

Study Area



Fig.1 – Greater Dammam Area

Introduction

- Municipal Solid Waste (MSW) can be characterized as all the solid waste that is generated by commercial or residential buildings.
- Most conventional methods of solid waste disposal use up precious land and cause harm to the environment.
- Integrated Solid Waste Management (ISWM) ranks all methods of waste management in terms of desirability, ranging from Waste Reduction as most desirable to Disposal as the last resort.
- This study will investigate the waste management system of the Greater Dammam Area in order to assess where it stands when compared to global Integrated Solid Waste Management standards.
- Phase 1 of this study is to conduct a survey to assess the level of public awareness on this issue and gather feedback from local residents on how to solve it.
- This survey will be used to determine local residents' willingness to apply ISWM practices in daily life.

Objectives and Methodology

- The first objective of the survey is to assess the level of public awareness regarding the current MSW management system in the study area.
- The second objective is to get obtain feedback to determine the general public opinion concerning the issue of waste management.
- The questionnaire is specifically designed to gauge the general public's knowledge regarding ISWM methods, and to what extent they are believed to be practiced within the Greater Dammam Area.
- The public opinion section focuses on overall satisfaction with current MSW collection and disposal services, possible ways to improve them, and willingness to actively participate in ISWM practices.
- Selected personal information is also documented in order to characterize the data, and determine some of the variables that may influence public opinion.
- All survey data is entered into and analyzed with the use of IBM SPSS Statistics, and charts have been prepared for response results for the most significant questions in the survey

Results and Discussion

Age Group	Participants	%
<30	137	27.3
30-39	158	31.5
40-49	97	19.4
50-60	70	14
>60	28	5.6
Unspecified	11	2.2
Total	501	

Education Level	Participants	%
High School	68	13.6
Diploma	57	11.4
Bachelors	258	51.5
Masters	94	18.8
PhD	13	2.6
Unspecified	11	2.2
Total	501	

Fig. 2 – Sample Group Characteristics

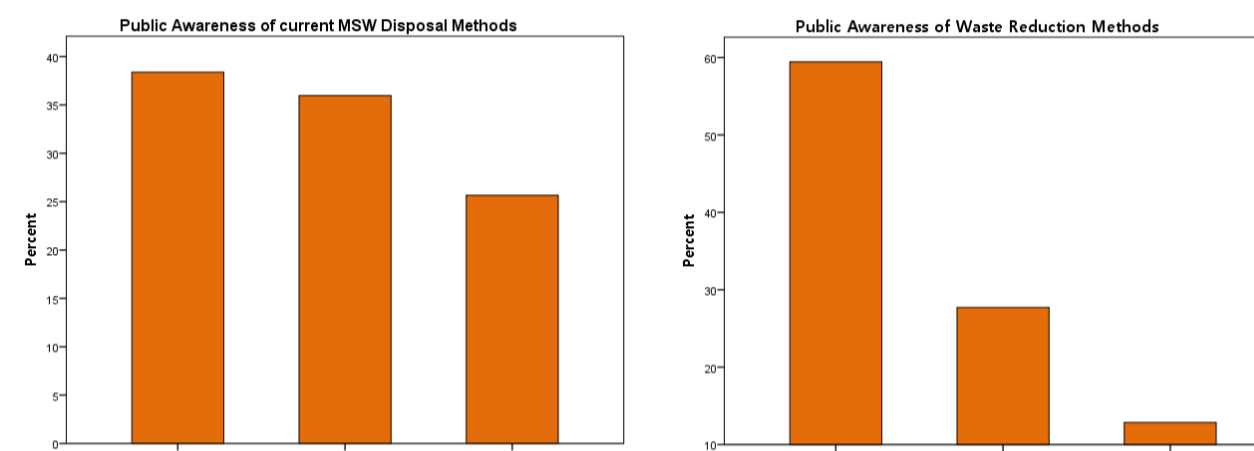


Fig. 3 – Analysis of Public Awareness

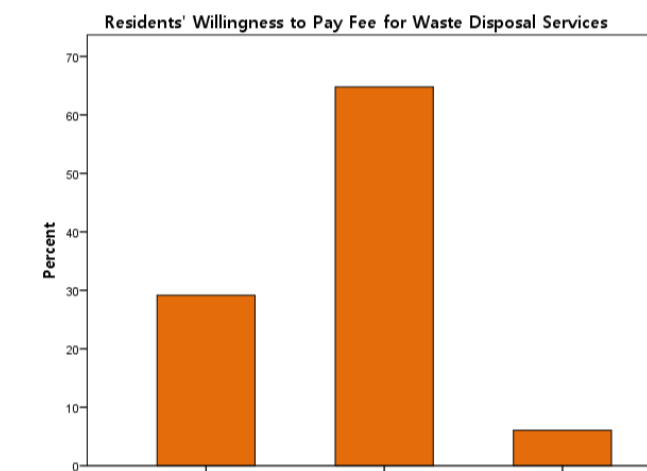
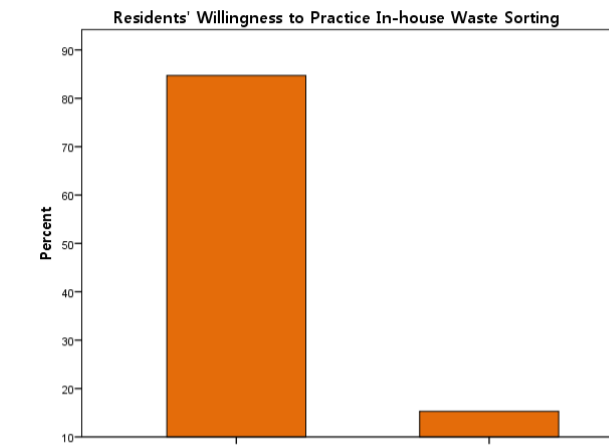


Fig. 5 – Survey Responses Regarding In-House Waste Sorting and Waste Disposal Fees

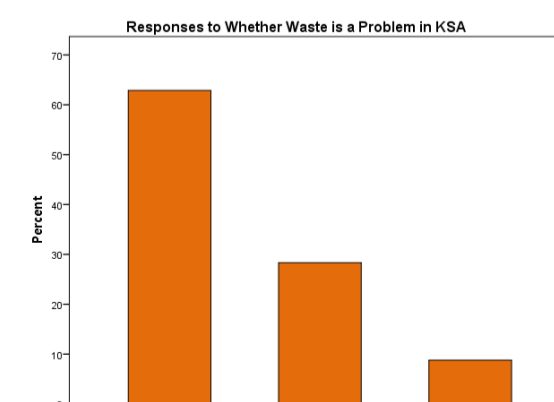
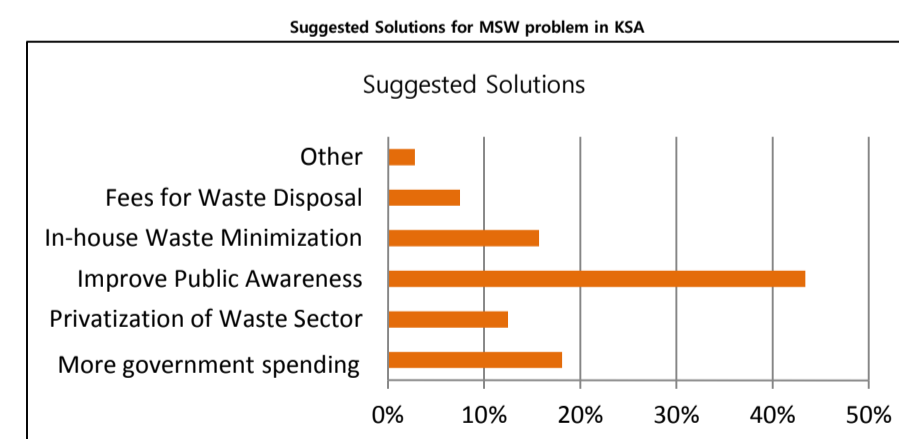
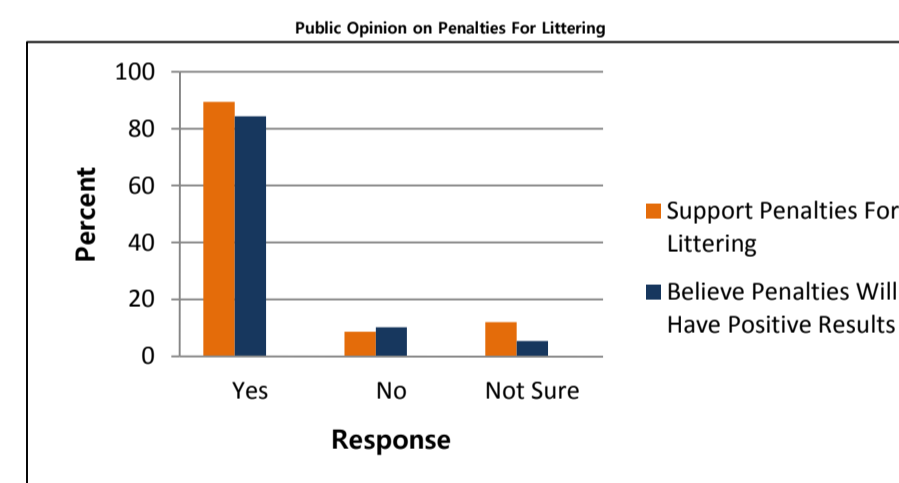


Fig. 4 – Analysis of Public Opinion

- A total of 501 questionnaires were completed by various residents from the different cities in the Greater Dammam Area.
- A decent majority of the public believes that waste is a problem in Saudi Arabia. Hence, it is definitely an issue that is significant enough to be looked into.
- Most people believe that the best solution to this problem is to improve public awareness. Other solutions that were preferred included more government spending and in-house waste minimization, both of which would go hand in hand with the first choice.
- A surprising 60.8% of people surveyed either were not sure or had no idea regarding how MSW is currently disposed in this region. This either comes down to a failure of the municipality in keeping the public properly informed, or general public apathy regarding waste management.
- MSW services are currently free throughout the Kingdom of Saudi Arabia. When asked whether they believed that residents should pay for this, a majority of 64% of residents were against the idea. Only 28% support waste disposal fees, while 8% were unsure.
- Most residents believe the MSW collection system can be further improved with increased cooperation from the residents themselves. Fines on littering are also heavily favored, with most residents believing it will result in a cleaner city.
- The majority of the study group believes that more can be done to improve diversion of waste from landfills toward more environmentally friendly purposes. Residents showed a clear inclination towards practicing ISWM methods at home provided the required facilities are available. Almost 85% of the residents surveyed are willing to do in-house waste segregation, provide the relevant Materials Recovery Facility (MRF) is available.

References

- Ouda, O.K.M. et al., Waste-to-energy potential in the Western Province of Saudi Arabia. Journal of King Saud University – Engineering Sciences (2015), <http://dx.doi.org/10.1016/j.jksues.2015.02.002>
- Al-Wabel, M. I., Al-Yehya, W. S., Al-Farraj, A. S., & El-Maghraby, S. E. (2011). Characteristics of landfill leachates and bio-solids of municipal solid waste (MSW) in Riyadh City, Saudi Arabia. Journal of the Saudi Society of Agricultural Sciences, 10(2), 65-70. Retrieved February 13, 2016, from <http://www.sciencedirect.com/science/article/pii/S1658077X11000312>
- Ouda, O. K., Cekirge, H. M., & Raza, S. A. (2013). An assessment of the potential contribution from waste-to-energy facilities to electricity demand in Saudi Arabia. Energy Conversion and Management, 75, 402-406. Retrieved February 1, 2016, from <http://www.sciencedirect.com/science/article/pii/S0196890413003683>
- Ouda, O. K., Raza, S. A., Al-Waked, R., Al-Assad, J. F., & Nizami, A. (2015). Waste-to-energy potential in the Western Province of Saudi Arabia. Journal of King Saud University - Engineering Sciences, 27. Retrieved February 1, 2016, from <http://www.sciencedirect.com/science/article/pii/S1018363915000033?np=y#FCANote>
- Gharaibeh, E. S., Haimour, N. M., & Akash, B. A. (2011). Evaluation of Current Municipal Solid Waste Practice and Management for Al-Ahsa, Saudi Arabia. International Journal of Sustainable Water and Environmental System, 2(2), 103-110. Retrieved February 2, 2016, from <http://www.iasks.org/sites/default/files/swes20110202103110.pdf>
- Alhumoud, J. M. (2005). Municipal solid waste recycling in the Gulf Co-operation Council states. Resources, Conservation and Recycling, 45(2), 142-158. Retrieved February 12, 2016, from <http://www.sciencedirect.com/science/article/pii/S0921344905000649>
- Ouda O.K.M., Shawesh A., Al-Olabi T., Younes F., Al-Waked R., (2013b), "Review of Domestic Water Conservation Practices in Saudi Arabia", Applied Water Science 3, 689-699.
- Ouda, O. K., Tawabini, B. M., & Raza, S. A. (2015). INVESTIGATING WASTE TO ENERGY POTENTIAL AS A RENEWABLE ENERGY RESOURCE IN ALHASA REGION, SAUDI ARABIA. Research Gate, 2(2). Retrieved February 14, 2016, from https://www.researchgate.net/publication/283204278_INVESTIGATING_WASTE_TO_ENERGY_POTENTIAL_AS_A_RENEWABLE_ENERGY_RESOURCE_IN_AL-HASA_REGION_SAUDI_ARABIA
- IBM Corp. Released 2015. IBM SPSS Statistics for Windows, Version 23. Armonk, NY: IBM Corp.