

Municipal Solid Waste Management, a Step towards Sustainable Development Case Study: Zanzan City

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Extended abstract

1- Introduction

During the past two decades, municipal solid waste (MSW) management has become one of the major concerns. In municipal solid waste management, different ways of disposal exists. Hence, collection and proper disposal of waste in order to reduce health risks and damage to flora and fauna and the environment is very important. Although buriae is the best and most common method for disposal of solid wastes. But lack or loss of traditional waste disposal sites, environmental control monitoring solid waste disposal,

increasment of its size and weight, especially in industrialized countries and major cities, have a significant contribution in increasing services and disposal costs.

Because waste disposal services vary from economical aspect, hence, recycling waste and increasingly becomes cost-effective. The fact that urban waste management system of Iran has critical and undesirable conditions. Cannot be ignored. In Zanzan city municipal waste is not separated because there is no seperate transportation vehicles, there is no knowledge a boult physical properties of the waste produced in this city. Therefore determining the potential for recycling or disposal methods and machinery required for management is related to with is data. Lack of awareness of social obligations and urbanization, especially about health matter and environmental protection and the misconception of most citizens of waste

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management as getting rid of it personally of waste from the, lead to lack of success of the implementation of solid waste management programs. Therefore, a study in Zanjan about the understanding of solid waste physical components, capabilities and potential of each of the recyclable components, and also the necessity of public participation of practitioners and citizens in cleaning the city become necessary.

2- Theoretical bases

The purpose of this study is show municipal solid waste situation in terms of production, per capita, physical composition and various methods of disposal in Zanjan. Using weighted analysis and field studies - cases of solid waste were collected in the period of the autumn of 2008 to the summer of 2009 through the truck-load sampling based on random cluster sampling. As such, in the middle of each season, the weight of each garbage truck has been measured for seven days and each day, the load of just one truck were separated manually for determining the physical components of the waste constituents. So that the solid waste was analyzed. Generalizing the findings to other days of each season, information relating to municipal solid waste of each season was gained. Also in this study, Zanjan's citizen participation in the implementation of waste separation at source has been investigated. Public surveys were conducted by classifying the city into four clusters and completing 400 questionnaires through interview method by 0.4 percent of households living in each clusters.

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3- Discussion

Results show that citizens of Zanjan produce about 270 tones of solid waste daily. Per capita 0.77 kg per capita this is 0.13 kg higher than the average per capita (0.64 kg) in Iran. The the maximum rate of 25623 tons of solid waste was produced in the autumn, i.e. 284.7 tons per day and the lowest rate of 24142.8 tons was produced in the spring , i.e. 259.6 tons per day. Also, by comparing values obtained for the density of solid waste in different seasons, it is found that the highest density was related to the autumn, which is averaged around 238.6 kg per cubic meter and lowest density of solid waste is in the spring with the average of about 219.2 kg per cubic meter. The high density of solid waste in the autumn can be due to the high amount of organic matter in the season with high humidity such as fruit and vegetable skins which compose the highest percentage of solid waste. Also in Zanjan city, hospital waste production rate is 3.3 tons and industrial waste is 2.5 tons per year. On the whole, 98531.5 tons of solid waste is produced annually in Zanjan. The results show that separation at source is more desirable, efficient and practical than separation at other stages due to the ease of separation requiring minimal time and cost, less contamination and destruction of recyclable materials. In this study citizen participation in recycling programs was also studied and evaluated and the results. Hopefully shows the positive view of citizens for cooperation in urban waste management in Zanjan in the future.

4- Conclusion

Based on the research about 73 percent of Zanzan waste is organic waste, so, there is a high potential for composting industry. On the other hand, the share of total dry waste production is growing slowly, that necessitates the use of recycling. Although the separation of recyclable can be done in transfer stations materials, in the central processing station or landfill occur but separation of recyclable materials in the production stage (in source separation). Is more desirable, efficient and practical than separation at other stages due to the ease of separation requiring minimal time and cost, less contamination and destruction of recyclable materials? Considerable value of source separation of dry waste and separation of dry waste from the total waste produced the need for producing energy material from waste as well as the need for proper and healthy and doing this burial along with other countries, prescribe appropriate strategy and implementation plan for Zanzan city. Accordingly, two strategies, of solid waste separation at source and increasing processed waste strategy has been proposed.

5- Suggestions

According to the results and discussion of the research for municipal solid waste management in Zanzan city two strategies of separation and isolation of solid wastes produced in the source and increasing processed waste are recommended. Separation of wet and dry wastes can be done in two ways: separation during production or separation of waste from source and separation with processing waste

during collection, transport, storage, burial or composting. To perform source separation hardware and software features are required. Success in this regard, needs multilateral cooperation of the executive team of solid waste management, people, official and commercial units operating in Zanzan city. In the other word, implementing such a plan demands legal requirements, proper planning, proper funding and its classification, hardware, software and structural requirements and private sector participation. And also to increase the processed waste, residual waste after the stage of separation at source, includes dry organic and mixed waste, processing units (including composting and energy production) and maximization of recycling minimization of burial of recyclable materials. Implementing this strategy, with participation of producers of this material (people) can become a successful activity. New health promotion movement needs the cooperation of all sectors of society and without their active participation it cannot be done or achievement of the objectives is very difficult. Therefore, solving today's problems of collecting, transportation and disposal of municipal solid waste, is not possible without people's cooperation with the authorities.

Keywords: Municipal Solid Waste, Waste Management, Recycling, Sustainable Development, Zanzan city.

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