THE ASSESSMENT OF ENVIRONMENTAL VARIABLES BASED ON SWOT IN URBAN WASTE MANAGEMENT: CASE STUDY OF SOWME’E SARA CITY, IRAN

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ABSTRACT

Nowadays, with the increase of urban wastes size; we’re observing many concerns and worries in the field of waste management, because weakness of urban waste management in the urban area will impose irrecoverable environmental, sanitary and aesthetics consequences to the community. Waste management is considered as one of the most basic topics of sustainable development, and in this case the way of taking advantage of modern and scientific methods in organizing urban wastes has always been very important according to specific geographic location of each part of the country, along with the expansion of cities and indiscriminate growth of population. In this regard, this research has been provided and set with the aim of assessing the environmental variables in waste management of Sowme’e Sara city located in Gilan province, Iran. The present study using the method of analytical-descriptive and on the basis of SWOT model and its matrix has been dealt with identifying strengths and weaknesses, environmental susceptibility opportunities and threats based on urban wastes in the studying area and will provide solutions to achieve the goals of research.

KEYWORDS: Environmental, Waste Management, Sowme’e Sara City, SWOT Model

Nowadays, developing of urbanization as well as increasing the production per capita of urban waste due to the industrialization of communities, collection and disposal of urban waste has become one of the most important topics of comprehensive urban waste management categories. Sanitary landfill has been a new topic in Iran, and in most areas of Iran wastes are generally landfilling in the form of pile, burning, and unsafely in the best conditions, and among 92 percent of burial materials in the country, about 25 percent is principally and nearly sanitary buried. The main purpose of establishing a sanitary-engineering Centre is to minimize the risks resulting from wastes disposal. To achieve this goal, the risks and how to deal with them must be exactly identified (Monavvari et al, 2007).

One of the important impact of waste management on the environment can be the effect of waste management on global climate or on global warming, carbon dioxide and methane gas are the main constitutive gases to global warming topic, one of the main sources of the two methane gases, are sanitary and unsafe landfills (Hassani et al, 1392).

Waste can be classified in several aspects: physically (solid, liquid, gas), in terms of main usage (packaging, food materials, etc.), in terms of materials (glass, paper, etc.), in terms of physical characteristics (burning, composting and recycling feasible), the origin (domestic, commercial, agricultural, industrial, etc.) or level of safety (hazardous and safe). Domestic and commercial wastes are totally called urban waste that is usually less than ten percent of the total waste. The other ninety percent consists of agricultural waste, mining waste, manufacturing and industrial waste, energy production waste, water purification waste and construction and destruction waste. Domestic waste has always been complicated in urban management. Due to wide range of the existing materials in waste (glass, metal, paper, plastic, organic material, etc.) and complete mixing of the ingredients, there would occur many problems in their management. Moreover, waste composition would be changed in different seasons, in different geographic areas and from one country to another, and from one city to another, so are these barriers causing not have the same and single rule for all cities. Commercial and industrial waste is usually produced more uniform and in higher amounts, therefore a management system that can manage the domestic waste is definitely able to manage waste from the other sources too. Historically, health and safety has been the most important necessities about waste, so that the waste must be managed in such a way to have minimal risk to human health, but modern societies have mentioned broader needs. Environmental sustainability (cycle returns to nature) through recycling and reuse, and economic efficiency is the most important (Nourpour et al, 2013).
The current sensitive conditions, we cannot confront wastes via collection and traditional disposal systems, and require new methods of urban management based on specialized science to find and design the essential choice or agenda against environmental pollution resulting from a variety of wastes to the choice principles think. According to the issues raised, the present research deals with studying the environmental variables in municipal solid waste management in the studied area of Sowme'e Sara City located in Gilan province and would mention required analyzes and assessments using SWOT model.

RESEARCH METHOD

The research is applied in purpose and is survey kind in terms of the way to collecting descriptive data. Library researches, referring to books, scientific journals and valid internal and external sites have being used to access updated and efficient information. The research method is descriptive - analytical. The main scope of this study is Sowme’e Sara located Gilan province, Iran. To achieve the goals of research, a combined method has been used first and then for next steps we’ve used SWOT analytical model to analysis data, provide solutions and evaluate environmental variables in the waste management of Sowme’e Sara City. This matrix is prepared by the following steps:

1. Strengths and then weaknesses are listed.

2. Coefficient is given to these factors. Coefficient given to each factor from zero (not important) to 1 (very important) represents its relative importance in success. Regardless of whether the agent is considered as an internal strength and weakness, the highest coefficient must be given to the factor that has the greatest effect on performance. The sum of these coefficients must be equal 1.

3. Then a score of 1 to 4 will be given to each of these factors. Score 1 indicates a fundamental weakness, score 2 low weakness, score 3 states the strength and score 4 represents high strength of the factor. Scores are based on the area situation and coefficients (which are shown in the second step) are based on the type of activity.

4. To set the final score of each factor, the coefficient of each factor is multiplied in its score.

5. All final scores of each factor will be calculated and final grade will be determined.

LOCATION OF THE STUDIED AREA

Sowme'e Sara City is located in the west of Gilan province, Iran, from the north it is limited to of Bandar Anzali, from the south to Fuman County, from the east to Rasht counties and Shaft, and from the west to Masal and Rezvanshahr counties. Sowme'e Sara city with an area of approximately 633 square kilometers and based on the last country’s divisions it subdivided into three districts: the central, Tolam, and Mirza Kuchek Jangali district, and into seven rural districts of Ziabar, Kasma, Hende Khaleh, Lifshagerd, Gurab Zarmikh, Taher Gurab and Markiyeh and three cities of Sowme'eh sara, Marjaghal and Gurab Zarmikh, and one hundred and fifty two villages.

The city latitude is thirty-seven degrees and its longitude equals forty-nine degrees and eighteen minutes. The city center i.e. Sowme'eh Sara is located at a distance of approximately twenty- five kilometers from the province center. People in Sowme'eh Sara speak Gilaki with Bieh pas dialect, but, in mountainous areas and highlands people speak Talesh and in Gaz Gisheh village they speak Kurdish due to multiplicity of Kurdish migrants (from the distant past).

Also, an Azeri immigrant group resides provinces of Ardabil and Zanjan provinces sporadically, especially in an area known as Zeydeh Sara in Sowme'eh Sara. Economic activities of Sowme'eh Sara people mainly rely on the exchange of agricultural products of the villages around. Sericulture and bee growth in the county has also the country privileged position. In natural resource sector, it has the first position in terms of planting Pine and wood production but it doesn’t have much growth in livestock field due to small area of the county. Traditional rural architecture in Sowme'eh Sara relies on a valuable experience of the ancients and have been created in a harmonious environmental factors which have an essential role in the architecture way of climatic factors such as constant rainfall, winds, natural and available materials, and in some areas, type of houses like Talambar, Kandooj and etc. is in direct contact with agricultural labor. Sowme'eh Sara city with its special climate is located in humid and mild climate, and has plenty rain over thousands millimeters per year (Map1).
ANALYSIS

Essential component of municipal solid waste management is to develop a management plan tailored to the ecological, economic and social characteristics of an area. SWOT model is a planning techniques to identify the main and affecting factors on anticipated targets. SWOT analysis is done before the strategy codification and the analysis includes current and development effects in the future that cover the set of internal factors (strengths and weaknesses) and external factors (threats and opportunities). Forming and listing evaluation matrix, we can examine various factors, so that if final score in the evaluation matrix of internal factors is more than 2/5 (average of 1 and 4), respectively, strengths will be more than weaknesses, and if final sum less than 2/5, strengths will be less than weaknesses. The procedures would be repeated for evaluation matrix of external factors.

INTERNAL FACTORS INFLUENCING THE ASSESSMENT OF ENVIRONMENTAL VARIABLES IN MUNICIPAL SOLID WASTE MANAGEMENT OF SOWME'E SARA

The purpose of this section is to identify and assess the effects of inner environment of studied area in order to evaluate the strengths and weaknesses. That means the aspects are considered in which achieving way of planning goals and executing tasks there are favorable and dissuasive fields. In this respect, the strengths and weaknesses are divided in a specified framework. Internal factors such as: implementation of breakdown plan of domestic wastes source in some areas, utilization convenient urban transportation machines to collect garbage, housewives awareness in the breakdown of domestic wastes, using smooth and reflective uniforms by municipal employees, manual and non-mechanized collection of municipal solid wastes, lack of proper education and information to citizens about waste breakdown, unsafe landfills along with the lack of necessary researches in this section, change in consumption patterns and increase of waste production rates, failure to meet the schedule of waste collection by municipal employees, hospital landfills along with domestic wastes, failure to meet safety-health principles by municipal employees and inadequate waste collection vehicles all over the city.

EXTERNAL FACTORS INFLUENCING THE ASSESSMENT OF ENVIRONMENTAL VARIABLES IN MUNICIPAL SOLID WASTE MANAGEMENT OF SOWME'E SARA

The purpose of this section is to review and assess the impacts of the external environment of studied area to identify opportunities and threats that we’ll face while evaluating the environmental variables in municipal solid waste management in the studied area. On this basis, the set of available opportunities and threats would be divided in a specified framework. External factors such as: save the costs of waste collection and disposal, create job opportunities, provide executive-service programs of waste management, environmental laws and regulations, less need to land for municipal landfills through recycling plan, lack of using advanced technology in municipal solid wastes disposal, the use of non-specialist staff for garbage collection, lack of citizens’ participation and NGOs, close municipal landfills to rural districts and sometimes residential ones, available badgers to collect municipal wastes in order to sell, environmental pollution breakout in the city and lack of culture and use of recycled utensils.

DISCUSSION AND CONCLUSION

After collecting the data, research information and its analysis by SWOT model, the research findings indicate the superiority of weaknesses with weighted credit of 1/461 on the strengths weighted credit of 0/391, which reflects sensitivity of the studied area in terms of environmental vulnerability. Also threats with weighted credit of 1/54 have superiority on opportunities with credit weighted of 1/083. Results of each of identified internal and external strategic factors represent vulnerability degree of Sowme'e Sara City based on upward urban waste and to improve the scope of urban services due to existing potentials in the studied area, we require planning and investment in infrastructure sector in order to improve environmental management. If the
correct environmental assessment is not carried due to the extension of urban waste of Sowme’e Sara, a negative outlook will be drawn for the future. While implementing utilization plans, the subject of prevention, damage and contamination of the environment along with establishing an integrated information system must be specially considered. After evaluating the environmental variables in solid waste management of Swome’e Sara, it would be better to use a grid matrix to present placement status of the studied area. The area position will be achieved of symmetry of the sum total of the inner and outer factors, so that the results of internal and external matrix show that the studied factors will be places in 6th house (VI) that suggests unfavorable circumstances. According to figure (1), multiple environmental threats are facing Sowme’e Sara City. As the provided strategies present, it can be generally concluded that the role of planning and advertising has been much emphasized on these strategies. Thus, we can mention some of basic solutions such as holding training courses, reloading advertisements, culture and waste breakdown of the origin for the citizens. Of course, cognition and planners and decision-makers’ knowledge of urban field in transferring technical knowledge of recycling lines in order to protect the environment is very important and we should not be unaware of the existing rules. In the end, creating incentive motivation to accompany citizens and support private sector are considered as unbroken circles on the way of achieving sustainable development.

**Figure 1: Matrix of SWOT strategies and enforcement priorities**

![Matrix of SWOT strategies and enforcement priorities](image)

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