors are involved in the collection of waste. The survey showed that 59% of male and 41% of female were involved in waste collection tasks at Savar city. Domestic, industrial, institutional and commercial wastes have collected from different dustbin container and dirty places where absence of dust container, people throws useless waste on the open land. Different vehicles as truck, rickshaw van use for the transportation of collecting waste. Other waste collection systems include door to door collection, block and yard collection systems. Most of waste collectors gather from door to door by knock to door or ring the door ring. In block collection method, waste collectors ring the horn or bell and wait in a specific location for useless waste.

4.2. Reuse and recycle systems

Reuse and recycling systems are more sustainable way for the reduction of solid waste because of providing earning sources and livelihood through collecting useless waste. It exhibit an outstanding relationship among the urban poor people and informal waste management process [12, 13]. A number of people depends on waste recycling activities which is profoundly found in the developing world where majority of the people living below the poverty line [14]. Bio-degradable and non-biodegradable waste can be reused according to purposes and demand. Biodegradable waste can be reused as the production of organic fertilizers and biogas materials [1]. Domestic and agricultural wastes are very helpful for the production of organic fertilizer and biogas. But non-biodegradable wastes which are recyclable can be reused after washing and other sterilization treatment. Recycling technique is now consider to be the best approach for the non-biodegradable waste management. Recycle refers to the withdrawal of useless items from wastes and to be used as raw materials and new product. Recycling is a key component of modern waste reduction technique and is the third component of the "Reduce, Reuse, and Recycle" waste hierarchy [8]. Different solid waste as papers, rags, plastic container, fresh containers, useless cloths, shoe, others commercial wastes are collected by Feriwalla, hawkers and tokais groups from different dustbins and household, and sold to waste materials shops in the Dhaka Savar then they supplied to recyclable shops. Different recyclable shops in Dhaka Savar also purchase waste for recycling from others cities of Bangladesh.

4.3. Thermal treatment

Waste treatment is a technique which waste transforms into a refresh form to remove the poisonous of waste. The treatment of waste depends on the waste materials composition, quality and types of waste. Different treatment methods are available for the waste management or detoxifying the waste containing materials

including thermal treatment, biological treatment and landfill. Thermal treatment is a process where utilizes heat for the removal of toxicity of waste. Incineration, Pyrolysis and Gasification, and open burning are major sub-processes of thermal treatment. Incineration and Pyrolysis and Gasification are very high costing method. Incineration treatment is rare economically feasible for developing countries as Bangladesh [15]. Open burning is the common method of thermal treatment in the study area. Here, 84% of shop owner in the Savar city is openly burn the loose waste as different papers and thinner plastic. Marginalized groups who are involved in clearing wastes said that they collect papers, plastic and useless vehicles tower for burning especially in winter season. Open burning of waste emits carbon di oxide and contaminates air that is responsible for Greenhouse gases. But the advantages of open burning include low cost of transport and labor.

Fig. 3: Shows the real scenario of waste management status and its existing feature of the study area. (Fig. a. indicate plastic waste collecting shop where most of the ferriwala and hawker sell their collected plastic materials at the end of the day; Fig. b, denote the metal collecting shop which is consisted with several wings of customer like ferriwala, hawker, local people, residential and industrial personnel; Fig. c, urban solid waste management crisis and open disposal site; Fig. d, paper waste collecting shop where most of the ferriwalla sell their wastage paper)

5. Perceptional Attitude towards solid waste generation

Solid waste generation is a major problem in the study area for high population density and unplanned urbanization. Regarding with the respondents perception, population density is increasing gradually in the study area (Fig. 3). A large number of people from different places migrated to savar area owing to professional, business and other causes. People believed that waste has increased for the more utilization of materials by a large number of people. In the total number of respondents, 67% people were reported that, maximum people of the study area were not followed the standard rules and regulation in terms of waste generation, collection, disposal and management while a large number of people throw wastage materials on the open space instead of dustbin. They also believed that solid waste generation rate is also accelerated for lack of law and enforcement in the study area. Some peoples were found to be involving waste collecting and picking activities who were always tried to collect and/or pick waste from different points, household and institution through making a little amount of money. According to the waste shop owner citation, number of ferrywalla, waste picker and worker

gradually increasing due to the loss of livelihood and unemployment in the last two decades. In the statistical point of view, 76% of women, 68% of children and 53% of male Feriwalla as well waste pickers has been increased compare with the previous study. Most of the waste shop owner out of total number of 400 shops reported that, solid waste and its generation rate gradually increased as 45% of paper, 33% of plastics, 19% of iron, 5% of brass (pitol) and 7% of copper (Tama) respectively. Regarding with the recycling personnel 15% of medical waste, 4% of chemical toxic waste, 39% of domestic waste, 42% of industrial waste and 33% of commercial waste has been increased due to the high rate of resource consumption and improper management strategy. On the other hand, the waste worker and picker reported that it is potential source of income and new door of livelihood pattern but infectious to human health. Respondents of the study area expected that solid waste generation rate would be minimized by appropriate policy make and its enforcement among the waste generating potential source.

6. Environment, health and urbanization

Improper solid waste management and its negative consequences on environment, health and asthenic urbanization building are concerning issues perspective to Environmental science and sustainable environment. Now-a-days, solid waste exposure creates a major environmental problems that poses risk on environment and human health. Later, the negative consequences of environmental pollution and health diseases are a potential barrier to build suitable and pulchritude urbanization. Sometimes, urban waste inhibit to the drainage activities and waster courses with the blocking of the channel [16].

Naturally, solid waste throws in the open place of environment. Environment acts as warehouse of solid waste. Domestics, commercials, industrial and institutional wastes pitch open air in the environment. As result, solid waste is a significant cause of environmental pollution- land, water and air pollutions. One of the major form of environmental kaput is land pollution that the world is being faced [17]. Improper solid waste disposal or dumping at the open place is consider the main cause of land pollution. On the other hand, land pollution is a more specific cause of land degradation which results from solid waste generation. Throwing of wastes into the water body is mingled with water that can cause of water pollution through breaking down water quality standards. After land pollution, water pollution is a common and in general issue in the environment. However, water quality is influenced by the disposal waste on the water bodies. The BOD and COD level of pure water is disrupted for the decomposition of waste by micro-organisms. As a result, the diversity of aquatic organisms is reduced for ruining of suitable habitat. Odor is emitted for land and water pollution from decomposing of polluted waste. Odor of polluted waste leads to air pollution. Different gases emit from the decomposition of waste which are responsible for Greenhouse effect. The emission of GHG as Carbon di oxide and Methane leads global climate change. The decomposition of aerobic and anaerobic organic compounds produces gases that poses threat to the environment and also climate [5]. Carbon di oxide and Methane gases are the major fact of Greenhouse effect. Carbon di oxide is emitted from burning of solid waste and methane from the decomposition of domestic and agricultural wastes. Methane is a byproduct of the anaerobic respiration of bacteria and its concentrations can reach up to 50% of the composition of landfill gas [18]. Finally, the major three categories of pollutions are extremely harmful to the environment.

The impact of solid waste generation on human health is a critical phenomenon at the present era. Biological infection or respiratory diseases are common in the solid waste generating region. People who are engaged in solid waste management activities extremely and directly they suffer from major health diseases. But general people are being indirectly affected by the breeding of disease vectors, primarily flies and rats [18]. Most of marginalized people are engaged in the waste collection and its recycling activities for employment and earning more money. But they are not conscious about solid waste management systems and its negatives impacts. After surveying in the study area result showed that only 19% of labor was conscious and 81% of labor was unknown about its negatives consequences on health and appropriate management systems. Out of 19%, 15% of matured (Above 15 years aged) labor was accepted to the health impacts for earning money to remove their penury and meeting daily meal. Other 4% of labor was immature (Under 15 years aged) and easily accepted the damned action. Out of 81% of unknown labor, 39% of immature and 42% mature labor. At the field level, waste pickers are involved in waste dustbin clearing without pre-cautionary measures and hand gloves [4]. For this reason,

labor and picker are suffered from different health diseases. Major five diseases include physical wound (22%), respiratory ailment (31%), diarrhoea (7%), skin problems (11%) and appetite (29%). Other major diseases for solid waste generation also include eye problems, bronchitis, gastrointestinal ailment, asthma, fever, cold and cough, headache, parasitic diseases, reproductive effects, immune system effects, failure of kidney and liver, cancer etc. All cancer is possible for environmental pollution from illegal waste disposal [10]. So, it is a major devastating problem for the worldwide people and especially in the urban regions.

Overall, the aesthetic view of urbanization is reduced for solid waste generation and environmental pollution. People always avoid thus urbanization where fresh air is polluted with toxic and hazardous gases. Standard life style is disrupted by the solid waste polluted urbanization. Net and clean is an essential issue for building suitable modern urbanization.

7. Solid Waste and Potential Source of Energy

Sometimes a useless or scrap materials could be a fact of new invention while its potentiality keep remain as original materials or transformed one. The byproduct of any substance leads to beckon better one than the original product. However, some hazardous materials like solid waste gradually increasing day by day due to the overloading of resource materials, population growth and financial welfare around the world. Now-a-days it creates a hazardous environment through emitting a number of hazardous gases along with compositional materials toxicity. Sometimes its poisonous activity spread out as a fatigue problem among the communities and environmental components. Practically management process of solid waste is not so easy from generation to last. On the other hand, it could be a sustainable way to solid waste conversion process to potential energy depending on compositional materials than manual management (Fig. 4). The utilization of solid waste to energy produce it might be the new era to ensure sustainability for the social development and environment. If these process continue or innovate then unconscious people would be aware about the resource potentiality and economic benefit of solid waste. In addition, solid waste management and its problematic results will not play an antagonist role to achieve sustainability in the environment.

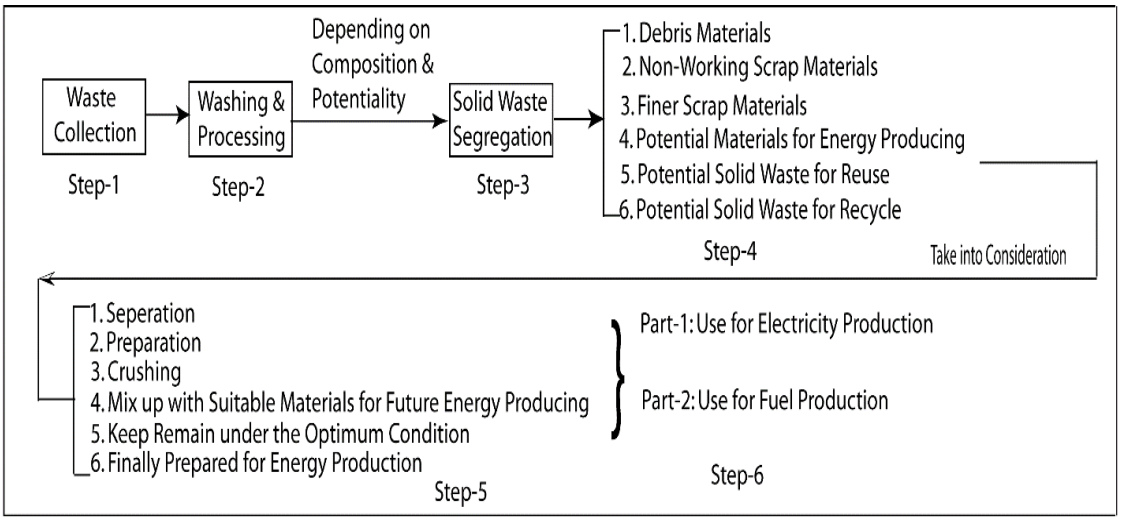

Figure 4: Shows the possible pathway to engergy producing technique using solid waste

Figure-1 consisted with some steps whereas it could be explicitly able to explain the whole process of energy producing technique by the utilizational of potential wasteage materials. It is very important to deal with the activities to make clean the environment along with to ensure the sustainability in the society. At first, step-1 indicate to closet better one for the next activities whereas all the process contained a number of sub-process which helps to make easier of the entire activities. However, step-4 and step-5 consider to be a significant process because of its containing methodological process which directly helps to energy conversion pathway from solid waste.

8. Conclusion

Solid waste generation is now considering to a great threat for the public health. The rate of solid waste generation is gradually enhanced along with the increasing rate of population. On the other hand, Migration of people from rural area to Dhaka, Savar continuously influences to the intensity of solid waste generation. This study showed that lack of technological advancement and public awareness triggered to the waste management problem. But for keeping net and clean savar city need to appropriate solid waste management methods and materials, and also skilled manpower. The waste treatment and recycling factories should be followed by suitable technique which would be strengthened its responsibilities for the future performance. Government and non-government organization should be taken some initiatives to enhance awareness and knowledge on environmental related problem and its impacts and science based study. Results showed that, people were not well fitted with the regional waste management crisis and future impacts. It should be noted that, it is very important to make aware about waste management approach among the local communities through participating knowledge shearing programme. Depending on the situation basis crisis, government should be taken some steps to step forward to ban using environmental hazardous materials openly and to using pattern. It could be obliged to the local people to follow the rules and responsibilities on waste generation, collection and disposal strategy in a right way and place. But it is very important to technological advancement for the solid waste management as well using in different sustainable purpose like energy production through waste utilizing. It might be used as a potential source of energy for the sustainable development and economic growth.

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Conflict of Interest

The authors decleared that there is no conflict of interest for this publication

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