A pilot study on waste management services for Mixed Density Housing Scheme. Case study: Section 7, Shah Alam, Selangor, Malaysia

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Abstract. The rapid growth of population in urban areas resulted in a higher amount of waste generated yearly. According to the Solid Waste Management and Public Cleansing Corporation (SWCorp), in 2018, Malaysians generated 38,142 tonnes of waste per day with an average of 0.83 kg/capita/day for a household in the urban area. Malaysia, with a population of 32.4 million, 76% of the entire population are living in urban areas (Department of Statistic, 2018), this figure is worrying. This pilot study explores and evaluates the perspectives of governance on waste management processes and practices for urban residents; in a mixed density housing scheme. A survey was conducted on 30 respondents of a mixed density housing scheme in Section 7, Shah Alam, Selangor. The data then analysed through reliability test analysis. There were four (4) key variables being put forward for this study; services and practices, socio-economic and well-being, stakeholders and environment. The result of the analysis has found out that, the variables for waste management services for mixed density housing scheme are reliable with the respondent’s feedback. However, some questions are not compatible to be analysed in parallel with other questions.

1. Introduction

Best management practices can be associated with good governance practices as it a concern for the full cooperation of involved stakeholder in achieving effective policy implementation [1][2]. Therefore the involvement and interactions between stakeholders determine the condition of the cities [3]. Governance involves governing and achieving collective action for the benefit of public interest [4]. Thus, failure to accept common goals resulted in poor service delivery [1]. Through efficient and effective management practices, it leads to the betterment of the people they served. On the other hand, the coordination between relevant stakeholders in the management of waste is one of the crucial elements to achieve effective management services.

Stakeholders are individuals, groups, and organisations that affect or affected by the actions of a system [5]. Equally, [6] stated that interested parties could define as individuals or groups or institutions involved directly or indirectly in projects or parties who benefited from a project. According to [1], stakeholders are divided into three categories, namely primary, secondary and tertiary stakeholders (Refer Table 1). Primary stakeholders referred to the one located at the national and state level. This level concerned with the formulation and coordination of policies.
implementation. The secondary stakeholders, meanwhile, focus on the delivery system of waste management services. State-level engagements are common for the secondary type stakeholders. This involves waste concessionaires such as Alam Flora Sdn. Bhd., E-Idaman Sdn. Bhd., and SWM Sdn. Bhd. Local communities are placed at the lowest part known as the tertiary level. At this level, local communities are subject to the current policies enforced. In this pilot study, the perception of respondents on governance on waste management processes and practices were investigated. Moreover, the aim of the pilot study also to check the validity and reliability of the questionnaires before being put into the larger-scale population. Issues and problems associated with the questionnaire were identified in this study.

Table 1. Categories of stakeholders in Solid Waste Management.

| Types of stakeholders | Engagement level | Sectors |
|-----------------------|------------------|---------|
| Primary               | National/State   | Public  |
| Secondary             | State            | Private |
| Tertiary              | Local            | Local Communities |

Source: modified from [1]

2. Methodology
The research project should not favor a particular group, but it must represent all levels of the urban community. Therefore, the research project used the questionnaire survey as a method of collecting data. This process takes place in selected areas to identify and evaluate the contribution of knowledge, experience and approach to solid waste management and socio-economic aspects. The purpose of this method also helps to compare, shape and challenge the information provided by other informants. The survey used the questionnaire forms. The questionnaire list acts as a "guide" for the researcher in conducting the survey. The main reason is to explore and understand the facts, phenomena and dynamics that take place in the selected study site associated with the socio-economic and welfare from the implementation of solid waste management policy and strategy from the user's point of view. The list of questionnaires structured to allow respondents to cooperate without involving complex thinking skills. Questionnaire built to explore the governance perspective of urban residents lived in a mixed density housing scheme from the current management practices of urban solid waste.

Overall, the questionnaire was structured to meet the objectives of the research project. Selection of respondents: The criteria for selection being that the respondents, who are over 18 years of age, were either head of the households or families, their wives or person responsible for economic decisions for families. The overall sampling design for the research project based on the purposive sampling technique with the respondents will be stratified based on gender, age, and occupations. In having more diverse interviewees, household income, the level of education and time of residency included. The questionnaires are divided into five (5) sections. The section is: Section A: Demographic characteristic, Section B: Solid Waste Management Services and Practices, Section C: Socio-economic and Well-being of Neighborhood Area, Section D: Residents, Government Agencies & Private, and Section E: Environmental.

Sampling
In conducting the survey, respondents are coming from residents located in Section 7, Shah Alam, Selangor Darul Ehsan that lived in the mixed density housing scheme. The respondents were selected randomly from people who lived in PKNS Flat, Pangsapuri Danaumas, and terrace housing development scheme at Jalan Kristal, Jalan Zirkon and Jalan Platinum. Regarding this survey, 50 sets of questionnaires were allocated. However, only 30 sets of questionnaires have sufficient information to be analysed. This brings the response rate of 60%. According to [1], the minimum sample size for a pilot survey is deemed sufficient with only 20 sets of questionnaires. Their arguments are based on [7][8], who argued that the minimum sample size for a pilot study is between 10 to 15 respondents. The later even suggested that ten (10) respondents are sufficient enough to answer the aims laid out in
research. However, the rules of thumb in estimating sample size for pilot study suggested that minimum of 30 respondents is required as it would provide a safety net for the research undertaken so that the finding would answer the aims outlined [9].

Table 2 showed the frequency data derived from Section A questions. Table 2 below showed the characteristic of the respondents involved in this pilot survey. The demographic information includes gender, age, ethnic, marital status, household status, education level, duration of stay, housing types and also respondent’s profession. 76.7% of respondents are male, with the age range between 20 - 29 years old (66.7%), where 96.7% were Malay and 66.7% not married. Around 70% of respondents are not categories as head of household and 66.7% respondents having higher institution education level. 43.3% of respondents have a duration of stay between 1 - 5 years, while 36.7% are living in the medium-cost flat and working in the private sector (46.7%).

Table 2. Respondents Demographic Characteristic.

| Attributes               | Categories          | Frequency | Percentage (%) |
|--------------------------|---------------------|-----------|----------------|
| Gender                   | Male                | 23        | 76.7           |
|                          | Female              | 7         | 23.3           |
| Age                      | 20 -29 years        | 20        | 66.7           |
|                          | 30 – 39 years       | 6         | 20.0           |
|                          | 40 – 49 years       | 3         | 10.0           |
|                          | 50 – 59 years       | 1         | 3.0            |
| Ethnicity                | Malay               | 29        | 96.7           |
|                          | Indian              | 1         | 3.3            |
| Marital Status           | Not Married         | 20        | 66.7           |
|                          | Married             | 10        | 33.3           |
| Head of Household        | Yes                 | 9         | 30.0           |
|                          | No                  | 21        | 70.0           |
| Number of Households     | None                | 5         | 16.7           |
|                          | 1 Person            | 1         | 3.3            |
|                          | 2 Persons           | 2         | 6.7            |
|                          | 3 Persons           | 5         | 16.7           |
|                          | 4 Persons           | 3         | 10.0           |
|                          | 5 Person            | 8         | 26.7           |
|                          | More than 6 Persons | 6         | 20.0           |
| Education Level          | High School(SRP/PMR)| 2         | 6.7            |
|                          | High School (MCE/SPM)| 7       | 23.3           |
|                          | Higher Institution  | 20        | 66.7           |
|                          | Others              | 1         | 3.3            |
| Duration of Stay         | 1 - 5 years         | 13        | 43.3           |
|                          | 6 - 10 years        | 7         | 23.3           |
|                          | 11 - 15 years       | 3         | 10.0           |
|                          | 16 - 20 years       | 3         | 10.0           |
|                          | 21 - 25 years       | 4         | 13.3           |
| Household Income         | Under RM 1, 000     | 1         | 3.3            |
|                          | RM 1, 001 – RM 1, 499| 8       | 26.7           |
|                          | More than RM 1, 500 | 13        | 43.3           |
|                          | Others              | 8         | 26.7           |
3. Result And Findings

In the context of the waste management system in Malaysia, both public and private; they are in the process of addressing the appropriate actions and policies. However, the impact of waste management practices and processes on urban residents, especially the residents lived in densely populated areas, still wholly uncovered. Understanding the perception of urban residents, in particular, their views and actions on urban solid waste management, provides a better understanding of the course of the measures undertaken by this group of people.

3.1. Reliability of questionnaires

In this research, a reliability test had been conducted to measure the reliability of the questionnaires constructed. Internal consistency approach was used as a reliability measures as this research used multiple Likert questions that forms a scale. As academic research, it is important to determine whether the scale is reliable or not as it would affect the final output and result. Statistical Software for Social Sciences (SPSS) was used as a medium to calculate the Cronbach's alpha coefficient and correlation value for internal consistency approach. According to [1], the question that has a low correlation value has low-reliability value. In the same research also, [1] argued that there are different research regarding the acceptance of alpha value, which ranges from 0.75 to 0.95. Therefore, for this research setup, 0.70 is the benchmark for this pilot research. Cronbach’s alpha coefficients that are less than the benchmark value will be regarded as not reliable for the research. Table 3 showed a summary of reliability statistics for the questions in the questionnaire form. Based on the same table, it showed that the Cronbach's alpha in this research recorded as 0.898. This indicates that the questions have a high level of internal consistency for this research.

Table 3. Summary of Reliability Statistic for Pilot Study Questionnaire.

| Cronbach’s Alpha | Cronbach’s Alpha Based on Standardized Items | N of Items |
|------------------|---------------------------------------------|------------|
| .898             | .915                                        | 52         |

3.2. Section B: Solid Waste and Public Cleansing Management Services and Practices

Table 4. Summary of Reliability Statistic for Section B: Solid Waste and Public Cleansing Management Services and Practices

| Cronbach’s Alpha | Cronbach’s Alpha Based on Standardized Items | N of Items |
|------------------|---------------------------------------------|------------|
| .746             | .786                                        | 10         |

Based on Table 4, it showed that the Cronbach's alpha for the questions in Section B: Solid Waste and Public Cleansing Management Services and Practices, recorded as .746. This indicates that the questions have a high level of internal consistency for this research. Table 5 meanwhile indicates that
questions B1, B2, B7, B8, B9 and B10 if remove from the questionnaires would result in much higher Cronbach's alpha value. Therefore, these questions may be considered to be excluded from future research.

**Table 5.** Reliability Test for Section B: Solid Waste and Public Cleansing Management Services and Practices

| Questions                                      | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach’s Alpha if Item Deleted |
|------------------------------------------------|---------------------------------|-------------------------------|----------------------------------|
| B1. Know about SWPCM services                  | -1.17                           | .231                          | .765                             |
| B2. Require SWPCM services in neighbourhood area | .551                            | .567                          | .704                             |
| B3. SWPCM in your neighbourhood area effective  | .791                            | .847                          | .665                             |
| B4. SW collection according to prescribe schedule | .876                            | .944                          | .653                             |
| B5. SW collection compartment barrel according to schedule | .827                            | .890                          | .661                             |
| B6. Clean SW collection                         | .872                            | .852                          | .654                             |
| B7. Leachate water leaks from the trash truck   | -.360                           | .351                          | .878                             |
| B8. SW spill during collection and dispatch process | .252                            | .529                          | .749                             |
| B9. Workers do their job well                   | .558                            | .705                          | .705                             |
| B10. The garbage bin is closed/reinstated in the original place | .495                            | .639                          | .713                             |

3.3. **Section C: Socio-Economic and Well-Being of Neighborhood Area**

**Table 6:** Summary of Reliability Statistic for Section C: Socio-Economic and Well-Being of Neighborhood Area

| Cronbach’s Alpha | Cronbach’s Alpha Based on Standardized Items | N of Items |
|------------------|---------------------------------------------|------------|
| .897             | .904                                        | 10         |

Based on **Table 6**, 0.897 is the Cronbach's alpha for the Section C hence indicates that the questions have a high level of internal consistency. Meanwhile, **Table 7** shown that, if questions C2, C3 and C4 removed from the questionnaires, the result would translate into much higher Cronbach's alpha value. Therefore, there is a possibility that the question excluded from future research.
Table 7. Reliability Test for Section C: Socio-Economic and Well-Being of Neighbourhood Area.

| Questions                                                                 | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach’s Alpha if Item Deleted |
|---------------------------------------------------------------------------|----------------------------------|------------------------------|---------------------------------|
| C1. LA concerned about the social and economic needs of the neighbourhood | .730                             | .690                         | .882                            |
| C2. LA concerned about the cleanliness of your neighbourhood              | .614                             | .597                         | .890                            |
| C3. Disposal of waste in an unauthorized area                            | .404                             | .438                         | .904                            |
| C4. No specific place for disposal of solid waste                        | .258                             | .387                         | .916                            |
| C5. SW disposal area always maintained by the authority                  | .766                             | .780                         | .878                            |
| C6. Sufficient area for disposal of SW                                   | .793                             | .832                         | .878                            |
| C7. Suitable SW disposal site                                            | .750                             | .628                         | .881                            |
| C8. Communal work is often conducted by LA in collaboration with resident| .788                             | .748                         | .877                            |
| C9. Neighborhood area always clean and comfortable                        | .775                             | .763                         | .877                            |
| C10. No problem with SWMPC in the neighborhood area                      | .729                             | .816                         | .881                            |

3.4. Section D: Residents, Government Agencies and Private

Table 8. Summary of Reliability Statistic for Section D: Residents, Government Agencies and Private

| Cronbach’s Alpha | Cronbach’s Alpha Based on Standardized Items | N of Items |
|------------------|---------------------------------------------|------------|
| .897             | .904                                        | 11         |

Table 8 above has shown the summary of Cronbach’s alpha for the questions in Section D of the questionnaire. The value recorded is 0.897 and indicates that the questions have a high level of internal consistency. Although this may be true, Table 9 meanwhile indicates that questions D1 and D2 would change the Cronbach’s Alpha value to a much higher one. This may result from the questions that used multiple-choice answers. In future research, these two questions should be considered to be removed from the questionnaire.

Table 9. Reliability Test for Section D: Residents, Government Agencies and Private

| Questions                                                                 | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach’s Alpha if Item Deleted |
|---------------------------------------------------------------------------|----------------------------------|------------------------------|---------------------------------|
| D1. Lodge complaint, objections and suggestion                            | .100                             | .287                         | .910                            |
| D2. Medium of submitting complaints, objections and suggestion            | -.100                            | .261                         | .937                            |
| D3. Resident should be consulted in MSWPC in their neighborhood            | .738                             | .825                         | .882                            |
| D4. It is necessary for you to be involved in the PC program              | .779                             | .760                         | .879                            |
| D5. Local people’s ideas and views taken into account                     | .802                             | .740                         | .877                            |
3.5. Section E: Environmental

Table 10. Summary of Reliability Statistic for Section E: Environmental

| Cronbach’s Alpha | Cronbach’s Alpha Based on Standardized Items | N of Items |
|------------------|---------------------------------------------|------------|
| .867             | .880                                        | 10         |

Section E questions also undergo the reliability statistic test. Through Table 10, the Cronbach’s alpha recorded is .867. The value itself showed that there is a high level of internal consistency for these types of questions. Table 11 nevertheless indicates that there are two values of Corrected Item-Total Correlation of -0.289 and 0.019 (Question E1 and E2, respectively) that may affect the Cronbach's Alpha Value. This may be resulted from using multiple-choice answers types of question. Therefore, these questions are removed for future research undertaken.

Table 11. Reliability Test for Section E: Environmental

| Questions                                      | Corrected Item-Total Correlation | Squared Multiple Correlation | Cronbach’s Alpha if Item Deleted |
|------------------------------------------------|----------------------------------|------------------------------|---------------------------------|
| E1. Environmental issues in your neighbourhood area | -.289                            | .266                         | .916                            |
| E2. Respond to the problems faced              | .019                             | .273                         | .907                            |
| E3. Environment important for me               | .767                             | .792                         | .839                            |
| E4. I know the importance of preserving the environment | .743                             | .735                         | .841                            |
| E5. Cleanliness is important in achieving comfort and well-being | .899                             | .926                         | .830                            |
| E6. Health is closely related to the cleanliness of surrounding area | .868                             | .940                         | .831                            |
| E7. SWPCM are closely related to the environment | .821                             | .841                         | .835                            |
| E8. Human activity affects the environment     | .803                             | .801                         | .837                            |
| E9. Economic activity affects the SWPCM       | .828                             | .823                         | .835                            |
| E10. Environmental protection is the responsibility of all parties | .783                             | .907                         | .838                            |
4. Conclusion
In conclusion, the results from the pilot study demonstrate that the variables used in the study on the perceptive of governance in waste management services for mixed density housing scheme are reliable with the respondent’s feedback. As a matter of facts, some questions are not compatible to be analysed in parallel with other questions thus required adjustment and reconstruction in achieving better reliability coefficient for the statistical analysis procedures. Therefore, these questions need to restructure, or it must be analysed separately. It is important to have a pilot study test to measure the reliability coefficient of variables whether it should be removed, restructure or proceed for the actual survey.

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