Determining Appropriate Strategy to Improve Performance of Solid Waste Recycling System in Zahedan Using SWOT Method

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Abstract: Following the development of solid waste management law and the executive regulations of wastes, along the line of 20-year vision plan for the country and based on Article 50 of the Constitution of the Islamic Republic of Iran, Waste Management Organization was established in Iran for the purpose of achieving the objectives of sustainable development. Therefore, (Deputy for Research and Education) of the Recycling Organization was selected as official responsible in order to determines strategy and plans for establishment and implementation of this organization. Basic strategy principles for waste in every city is determined by policy and planning in various management areas such as culture and education, storage system, material transport and disposal and particular cases such as lower production (minimization) and the important issue of (recycling in the production process from the source). This issues needs to be dealt with appropriate technology in all the cities. Despite efforts made in recent years in Zahedan, >40 million Rials is spent daily in order to transport 220 ton/day of waste materials. Considering the uncertainty of efficiency of the current strategy, it is obvious that applying an appropriate strategy can reduce a large portion of the costs across all the stages of solid waste management. This study aims to offer efficient strategies to improve solid waste recycling system in Zahedan based on the technical and economic conditions in the SWOT matrix (weaknesses, strengths, opportunities, threats). The results of this strategic analysis are presented in the following sections.

Key words: Management, planning, strategy, solid waste assessment, recycling, Zahedan, SWOT

INTRODUCTION

Strategy is a Greek word and it means the operation and guidance of war and military formation. The science of strategic management was developed following World War II. At the time, the general idea was that the mechanisms of war are not the sole factors in success and that the recognition of other factors and their appropriate

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combination can lead to better results (Tanskanen, 2010). In 1950 and following the war, governments set their ssssstrategic objectives as welfare, peace and human dignity rather than war and military conquests. In fact, strategic management can be defined as the art and science of development, implementation and evaluation of multiple tasks in any organization which enables the organization to achieve all its objectives (Read, 1999). In general, strategic management process includes steps (setting the vision and mission, setting goals based on the organization's mission to develop solutions and strategies). Following a decade of neglect in the 1980's, strategic management was revived once again in the late 2000's and it can be confidently said that today it is used in all successful organizations. Science of strategies can be used to develop, implement and assess knowledge and eventually observe its effects in the success of the organization with its decision to achieve the objectives (Hogland *et al.*, 2004). Given the developments of the last century along with population growth, progress in technology and production of solid waste, a new stage of environmental degradation has begun and since solid waste is one of the main pollutants in the environment and is an integral part of human life, some concerns regarding depletion of God-given resources and pollution of natural resources have led researchers to put the issue of recycling of solid waste on top of their agenda for waste disposal (Omer, 2008; El-Fadel *et al.*, 1997; Biglari *et al.*, 2016; Biglari *et al.*, 2016). According to the Constitution of the Islamic Republic of Iran and due to the importance of preserving the environment and more efficient development of this inheritance for our descendants, the issue of waste management and recycling has gained further significance (Biglari *et al.*, 2016; Damghani *et al.*, 2008). Basic principles of waste strategy for each city is determined by policy and planning in various management areas such as culture and education, storage system, material transport and disposal and particular cases such as lower production (minimization) and the important issue of recycling in the production process from the source. This issue needs to be taken into account using the appropriate technology in all the cities. According to the figure presented at the end of the present section, available books and references and following the waste reduction program, recycling process has been at the forefront of solid waste management programs (Tchobanoglous *et al.*, 1993; Davidsson *et al.*, 2007). Recycling reduces not only the risk of contamination in the environment but also has numerous economic benefits. Findings show that recycling 25% of waste paper in the country can lead to one hundred thousand recycled study in a year (Abdoli 2005; Ebrahimi *et al.*, 2015; Yarmohammadi *et al.*, 2016a, b; Moradi *et al.*, 2016). Unfortunately, because, production of large amounts of wastes threaten our environment in different ways, the current situation regarding solid waste management, despite the rapid development and modernization of this field in the world is in the early stages of its progress and crucial state in our country and there is a huge gap between the current situation and a desirable one. This situation is not acceptable in achieving the objective of preserving and protecting our environment and appropriate action is needed to be done quickly in this (Monavari *et al.*, 2012). So far different strategies have been proposed in different cities in order to improve the efficiency of waste recycling system. Since the success of recycling programs is closely related to the identification of all the influential factors in recycling including strengths and weaknesses (internal factors), opportunities and threats (external factors) and at the macro level it is the foundation for sustainable development, the method for setting the priorities strategies is of special importance (Salem *et al.*, 2009). Finally, since the process of solid waste management and the issue of recycling is composed of many areas not only in the city of Zahedan but in all of the country, in order to achieve a desirable degree of the objectives we should study the challenges, accelerating factors and inhibitors as well as potential opportunities (outlooks) and then develop appropriate plans of action. In order to achieve its objectives, this study has investigated the challenges and prospects of economic and technical feasibility of waste recycling systems in Zahedan. With regard to technical conditions and environmental strategies for the purpose of improving solid waste recycling system in Zahedan, this study has utilized SWOT analysis (Strengths, weaknesses, opportunities and risks) and recommended several practical strategies (Srivastava *et al.*, 2005). Using the aforementioned strategies and solutions plays an important role in increasing the efficiency of waste recycling systems.

MATERIALS AND METHODS

Of the three stages of strategic management (strategy formulation, strategy implementation and strategy evaluation) the present study has solely explored solid waste recycling programs in Zahedan in terms of management strategies using SWOT analysis (Mor *et al.*, 2016). In the stage of Strategy formulation determined by recycling organization missions, the factors in the external environment which threat or constitute opportunities are recognized, the internal strengths and weaknesses of recycling organization are identified, the long-term goals are determined, the various specific strategies are taken into consideration for the activities of the organization. Long-term activities of the organization are also specified and then it is determined what activities should be halted The degree of resource allocation to certain types of.

A summary of the hierarchy of waste management and pollution management strategy
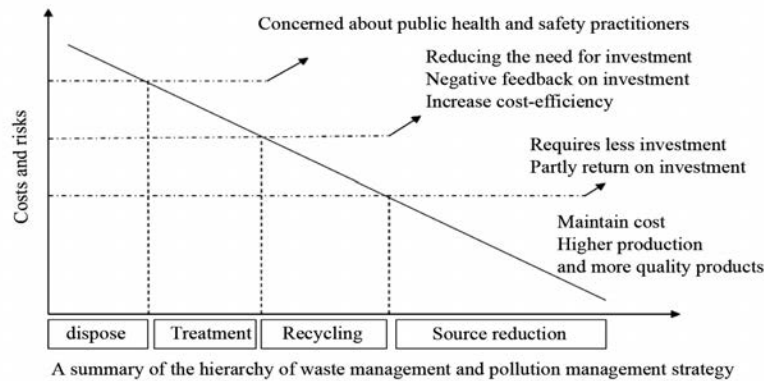
Fig. 1: A summary of the hierarchy of waste management and pollution management strategy

Fig. 2: Strategic document for recycling

activities, deciding to expand activities, development and even merging with or joining new companies and overcoming challenging factors are also considered during this stage (Aich and Ghosh, 2016). In short, strengths and weaknesses (internal factors), opportunities and threats (external factors) to solid waste recycling system are identified and analyzed in this method and finally strategic document for recycling organization in Zahedan is developed and presented (Fig 1 and 2).

Determining the organization's mission: Determining the mission for an organization is a term with which objectives of one organization can be distinguished from another organization. It also explains the rationale behind the organization's existence (Biglari *et al.*, 2016). The executive management of solid waste in Zahedan as an independent organization in the organizational structure of the Zahedan municipality is established with the objective of playing an effective role in achieving sustainable development and clean environment for all citizens. Using modern technologies, this organization aims to conduct planning, research, training and executive management, production, storage, collection, transportation, recycling, processing and disposal of solid

waste, on the basis of solid waste management and utilization of public participation and cooperation with other organizations with similar aims and the private sector in order to achieve the objectives of their won stakeholders Recycling Organization of Zahedan in 2008.

Organization objectives: Using its management powers, creative human resources and modern technology, the executive management organization of solid waste in Zahedan will take appropriate actions to excel in urban and environmental indicators in the country. In addition, it aims to be recognized as a credible organizational executive management of urban waste and more specifically it aims to reduce waste production from the source, have the healthiest and cleanest environment of the region, increase the active participation of society, strengthen interpectoral coordination, reuse and recycle dry wastes from the source, reduce the maximum amount of waste in landfills by utilizing economic energy recycling techniques, produce compost at the maximum capacity and ultimately promote the economic and governance trend, supervision and assign of all of government incumbencies to private sector Table 1-3.

Table. 1 Economic energy recycling

Strengths	Coefficient	Rank	Score	Weakness	Coefficient	Rank	Score
On the goals of the organization and its relevance to societal goals	0.02	4	0.080	The need for retraining and training of personnel and managers	0.05	2	0.10
The spirit of cooperation of staff and employees	0.02	3	0.060	The exact cost of compliance issues and harmful jobs	0.05	2	0.10
Software and hardware	0.025	3	0.075	Costs of education and research and development	0.04	1	0.040
Manufacturing practices and standards identified	0.035	3	0.140	Problems related to the safety and health of employees	0.03	1	0.003
Creating a good market sales	025/0	3	0.075	Limitations in the methods of disposal	0.04	2	0.080
Turnover	0.025	3	0.075	The need for planning occupational health	0.025	1	0.025
The potential for research and development	0.03	3	0.090	The need for changes to the statutes and regulations relevant	0.04	2	0.080
Research centers and universities cooperating	0.015	3	0.045	The need for investment in equipment	0.03	2	0.060
Co-education in cultural issues	0.05	3	0.150	Problems related to the geographical location and the need for handling	0.03	2	0.060
Statistics and analysis of information	0.025	3	0.075	Weakness in process variation, process control and related industries	0.025	2	0.050
Industrial potential	0.02	3	0.060	The lack of coordination within the part	0.025	1	0.0250
High potential for scientific	0.015	4	0.060	The high rate of waste production	0.03	2	0.0600
Any significant amounts of recyclable components	0.02	4	0.080	Low private sector participation in recycling programs	0.03	2	0.0600
There are religious beliefs and their role in saving and	0.07	4	0.280	Low participation of people in preserving the God-given gift environmental programs	0.015	2	0.0300
High population covered	0.07	4	0.280	Most industries, especially in state-owned recycling	0.015	1	0.0150
High economic potential	0.035	3	0.105	The absence of formally source separation	0.25	2	0.0500
Total			1.700	Total	0.865		

Table 2: Opportuntiy of external factor evalution

Opportunity	Coefficient	Rank	Score	Threats:	Coefficient	Rank	Score
A broad group of stakeholders	0.05	3	0.12	Hard and harmful jobs and therefore relevant expenses	0.3	1	0.03
Monopoly of the market (municipalities)	0.03	3	0.09	Public education and accept the need for cooperation and related costs	0.05	3	0.15
Support government regulations	0.04	1	0.04	Problems related to the culture of public	0.05	3	0.15
Support government regulations	0.03	3	0.09	New laws and relevant style sheets	0.05	2	0.1
Increasing growth and market position	0.04	3	0.012	Regarding the use of illegal and unprincipled of products and services	0.02	2	0.06
The possibility of obtaining a very low-interest loans	0.03	1	0.03	Degradation of natural resources (soil, water and air)	0.04	2	0.08
Job creation and entrepreneurship	0.03	2	0.06	The low social level jobs	0.04	1	0.04
Take advantage of technological advances	0.05	3	0.15	Since the implementation of the goals	0.05	2	0.1
Environmental impacts	0.04	4	0.16	The cost of developing the right culture production and separation of waste	0.02	2	0.04
Creating the potential for setting up public education to academic	0.04	3	0.15	Weakness in the standards, benchmarks and rules	0.04	2	0.08
Despite the progress in various fields in the country	0.04	4	0.16	The lack of cross-sectoral coordination	0.03	3	0.06
There is a lot of potential and a lot of potential	0.03	2	0.04	Not using new technology	0.03	2	0.06
There are recycling industry	0.03	3	0.09	The absence of official and	0.02	1	0.02

Table 2: Continue

Opportunity	Coefficient	Rank	Score	Threats:	Coefficient	Rank	Score
across the country				independent organization responsible for recycling			
There are many NGO	0.03	4	0.12	Lack of foreign investment in recycling	0.03	2	0.06
Total			1.42	total			1.03

Table 3: SWOT analysi

E	Strengths	Weakness
Opportunities	2.414	1.228
Threats	1.751	0.980

- Internal Factors Evaluation (IFE)
- External Factors Evaluation (EFE)
- SWOT analysis

RESULTS AND DISCUSSION

According to the descriptions and data resulting from previous calculations, the theory of SWOT and its theoretical analysis, the confluence of internal and external factors for the strategy was found to be SO strategy. In order to achieve its objectives, the recycling organization is recommended to take steps towards using legal and administrative support, software and hardware development, horizontal strategies and educating employees and stakeholders. Using SWOT matrix analysis, it was found that horizontal integration strategies (growth strategy) are more suitable to achieve focus strategy more than current defensive strategies of the organization. It then can be recommended that while maintaining the current economic conditions and position, by changing the methods of culture, education personnel and people, setting out procedures and methods of work, determining the criteria for working, closer relationship with scientific communities, better relationship with people in terms of advertising, exhibition ,brochures, radio, television, celebrations and gatherings, more scientific methods of work, making relevant jobs more specialized, paying attention to the health of workers, managing peddlers and waste landfills, construction of recycling plants for glass and metals, attracting international assistance and cooperation in the provincial recycling programs, emphasis on the adoption of solid waste management in the organization as soon as possible, changing face to face education method, replacing old collection machines with modern ones, increasing the number of machinery, demanding the cost of services from citizens, justifying the reorganization of hospital waste, updating technology, hardware and software equipment, organizations goals can be achieved.

CONCLUSION

This study with the aims of determine the efficient strategies to improve solid waste recycling system in Zahedan based on the technical and economic conditions in the SWOT matrix. The result has been shown that the recycling organization is recommended to take steps towards using legal and administrative support, software and hardware development, horizontal strategies and educating employees and stakeholders.

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