

Evaluation and Productivity Enhancement of Fixed Exchange Stations of Arid Wastes from the Bank

Amirhossein Tayebi Abolhasan

Industrial Engineering, Ferdowsi University Of Mashhad, Iran

Mashhad Municipality's Youth Advisory Group Member

Email: Amirhosseintayebi69@gmail.com

Abstract

Nowadays solid waste materials disposal in large cities has turned into an issue with increasing consequences. In some cities, including Mashhad, large-scale projects and good programs in the field of waste management and recycling are running. One of the appropriate actions done in this regard is the establishment of fixed exchange stations arid wastes in waste bank. In this article, as well as introducing these stations, we will investigate their performance and determine standard criteria. Finally, for a better performance of these stations in the country, the achieved as well as strategies for improving productivity shall be given. This study is a result of evaluation of field interviews with 12 stations of Mashhad municipality waste management organization with the help of teachers and environmental specialists in the province. It is worth mentioning that 23 indices were identified and evaluated in this regard. Finally, except for two cases, everything else was fairly suitable.

Keywords: environment, waste management, performance evaluation, efficiency, separation stations from waste bank

Introduction

The importance of the environment is not unknown to anyone. Despite Appropriate taken measures, some citizens have not paid enough attention to it unfortunately. Article 50 of Iran Constitution says: in the Islamic Republic, Environmental protection which current and the next generation should have a developmental social life in ,is a public duty. Hence, the non-economic activities which lead to environmental pollution or destruction are prohibited (Tayebi, 2012)

Environment is called environment when human beings both live in it and benefit it. To achieve comfort and joy and at the mean time protect it. The question that how can it be protected is a hard question which needs its own protective methods with its own special form Kazemi kheibari (2009).

Today, the disposal of solid wastes in large cities has turned into a big issue with increasing outcomes. Aside from the very high cost of collection, transport and disposal of urban waste, its environmental hazards is serious enough which the concerns of the continuation of this situation should make all segments of society, especially environmental managers to think and act in this regard (Pedram, 2003). In this challenge ahead of us, using the experience of other countries or successful executive models in different cities of Iran seems necessary and urgent 22. According to the law of urban wastes, managers should apply methods in order to make the existing elements in waste material management come to a conclusion and prevent non-prilimentary disposal, return of capital to the national economy, help to preserve the environment, the economy, job creation, community as well as private sector Participation. Due to the fact that optimal objective of urban solid waste management in all aspects of the production, gathering, processing, transportation and temporary storage, recycling and disposal of these materials is to reduce environmental pollution and recycle these materials and use the energy hidden in tem 15, good programs are running in the

country. Mashhad municipality waste management organization was one of the pioneer organizations in this respect which one of its good practices in the field was the establishment of an exchange stations of arid wastes from waste Bank (Asadi & Nabi Zadeh,1998).

Waste management

Solid waste refers to all solid or semi-solid materials which have no retention value. If these substances are not inappropriately and safely disposed, they can cause health problems as well as uplifing the environment.

For the right disposal of urban wastes, they should be analyzed and separated based on their physical and chemical characteristics. Urban waste usually consists of two broad categories of arid and wet wastes. Wet wastes including fruit skin, vegetables, green spaces wastes, etc. arid waste such as variety of metals, glass, wood, fabric, plastic and the paper (Vesilind, Worrell, & Reinhart, 2002). The sources of solid waste production are residential and commercial areas, educational centers, administrative and construction activities, health, waste treatment plants and the various industries and other agricultural activities.

An improvement in peoples' life as well as their economic and industrial development has made a lot of wastes which is now the most important environmental problems. With the development of science and technology, solid waste management had its own expansion 3. There are different methods for waste management including recycling, burying, burning, etc. which using each depends on the type and the amount of the waste.

Separation at waste bank

With the taken evaluation, reduction of the amount of produced wastes is the suitable method for preserving the environment. The most appropriate option in this regard is that waste recycling. for this purpose we should consider the following two important.

(A) Separation at waste bank

(B) Conversion of wastes in industrial centers

Regarding item A, an Administrative Office of separation at waste bank in some of the country's waste management organization is responsible for saving and separation management of wastes at waste bank. Regarding item B, most industrial complexes have tried a lot to make this objective met.

Based on an old saying "prevention is better than cure" has been the core theme of separation at waste bank. It is all clear that with technological advances in waste separation, classifying dry and wet wastes in different categories of collected glass, paper, metal, etc ... we can have better management of such wastes. It both would be a save of time and money when the dry wastes are classified, and easily transferred to recycling factories.

In the following part some information is given about the separation station at waste bank in some cities of Iranian, then the best stations in Mashhad will be introduced (Vesilind et al, 2009).

In waste management organization of Tehran municipality the separation of arid wastes (waste bank) is done by the municipality car from door way of citizens. Although some recycling pavilions are located in the city which are busy buying citizens wastes.

Waste management organization in Shiraz is busy with waste collecting in its 5 waste exchange stations.

The waste management organization of Oromihe municipality in September 2012 started to place two arid waste exchange stations in the city .these stations are only open on Fridays 8 am to - 13 pm.

The waste management organization of Mashhad municipality and methodology of the research

Regarding the tourism and pilgrimage conditions of Mashhad as capital of Khorasan Razavi as well being the second largest religious metropolis in the world, the amount of waste management organization of Mashhad municipality's activities (map) is relatively specific. According to the official website of the Organization, daily more than 1,800 tons of garbage is produced in average which part of it (about 60% 70%) is of wet waste and about 30 to 40 percent of it is the arid wastes. Map organization as the largest industrial cluster of the country in recycling field, includes factories such as, tire recycling, asphalt recycling, e-waste recycling, paper recycling, poly styrene plants, biogas recycling, etc.

Considering the importance of recycling and recovery and accelerating arid wastes recycling, this organization has started to build fixed waste exchange stations from the year 1386. In this way the aim is to give the optimum services and provide easier conditions for the families to recycle their arid wastes. These stations are also equally spread in the city which the number is around 36 in Mashhad.

In this way the citizens through delivery of arid wastes to the stations receive a membership card and then the amount of handed arid wastes is weighed and calculated on the basis of national market value and money is put into the account of the citizen. Citizens can spend their money in the card to buy variety of detergents or save it in their account to use it in future reference.

In this study, with the initial evaluation, the necessity for the evaluation and implementation principles of efficiency in these stations were proven. For the necessities of this research, the following items can be pointed out:

- 1-Optimizing and increasing the efficiency in the waste management organization measures in the field of fixed stations and arid wastes at wastes bank
- 2-Saving energy resources of the organization
3. Evaluation of effective performance and effectiveness of the stations
- 4- Giving better services
- 5-Increasing employees and citizens' satisfaction and motivation
6. Preserving the environment and better culture making for citizens

This study is a result of field evaluation and questionnaire interview in 45 days from 12 fixed exchange stations of arid wastes in Mashhad, which the selection of the stations and the amount of the samples was done according to the facilities and experts' opinion (Pedram,, 2003)

According to the comments of experts in this field, the General indicators of these stations were identified in the following format (Rahimi-Moghaddam, 2009)

1-Nominal indices: As you know the appearance of each thing will have the first impact on our opinions which means that when people are dealing with any subject will first pay attention to its appearance. This case is also true about separation stations at waste banks. Factors such as the physical appearance, design, color, and coloring, type of the station, vehicles and personnel working in that set are of high importance. Therefore, the above stated cases should highly be paid attention to .

For example, in designing and painting of the station ,psychology of color can be paid attention as well as the appearance of the stations , the logo of the organization, phone numbers , connection ways, specifying the received items, specified working hours , warnings , announcements and etc..

2-Demographic, cultural, and geographical indices: these cases both need to be assessed individually and in a group. Locating each stations is done according to the distribution of population. This means that wherever the number of people who are living in a place is more the

number of stations will increase. For example, regarding Gasem Abad's population in Mashhad, three stations seem not many. Regarding the geographic index civil status of Mashhad in terms of the length of the streets, the number of squares and intersections as well as being a residential or commercial region should be paid attention to. In terms of cultural indexes, it should also be noted that on the basis of the regions the received material and offered gifts should be reconsidered. For example, in areas with low income, it is not desirable to provide expensive gifts as well as in areas with high income levels, offering low-price and low-quality gifts is not desirable.

3-Educational indices: Arguably the forgotten index in the stations is the education. The issue of education is indirectly done at the stations, but nothing is actually done in this regard. In some stations, the contractor is obliged to provide the education to the citizens through catalogues, CD, etc. Therefore, the topic of culture can be taken seriously.

4. Incentive indices: As it was discussed in the cultural debate, the appropriateness of offered gifts in terms of price-quality must be at the region's level.

According to the various evaluations and other experts' opinion, it seems that the above assessment criteria and other parameters can be used in 3 other areas (municipality, officials, citizens and the station).

Results of the study

Except for one station (gas station) all other 11 stations obtained a rate above 60% which relatively shows a favorable status in Mashhad's stations. Regarding the high attention in selecting the parameters, the general criterion according to 10 points has been provided.

The results have been compatible with environmental experts' recommendations and it also indicated that the selection of 23 indices in evaluation of these stations and their results seem appropriate and logical. Same organizations can see this article as a role model in evaluation of similar places in order to measure the improvement of their productivity.

Conclusion

The product of a new life for human beings have been the indiscriminate consumption of products and polluting the environment .In recent decades, the importance of the environment is known for everyone, in between, the importance of wastes managements and recycling has played a good role in environment as well.

In this study, while introducing fixed exchange stations of arid wastes at bank, the wastes and their management were introduced as well. According to the different researches done in this area, we paid attention to their performance evaluation and determination of the criteria. The results of the study were gained through field evaluation and an interview with 12stations of Mashhad municipality waste management organization. At the end suggestions about promotion of social welfare and applicable proposals with overall approach will be given in this regard.

General suggestions on improving the status of the station:

1. The structure and design of the stations:

Locating stations on the Foundation

Providing cooling and heating facilities

A change in the internal layout of the station

Allocation special shelves for organizing the products

Anticipating the first aid kit and fire extinguisher

Anticipating WCs and resting place inside each station

2-Update notification

3-Monitoring and communicating a common account between stations in the city

Openly accessible at <http://www.european-science.com>

4. Revision of the stations working hours
- 5-Diversity and the replacement of high-quality products with reasonable price according to the area
- 6- Anticipating sub-work force for the employees
- 7- Required policies for all municipality employees to register in these stations.
- 8-Obligation to more and better education and culture in the station by distributing catalogs or CDs and letting people know about the process of waste recycling from very beginning to its end. This may bring more responsibility to the citizens.

Minor suggestions on improvement of the status of stations on 3 areas of stations' staff, citizens and municipalities:

1. On the scope of the citizens
 - Gradual removal of gifts is recommended: it can be shown through pictures or slogans that recycling is a cultural issue and those who are doing it are cultured and sophisticated.
 - Taking people on pilgrimage trips by their own expenses which they have made by giving their wastes to recycling stations. It is both good for people and the municipality.
 - Making profits for citizens from arid waste separation
 - Giving more and better information to citizens, especially at the time of celebrations and providing them with special awards for better transparency in the form of posters in the stations, the back of the Bills, etc..
 - Giving them special gift or sending a welcome message to those who register in the recycling stations for the first time.
 - Setting up a competition for each station and members of the urban area by the authorities and making them more familiar with the process of recycling as well as holding them competitions like: who can make the best handcraft out of arid wastes or who can make a Haftsin table out of arid wastes.. etc.
2. In the scope of stations staff
 - Paying more attention to the cleanliness of the stations as well the instrument which are used in these places.
 - Paying more attention to the personnel of the stations and teaching them how to treat people well no matter what.
 - Designing and setting up a complaints forms as well placing a comment box for people to put their comments in
 - Having monthly meetings with the Director of the station, all the relevant authorities and asking for their opinions about the existed problems
3. In the scope of municipality:
 - The use of private sector contractors in order to update activities
 - The appropriate design of the cars, garbage collection
 - To increase the number of stations in all parts of town
 - Use of solar panels for solar energy and reduce the costs of each stations in long term
 - Paying attention to the working days and hours of the stations and considering additional working staff if necessary

References

- Abdollah Zadeh, R.(2009). Reports the international agency volume one, and recycling the material organization of Tehran municipality, and energy, p.2.
- Asadi & Nabi Zadeh (1998). Hazardous waste management, environmental protection agency publications, Tehran, Iran, p. 349,

- Havaeji, Z. (2011). Energy management in industry, energy management Conference on oil
- Jafari.(2008). Biogas as a an energy, new energy organization of Iran (Sana),
- Karimian, A. (2010). Evaluation of environmental and quality management systems as well as the fifth National Conference on waste management, waste management, Mashhad,
- Khiberi Kazemi, K. (2009). Separating of origin and mechanization available materials collection systems recover with view on executive management and pattern used in the city of Mashhad, the third National Conference on waste management, 11-, Mashhad
- Naghavi, R. & A. dyari (2009). Waste management to investigate the arid city of Tehran, the third National Conference on waste management, Mashhad.
- Omrani, G. (2007). Waste management development, urban management, *Urban Waste, Journal*, Tehran University of medical sciences.
- Omrani, G. (2010). Solid waste management, volume 2, printing and publishing organization, Islamic Azad University.
- Papeli Yazdi, M. & Rajabi snajerdi, H. (2004). The city and side theory, publishing, Tehran,
- Pedram, S. (2003). The attitude of the Council and municipality to municipality, *Civil Education Journal*, Tehran
- Rahimi-Moghaddam, H. (2009). Training and continuous communication with the citizens of the municipality, the municipality, the quarterly magazine of the third year, Tehran, Iran.
- Saeid Nia, A. (2009). Solid waste management in municipalities, urban book: 7, Organization's publications, Tehran, Iran.
- Sheikh Azami, A. (2008). Urban cleaning, a new citizenship participation, the second specialized exhibition and Conference on environmental engineering
- Tayebi abolhasani, A. (2012). Energy waste in energy extraction of maintainability, the second International Conference of the new approaches in energy maintenance, Tehran.
- Tayebi Abolhasani, A.(2012). The research plan to determine the indicators and the evaluation of the constant exchange of dry residue in the stations of origin of the young advisors, Department of waste management organization municipality of Mashhad, Mashhad.
- Vesilind, A, Worrell, W. & Reinhart, D.R. (2002). Solid waste Engineering Brooks, Pacific Grove. Calif.
- Wath SB, Dutt PS, & Chakrabarti T, (2011). E-waste scenario in India, its management and implications, Environmental Monitoring and Assessment.