Explaining and Assessing Indices of Waste Processing and Recycling in Line with Sustainable Urban Development (Case Study; Yazd City)

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Extended Abstract

1. Introduction

During the past few decades, the extent of urban solid waste production has been multiplied in cities across developing countries. Certain factors behind such increase include lifestyle changes, rapid growth of urban population due to immigration from rural areas, economic growth, and improved social circumstances among different urban groups in cities throughout Asian and African developing nations. Today, proper management of urban solid wastes is known as one of the most important environmental issues all over the world. Considering the increase in both populations and immigrations, waste production has been increased in Yazd city. The significant presence of foreign citizens in this city and the activities of a portion of these people in the unofficial recycling sector demonstrate the necessity of organizing unofficial activists in said field. The low environmental awareness level and cultural inconsistency have been problematic barriers against the implementation of recyclable material separation programs in regions where these individuals reside. Additionally, the presence of a significant percentage of recyclable materials within urban solid wastes and absence of modern waste processing methods suggest the necessity of paying special attention to processing and recycling in Yazd city. This study is aimed at assessing and explaining the effective indices on waste recycling and processing in Yazd city.

2. Literature Review and Theoretical Framework

Waste management is a method that requires managers and organizations to make use of their abilities in line with conservation and correct usage of resources in order to achieve sustainability (Kwalho & Long, 2018). Recycling is also the main fundamental part of any comprehensive waste management programs which, if done correctly, can turn into an ideal activity for citizens to manage urban solid wastes (Farzadkia, Ghasemi, Allahabadi, and Rastegar, 2016). The significance of the issue is emphasized by studies that show more than 2% of people living in certain developing countries spend their daily lives by collecting and selling recyclable materials (Izeh, Fezcurly, & Roberts, 2013).
Almasi et al. (2019) showed that women with academic education and occupation, especially young women, have a better attitude and performance with respect to

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separating recyclable wastes whilst expressing less satisfaction regarding waste collection systems. Another study titled, "Recyclable Resources of Urban Solid Wastes: Assessing Energy and Economic and Environmental Benefits in Nigeria" showed that the use of recyclable wastes instead of producing new products can help with saving electricity and providing this energy for nearly 8.9 million people. Moreover, this would offer a total of a 11.71 million dollars of economic benefits which is equivalent to creating approximately 16,562 jobs (Ayodele, Alao, & Ogunjuyigbe, 2018). Long and Kwalho (2018) concluded that the most sustainable strategies in Rio de Janeiro involves focusing on separate waste collection and recycling them.

3. Method

Data required for this study were collected using two methods. In the theoretical part of the research, books, valid studies, and English and Persian theses related to the subject were taken into account. Additionally, a questionnaire was employed to collect other required information which were filled by experts. The total population of the study included 70 experts from Yazd Municipality Waste Organization, urban services field, and the Environment Organization. The number of samples was calculated using the 10x rule. Accordingly, 70 questionnaire were completed. Divergent validity was assessed using cross-sectional loads and Fornell-Larcker criteria. Reliability of the model was evaluated using mixed reliability. Path coefficients were obtained after executing the PLS-SEM algorithm. The estimated path coefficients that are exactly equal to +1 show strong positive relations; coefficients closer to zero represent weaker relations. Whether a coefficient is significant or not, ultimately depends on its standard error which is obtained from boot strapping.

4. Results and Discussion

Results of the study in the processing dimension showed that the composting technology (T=5.730) is effective in increasing the efficiency of Yazd waste management system. However, processing infrastructures have been ineffective in increasing efficiency (T=.129). According to the findings, the use of persuasive factors has not been effective in system efficiency (T=1.902); nevertheless, these factors have been effective on the recycling dimension which is consistent with the results of study by Amini et al. (2014) in Malaysia on the effectiveness of encouragement and punishment in recycling. It is important to note that punitive measures have not been taken on Yazd citizens with respect to recycling.

The organization of the unofficial sector has been effective in system efficiency (T=3.278). Moreover, the same factor has also been effective in the recycling dimension (T=20.140). The obtained results confirm the findings of Izeh et al. (2013) regarding the importance of the unofficial sector in achieving sustainable waste management.

The presence of recyclable material delivery centers and the appropriate distance between them has been effective in system efficiency (T=9.130), yet ineffective in the recycling dimension.

5. Conclusion

Considering the obtained results, in order to enhance the efficiency of Yazd waste management system, it is essential to take more effective persuasive measures to encourage citizens and manufacturers who use recycled materials. In addition, the existence of properly distributed integrated centers (recyclable material delivery centers with recycling tanks) would be effective in increasing the efficiency of Yazd waste management system. Other effective measures in this regard include increasing the capacity of compost production factory, elevating the quality of produced compost, and improving processing infrastructures. In order to enhance the quality of the produced compost (educating people on correct separation of dry wastes) and create the essential infrastructure for producing gas from waste, it is necessary to take effective steps using academic capacities and accurate, comprehensive studies.

Keywords: Processing, Recycling, Path Analysis, Waste System Efficiency, Yazd City

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