CHALLENGES AND STRATEGIES OF CARRYING OUT SOLID WASTE MANAGEMENT SERVICES IN KAMPUNG TABUAN MELAYU, KUCHING, SARAWAK

Sarius Lee Kim Lye

Master of Environmental Management (Development Planning) 2012
CHALLENGES AND STRATEGIES OF CARRYING OUT SOLID WASTE MANAGEMENT SERVICES IN KAMPUNG TABUAN MELAYU, KUCHING, SARAWAK

SARIUS LEE KIM LYE

A dissertation submitted in partial fulfillment of the requirements for the degree of Master of Environmental Management (Development Planning)

Faculty of Social Sciences
UNIVERSITI MALAYSIA SARAWAK
2012
I declare that this Project/Thesis is classified as (Please tick (✓)):

☐ CONFIDENTIAL (Contains confidential information under the Official Secret Act 1972)*
☐ RESTRICTED (Contains restricted information as specified by the organisation where research was done)*
✓ OPEN ACCESS

Validation of Project/Thesis

I therefore duly affirmed with free consent and willingness declare that this said Project/Thesis shall be placed officially in the Centre for Academic Information Services with the abiding interest and rights as follows:

• This Project/Thesis is the sole legal property of Universiti Malaysia Sarawak (UNIMAS).
• The Centre for Academic Information Services has the lawful right to make copies for the purpose of academic and research only and not for other purpose.
• The Centre for Academic Information Services has the lawful right to digitalise the content for the Local Content Database.
• The Centre for Academic Information Services has the lawful right to make copies of the Project/Thesis for academic exchange between Higher Learning Institute.
• No dispute or any claim shall arise from the student itself neither third party on this Project/Thesis once it becomes the sole property of UNIMAS.
• This Project/Thesis or any material, data and information related to it shall not be distributed, published or disclosed to any party by the student except with UNIMAS permission.

Student signature: [Signature]
(13 July 2012)

Supervisor signature: [Signature]
(3/9/2012)

Current Address: 19 Everbright Park, 3rd Mile, Jalan Penrissen, 93250, Kuching, 93250, Sarawak.

Notes: * If the Project/Thesis is CONFIDENTIAL or RESTRICTED, please attach together as annexure a letter from the organisation with the period and reasons of confidentiality and restriction.

[The instrument is duly prepared by The Centre for Academic Information Services]
DECLARATION OF ORIGINAL WORK

This declaration is made on the 12th of July 2012.

Student's Declaration:

I, Sarius Lee Kim Lye (10031698) Faculty of Social Sciences, hereby declare that the work entitled Challenges and Strategies of Carrying out Solid Waste Management Services in Kampung Tabuan Melayu, Kuching, Sarawak is my original work. I have not copied from any other students' work or from any other sources except where due reference or acknowledgement is made explicitly in the text, nor has any part been written for me by another person.

3/9/2012
Date submitted

Sarius Lee Kim Lye (10031698)

Supervisor's Declaration:

I, Dr Wong Swee Kiong hereby certify that the work entitled Challenges and Strategies of Carrying out Solid Waste Management Services in Kampung Tabuan Melayu, Kuching, Sarawak was prepared by the above named student, and was submitted to the “FACULTY” as a partial fulfillment for the conferment of Master of Environmental Management (Development Planning), and the aforementioned work, to the best of my knowledge, is the said student's work.

Received for examination by: (Dr Wong Swee Kiong)  
Date: 3/9/2012
ACKNOWLEDGEMENT

Firstly, a special note of appreciation needs to be mentioned to the key people whom have made this report possible. I am truly grateful to everyone who has supported me during my Master Program and has contributed to achieving this end result.

First of all, I would like to give my thanks and appreciation to my Supervisor, Dr Wong Swee Kiong of Faculty of Social Sciences for her patience, kindness and grace. She has consistently demonstrated her relentless effort, guidance and valuable advice to the students throughout my Masters program study of which I am grateful of.

I would also like to give a special thank to all my highly respected lecturers and professors whom we have had the privilege and opportunity for their knowledge imparted to us. These lecturers are namely:

- YB Dato Dr James Dawos Mamit
- Professor Dr Lau Seng
- Professor Dr Spencer Empading Sanggin
- Professor Dr Gabriel Tonga
- Professor Dr Mustafa Abdul Rahman
- Professor Dr Dimbab Ngidang
- Professor Dr Lee Nyanti
- Associate Professor Dr Ling How Kee
- Associate Professor Dr Abd Mutalip Abdullah
- Associate Professor Dr Hew Cheng Sim
- Associate Professor Dr Gusni Saat
- Associate Professor Dr Petrus Bulan
- Dr Mohd Effendi Wasli
- Dr Lim Po Teen
- Dr Siti Rubiah Zainuddin
- Dr John Phoa
- Mr Kelvin Egay John
- Associate Professor Dr Neilson Ilan Mersat
- Dr Zamri bin Hj Hassan
• Dr Nwanessi Peter Karubi
• Mr John Tien Kiong
• Mr Robert Malong

I would like to also thank my four helpful enumerators Mr Mohd Morzani, Mr Rusmalihadi bin Mat Darus, Mr Roland Ak James Wong and Ms Christina Neti Ak Dominic Nyoem for assisting me with the primary data collection.

Lastly, I would also like to thank all the respondents who had spent their time to answer all questions in my questionnaires without whom, the study would not have been possible.

In a more personal note, I would like to thank my family and friends for their relentless support and encouragement throughout my course in the Master of Environmental Management (Development Planning) in the (SLUSE-M) program.
ABSTRACT

This study aims to evaluate strategies and challenges in carrying out the solid waste management services in Kampung Tabuan Melayu, Kuching, Sarawak, Malaysia. Specifically, the strategies and challenges are explored from the social, political, technical, economic and institutional perspectives.

The objective of this study is to determine how these social, political, technical, economic and institutional factors play their roles towards contributing to achieving an integrated solid waste management system particularly in Kampung Tabuan Melayu, Kuching, Sarawak. In this study, a total number of 100 households who are currently residing within the vicinity of Kampung Tabuan Melayu, Kuching, Sarawak had been chosen randomly as respondents and interviewed face-to-face in May 2012 using a structured questionnaire to find out their perceptions on solid waste management services based on the five aspects. The respondents are primarily residents whom are faced with accessibility for establishment of house to house solid waste collection services.

The findings of this study show that political, technical and social factors with regards to solid waste management system in Kampung Tabuan Melayu have a significant influence. The results of the analysis also reveal that political factor which can bring about infrastructural changes appears to play the most crucial role in contributing towards an effective and successful solid waste management system.

Thus, to effectively devise a successful solid waste management system in Kampung Tabuan Melayu, policy or the related authorities need to take into consideration infrastructural impeding factor to support an efficient and effective solid waste collection system to the community.
ABSTRAK

Kajian ini bertujuan untuk menilai strategi-strategi dan cabaran-cabaran dalam pengurusan sisa pepejal di kawasan Kampung Tabuan Melayu, Kuching, Sarawak, Malaysia khususnya dari aspek sosial, politik, teknikal, ekonomi dan institusi.

Tujuan kajian ini adalah untuk mengenalpasti bagaimana faktor-faktor sosial, politik, teknikal, ekonomi and institusi memainkan peranan terhadap pencapaian satu sistem pengurusan sisa pepejal yang bersepadu khasnya di Kampung Tabuan Melayu, Kuching, Sarawak. Kajian ini telah dilaksanakan terhadap 100 isi rumah di kawasan Kampung Tabuan Melayu, Kuching, Sarawak. Pemilihan keluarga tersebut adalah secara rawak dan responden ditemuramah cara bersemuka sepanjang bulan Mei 2012 dengan menggunakan borang soal selidik berstruktur yang disediakan untuk mendapat persepsi penduduk terhadap perkhidmatan pengurusan sisa pepejal berdasarkan lima faktor tersebut. Responden kajian ini adalah terdiri daripada penduduk setempat yang tidak dapat dicapai melalui jalan raya semasa perkhidmatan pengutipan sisa dari rumah ke rumah dijalankan.

Keputusan kajian ini menunjukkan bahawa tiga faktor utama yang mempengaruhi pengurusan sisa pepejal adalah politik, teknikal and sosial. Dari tiga faktor tersebut, faktor politik telah dikenalpasti sebagai faktor yang memainkan peranan yang paling penting kepada pihak penduduk untuk mencapai pengurusan sisa pepejal yang lebih berkesan dan cekap.

Justeru itu, untuk mencapai pengurusan sisa pepejal yang lebih cekap dan berkesan untuk penduduk Kampung Tabuan Melayu, pembuat polisi atau pihak yang berkuasa perlu mengambil kira kekurangan infrastruktur serta menggubalkan polisi yang sewajarnya bagi meningkatkan
kualiti perkhidmatan pengumpulan dan pengangkutan sisa pepejal khususnya di kampung Tabuan Melayu, Kuching.
# Table of Contents

ABSTRACT ........................................................................................................... i-iii

ACKNOWLEDGEMENT ......................................................................................... iv-v

LIST OF TABLES ................................................................................................... x

LIST OF FIGURES ................................................................................................. xi

CHAPTER 1: INTRODUCTION

1.0 Background .................................................................................................. 1

1.1 Waste Management in Study Area ............................................................... 4

1.2 Problem Statement ....................................................................................... 6

1.3 General and Specific Objective of the Study ............................................... 9

1.4 Significance of the Study ........................................................................... 10

1.5 Limitation of the Study ............................................................................. 11

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction .................................................................................................. 14

2.1 Waste Composition in Malaysia ................................................................. 15

2.2 Privatisation of Solid Waste Management in Malaysia ............................ 23

2.3 Importance of a Sound Environmental Framework ................................... 28

2.4 Challenges Faced by Waste Management Industry in Malaysia ............ 32

2.5 Theoretical Framework ............................................................................. 39

2.6 Conceptual Framework for a Sustainable Solid Waste Management Framework in Kampung Tabuan Melayu, Kuching, Sarawak ................ 41
CHAPTER 3: METHODOLOGY

3.0 Introduction .................................................. 47
3.1 Methodology .................................................. 47
3.2 Research Design ............................................ 48
3.3 Population and Sampling .................................. 49
3.4 Survey Instrument .......................................... 50
  3.4.1 Reliability Test .......................................... 51
  3.4.2 Pilot Test ................................................. 52
  3.4.3 Actual Data .............................................. 52
  3.4.4 Data Collection Technique ............................ 53
3.5 Measurement of Variable .................................. 55
3.6 Data Analysis ................................................ 56

CHAPTER 4: RESULTS AND DISCUSSIONS

4.0 Introduction .................................................. 57
4.1 Demographic Profile of Respondents ....................... 58
4.2 Descriptive Statistics ....................................... 59
4.3 Perception of Respondents on Factor Affecting Solid Waste Management ....................... 61
REFERENCES............................................................................................................................ 82

APPENDICES

Appendix A: Survey Questionnaire (Malay Version)
Appendix B: Survey Questionnaire (English Version)
Appendix C: Media Compilation
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Community Leaders in Kampung Tabuan Melayu, Kuching</td>
<td>8</td>
</tr>
<tr>
<td>Table 2</td>
<td>Waste Composition in Malaysia 2005</td>
<td>15</td>
</tr>
<tr>
<td>Table 3</td>
<td>Solid waste Generation Rate from Major Asian Countries</td>
<td>19</td>
</tr>
<tr>
<td>Table 4</td>
<td>Conceptual Framework of Municipal Solid Waste Management</td>
<td>21</td>
</tr>
<tr>
<td>Table 5</td>
<td>Conceptual Framework for Sustainable Solid Waste Management Framework in Kampung Tabuan Melayu, Kuching, Sarawak</td>
<td>41</td>
</tr>
<tr>
<td>Table 6</td>
<td>Reliability Statistics for Pilot Test</td>
<td>52</td>
</tr>
<tr>
<td>Table 7</td>
<td>Reliability Statistics for Actual Data</td>
<td>53</td>
</tr>
<tr>
<td>Table 8</td>
<td>Measurement of Variable</td>
<td>55</td>
</tr>
<tr>
<td>Table 9</td>
<td>Demographic Profile of Respondents</td>
<td>58</td>
</tr>
<tr>
<td>Table 10</td>
<td>Summary of Mean and Standard Deviation</td>
<td>61</td>
</tr>
<tr>
<td>Table 11</td>
<td>Perception of Respondents on Social Factor</td>
<td>63</td>
</tr>
<tr>
<td>Table 12</td>
<td>Perception of Respondents on Political Factor</td>
<td>64</td>
</tr>
<tr>
<td>Table 13</td>
<td>Perception of Respondents on Technical Factor</td>
<td>66</td>
</tr>
<tr>
<td>Table 14</td>
<td>Perception of Respondents on Economic Factor</td>
<td>67</td>
</tr>
<tr>
<td>Table 15</td>
<td>Perception of Respondents on Institutional Factor</td>
<td>68</td>
</tr>
<tr>
<td>Table 16</td>
<td>Cross Tabulation of Area and Social Factor</td>
<td>69</td>
</tr>
<tr>
<td>Table 17</td>
<td>Cross Tabulation of Area and Political Factor</td>
<td>70</td>
</tr>
<tr>
<td>Table 18</td>
<td>Cross Tabulation of Area and Technical Factor</td>
<td>71</td>
</tr>
<tr>
<td>Table 19</td>
<td>Cross Tabulation of Area and Economic Factor</td>
<td>72</td>
</tr>
<tr>
<td>Table 20</td>
<td>Cross Tabulation of Area and Institutional Factor</td>
<td>73</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

Figure 1: Map of Study Area, Kuching Sarawak ................................................................. 7
Figure 2: Google Satellite Imagery of Kampung Tabuan Melayu, Kuching ......................... 7
Figure 3: Solid Waste Composition in Malaysia 2005 .......................................................... 16
Figure 4: Solid Waste Composition in United Kingdom 1995 ............................................. 18
Figure 5: Element of Integrated Waste Management ......................................................... 27
Figure 6: Research Design ............................................................................................... 48
CHAPTER 1

INTRODUCTION

1.0 Background

In all communities in every country, people generate waste in their daily activities. The volume and type of waste varies significantly between urban and rural communities and it normally depends on the economic status of the society. In Asia, around 90% of solid waste in high income countries are being collected as compared to only between 50-80% collection rate from medium income countries whilst only around 30-60% of solid waste being collected in low income countries. Most of the current problems associated with waste management are mainly as a result of increased urbanization particularly in both the developed and developing countries. Limited financial resources and the underplayed role of personnel involved in the improvement of the entire waste management services add to the predicament in smoothly carrying out waste management services for all level of societies particularly the vulnerable low income groups (Mc Granahan & Goethert, 2000).

Solid waste management has become such a global problem especially in developing countries where situation of environment deterioration continues to persist mainly due to urbanization, population growth, improved lifestyle and insufficient funds to properly manage solid waste (Babolola et al., 2010). In Malaysia, cost of waste management accounts for 50% of the local authorities operating budget generally. Changes brought by
globalization of education and business transaction have influenced the values, lifestyle and consumption pattern in such a way that it has also concurrent significant impact to our environment (Ramayah et al., 2010).

Generally, the higher the level of prosperity a country enjoys, the higher would be the purchasing power of its people from the extra disposal income earned. Naturally, the concurrent policy of the government of the day to increase the people’s financial standing will also result in higher purchasing power and greater amount of resources demanded to produce the products and packaging material. This ultimately would result in higher volume of solid waste being generated (Sharma, 2009).

The management of solid waste in mega city needs to be accomplished in accordance to the economic rhythm of the mega city as it would have important effects on the immediate outlook of the city. However the problems vary for each country depending on various characteristics like socio-cultural, political factors and the belief system of its citizen (Idowu et al., 2011).

In Malaysia, the definition of solid waste is described as:

“any scrap material or any unwanted surplus substance or rejected products arising from the application of any process; any substance required to be disposed of as being broken, worn out, contaminated or otherwise spoiled; or any other material that according to this Act or any other written law is required by the authority to be disposed of, but does not include scheduled waste as prescribed under the Environmental Quality Act 1974 (Act 127), sewage as described in the Water Services Industry Act 2006 (Act 655) or radioactive waste as defined in the Atomic Energy Licensing Act 1984 (Act 304)”

National Solid Waste Department, Malaysia (2012).
However, according to Pongracz (2002), waste is defined as “a man-made thing that in the given time and place, in its actual structure and state, not useful to its owner”. It has a possibility to be turned into non-waste and should not be confused with garbage. Waste itself is not necessarily essentially bad but it is the wasteful act itself that is said to be damaging. Pongracz (2003) also highlighted that the term of waste such as municipal waste and household waste have not been clearly defined and the terminology has often been confused. Municipal waste is the term used to identify the waste which is being collected by a contractor on behalf of the municipal council whilst household waste is the terms referring to all wastes which are being generated from a particular source namely the household.

In principal, municipal solid waste management is a major responsibility of the local government under the Local Government Act 1976 which in turn requires the organizational skills and expertise of the appointed organization and cooperation of various stakeholders both in the public and private sectors (Goh, 2007; Schubeler, 1996).

In Malaysia, Goh (2007) explains that municipal waste collection is a labour intensive task whereby individual property home owners enjoy a door to door collection services typically with two or three workers following the waste collection trucks to load garbage slowly along residential lanes. Cost of waste collection services alone accounts to 60% to 70% of solid waste management expenditure. Goh (2007) claims that although plastic bags are typically used to store most domestic waste, there are no standardised size of
bags or packaging such as plastic bags for packaging of waste which currently comes in all forms of sizes and sources. The usage of wheel bins are also gaining popularity but the type and size are not uniformly mandated in Malaysia.

All local councils in Malaysia also have their respective provision of laws to regulate sanitation. The regulations and law spelled out how solid waste should be packed, managed, stored and disposed. An example of such provision is the Public Cleansing and Safety By-Laws 1980. In Sarawak local authorities were established under the Local Authority Ordinance 1996.

Public cleansing by law (1980 cited in Goh, 2007) states that:

"No person shall throw or deposit or cause to be thrown or deposited any earth, sawdust, rubbish, refuse, night soil, urine, corpse or carcass, or any part thereof into or upon any street, back lane, footway, or carcass, or into or upon any ground or open space to which the public have access, or into or upon the banks of any river, canal, drain or watercourse or into or upon the foreshore”.

1.1 Waste Management in the Study Area

In the state of Sarawak, solid waste management currently still falls under the responsibility of the local authority. In 1999, the State Government of Sarawak has decided to privatize the function of waste collection, transportation, treatment and disposal in the city of Kuching, Sarawak. Privatisation of collection services is under the ambit of three councils namely Kuching City North Council (DBKU), Kuching City South Council (MBKS) and Padawan Municipal Council (MPP). The operational task to
manage the collection, transportation and disposal of all municipal waste was privatised to a German and Sarawak Government joint venture operating company called Trienekens (Sarawak) Sdn Bhd.

Since 2000, the local authority has mainly supervised the activity of solid waste management rather than being directly involved in the logistical activity. According to Trienekens (2012), under the privatisation scheme, majority of the households are provided with a plastic bin of 120 litre volume. Equivalent capacity bin volume shall be provided for multiple dwellings and collection is done twice per week on a fixed schedule basis. Commercial and industrial premise are provided with larger bin volume waste receptacles. Collection schedule may differ from twice per week to even daily services in the city centre or where volume of waste is considered significant. Modern collection vehicles and uniformed personnel are used to carry out the collection from door to door at all accessible points. In order to keep up with the growth of the Kuching city waste generation, the logistics of collection is divided into 45 collection zones covering approximately 135 areas (Trienekens, 2012).

According to Trienekens (2012), all collected waste within the three (3) Kuching city councils municipality are transported daily for disposal at the state approved sanitary landfill in the Kuching Integrated Waste Disposal facility at km 22, Jalan Kuching Serian, Mambong, Kuching.
Currently, the integrated solid waste management system (ISWMS) implemented in Kuching, Sarawak mainly covers provision of domestic waste bins, collection, transportation and final disposal of municipal and commercial waste to a sanitary landfill on behalf of the three local authorities whilst scheduled and hazardous waste are separately arranged, collected and disposed by incineration (Trienekens, 2012).

1.2 Problem Statement

Based on a series of printed media publications highlighting pollution at Tabuan River, waste management has been recognized to be a significant contributing factor which has affected hygiene and public health of the resident in Kampung Tabuan Melayu. In fact, improper waste management has been regarded as a contributing factor to the pollution at the Tabuan River, next to Kampung Tabuan Melayu Kuching. As Kampung Tabuan Melayu occupies a significant portion of households residing by the Tabuan River, what could be identified as the critical factors that may provide improved solutions to their solid waste management issues?

The total number of the community at Kampung Tabuan Melayu is estimated to be around 11,000 residents. Unlike new council planned housing, there is still an absence of a functional public transport system to the area such as bus services, central sewerage collection system, or road system to support a comprehensive door to door waste collection services at Kampung Tabuan Melayu, Kuching.

Added by poor social habits, municipal waste can visibly be seen directly disposed
indiscriminately along the road side curbs and even directly into the waterways of the river at Kampung Tabuan Melayu areas. This has exacerbated the poor living condition of the residents at Kampung Tabuan Melayu Kuching.

Figure 1: Map of study area Kuching, Sarawak

Figure 2: Google Satellite Imagery of Kampung Tabuan Melayu, Kuching

Most of the residents in Kampung Tabuan Melayu are provided with individual wheel bins despite the lack of accessibility for collection trucks. However, these bins are rarely utilised as residents continue to either empty their waste unto the nearest main road or dispose their waste to the nearest communal bins situated along the main roads. Waste collection contractors are forced to push a bigger bin through the narrow alley of the village twice a week in order to serve the problematic areas which are not accessible by municipal trucks.
Over the years, the population within the neighbouring area has continued to increase as job opportunities continues to be developed within the close proximity to the village of Kampung Tabuan Melayu. Due to its strategic location and close proximity to several industrial zones which provide employment opportunities to the residents there, increasing development of housing and commercial projects has narrowed down all available open space which once existed to this village.

There are seven different zones and five village headmen at Kampung Tabuan Melayu, Kuching.

Table 1: Community Leaders in Kampung Tabuan Melayu, Kuching

<table>
<thead>
<tr>
<th>No</th>
<th>Village Name</th>
<th>No of Houses</th>
<th>Village Headmen</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kampung Tabuan Selipar Putus</td>
<td>99</td>
<td>KK Ramli B Hj Salleh</td>
</tr>
<tr>
<td>2</td>
<td>Kampung Tabuan Tengah</td>
<td>495</td>
<td>KK Hj Alan B Sahari</td>
</tr>
<tr>
<td>3</td>
<td>Kampung Tabuan Lot</td>
<td>316</td>
<td>KK Jas B Sait</td>
</tr>
<tr>
<td>4</td>
<td>Kampung Tabuan Hilir</td>
<td>698</td>
<td>KK Ramli B Hj Salleh</td>
</tr>
<tr>
<td>5</td>
<td>Kampung Cemerlang</td>
<td>100</td>
<td>No village headman</td>
</tr>
<tr>
<td>6</td>
<td>Kampung Tabuan Dani</td>
<td>200</td>
<td>KK Hj Gapor B Basah</td>
</tr>
<tr>
<td>7</td>
<td>Kampung Hj Drahman</td>
<td>480</td>
<td>KK Hj Wan Sahappudin Hj Wan Kassim</td>
</tr>
<tr>
<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>2,388</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Trienekens (2012)

Consisting of approximately 2,388 households, the community of Kampung Tabuan Melayu is renowned for being one of the most crowded village community situated close
within the Kuching inner city boundary. Progressive development of this once small community village to a considerable size community today has created logistical challenges to carry out proper waste collection services due to its annually increasing number of unplanned housing layout with informal houses being built on family inherited land. Close proximity, congestion and land disputes for infrastructure services provides limited solution to address their waste management issues in the short term.

1.3 General and Specific Objective of the Study

This study aims to determine the impeding factors for a sustainable solid waste collection services to be smoothly carried out within Kampung Tabuan Melayu, Kuching by examining the perceptions of the residents. This study also aims to highlight other interrelated causality factors which may enable better understanding of the current stand of solid waste management within the study area and challenges faced for a better solution to the problems and a more sustainable solid waste management.

Demographic data of the respondents which may provide better understanding of the residents of the area will also be identified in this study to provide policy makers or local governmental agencies with regards to expectation of the community to the critical factors inhibiting smooth implementation of logistical systems to similar local communities.