

A CASE STUDY OF SOLID WASTE MANAGEMENT PRACTICES OF HETAUDA SUB METROPOLITAN CITY: SITUATIONS, PROSPERITIES, AND CHALLENGES

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Abstract

The study revealed that women played major role in waste production. The main reason behind this can be the patriarchal thinking of society. Women are more involved in household works by their nature. The migration rate is rapidly increasing since last 5 years. The 40 percent of people migrated in this municipality within last 10 years which has directly influenced on the quantity of wastes. The majority of the houses in this municipality are non-concrete and semi-concrete. One third of houses are tiled, tin roofed or thatched roofed. All these structures highlight the condition of municipality. But most of these houses composed of developed, modern and trench toilet. Now, the dwellers of Hetauda have access to every kind of modern technologies. The most accessible technology is mobile. The use of coal, wooden dust, and firewood is also in the same ratio of cooking gas which verified the town is still in the stage of semi-urbanization. The lack of governmental or municipality level policy, and lack of institutional accountability has created more problem in waste management. The lack of separate act on waste management has created challenge to waste management system.

Key Words

waste; solid waste; management; Municipality; local governemet

Introduction: context

The town/city is an organized group in which normally the main occupations are concerned with commerce and industry

as opposed to agricultural pursuits. At the beginning of the twenty-first century it is a global world, to be sure, but more than that, it is, for the very first time, an urban

world, for the first time in human history, more than half of the world's population-some 3 billion persons-lives in urban areas. In the next two decades the number of persons living in urban areas will increase by another 2 billion persons-an amazing 60 percent increase-to 5 billion persons. The United Nations estimates that by 2030, more than two-thirds of total world population will live in urban areas. It should be well-known that urban growth has a number of positive impacts on the environment and human welfare i.e. higher population densities mean lower per capita costs of providing energy, health care, infrastructure and services. Also, urbanization has historically been associated with declining birth rates, which reduces population pressure on land and natural resources. As well as all these positive impacts, almost all major cities of the region are increasingly plagued by environmental problems. Some major problems of cities are: Air pollution, waterborne diseases, drainage and solid waste collection services, traffic congestion and water pollution, industrial and domestic wastes are damaging the productivity of urban economies, uncollected and improperly handled solid waste etc (<http://www.sage-reference.com/urban studies/Reading>).

This article is limited to discuss within the solid waste management situation, opportunities, and facing problems and practices of Hetauda Municipality. Its data, information based on a study jointly conducted Hetauda Municipalit

and Social Study and Research Council (SOREC) lead by writer himself. It is a very small and short discussion of waste management of this city. This article prepared based on a research conducted by SOREC with financial assistance of Hetauda Municipality from f/y 2068/069, here briefly highlights some issues which relate to waste disposal in city. This article mainly organized in briefly present situations, waste management practices, suggestions and lessons learned from Hetauda and conclusion lastly references (Hetauda Municipality, 2077).

The article 214 of Constitution of Nepal 2015 has made the provision of local level government which promotes the people's participation in the state governance by creating a positive environment for using people's sovereignty. This perspective has focused on the development of local governance through the policy of devolution and federalization in order to provide services to local people and to institutionalize democracy at the local level. The Local Autonomous Act 2055 has also made the provision of running local authorities on the basis of decentralization and norms of local autonomous governance (Nepal Law Commission, 2015).

The municipality is one of the autonomous and important institutions in the development of town. Its major function is to provide services, facilities and to fulfill the necessities of city/town

dwellers. The waste management is the important task to be performed by the municipality for the development of town or urban development. The background of this study has been based on the Minimum Conditions and Performance Measurement to measure the performance of municipalities by the Nepal Government in the fiscal year 2064/65 which accepted waste management as one of the important indicators. The disposal of plastic and other wastes have been the major problem seen in the urban development. This has not only affected the public health but also created a major social problem. The unmanaged urbanization and infrastructural development has made this problem more critical. This problem should be addressed in a sustainable way through the involvement of all stakeholders. So, the state should implement this program on the Public-Private Partnership perspective to find out its solutions.

Situation of Waste management of Hetauda

Hetauda municipality has been collecting waste through private sector since last six years. This has also deducted human resources of municipality who are involved in cleaning. This has reduced some the economic burden of municipality in waste management but also problems have been seen in this process. The municipality has been collecting waste from every household

through the mobilization of private sector since last three years. This had deducted the large amount of expenses spend on waste management as well as number of cleaning manpower of Hetauda municipality (Hetauda Municipality, 2075).

The Hetauda municipality should adopt the integrated sustainable management system in waste management which could be more effective. The expected population of the municipality is 1, 10,000. The previous studies show that average 300 gram of waste is produced per day by per individual. In this way, 33 ton of waste is produced per day. On this basis, the waste management task should be done in an integrated way (Hetauda Municipality, 2010). The women are mainly related to waste in Hetauda city. 65 percent of women are related to waste management in contrast to 35 percent of men. The average family member is 4 persons in the municipality. 57 percent of household is affiliated to Tol Bikash Sanstha. The increment is seen in the migration rate of municipality within 10 years. Out of total in-migration, 21 percent is below 5 years and 19 percent is in between 5-10 years (Hetauda Municipality, 2075).

17 percent of houses are non-concrete and semi-concrete whereas 76 percent of houses are cemented or tiled and 24 percent is thatched roofed. 98 percent have toilet. The user of modern facilities like mobile is 38 percent whereas 13.75

percent use radio. The user of bicycle is 8.25 percent and motorcycle is 7.45 percent. The majority of town dweller which is 36 percent uses cooking gas, and 33 percent use coal, firewood, wooden dust, etc (Hetauda Municipality, 2075).

The majority of people that is 89 percent use plastic bag in purchase whereas the users of jute bag is only 11 percent. The large amount of waste i.e.53 percent is produced from kitchen which includes 10 percent of plastics. Among these wastes, 75 percent of waste is exhaustible. 58 percent of households produce small quantity of wastes. 72 percent households do not categorize the wastes. 90 percent haven't taken any training related to waste management. 22 percent disposed waste on river and 28 percent collected it at home. 18 percent make compost from kitchen wastes whereas 36 percent mixed kitchen wastes with other wastes. 84 percent use trench to make compost. 50 percent of non-biological wastes which is very difficult to disposed are sold or re-used. Half of such wastes are disposed in an unmanaged way (Hetauda Municipality, 2075).

Suggestions and Lesson Learn

Hetauda municipality has to take policy level decision for the management of waste. The present system of waste management can be explosive in any time. So, it's proper management should be done quickly which is also

the need and compulsion of time. The following suggestion and lesson learn, recommendations can be helpful in its proper implementation.

Resolution: regularities

- The campaign of collecting non-biological and biological wastes should be run in an alternative days. For this, at least 2 waste collecting bins should be distributed to every house. There should be certain allowances for those who collected the waste separately as biological and non-biological.
- The categorization of waste in the coordination of Area Development Organization (*Tol Bikash Sanstha*) and encouragement to the well consumer who produce less amount of waste. Example: Public gratitude, Good consumer's reverence, etc.

Policy Level

- Waste management is an activity possible by the joint attempt. So, it can be addressed sustainably by the joint attempt of concerned stakeholders with their joint effort, responsibility and investment.
- The stakeholders viewed that if the perspective of Public-Private Partnership is applied in a long term way with the provision of regulation, than positive result can be obtained from it. It means that the work should be done on the contract of 20-25 years period.
- Establish waste management unit with organizational structure and

policy system along with the technical expert within municipality. All the aspects of this unit as regulation, recording and implementation will be directly supervised.

- The compost should be sold to local agricultural group with the coordination of agricultural cooperative with certain profit. The municipality should play the coordinating role in this aspect which can indirectly help the land fill site and link to rural community.
- The measures of giving grant on plastic re-cycling and on the side, reducing it on the source should be taken. The provision of monitoring should be done with the awareness program, environmental education, health education and income earning measures.
- The traditional management system of disposing medicine and medicines related waste and human parts should be reformed because it is dangerous than other wastes. Its present disposal system is not effective because it is disposed in an unmanaged way. It should be disposed on the basis of medical and medical related waste disposal method.
- It is necessary to do more research on waste in the coordination of plastic pickers, scrap collector and Federation of Iron and Scrap Industry.
- The waste collection task should be regular and its categorization should be implemented strictly. For

this, bucket distribution and training should be run immediately in every ward.

- For the sharing of experiences of waste management, a regular fund should be maintained for the excursion tour, visit and study. The study/research should be in a programmatic way according to the need.

Organizational Structure

- The managerial function of this work should be given to the individual with Bachelors degree in the area of waste management and environment. S/he will present the integrated report of all activities to concerned authority monthly or as per need. The difficulties have been found on the management of waste by Town Police. The waste management is actually a managerial task. It is better to give the responsibility of monitoring to Town Police which will continue and regularize the monitoring system. But its managerial function by Town Police has created more difficulty.

Strengthening of Private Sector

- It is better to play the role of coordinator by municipality. This can help to invest the time and investment in other development works and policy management.
- The wastes of few wards are only in collection on waste collection center at present. This can be extended for the participation of all level and hierarchy. The private sector is also

ready for this and should be fixed for long period and secured investment.

- For this, long term agreement should be done and investment of private sector should be secured. The agreement should be at least for 10-15 years.
- The separate management of collected plastics can be done in the coordination of private sector. This can help in achieving the proficiency in management and can produce skilled human resource in its management.
- The employment can be generated from collecting plastic and its cleaning and recycling in less investment. This can generate income. The industry which consumes such products is already opened in Hetauda.
- The plastic collection campaign run by Hetauda municipality has done well in its initiation phase but it became unsuccessful because of managerial weaknesses. This had benefitted the consumer by Rs.6 per kg., Rs.10- 15 thousand to Tol Bikash Sanstha and Ra.10-15 thousand to the municipality. So, this work should be started through an organizational structure.
- Plastic collectors are collecting the plastics which are only useful to them. They are doing this job in an unorganized way. It is not difficult to organize them because they are selling their plastics to few people who are investing on it. So, by giving certain grant to these people, this activity can be continued in a better way for a long term.
- The labor invested in plastic (cleaning, collecting, etc.) will added value in its management. According to the expert the cost of recycling white plastic is more than other plastic. So, attention should be given in such aspect.
- Medicine and Medicine Related Wastes: Hetauda municipality has been managing the wastes produced by the pharmacy, clinics, private hospitals and labs through the Secured Syringe Promotion Committee. But this committee is inactive at present. This is running by one worker in this own effort. Such wastes is collected and disposed in incinerator at hospital. All the accounts related to its income and expenditure is maintained by the committee. The authoritative statement related to it cannot be found from the municipality. No any information can be generated related to the formulation process, work schedule and its boundary, responsibility or authority of this committee.
- Disposal of Medicine and Medicine related Wastes: This work was started by the Secured Waste Promotion Committee through the collection of waste in a cycle cart from every clinic and is continued till now. Every clinic has to pay minimum Rs.50 to Rs.200 to committee which is used in cycle repairing and payment of worker.

Decentralized Waste Management

The Hetauda Municipality can easily manage the wastes of the town by decentralizing the waste management in various places. For example: it is better to dispose the waste collected from the market area in two places. The waste collection center can be constructed in east and west. This can help in the door to door waste collection campaign and its disposal. The collection of categorized wastes from the household level, categorization of some wastes in collection center; separation of non-biological wastes which can be sold to scrap seller; and separation of exhaustible biological goods should be done to separate the wastes. The private sector should be participated in the selling and distribution of such waste in an institutional and sustainable way. The private sector can play major role if land is provided for its disposal. The Hetauda municipality should also give attention to waste management of Chaughada, Ward No. 7, 8 and 9, and Bhairab Dada of Ward no. 1. It is possible to collect the waste of Bhairab Dada in every 15 days. The door to door waste collection campaign should be run in other places and municipality should provide grant for this.

Land Fill Site

The worst situation of Hetauda municipality is its land fill site. This is not a kind of land fill site. The open river bank is used as the place of waste disposal. The municipality has been

using the bank of Rapti River as land fill site where wastes are disposed in an unmanaged way. This has polluted the water of Rapti River and its surrounding environment. The epidemic can spread any time by these wastes. There is the certainty of creating dangerous situation of health problem and public pressure. So, after the implementation of integrated waste management, only 15-20 percent of wastes should be disposed in land fill site. The detailed study on its cost-expenditure should be done.

Structure of Waste Management and Disposal

The detailed structure of Waste management on the basis of public-private partnership is discussed as below. The mostly collected waste is biological waste which is shown by this study too. But the very small amount of nonbiological wastes has created the problem in its disposal. So, this perspective is recommended on this basis. This method is prepared for the easy disposal of wastes from waste production place. Wastes should be separated into two categories as biological and non-biological and collected in this way.

- The collection of non-biological waste every week which may consists of plastic, copy, book, cartoon, pieces of aluminum, drum, tin, bottle, hard objects, aluminum, etc. This should be managed by dividing it into two parts. The Federation of Iron and Scrap Industry can be helpful in the management of all wastes except

plastic and plastic collectors, scrap collectors and Tol Bikash Sanstha can play the secondary role in plastic disposal.

- The categorized waste can be sold to industry or used after recycling. All these activities can be done on the participation of private sector or publicprivate partnership.

Conclusion

The joint study on integrated waste management done by Hetauda municipality and this organization concludes that the women play major role in waste production. The main reason behind this can be the patriarchal thinking of society. Women are more involved in household works by their nature. The migration rate is rapidly increasing since last 5 years. The 40 percent of people migrated in this municipality within last 10 years which has directly influenced on

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