FACILITATING OPPORTUNITIES FOR SOCIAL LEARNING ABOUT SUSTAINABLE WASTE MANAGEMENT

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Abstract

This study contributes to filling a gap identified in the current Malaysian national waste policy, the National Strategic Plan for Solid Waste Management (NSPSWM 2005). It also contributes to the sparse knowledge of NGOs' involvement in Malaysia in promoting recycling and general environmental awareness with the Malaysian public particularly in an urban context. Although the NSPSWM alludes to NGOs as actors that can assist in improving the public's awareness of and participation in sustainable waste management (SWM), there is sparse knowledge on how this is facilitated. This study was also motivated to investigate to what extent social learning elements were being embodied in the initiatives of two NGOs that were studied, as it is posited that facilitations for social learning create pathways for change. Although there are various studies on the functions of NGOs, there is little research conducted on how environmental NGOs play a part in SWM in Malaysia.

The research approach applied in this thesis was mixed-methods, and the rationale was to apply both qualitative and quantitative methods that would be useful and would combine complementary strengths to help answer the research questions. A qualitative two-case-study approach was used to predict similar or contrasting results based on the theoretical framework considered relevant. The unit of analysis of each case study was a programme that promoted recycling as a sustainable waste management strategy, to the general public in the study area of Selangor, Malaysia. The first case study's target audience was urban school students; while the second case study's focus was urban school students, charity homes for the handicapped and hypermarkets. Both NGOs are considered two of the earliest NGOs in the study area to be involved in promoting SWM with the public. The quantitative aspects included findings from a questionnaire survey of 411 students. The population sampled was obtained based on a stratified sampling procedure. The urban student population's response was collected to gain insights into students' perception of NGOs' involvement in SWM, and into *what* factors significantly influence the students' recycling participation in schools. Both descriptive and inferential analyses were conducted. The findings from this approach complemented the qualitative findings obtained from the two case studies. In addition, interviews were conducted with some students to complement the survey evidence. Where relevant, secondary evidence from the press, reports and Web pages were used to support the primary evidence.

The qualitative evidence was synthesized and the aggregated findings were then triangulated with the quantitative evidence for corroboration purposes. These evaluations revealed that the processes involved in the programmes to promote recycling supported social learning and positive outcomes. Almost half of the students sampled were aware and welcomed NGOs' involvement in SWM, both in schools and in their community. They reported that they learned more about SWM and the environment from participating in their school's SWM programmes (although these programmes may not necessarily have been facilitated by the particular environmental NGO identified in the case studies). The students also generally perceived that the government should support NGOs' involvement in SWM and that SWM programmes in schools coordinated by NGOs were beneficial to their learning about SWM. Various factors were also found to have influenced their participation in sustainable waste behavior.

The findings could be used to inform the relevant policy makers' decisions about NGOs' contributions towards SWM. In addition, the findings from the students' survey could help inform other NGOs or other organisations, such as universities or corporate bodies that are interested in implementing SWM programmes with schools and who may be eager to extend their corporate social responsibilities using approaches similar to those highlighted in this thesis.

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Ikhlas,

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Abbreviations

3R	reduce, reuse, recycle
ASEAN	Association of South East Asian Nations
CALPRO	California Adult Literacy Professional Development Project
CRN	Community Recycling Network
CWP	Community waste projects'
CWP	Community Waste Management Programme'
DANIDA	Danish International Development Agency
DEFRA	Department of Environment Food and Rural Affairs
ENGOs	Environmental NGOs
EPU	Economic Planning Unit
EU	European Union
EXNORA	Excellent Novel Radical's
FAST	Fast Action Stops Torture
GCS	Global civil society
GEC	Global Environment Centre
GFE	Garbage for Eggs
Harmoni COP	Harmonising collaborative planning
HEC	Human Ethics Committee
ICTs	information and communication technologies
JICA	Japan International Cooperation Agency
JPNS	Jabatan Pelajaran Negeri Selangor
KPAS	Kelab Pencinta Alam Sekitar
LA	Local Authority
MBPJ	Majlis Bandaraya Petaling Jaya
MBSA	Majlis Bandaraya Shah Alam
MENGOs	Malaysian Environmental NGOs
MHLG	Ministry of Housing and Local Government
MOE	Ministry of Education Malaysia
MPSJ	Majlis Perbandaran Subang Jaya
NGOs	Non Governmental Organisations
NSPSWM	National Strategic Plan for Solid Waste Management 2005
NCEA	National Certificate of Educational Achievement
NZ	New Zealand
NZD	NewZealand Dollar
RM	Ringgit Malaysia
Rs	Rupees
SMK	Sekolah Menengah Kebangsaan
SK	Sekolah KebangsaanNational School
SLIM	Social Learning for the Integrated Management and sustainable use of water
SMART	Start Managing All Resources Today
SMKKJ	Sekolah Menengah Kebangsaan Kelana Jaya
SWM	Sustainable waste management
TrEES	Treat Every Environment Special
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Programme
USD	United States Dollar

UNDP-GEF	United Nations Development Programme Global Environmental Fund
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
WMP	Waste Management Master Plan

Chapter 1

Introduction

Non-governmental organisations (NGOs) are widely assumed to act as agents of social change (Edwards 2009; World Bank 2009). However, little is known about how they facilitate this change. NGOs create an impact on development through activities such as disseminating information, implementing public services and advocating for environmental reforms (Anheier 2007; Handy 2001; Martens 2002; Teegen et al. 2004). These often involve collaborative processes with other actors: a key concept in social learning and social capital theories (Blackmore 2010; Keen et al. 2005; Eames 2005). NGOs have diverse roles and functions (Vakil 1997). They have the potential to support and integrate social and environmental policies (Gemmil & Bamidele-Izu 2002; World Bank 2009), including those related to waste management governance (Davies 2007). However, NGOs' involvement is often marginalised in waste management despite the recognition by many governments that they have a role in sustainable waste management (SWM) (Davies 2008). One key role is that of raising the general public's awareness towards SWM (Agamuthu et al. 2009; Colon & Fawcett 2006; Grodzinska-Jurczak et al. 2006). One relevant perception often emphasised in the waste management and development literature is that waste management is an institutional responsibility distinct from a social responsibility (Bolaane 2005; Davies 2009; Mongkolnchaiarunya 2005; Suttibak & Nitivattananon 2008).

In the context of SWM, several authors suggest that NGOs' role varies (Agamuthu et al. 2009; Klundert & Anschiitz 2000). Generally, empirical evidence of their involvement in SWM in the developing countries is sparse, but studies of this nature are growing (Troschinetz & Mihelcic 2009). Currently, NGOs' involvement has been shown to include providing technical expertise to municipalities, collecting waste for deprived communities and initiating recycling programmes (Colon & Fawcett 2006; Luckin & Sharp 2004; Rathi 2006). In addition, they mobilise public awareness and education campaigns (Grodzinska-Jurczak et al. 2006). Despite these research efforts, NGOs' role in SWM is largely undefined (Hung et al. 2007; Shekdar 2009).

In Malaysia, the focus of this study, the National Strategic Plan for Solid Waste Management 2005 (NSPSWM) forms the basis of waste policies. The NSPSWM is a planning and

resource management guide for more-effective solid waste management (Executive Summary NSPSWM 2005). The NSPSWM states two main targets for waste management development: consideration of the waste hierarchy, e.g. the concept of reduce, reuse, recycle (3R), and establishing service targets, e.g. for source separation and collection. The NSPSWM also identifies six strategies for the government to achieve its objective of sustainable solid waste management. One of these strategies and the focus of this dissertation is to improve public environmental and waste awareness, through, for example, schools, the general public and NGOs helping the government implement relevant campaigns or activities (Ministry of Housing and Local Government 2005).

The Japan International Cooperation Agency (JICA) Waste Management Master Plan (WMP 2006) prepared for the NSPSWM also identified that NGOs' input can help the government's waste minimisation efforts. However, there is scant information on the actual process of project implementation (JICA 2006). From a social learning perspective, Holden (2008) posits that this represents a missed opportunity for policy makers to understand which aspects of project implementation are more efficient or relevant within their localised context. This study aims to help fill this gap by providing insights into the processes of implementation of SWM activities by two urban-based NGOs. These activities focus on improving the general public's recycling awareness. The evaluation takes into consideration key elements proposed within the social learning perspective: reflections, forms of participation, collaboration and networking. In addition, this study evaluates the perception of NGOs' role from the perspective of urban school students, who are also important stakeholders identified in the NSPSWM.

The study uses a mixed-method approach to evaluate and corroborate its qualitative evidence and quantitative findings. It describes the constraints faced by two key NGO respondents in implementing SWM programmes, and it analyses urban students' perceived benefits of NGOs' contribution to SWM in Malaysia. The perceptions were obtained from a questionnaire survey of a sample of urban students. The respondents in this study (NGOs and students) were selected based on their willingness to participate in this research and the criteria identified and described subsequently in Chapter 3.

1.1 The context of waste management in Malaysia

Waste generation is both a social and urban management issue in Malaysia. As a consequence of an increase in urban population, changing consumption patterns and higher purchasing power, solid waste is being generated at an increasing rate (Taylor 1999; Shekdar 2009). The growth of the urban population in Malaysia prior to the Second World War was mainly attributed to the growth of immigrants from other countries attracted to the nation's tin and rubber industry (Jaafar 2004). The urban population continued to rise between 1.4 per cent and 3.4 per cent per year during 1947–1957, largely due to the relocation of people from rural villages to towns. This was in part a safety and emergency measure to counter communist insurgency in the country in 1948 (Jaafar 2004). A low rate of urban growth occurred from independence (1957) to the 1980s, but after this period, several states, especially Selangor, showed sharp increases. This was mainly due to economic growth or to expansion in the administrative boundaries of the states' urban areas (Jaafar 2002). Since the 1980s, more aggressive economic and industrialisation policy implementation in Malaysia has resulted in more infrastructure being built, which has led to increases in both urbanised area and population concentration (Cohen 2006; Ngoc & Schnitzer 2009).

An increasing urban population places a financial and management pressure on the municipalities to provide basic infrastructure, including solid waste management services. Currently, Malaysians produce an estimated 17,000 tonnes of solid waste annually (0.8kg per person daily) and this is projected to increase by 30,000 tonnes in 10 years' time, with the expected increase in urban population (Chenayah & Takeda 2005; Fauziah et al. 2004; UNDP 2008). The increase in the volume of solid waste generated implies a higher cost for collection, transportation and treatment. Budget and infrastructure constraints mean that implementation of SWM is far from satisfactory, and, currently, some 30% of solid waste is not collected (Manaf et al. 2009; Omran et al. 2009; Saeed et al. 2009). It is reported that the Malaysian Government spends US$105 million annually to manage solid waste (Isa et al. 2005).

Although Malaysia has the potential to recycle its solid waste the nation's current waste recycling rate is one of the lowest in the ASEAN region, at only 5% (Kathirvale et al. 2004; UNDP 2008). Resistance to new waste management programmes and the lack of information received by the general public have been cited by Agamuthu et al. (2009) as being some of

the reasons contributing to low participation in recycling practices. To date, recycling remains a challenge in Malaysia's waste management system (Manaf et al. 2009). For example, pilot programmes involving household kerb collection have failed to encourage people to separate waste, an integral phase of recycling (Noor 1996; NSPSWM 2005). Currently, there is no recycling system in place and any such activities are either informal or voluntary (Saeed et al. 2009). The public's weak knowledge and the lack of relevant capacity-raising strategies contribute to a general apathy towards SWM (Chenayah & Takeda 2005).

Some authors contend that waste disposal sites in Malaysia are almost exhausted (Fauziah et al. 2004; Idris et al. 2004). The alternative incineration technology for solid waste management has frequently met with community suspicion over the expected environmental impacts and has been opposed by the public, as in the case of the cancelled Broga project in Selangor (Habib & Saad 2008). Selangor is the most populous, and one of the most urbanised, states in Peninsular Malaysia, generating the most waste of any state (Ministry of Housing and Local Government 2003; Omar 2008).

A sustainable solution to reduce waste reaching the landfills or dumping grounds is for the public to reduce, reuse and recycle, a strategy known as the '3R concept' (NSPSWM 2005; Troschinetz & Mihelcic 2009). This requires a change in understanding and behaviour (Barr 2001). At the community level, participation in relevant activities can develop the public's waste awareness and knowledge capabilities (Agamuthu et al. 2009; Hassan et al. 2001; Ngoc & Shnitzer 2009; Shekdar 2009; Troschinetz & Mihelcic 2009). It is predicted that, in Malaysia, recyclables collected, for example, can be improved from the current 5% to 20% with the appropriate and relevant awareness-raising strategy and provision of infrastructure (Chenayah & Takeda 2005). Agamuthu et al. (2009) contend that a negative attitude towards waste management can be 'softened' by an increase in waste education and awareness. This is where the civil society actors e.g. NGOs, are often expected to get involved (Chakrabarti et al. 2009; Hassan et al. 2001; Klundert & Anschiitz 2000; Shekdar 2009).

1.2 Research aim and objectives

The goal of this study is to develop a conceptual model based on the evidence collected that applies key elements from the relevant theoretical perspectives. The forms of evidence are

mixed, i.e. both qualitative and quantitative perspectives of NGO facilitators and students involved in SWM activities. The theoretical framework highlights the importance of facilitating social learning that parallels social capital building within the context of environmental NGOs in Malaysia. The objectives of the thesis are:

1. To critically review the relevant theoretical underpinnings.
2. To describe and evaluate qualitative evidence, which will be framed using the main elements of a social learning perspective.
3. To evaluate the quantitative data obtained from the sampled population regarding factors influencing urban students' recycling participation. This includes analysing students' perception about NGOs' involvement with SWM.
4. To synthesise the data and triangulate the findings for corroborating and complementary purposes (Jick 1979).
5. To formulate a conceptual model that promotes facilitating social learning for the implementation of more-effective waste awareness and minimisation programmes.

1.3 Methodology

1.3.1 Research design

This study applied a mixed method approach to collect, analyse and interpret the data. Two cases of different environmental NGOs were studied, and the qualitative evidence was evaluated using a case study approach (Yin 2003), and analysed using a relevant analysis technique, i.e. content analysis (Hsiu-Fang & Shannon 2005; Weber 1990). The qualitative data were statements obtained by interviewing all respondents face to face, based on semi-structured questions. The quantitative data were self-reported perceptions gained from a sample of the student population about NGOs' involvement in SWM. The instrument used was a questionnaire. The data were descriptively analysed and findings inferred using statistical techniques (Sekaran 2005).

The two key individuals/respondents from two different NGOs interviewed are both facilitators of their organisations' waste minimisation projects and can be considered respondents with expert knowledge (Bostrom & Hallstrom 2010). Each was interviewed individually in their office, and their statements were tape recorded with their permission.

The interviews with 17 urban students were made either face to face with an individual student, or with a group of four or five. Prior to the student interviews, permissions from several bodies had to be obtained, i.e. from the University of Canterbury's Human Ethics Committee, the Malaysian Economic Planning Unit, the Petaling State and District Education Office (Pejabat Pendidikan Daerah Petaling) and the principals of the students' schools (Appendix 3). The students were from three urban schools in the Petaling District, State of Selangor, i.e. two schools from Petaling Jaya, Selangor and one school from Subang Jaya, Selangor. The students were randomly selected and had agreed to take part in the study. All student interviews were held within the respective school premises. A few of the students had been involved in waste awareness activities in school. Five of them had been involved with activities initiated by one of the NGOs in the case study. The approach used was that of a qualitative case study (Yin 2003), and evaluations were conducted using qualitative software. The small number of respondents is due to the difficulty faced by this researcher in gaining access to more student respondents willing to be interviewed. The interview sessions coincided with the mid-term examination schedule, which placed an unanticipated time constraint, as most students were busy attending their school's extra revision classes, while some had to go home early to attend their tuition classes held out of school.

The quantitative data on 411 school students were collected using a survey instrument. The details are described in Chapter 3 and 6. Initial permissions to conduct this survey were also required from the organisations mentioned previously. The quantitative data approach allowed some identified variables to be measured (Sekaran 2003). Using a stratified sampling method, 11 schools were initially identified; subsequently, only 10 schools responded with their willingness to allow their students to participate in the questionnaire survey. Five hundred questionnaire forms were distributed to students from 10 schools in the most populated urban areas in the Petaling District, in the state of Selangor, i.e. Petaling Jaya, Shah Alam and Subang Jaya. Each school was given 50 questionnaires to be filled. This method was considered to be the best means to represent a sub-group of the population (Sekaran 2003), i.e. urban secondary students. The analysis provided an insight into what factors were significant in influencing students' sustainable waste recycling participation in school, including their perceptions of outside organisations' (e.g. NGOs') efforts in SWM.

Other forms of data used were published material from the NGOs in the case studies' web sites and relevant secondary material from local newspapers and government periodicals. Table 1.0 highlights the approach taken to meet the objectives and address the research questions.

Table 1.0: Design of the study

Methodology	Mixed Method Approach	
Type of Design	Concurrent Mixed	
Methods	Survey	Two-case study
Techniques	Questionnaire	Interviews with group members Collection of relevant documents
Analysis	Descriptive and Inferential	Content analysis approach

1.3.2 Research questions

The central question that shaped this research is how NGOs facilitate activities that support raising the general public's awareness in SWM. The research questions (RQ) are:

RQ1: How do local-based NGOs facilitate the opportunities for the public to engage in social actions and learning that address sustainable waste management?

RQ2: What are the structural and institutional constraints faced by these NGOs in their efforts?

RQ3: What do urban students perceive of NGOs' general involvement, and do these create any impact on students' recycling participation?

RQ4: What best practices can be derived from the case studies and the survey findings that would facilitate a positive learning outcome, i.e. improved understanding and recycling participation?

The study is expected to add to the understanding of forms of capacity building, i.e. advocacy work to engage people in social and environmental concerns that support more-sustainable waste management awareness, particularly recycling activities. It will also explore the elements of *active* participation, associated with the process of learning. The structural and institutional forms of barriers to local-based environmental NGOs are also explored. This

aspect refers to the limited, or lack of, decision-making power and financial support for awareness activities and SWM programme implementation.

Table 1.1: Research objectives and questions

Objectives	Questions	Techniques	Chapters in this thesis
• To critically review the relevant theoretical underpinnings. • To describe the roles NGOs play locally and globally. To identify the important elements of social capital building that parallels 'social learning'. To explore the claims of learning for sustainability from proponents in the literature of best practices in resource and waste management.	• What role do environmental NGOs play locally, globally? • What important elements (e.g. social capital building, social learning elements and general works for public good) are attached to NGOs? • What are the objectives and outcomes of learning? • What kinds of learning paradigms?	• Literature review	2
• To describe the methodology of the study	• What is the rationale for using a 'mixed-methods' design?	• Description	3
• To analyse the roles of NGOs as facilitators of learning; identifying their strengths and weaknesses, opportunities available and barriers they must overcome as advocates supporting sustainable waste management.	• How do they facilitate social activities to raise SWM awareness and behaviour? • What have the interviewed participants in this study learnt from their involvement with recycling activities or SWM?	• Two-case study (qualitative)	4, 5
• To describe and evaluate qualitative evidence, which will be framed using the main elements of a social learning perspective.		• Interviews with leaders of NGOs • Interviews with school children (qualitative)	4, 5
• To interpret the learning themes formed within the context of the case studies.	• What themes of 'social learning' are more relevant to the cases studied?	• Mixed-method approach to data analysis and evaluation	4, 5
• To evaluate the perceptions that urban students have towards NGOs' involvement in recycling activities, either in their school or generally.	• What do students perceive of NGOs' involvement with recycling or SWM matters? • What are the factors that influence urban school students' recycling participation?	• Interview (qualitative) • Survey using questionnaires	6
• To synthesise the evidence and derive some conclusion towards the formulation of a conceptual model of best practice based on the evidence obtained.	• What are the implications for future policy formulation?	• Synthesis using comparative matrix	7, 8

1.4 Overview of the chapters

This study has eight following chapters. They are described below:

Chapter 2 – 'Facilitating opportunities for social learning: The role of NGOs' – is a critical review of the relevant literature. It provides a background of key concepts, including the role of NGOs and civil society, importance of networks in social capital building and the rationale for applying 'learning' elements to effect a change in people's understanding and their propensity to take actions. It reviews successful efforts of NGOs in resource management activities in the community and with schools, while considering the institutional barriers or constraints they faced. Such efforts are important elements in the formulation of a best-practice framework in the context of this study.

Chapter 3 – 'Methodology' – describes the study's mixed-method research design. The major consideration in developing the methodology was the practicality of employing different approaches to address the research questions, while maintaining reliability and validity.

Chapters 4 and 5 – 'Case studies of NGOs' – describe the physical and social contexts of a few cases from the literature in which NGOs act as facilitators of social change in SWM. Each provides an overview of the NGOs' priorities and roles, including constraints and institutional challenges.

Chapter 6 – 'Influencing factors to students' recycling participation' – provides an evaluation of students' waste management activities in school and their perceptions on recycling. It highlights the perspectives of the students on NGOs' general involvement with recycling activities. A major portion of this chapter was previously peer reviewed and published during the study.

Chapter 7 – 'Synthesis' – provides an evaluation of the findings from the different groups of participants and triangulates for corroboration and further understanding.

Chapter 8 – 'Discussions and strategies formulation' – contributes to a formulation of a conceptual model of activities implementation based on best practices applied by the NGOs in both case studies that supports efforts to increase the general public's waste awareness, especially towards recycling. The limitations of the study and potential similar future research are discussed.

Chapter 2

Facilitating opportunities for social learning: The role of NGOs

This chapter discusses a number of key concepts that are important in exploring the research questions outlined in Chapter 1. It draws on ideas that help to frame an understanding of how NGOs might facilitate social learning in SWM. There are four main sections. Section 2.1 highlights the concept of civil society, describing definitions and perspectives, and roles of actors such as non-governmental organisations (NGOs). Section 2.2 describes the relevancy of social capital building, defined as the building of 'networks of collective learning and solidarity' (Isaak 2010). Section 2.3 explores the concept and importance of learning, and includes the theories and rationale of facilitating learning in a social context (Blackmore 2010; Keen et al. 2005). Section 2.4 examines international case studies where elements of 'social learning' are applied within sustainable waste management (SWM). This is to gain some understanding of how learning is promoted by NGOs, particularly in the context of SWM.

2.1 The concept of civil society

The literature suggests that the term 'civil society' has varying interpretations (Anheier & List 2005; Edwards 2009; Handy 2001; Kaldor et al. 2003; Mercer 2002). Edwards (2000, p. 7) describes civil society as *the arena in which people come together to advance the interests they hold in common, not for profit or political power.* Anheier and List (2005) state that civil society places social capital building as a key element. According to Teegen et al. (2004, p. 464), civil society is referred to as the 'third sector' or 'non-profit sector', broadly denoting all aspects of society that go beyond the public and private/market sector. Figure 2.1 illustrates this.

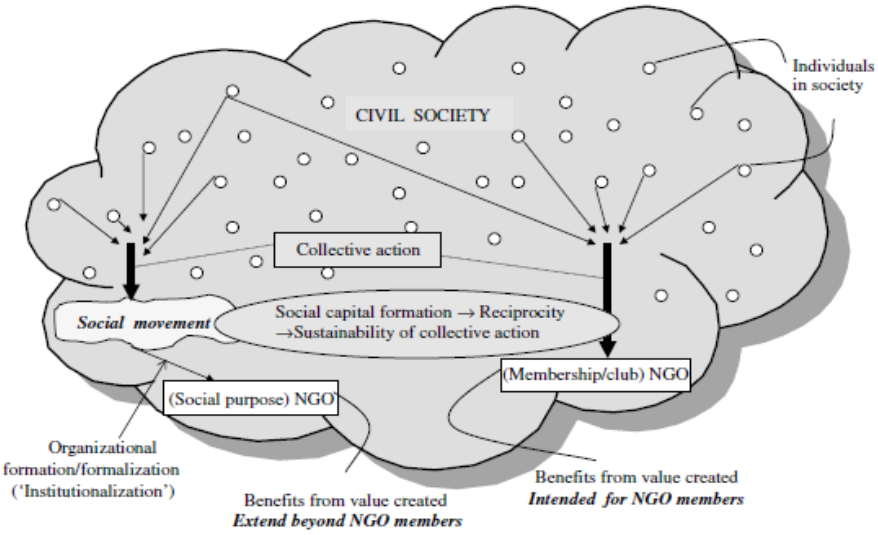


Figure 2.1: Civil society: relevant units of analysis, concepts and processes
Source: Teegen et al. (2004, p. 464)

Mohan (2002) posits that, theoretically, civil society is looked upon as a space of freedom not connected to the state/government. Other authors assert that the varying interpretations of the term 'civil society' are partly due to the different emphases given to different influencing factors, i.e. historical conditions and political systems (Kaldor et al. 2003; Seligman 1992). The following paragraphs highlight in more detail some views on civil society from the literature.

2.1.1 The varying perspectives

Many authors suggest that the concept of civil society was born in Europe in the midst of the transformation known as the Enlightenment, and emerged from political theorists such as Thomas Paine and George Hegel (Cohen & Arato 1994; Edwards & Foley 2001). Until the 19th century, civil society was considered as a space for personal autonomy (Seligman 1992), and the rights of individuals received first ranking (Kaldor et al. 2003).

According to Outhwaite (2006) and Kaldor et al. (2003), civil society was conceived by Hegel as an intermediate sphere between the family and the state, and was a historically produced phenomenon brought about by the emergence of capitalism (Kaldor et al. 2003). Hegel had a notion of 'liberalism', in which isolated individuals, based on self interest, associated themselves in order to secure their life, liberty, and property (Seligman 1992).

Hegel thought that the public realm and individual or private interests should share ethical ideas and practices (Seligman 1992). He argued that individuals and institutions were interdependent and that both were necessary for the maintenance of a free and peaceful polity (Terrier & Wagner 2006). Hegel's theory of modern civil society as an ethical vision of social life and public freedom featured three major notions: the individual as the bearer of rights and the agent of moral conscience, the state and society as interdependent and civil society being where materialization or development takes place (Cohen & Arato 1994).

In the 19th century, Karl Marx criticised Hegel's notion of the apparent freedom of action that is granted to the individual, and argued that Hegel's idea of civil society is an illusion and a disguise for class exploitation (Hann & Dunn 1996). Marx argued that, instead of resolving the tensions in civil society, the capitalist state favoured the ruling class and the bourgeoisie and 'alienated' the working class both from the means and the product of their labour (Hann & Dunn 1996). Marx did not see civil society as a space for individuals to pursue their interest under a state's guidance, but as a means to promote class divisions (Ramasamy 2004).

Some authors contend that civil society in the late 20th century was now seen as being capable of catalysing opposition to an oppressive regime, i.e. it was more political (Edwards & Foley 1998). Edwards and Foley (p. 1) contend that civil society can be identified by two 'camps of arguments'. The first is 'apolitical', while the second is politically mobilized. They termed the first as 'Civil Society I', and this places special emphasis on associational life (referring to networks of civic engagement initiated by civil associations), and the propensity to foster patterns of civility in citizens' actions, within a liberal democracy. According to them this first version was adopted in Alexis de Tocqueville's *Democracy in America*, which took into consideration the works of the 18th century 'Scottish moralists', including Adam Smith, Adam Ferguson and Francis Hutcheson. De Tocqueville was impressed by a flourishing civil society in the 19th century in which Americans formed voluntary associations for common causes and opposed excessive individualism (Fukuyama 2000). This propensity to form civil associations, in de Tocqueville's opinion, produced 'schools of citizenship' (Fukuyama 2000, p. 7). This further reinforced public values such as habits of cooperation, solidarity and public spiritedness (Putnam et al. 1993), which enabled norms of reciprocity and understanding to be created. The creation of these norms or habits for associations and the resulting ability for associational life are considered to be 'civility'

(Edwards & Foley 1998). 'Civility' may refer to an individual's manner of tolerance, self-restraint, ability to take responsibility, social involvement, and respect for, commitment to and concern for others (Dekker & Evers 2009).

The second version, which Edwards and Foley (1998) termed 'Civil Society II', places particular emphasis on civil society as a realm of political action that is independent of the state and that opposes tyrannical regimes. Kaldor (2003) contends the concept of civil society has consistently been linked with aspects of politics. In the second half of the 20th century, post-World War II, the loss of faith in the institutions of the state to preserve essential human and democratic rights led to associations of individuals who sought to transform their societies from authoritarianism to democracy (Hall 1995). Such social movements developed in Eastern Europe, East Asia and Latin America. For example, in 1982, the Solidarity trade union led in the liberation of Poland from communist rule (Cohen & Arato 1994). The role played here by civil society is that of mobilizing pressure for political change towards democracy (Mercer 2002).

Ramasamy (2004) posits that political figures in Asia did not contemplate the concept until the late 20th century, and Lyons and Hassan (2002) maintain that Asia's civil societies are extraordinarily varied. Their development is distinguished by political history, colonial rule, diversity in approach to economic development, welfare regimes, cultural and religious traditions (Lee 2005). For example, in India and Bangladesh, the inheritance of British Common Law, cultural diversity, regional variations, and a federal system of government have contributed to a proliferation of civil organisations, including NGOs (Lyons & Hassan 2002).

The debates on the definition, emphases and role of civil societies, according to Edwards (2009), generally allude to the creative and collective actions of organisations (e.g. NGOs or groups with social objectives) counterweighing individualism. The concept of civil society currently has changed from being territorially bounded to global (Kaldor 2003). This is due to the opening up of opportunities for those within civil society to link internationally with others who pursue similar objectives (Kaldor 2003).

2.1.2 Global civil society actors

The term 'global civil society' (GCS), which appeared across the literature in the late 1990s, is highly contentious but generally alludes to citizen action operating across national boundaries, politics, and, dominated by voluntary associations usually for a public good (Dekker 2009; Etzioni 2004; Keane 2003). GCS can be defined as *the sphere of ideas, values, institutions, organizations, networks, and individuals located between the family, the state, and the market and operating beyond the confines of national societies, polities, and economies* (Anheier et al. 2001, p. 3). A revised version of this definition includes the term 'civility' as the basis of the sphere (Anheier 2007, p. 5). Examples of GCS actors are international NGOs such as Greenpeace, World Wildlife Fund and Friends of the Earth (Carter 2007). Another GCS actor, Oxfam International, based in London, forges links with other international NGOs, e.g. World Vision India, and provides humanitarian support (Anheier & Themudo 2002). Examples of faith based GCS actors are World Vision International (a Christian development agency registered as a US non-profit organisation (NPO) and Islamic Relief Worldwide (based in the UK), which provide humanitarian and monetary assistance to enable communities in Africa, South America and Asia gain access to basic resources such as clean water (Clarke 2006).

The literature on GCS in the last decade provides a varied account of its actors and actions; activities range from lobbying for environmental policy changes to fostering positive behaviour in individuals through public educational and capacity building programmes (Mercer 2002; Sokolova 2006). Service delivery is another GCS collaborative effort with governments (Ghimire 2010), and includes efforts such as immunisation programmes (Loevinsohn & Harding 2008). In war affected Afghanistan, for example, GCS actors Save the Children, the Swedish Committee for Afghanistan, HealthNet International, and other international NGOs such as the Bangladesh Rural Advancement Committee and the Aga Khan Development Foundation, have established operations to deliver health related services in collaboration with the World Bank, USAID and the Asian Development Bank (Palmer et al. 2006). Scholars posit that the membership of civil society is diverse (and can include NGOs providing waste management services to communities (Baud et al. 2001; Colon & Fawcett 2006; Luckin & Sharp 2004).

The ‘communication revolution’ of the past twenty years and citizens’ doubts about governments’ capabilities to cope with environmental problems and social development have stimulated the global growth of civil society (Salamon et al. 1999). Castell and Burgos (2009) cite Web based networks, e.g. Facebook, as platforms from which GCS actors communicate ideas and mobilize projects of public interest. The Internet, according to Edwards (2009), has been used to organise civic projects and attract public participation. For example, Amnesty International launched an online network, Fast Action Stops Torture (FAST),[1] which has enabled thousands of activists to sign electronic letters of protest to governments. Another GCS actor, OneWorld.org, provides information and creates a hub for campaigns on sustainable development and human rights in over 90 countries (Naughton 2001). Other GCS actors, according to Etzioni (2004), such as the informal transnational movement ‘Doctors without Borders’, have provided medical treatments for the poor in over 80 countries; and ‘Habitat for Humanity International’ has built thousands of houses around the world for those affected by natural disasters such as the Sichuan earthquake in China (Habitat for Humanity 2011).

Currently, GCS continues to be concerned with political, social and economic reforms (Holt 2008). The GCS actors, despite being in different geographical regions, share many features, e.g. goals, values, ethical standards and responsibilities (Omilecheva 2009). A survey involving 250 GCS actors from various countries found that 80–90% of the respondents endorsed associating with others nationally and globally despite operating from different countries with different political and socio-economic standing (Omilecheva 2009).

Table 2.1 lists some key concepts of civil society’s development and main concerns; (Anheier 2007). It gives an indication of the changing composition and forms of GCS. For example, individual participation in civil society organisations seems to be increasing with the innovations of electronic communications, while corporate forms of NGOs are replacing humanitarian based organisations.

[1] http://www.amnestyusa.org

Table 2.1: Changing contours of global civil society (GCS)

Decade	Infrastructure growth	Composition fields	Innovation in organisational form	Value changes	Individual participation
1970s	Medium rate of growth	Economic research and service provision	Humanitarian membership-based NGOs	Rise of post-materialism	Slow increase around humanitarian and anti-war efforts
1980s	Acceleration of growth	Advocacy	NGOs linked to international social movements	Cosmopolitan values	Mobilization for social movements
1990s	High rate of growth	Advocacy; service provision	Corporate NGOs	Scale and scope expansions in NGO activities	Slow increase
2000s	Moderate rate of growth	Advocacy; service provision	Social forums	Resilience; reorganisation and differentiation	Increase around social forums, and Internet-based participation

Source: Adapted from Anheier (2007, p. 8)

2.1.3 Locating Non-Governmental Organisations (NGOs) in civil society

The reviewed literature highlights that civil society enables actions by various members or associations that have social objectives. A prominent category of actor within civil society is non-government organisations (NGOs) (McIlwaine 2009). The term 'NGO' is a post-World War II expression initially coined by the United Nations (UN) as stipulated in the 1945 UN Charter, Article 71 (Martens 2002). On its Website, the United Nations describe an NGO as follows:

> Any non-profit, voluntary citizens' group which is organized on a local, national or international level. Task-oriented and driven by people with a common interest, NGOs perform a variety of services and humanitarian functions, bring citizens' concerns to Governments, monitor policies and encourage political participation at the community level. They provide analysis and expertise, serve as early warning mechanisms and help monitor and implement international agreements. Some are organized around specific issues, such as human rights, the environment or health. (United Nations n.d.)

The OECD (1988) refers to NGOs as organisations based in the developed countries, which are non-affiliated to the government, and which provide assistance to less developed nations. Korten (1990), on the other hand, describes private voluntary organisations (PVOs) and NGOs interchangeably, as people-centred developments serving the populations of the less developed countries in which they are based.

The World Bank through its Development Grant Facility is a major funding body for NGOs' activities. On its Website, it views NGOs as the following:

> The diversity of NGOs strains any simple definition. They include many groups and institutions that are entirely or largely independent of government and that have primarily humanitarian or cooperative rather than commercial objectives. They are private agencies in industrial countries that support international development; indigenous groups organized regionally or nationally; and member-groups in villages. NGOs include charitable and religious associations that mobilize private funds for development, distribute food and family planning services and promote community organization. They also include independent cooperatives, community associations, water-user societies, women's groups and pastoral associations. Citizen Groups that raise awareness and influence policy are also NGOs. (World Bank n.d).

The roles of NGOs imply notions of participation, voluntarism, and being connected to various groups pursuing social objectives. Anheier and List posit that one of NGOs' main objectives is 'social entrepreneurship', defined as 'initiation of social change' (2005, p. 238).

The term 'NGO' is widely used with the term 'non-profit organisation' (NPO) in the United States (Holmen & Jilstrom 2009; Vakil l997). But while this relationship has been widely acknowledged, it has been suggested that 'NPO' has a broader meaning and scope than 'NGO' (Salamon & Anheier 1992). Some authors contend that differences in definition are related to the differences in an organisation's structure and operation (Salamon & Anheier 1992; Vakil 1997). According to Vakil (1997), these have implications for the transfer of knowledge and experiences among NGOs. An overall definition of an NGO (Vakil 1997) is 'private and self governing, formal and non profit', which excludes the informal, often community based organisations in less developed countries.

Mercer (2002) in a critical review of NGOs and civil society defines NGOs as being organisations that are formally established, with staff employed to run the operation, that have funds to support them and are comparatively large in size and resources. On the other hand, Mercer states that local NGOs may be informal, relying upon donors or support from other NGOs, and tending to be short lived or issue based. Table 2.2 shows different terms used to identify NGOs. The descriptions suggest that the scale of the organisation may vary from small to large and be either local or national in context.

Table 2.2: Different terms for NGOs

Abbreviation	Description
BINGOs	Big international non-governmental organisations
CBOs	Community based organisations
CB-NGOs	Community based non-governmental organisations
DOs	Development organisations
DONGOs	Donor non-governmental organisations
ENGO	Environmental non-governmental organisations
GROs	Grassroots organisations
GRSOs	Grassroots support organisations
IDCIs	International non-governmental organisations
NGDOs	Non-governmental development organisations
NNGOs	Northern non-governmental organisations
NPOs	Non profit organisations
POs	People's organisations
QUANGOs	Quasi non-governmental organisations
SCOs	Social change organisations
SNGOs	Support non-governmental organisations
WCOs	Welfare church organisations

Source: Vakil (1997, p. 2060)

Vakil (1997) developed a five-element classification scheme for NGOs, based on the actual characteristics of the organisations (Table 2.3). These characteristics include the orientation taken, and the level of operation, i.e. whether the organisation is based in the community, at regional level, or at a macro/national scale.

Table 2.3: Classification of NGOs by other scholars

1) Community based (Uphoff et al. 1998)
2) Position based (Elliot 1987) – orientation to welfare, development or empowerment over poverty
3) People centred (Korten 1987; 1990) – people's organisation (membership organisation); voluntary organisation (value driven); public service contractors (market driven);
4) Providing services or seeking to affect the outcomes of public or private decisions on

issues that impact immediate clients or broader constituencies; commodified or non-commodified (whether there are cash payments for the goods or services provided); participatory/elitist (the extent to which the production of output involves consumers or clients) (Wolch 1990)

5) Level of operation based – membership that is community based, developmental (operating at a national level) or international voluntary; bridging organisations (acting as intermediary institutions to perform a range of functions, e.g. networking and partnering) (Brown 1991)

Source: Adapted from Vakil (1997)

Vakil (1997) argues that the overlapping dimensions of organisations can be explored to further define the classifications and the roles of NGOs. This thesis adopts the operational definition akin to the one posited by Vakil (1997): that a *local* NGO is not for profit and not operated by any state or government organisation (although it may support a government's objective), and is geared to improving the quality of life of the public.

At the global and regional scale, NGOs collaborate with the UN and its agencies in consultative efforts that give NGOs access to, and the possibility of participating in, other UN committees (Zettler 2009). Under the UN's charter (Article 71, Chapter 10) NGOs are given the right to speak on behalf of the public on many topics (Zettler 2009).

Environmentalism is one aspect that has gained much attention from NGOs. Environmental NGOs (ENGOs) are a subset of NGOs and many are dedicated to protecting air, land and water quality and sustaining the presence of non-human species (Chasek 2001). Gemmil and Bamidele-Izu (2002) argue that ENGOs are the prominent actors in the sphere of global environmental governance. They suggest (p. 2) that ENGOs can play five major roles. These are:

(1) collecting, disseminating, and analysing information;
(2) providing input to agenda-setting and policy development processes;
(3) performing operational functions;
(4) assessing environmental conditions and monitoring compliance with environmental agreements; and
(5) advocating environmental justice.

At the international level, ENGOs advance their interests and influence policies by lobbying states and working within and across societies (Wapner 1995). For example, studies have

shown that ENGOs have influenced negotiations over environmental protection of oceans, the ozone layer and Antarctica and have helped enforce national compliance with international mandates (Wapner 1995). Another example of lobbying activities in the United States in the early 1960s led to millions of acres of land being put aside for conservation (Handy 2001). The efforts of ENGOs such as Greenpeace, Friends of the Earth, and World Wildlife Fund have raised concern for the environment throughout the world, despite the ENGOs' being faced with criticisms. ENGOs, with the aid of information and communication technologies (ICTs), increasingly facilitate more-inclusive dialogue, and provide avenues for disseminating information on activities and issues (Gurumurthi & Singh 2006).

However, some scholars contend that actions of NGOs (including ENGOs) are highly contested, and politically and socially influenced with underlying assumptions (Holmen & Jirstrom 2009). It has been posited that one of these assumptions is that NGOs should bolster liberal democracy; in fact, NGOs are also active in *semi*-democratic societies (Holmen & Jirstrom 2009; Mercer 2002; Mohan 2000). While agreeing with Vakil (1997) that the concept of NGOs in general has ambiguities with regard to how they go about achieving their objectives, Holmen and Jirstrom (2009) posit that currently, the concept of an NGO is more that of an intermediary for global financing aid (Bebbington 2004).

The definitions of NGOs are as varied as their function and how they are interpreted depends upon the context considered (Ramasamy 2004). There are criticisms of NGOs' involvement, especially in the field of receiving aid and development, which point to issues of accountability and representation (Bebbington 2004; Holmen & Jirstrom 2009; Mercer 2002; Mohan 2002). Despite these criticisms, NGOs continue to influence people to practise a more sustainable way of life for public good (Baud et al. 2001; Davies 2007; Haigh 2006; Luckin & Sharp 2004; Middlemiss & Parish 2010).

A key component to NGOs' efforts in facilitating and implementing public activities for a better environment is receiving the support of and participation from both the public and the state (Omelicheva 2006; Stern et al. 1999). 'Support' is defined here as interest and commitment with active participation. For example, and more relevant to this thesis, NGOs as facilitators/coordinators have been shown to be more successful in gaining support for their recycling programmes or waste awareness activities in collaboration with targeted

communities when the NGOs employed realistic means of management (Colon & Fawcett 2005), when they made clearly known to the community the aims and benefits of the programme (Pasang et al. 2007), and when they involved both the local authorities and neighbourhoods (Crabbe et al. 2008 Mongkolnchaiarunya 2005; Perera & Chowdhury 2007). These measures are parallel to efforts for the forming of 'social capital' (Wilson 1997). The processes associated with developing social capital are believed to enable people to cooperate and network more effectively, a central theme in sustainable solutions to local development and resource management problems (Fukuyama 2002; Holt 2008; Pretty & Ward 2001; Pretty 2003). NGOs continue to establish networks with other civil associations and coordinate various public good initiatives that in turn contribute to social capital building (Fukuyama 2000; Perera & Chowdhury 2007; Putnam 1995; Ru & Ortolano 2009).

2.2 Social capital: establishing networks of cooperation

There is a vast amount of empirical work in the development literature that stresses the benefits of social capital (Pretty 2007; Pretty & Ward 2001; Narayan 2002; World Bank 2009; Wilson 1998). Radcliffe (2004) highlights that the concept of social capital, while little used in critical human geography, appears in important economic, political and development geography debates and has been a significant tool for development policy-makers. Portes (2000) contends that social capital theory is one of the most successful 'exports' from the field of sociology to be applied in fields such as public policy, urban management and education.

Fukuyama (2002) argues that there is no general agreement on a definition of social capital. However, one of the most highly cited definition is Putnam's. Putnam (1995, p. 66) refers to social capital as *features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit*. Putnam's *Bowling Alone* (1995) observed that civic engagement was declining in the United States and becoming less vibrant. Others suggest evidence to support this 'decline' theory in which individualism threatens traditional social bonds (Stolle & Hooghe 2004). Neo-Tocquevillians, including Putnam (1995) and Coleman (1988), assert that social capital is important to the vibrancy of civil society and democratic processes. Putnam, in considering the North American context (2000), places an emphasis on social capital as the property of collectivists, and contends that it enables participants to act together more effectively to pursue shared objectives (1995, p.

664). Putnam's (1995) social capital argument is that through participation in a range of voluntary associational activities, individuals encounter their fellows on equal terms and learn to interact with and trust them. Social capital is also considered as an informal norm that promotes cooperation among individuals, reduces transaction costs and promotes associational life necessary for the success of modern democracy (Fukuyama 2000). Notions of participation, voluntarism, being collectively connected to a non-profit organisation are important 'pre-conditions' of a civil society (Putnam 1995). Table 2.4 shows some definitions of social capital by different scholars. Each highlights the notions of relationships, networks and cooperation, within some structure. Generally, social capital illuminates the value of social relationships and networks and is characterised as a general public good (Holt 2008).

From a socio-economic point of view, Chou (2010) contends that social capital can enhance economic growth, but, like other forms of capital, e.g. human and physical capital, it requires a significant amount of time and effort, including money. According to Bourdieu (1985, p. 251), social capital is ` the product of investment strategies, individual or collective, consciously or unconsciously aimed at establishing or reproducing social relationships that are directly usable in the short or long term'.

From an environmental context, Steil (2009), using respondents from different regions in the US, found that there is, however, an inconsistency in the degrees of influence of social capital on various aspects of environmentalism, and that local social and spatial contexts influence individuals' environmental participation.

Table 2.4: Definitions of social capital

Authors	**Definition of social capital**
Baker	*A resource that actors derive from specific social structures and then use to pursue their interests; it is created by changes in the relationship among actors* (1990, p. 19)
Belliveau, O'Reilly & Wade	*An individual's personal network and elite institutional affiliations* (1996, p. 1572)
Bourdieu	*The aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships of mutual acquaintance or recognition made up of social obligations ('connections'), which is convertible, in certain conditions, into economic capital and may be institutionalized in the form of a title of nobility* (1985, p. 243)
Bourdieu & Wacquant	*The sum of the resources, actual or virtual, that accrue to an individual or a group by virtue of possessing a durable network of more or less institutionalized relationships of mutual acquaintance and recognition*

	(1992, p. 119)
Boxman, De Graaf, & Flap	*The number of people who can be expected to provide support and the resources those people have at their disposal* (1991, p.52)
Burt	*Friends, colleagues, and more general contacts through whom you receive opportunities to use your financial and human capital* (1997)
Knoke	*The process by which social actors create and mobilize their network connections within and between organizations to gain access to other social actors' resources* (1999, p.18)
Portes	*The ability of actors to secure benefits by virtue of membership in social networks or other social structures* (1998, p.6)
Coleman	*Social capital is defined by its function. It is not a single entity, but a variety of different entities having two characteristics in common: They all consist of some aspect of social structure, and they facilitate certain actions of individuals who are within the structure* (1990, p. 302)
Fukuyama	*The ability of people to work together for common purposes in groups and organizations* (1995, p. 10)
Inglehart	*A culture of trust and tolerance, in which extensive networks of voluntary associations emerge* (2000)
Portes & Sensenbrenner	*Those expectations for action within a collectivity that affect the economic goals and goal-seeking behaviour of its members, even if these expectations are not oriented toward the economic sphere* (1993, p. 1323)
Putnam	*Features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit* (1995, p.6)
Thomas	*Those voluntary means and processes developed within civil society which promote development for the collective whole* (1996, p. 11)
Loury	*Naturally occurring social relationships among persons which promote or assist the acquisition of skills and traits valued in the marketplace . . . An asset which may be as significant as financial bequests in accounting for the maintenance of inequality in our society* (1992, p. 100)
Pennar	*The web of social relationships that influences individual behaviour and thereby affects economic growth*. (1997, p. 154)
Woolcock	*The information, trust, and norms of reciprocity inhering in one's social networks* (1998, p. 153)

Source: Adler and Kwon (2002, p. 20)

Two key elements of social capital are 'bonding' and 'bridging' (Bertotti et al. 2011). Putnam emphasised that building and bridging connections between people and fostering trust to act in the public good could strengthen social capital and the democratic processes within society (1993a; 1993b; 1995; 1996). Stolle and Hooghe (2004) assert that connections matter for two reasons: they function to train people into a more civically oriented mind-set and to become better disposed towards cooperation, trust and reciprocity; and citizen–state connections offer important informal access for citizens wanting to influence governmental affairs. There are multiple dimensions in bonding and bridging, which may include levels of membership and political and social attitudes. Each may not necessarily be distinct from the other (Geys & Murdoch 2010). 'Bonding' is said to help people 'get by', by providing someone to turn to for practical help with, for example, childcare (Putnam 2000). It is also represented by the

close relationships one has with family members and friends (Bertotti et al. 2010). 'Bridging' in social capital is represented by different levels of relationships or networks: between individuals and between groups, who may be of different ethnic, geographical, and occupational backgrounds (Bertotti et al. 2010). Bridging networks are generally thought to represent the 'bright' side of social capital, creating positive effects on the wider society (Coffe & Geys 2008). They can help an individual access new opportunities, for example non-local jobs (Cleaver 2005). However, depending on the particular social or political context, strong ethnic group bonding discourages individual interaction with other ethnic groups, thus limiting bridging of the group (Bertotti et al. 2008). According to Coffe and Geys (2008), a failure to build bridges in this sense may create distrust, requiring policy interventions, whether of a 'bottom-up' or 'top-down' approach. Table 2.5 shows definitions of 'bonding' and 'bridging' and the possible consequences of an absence of these forms of social capital.

Table 2.5: Forms, definitions, benefits, and absence of social capital

Types of social capital	**Definition**	**Examples of key benefits**	**Effect of absence of social capital at individual/group level**
Bonding	Family members, ethnic group members, close friends, neighbours	Care and health in early childhood and frail old age; having someone to turn to for help; child care; creation of interest groups	Isolation; depression
Bridging	Across ethnic groups, occupational, and geographical backgrounds	Employment; political mobilization of interest groups; business relations; lower business crime	Racial tensions; unemployment; poor business networks
Linking	Relationships between communities and institutions such as governments	Loans; links with people of different social classes	Disempowerment; lack of civic engagement

Source: Bertotti et al. (2011, p. 4)

However, there has been significant criticism of and scepticism towards Putnam's (1995) concept of social capital; a debate surrounds the failure of the concept to understand issues of power (De Filippis 2001). In addition, other authors suggest that while social capital has a 'bright side' (Chou 2010; Holt 2008; Wilson 1997), its forms have a 'dark' or negative side (Marshall & Stolle 2004).

This occurs when, for example, the social relations are based on fear: they 'trap' people in harmful arrangements (Pretty 2003, p. 1914). Radcliffe (2004) noted that social capital raises questions about social interaction but it is unclear who initiates or maintains these interactions. Some authors are critical of whether it is possible to operationalise this concept, as it entails a long term effort (Mohan & Mohan 2002). As Putnam (1995) also contends from his observation of Italian civic associations, high levels of participation and trust in Italy had evolved over centuries and, therefore, may not be replicated easily.

Drawing on empirical examples from Belfast, Leonard (2004) asserts that forms of social capital, especially 'bonding' and 'bridging', include *and* exclude community members, thus they may not be such a benign phenomenon. This 'negative' side of social capital is indicated in Bertotti et al.'s (2011) study. In their study about the contribution of a social enterprise (in the form of a café) in building social capital in a disadvantaged urban area in London, the researchers found that an excess of 'bonding' in ethnic groups (Asians and other minority groups) was the root cause of racial tension that prevented an individual's interaction across ethnic groups, thus limiting 'bridging' at the group level. The study indicated that because of this limited bridging the unit of analysis, i.e. the social enterprise, was less able to make an impact. However, it did achieve some results by convincing a white resident to become a volunteer in the café and in doing so encouraged other white English residents to become involved. On the other hand, the tension was made worse by the lack of access to decision makers to voice concerns. Social conditions such as these, along with class conflict, can constrain social capital, making it a 'chaotic' concept (Das 2004). It is not clearly made known how precisely social capital is created through participation in day to day associational activities, while motivations of individuals to participate in a public good itself can vary (Mohan & Mohan 2002). Thus, not all participation activities would have the outcomes predicted by Putnam (Mohan & Mohan 2002).

The elements associated with social capital are influenced by many factors, e.g. political or institutional systems and geographical culture. These can lead to diverse applications and outcomes. Social capital is influenced by, among other things, the local context (Bertotti et al. 2008), types of individuals involved (Mohan & Mohan 2002; Radcliffe 2004) and the *nature* and objectives for which the activities are designed (Pretty & Ward 2001; Pretty 2003). As noted earlier, from a North American perspective an apparent decline in social connectedness and civic participation affecting democratic processes has been observed (Putnam 1995; 2000); for example, church attendance and voting patterns are declining (Sivesind et al. 2002). However, from a global perspective, especially in natural resource management, Pretty and Ward (2000) contend that new forms of social capital that deal with collective actions of people are emerging and replacing Putnam's notion of traditional types of civic or voluntary engagement. The associations made between different groups and NGOs in various development programmes may benefit the community and overall development (Carpenter et al. 2004; Yerbury 2011). For example, despite limited funding, and criticism of their degree of implementation, community based organisations and NGOs dealing with natural resource management, poverty alleviation and public–private partnerships have, since the 1990s, mobilized positive changes within urban and rural communities (Colon & Fawcett 2006; Marschke & Sinclair 2009; McIlwaine 2009; Pretty & Ward 2001; Woolcock & Narayan 2000).

2.2.1 Social capital and environmental capacity building

Capacity building is an approach to strengthen people's values and priorities about a concern and to enable them to act (Eade 1997). Since the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro (1992), various environmental capacity-building projects, awareness campaigns and education programmes have been initiated by NGOs on different geographical scales. There have been numerous case studies showcasing the positive impacts of NGO-facilitated initiatives in raising the public's environmental awareness and, to some extent, communities' environmental management capacity (Crabbe et al. 2010; Haigh 2006). The last two decades have seen ENGOs, in particular, aim to expand the capacities of people in resource and environmental management (Korten 1990), which has been defined as enhancing the understanding and skills of people through educational and informal learning activities, implying knowledge sharing and partnerships (Crabbe et al. 2010).

NGOs' involvement with pro-environment issues ranges from mobilising educational programmes or activities that help raise communities' awareness, to more-radical environmental activism that affects or influences policy change (Crabbe et al. 2010; Economy 2004; UNESCAP 2000). NGOs' capacity building programmes often involve the financial support of donors locally and internationally, thus the issues of accountability and transparency are raised (Mohan 2002). In environmental capacity building, NGOs through their programmes help communities to develop resources, motivate the public to participate, and increase awareness and understanding, i.e. learning (Armitage et al. 2008; Keen et al. 2005; McIlwaine 2009; Pretty & Ward 2001).

2.3 Learning

Learning is viewed as a normative goal and policy process (Armitage et al. 2008; Holden 2008) and is parallel to the social capital building processes (Eames 2005). It is concerned with the understanding and perception of people in the world to effect a change (Fazey et al. 2005; Woodhill & Roling 1998). Learning is essentially a process to acquire knowledge, skills, personal qualities, and the ability to act adequately and flexibly in both familiar and uncertain situations (Illeris 2003; Kolb 1984; Merriam & Caffarella 1992; Wenger 1998). Learning raises important issues about the future and how best we can deal with its uncertainties (Keen et al. 2005; Tempest & Starkey 2004; Vare & Scott 2007; Woodhill & Roling 1998). When the process of learning is shared it becomes a social construct and is using existing knowledge to innovate, invent and discover, thus facilitating competent actions (Howells 2002). Most learning occurs over time within a social context, and can be identified through communities of practice (Lave & Wenger 1991; Wenger 1998; Wenger et al. 2010).

2.3.1 Learning paradigms

The literature on the concept of learning and its application is diverse. Wenger (1998, 2000, 2010) contends that learning has been the domain of psychological theories that emphasise individual processes, but argues that it is more relevant to assume it is a social phenomenon. Kim (2004), basing his model of individual learning on the Lewinian experiential learning model (Kolb 1984) and Kofman's (1992) version of the 'Kolb cycle', opines that individuals

experience events, assess the experience (consciously or subconsciously) by reflecting, and construct a thought to respond appropriately. Illeris (2003, 2007, 2009), on the other hand, contends that in a competitive world, learning is an extremely complex process that involves both psychological and social elements. Each element may follow its own set of logic but all work together in a complex interaction to be applied to manage the complex function of modern life (Illeris 2003, p. 398).

Leonard (2002) contends that there are at least five learning paradigms or views – behaviourism, cognitivism, constructivism, humanism and organisational learning – which can be categorised according to their dominant traits. Learning theories are useful in that they help to clarify the process in individuals and groups. They form a basis that points to the notion that learning depends on various internal and external stimuli, motivations, reinforcements, interventions and interactions that could effect a change in a person or group. Although they can be categorised separately, their information may overlap.

Behaviourism, considered a dominant approach in psychology and social science from the 1970s onwards (Villani & Wright 2007), emphasises behaviour modification and focuses on control and adaptive responses or stimuli in the environment (Wenger 1998). Behaviourists such as John Watson (1920) argued that thoughts are not different from actions that can be studied. By observing behaviour directly, common principles of adverse behaviours such as smoking and those of anxiety disorders can be explained (Bouton 2010). From an environmental perspective, Blake (1999) argues that environmental concerns could be influenced by individual barriers such as conflicting attitudes, e.g. laziness or lack of interest, which then prevent people from prioritising the environment in their actions. This discrepancy, or 'value–action gap' (Fahey & Davies 2007, p. 14), is due to various factors, personal and social. This behaviourism theory is particularly applicable when the desired outcome of an educational intervention is a change in behaviour (Rostami & Khadjooi 2010).

While behaviourism is concerned with the observable changes in behaviour, cognitivism (Posner & Raichle 1998) is concerned with the thought process behind the behaviour (Mergel 1998). It is understood together with a computational-representation theory of mind (Watson & Coulter 2008). It is an approach to learning that views humans as information processors who collect, receive and encode (i.e. store) information, and sort and use (i.e. process) it (Adamo-Villani 2007). This learning paradigm is widely applied in understanding the

intelligence of machines, e.g. in the fields of computer science and artificial intelligence (Posner 1998).

Constructivism, on the other hand, has been attributed to Lev Vygotsky's social development theory, which concerns the understanding of the social and collaborative nature of learning (Golinski 2005; Leonard 2002). In constructivism, meaningful learning environments are emphasised in which learners can recognise, combine and create their own understanding (Adamo-Villani 2007). The constructivist in psychology tries to understand how people know and what they know: they theorise about and investigate how human beings create systems for understanding their worlds and experiences (Raskin 2002). Constructivist learning has been applied in the development of learning environments (Wilson & Lowry 1997), such as collaborative learning, problem based learning, vocational education: learning experiences that *facilitate construction of knowledge through experiential, contextual, and social methods in real-world environments* (CALPRO 2011). Some learning theories identified as within this realm are social cognitive theory (Bandura 1977) and communities of practice (Lave & Wenger 1991), which consider how individuals think and why they can be motivated to follow certain activities in a social context (Blackmore 2007; Leonard 2002; Wenger 2000). While Bandura's social learning theory focuses on imitation of role models, i.e. observing others and learning from their social interactions, the primary focus of Lave and Wenger's community of practice theory is on learning as a social participation (Illeris 2003; Pahl-Wostl et al. 2007).

Humanism emphasises that perceptions are centred in experience and the freedom and responsibility to become what one is capable of becoming (Merriam & Caffarella 1999, p. 256). Learning is considered to be a personal act necessary to achieve the learner's full potential to become independent (Rostami & Khadjooi 2010).

Organisational learning emphasises organisational competency, the ability to detect and correct errors, and the ability of organisations to know *when* they are unable to detect the deficiencies (Argyris 1999; Argyris & Schon 1978). Having this understanding and skills can lead organisations towards being more innovative, while knowing their innovation limits (Argyris 1999). Organisational learning theory is currently being applied in the educational field, i.e. in vocational training and education and in adult learning (Boreham & Morgan

2004), and in other fields such as resource and environmental management (Keen et al. 2005; Wenger 1998).

Scholars from various disciplines, e.g. geography, urban planning and environmental management, have, in the past two decades proposed that learning, particularly the two major themes in learning processes, i.e. participation/engagement (e.g. participating in activities or decision making collaboratively) and reflecting on the experience, have the potential of inciting or facilitating change in people's understanding and behaviour to be more sustainable – although not without barriers (Armitage et al. 2008; Bull et al. 2008; Milbrath 1989; Petts & Brooks 2006; Sinclair et al. 2007). In line with this thought, Keen et al. (2005) suggest that there are five core strands of activity that support learning, particularly *social learning*, for improving human interrelations with the environment, and these are described in the following paragraphs.

2.3.2 Social learning

'Social learning' originally referred to the learning of individuals in a social environment by observation and imitation of others (Bandura 1977). Bull et al. (2008) interpret this as cognitive enhancement (from mere technical competence to a deeper understanding of knowledge acquisition implications) and moral judgement development. Webler et al. (1995) argue that social learning is more than simply individuals learning in a social situation, as it involves the process of changes in the social condition. Other authors also contend that all types of learning have a social construct, as humans often interact with others (Blackmore 2010; Fazey et al. 2005; Snyder & Wenger 2010; Wenger 1998). Social learning as a process in the context of resource management is about fostering a (critical) awareness of social and ecological trends, the relationships between them and the efficiency of social institutions to tackle problems related to resource management (Brown et al. 2005; Woodhill 2002; Woodhill & Rolling 1998). The five essential learning strands in social learning are posited to be reflection, systems orientation and thinking, integration, negotiations and participation (Keen et al. 2005).

Reflection is a process of experiencing and developing a deeper understanding about our actions and ideas (Bull et al. 2008). For an environmental manager, programme facilitator or

practitioner, this involves ‘diagnosing what matters, designing what could be done’, i.e. adding new ideas or skills, doing what is possible, to bring about change (Keen et al. 2005).

A systems orientation and thinking is concerned with the properties, constraints and interactions of the parts within the system. Each ‘part’ may set differing boundaries or expectations (Keen et al. 2005). Quinton (2007) contends that in systems orientation thinking, the focus of enquiry should be on the relationships that connect the parts. While it is important to analyse the parts of the system, it is equally, if not more, important to explain the parts in their context (Quinton 2007). Understanding the system is important because it provides a way for organising thinking on how to facilitate further development of learning and on the integral elements attached to it, because the differing boundaries set upon these elements, e.g. perceived power and control, can constrain learning (Armitage et al. 2007; Ison 2005; Reed et al. 2010). Learning and working together for change constitute the essence of social learning (Pahl-Wostl 2007).

The soft-systems methodology in Figure 2.2, developed by Checkland (2000), is an enquiry process and one way of exploring a complex situation, by modelling the most relevant and interactive human activity. The model incorporates a ‘world-view’ and can vary from being about economics to being about the political or social-environmental situation (Bawden 1999). As the situations are context based, with different stakeholders often having a stake in the resource, power dynamics frequently come into play (Woodhill 2002). Power and learning within a community, according to Wenger (2010) are always intertwined and inseparable.

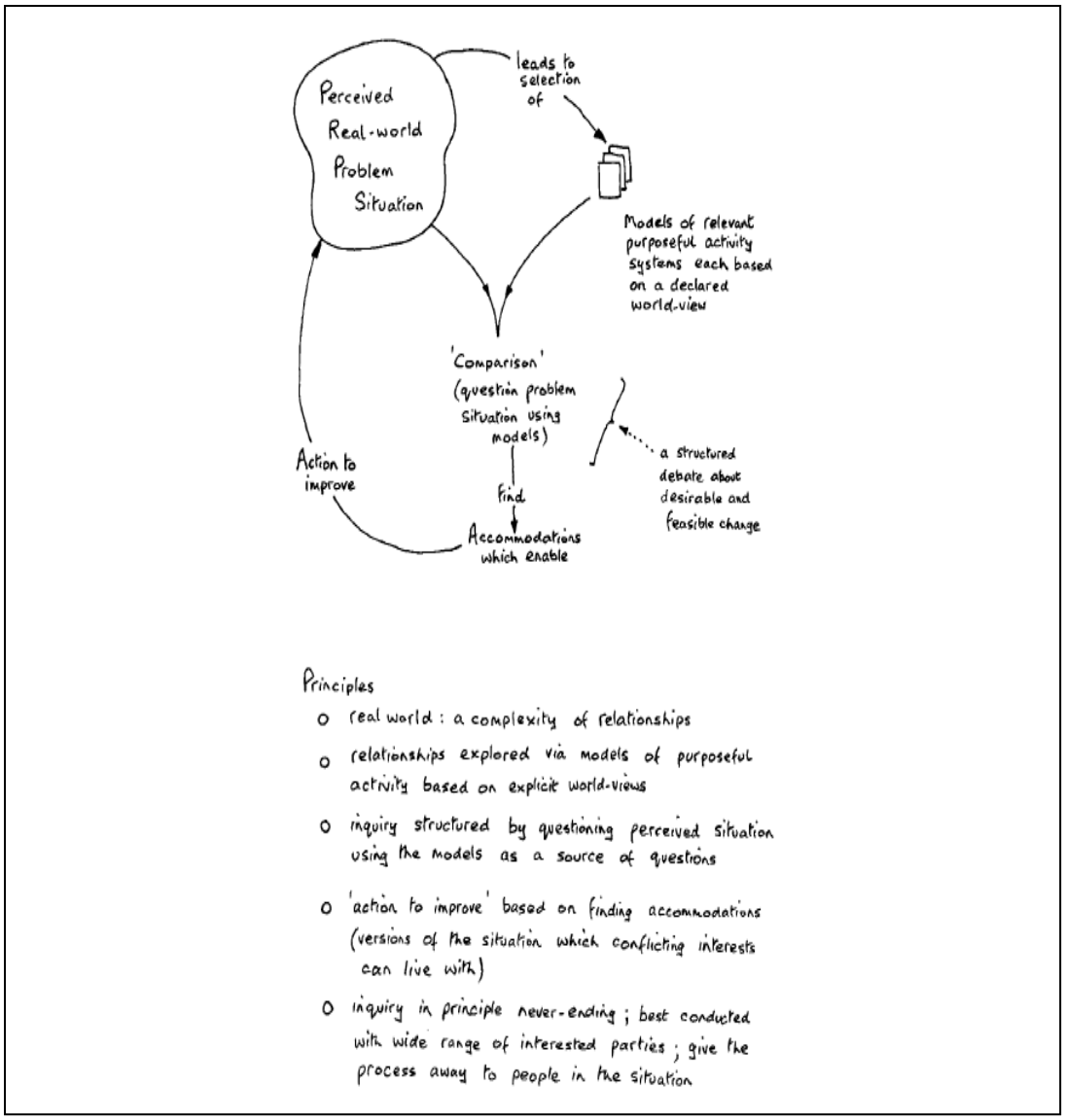


Figure 2.2: The inquiring/learning cycle of soft-systems methodology
Source: Checkland (2000, p.16)

Systems perspective considers the interacting parts, relationships and viewpoints of those involved (Bawden 1999), i.e. participation processes (Bolaane 2006; Bull et al. 2008; Webler et al. 1995), and sustainability, i.e. maintenance of the links in the system (Ison 2005; Johnson & Wilson 2000; Sinclair et al. 2008).

In this regard, opportunities for enabling different actors to participate in discussion and decision making are not being explored or given a chance (Ison 2005). This conclusion is also posited by Johnson and Wilson (2000), who contend that power relations often constrain opportunities for decision making. Putting social learning into practice, Bommel et al. (2009)

contend, can be problematic when there are different claims and stakeholders, and disagreements, along with frustration and distrust, which limit possible solutions. A possible intervention based approach to foster better understanding among different actors is through facilitating learning in projects that are relevant and benefits those involved (Bull et al. 2008; Cross 1981; Korten 1984).

Integration is a concept that is concerned with 'matching' differences of roles, understandings, decisions or assumptions about a matter of concern within the system (Ison 2005). Initiating communication, conversations and collaborations may help to match the differences mentioned towards 'improving the management of human and environmental inter-relations (p. 37). Brown et al. (2005) contend that integration is a process about connecting people, skills, knowledge and social roles in new ways.

Negotiations are processes to help overcome 'boundaries' placed by different communities, professions and agencies who have unique sets of values, knowledge, skills, identity and interest (Keen et al. 2005). Getting these different actors working together or consulting each other and going beyond their set boundaries or knowledge can be a challenge to the environmental manager or facilitator (Keen et al. 2005).

Participation can be defined as the engagement of different actors in activities to affect decision making and can range from coercion to co-learning or manipulation to self mobilisation (Arnstein 1969; Pretty 1995). Adapting the typologies of public participation by several authors, Keen et al. (2005) highlighted the types of participation. This is indicated in Table 2.6, which suggests that the interplay between people's role, positions of power and levels of knowledge transfer is reflected upon the categories used to describe the levels of participation.

Table 2.6 Types of participation

Type of participation	Description
Coercing	Token engagement within a context of large-scale power imbalance, where the will of one group is effectively imposed upon the other.
Informing	Information is transferred in a one-way flow; there is no knowledge or sharing of decision making.

Consulting	Information is sought from different groups, but one group (often the government) maintains the power to analyse the information and decide on the best course of action.
Enticing	Different groups share information and jointly consider priority issues, but one group maintains power and entices other groups to act through incentives (such as grants).
Co-learning	Insiders and outsiders share their knowledge to create new understandings and work together to form action plans and define roles and responsibilities. Decision making power is negotiated within institutional and social constraints.
Co-acting	People set their own agenda and mobilise to carry it out in the absence of outside initiators. Knowledge is shared between the groups engaged in the activity, but knowledge flow and learning outside of this community are not assured. Power in decision making remains with the initiators of the action.

Source: Keen et al. (2005, p.16)

2.3.2.1 Learning outcomes

The learning theories have in common the notions that the processes involved lead to a change or an outcome in the individual or group. This outcome could be a change in the way people perceive, understand and reflect upon the physical, social, emotional and intellectual world; or it could be a change in actions resulting from their experiences of being involved in or interacting with something that is social by nature (Fazey et al. 2005; Milbrath 1989; Timberlake et al. 2001; Wenger 2000; Woods 2002). A capacity for individuals to learn from their experience is necessary for them to develop an understanding of environmental systems (Fazey et al. 2005). It is expected that people's understanding and actions may vary according to their social and environmental context (Fazey & Marton 2002). The degree of change in understanding, behaviour or level of interactions can be demonstrated in environmental public participation hearings, for example. However, Diduck and Mitchell (2003) contend that how much one can detect the change in such situations is rather limited.

The literature also suggests that the intended outcome of learning taking place within an environmental management system concerns social change for stronger networking and civic engagement (Diduck & Sinclair 1997; Sinclair et al. 2009), adaptive co-management (Armitage et al. 2008) and improved organisational performance (Sinclair et al. 2009). A useful way of discovering the kinds of learning that take place is to look at what is being learned, who is involved in the learning, and how their learning is facilitated, i.e. how they

gain knowledge or skills, and what kinds of constraints they encounter (Armitage et al. 2008; Blackmore 2007).

However, while learning is considered a tool to facilitate our choices for change and enable us to gain a deeper understanding, Vare and Scott (2007) contend that we cannot control *where* the learning will lead us to, as human reactions naturally vary in different contexts. Meanwhile, Reed et al. (2010) posit that a learning outcome can sometimes be confused with the additional *potential* outcomes that come from the learning occurring from people's social interaction, for example stakeholder empowerment, improved socio-ecological management and even sustainability. They further argue that this can be problematic when other processes that can also lead to the outcome, e.g. monetary incentives, are not acknowledged.

An interpretation of the learning outcome that affects an *individual* is shown in Figure 2.3**.** This model indicates that the learner, driven by interest, desire, necessity or compulsion (Illeris 2003) interacts with his//her social environment mentally and emotionally.

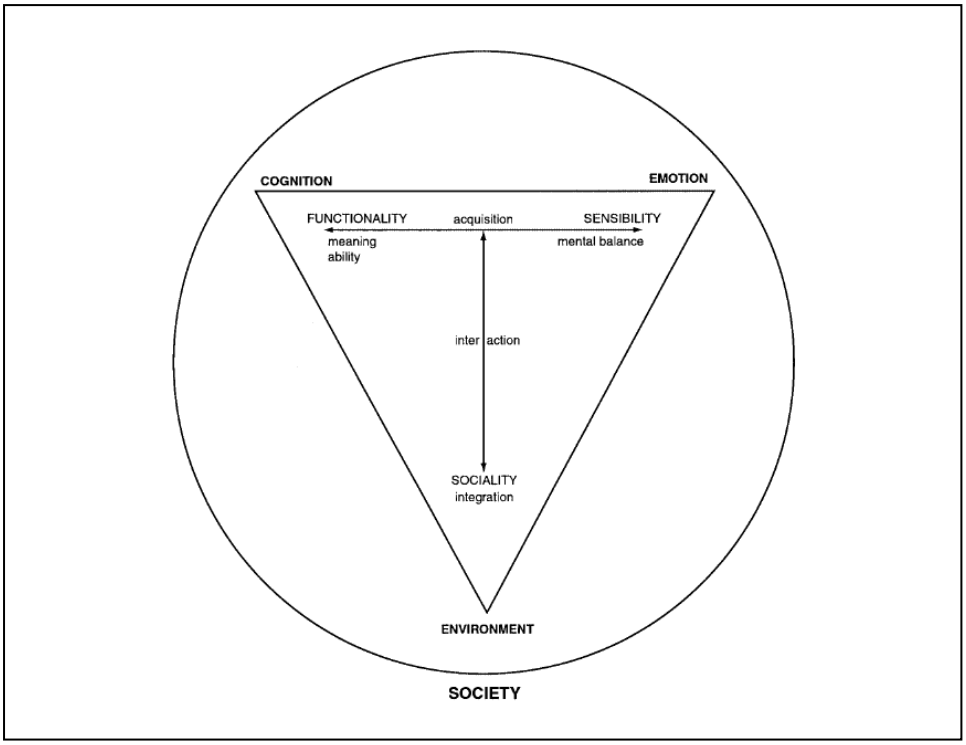


Figure 2.3: The process and dimensions of learning and individual learning outcomes
Source: Adapted from Illeris (2003, p. 400)

This experience of interactions leads to the development of understanding and abilities, to deal with life's challenges, for example, and to the 'sociality' of the learner (Illeris 2003, p. 399; Kolb 1984). Kolb (1984) from an experiential learning perspective contends, however, that learning is best conceived as a process, and not in terms of outcomes, as its nature *is* a conflict-filled process that requires the learner to be creative and adaptive to his/her environment, modified by his/her experiences, in a continuous fashion. He acknowledges that the theory of experiential learning has a different philosophical and epistemological base from that of idealist educational approaches. In the former, ideas are not static and are continually reinvented through experience, while the latter emphasise the fixed elements of thought that affect the tendency to define learning in terms of its outcomes (Kolb 1984, p. 26).

From another perspective, a 'social learning' can be an outcome *and* a process (Pahl-Wostl et al. 2008; Woodhill & Rolling 1998), and would include improved social-ecological systems, enhanced trust, changes in attitude and behaviour, and stakeholder empowerment (Colon & Fawcett 2000; Marschke & Sinclair 2009; Reed et al. 2010). For example, the conceptual model from the SLIM (Social Learning for the Integrated Management and sustainable use of water) Project Framework (2001, 2004a) (Figure 2.4) indicates that the social learning outcomes are a change in stakeholders' understanding and the actions taken, i.e. a process, which are influenced by certain variables. The SLIM project was based on the assumptions that to sustainably manage a natural resource, i.e. water, designated stakeholders must engage in learning that is institutionally supported, i.e. that is within a conducive policy context (Blackmore 2007; Ison & Watson 2007).

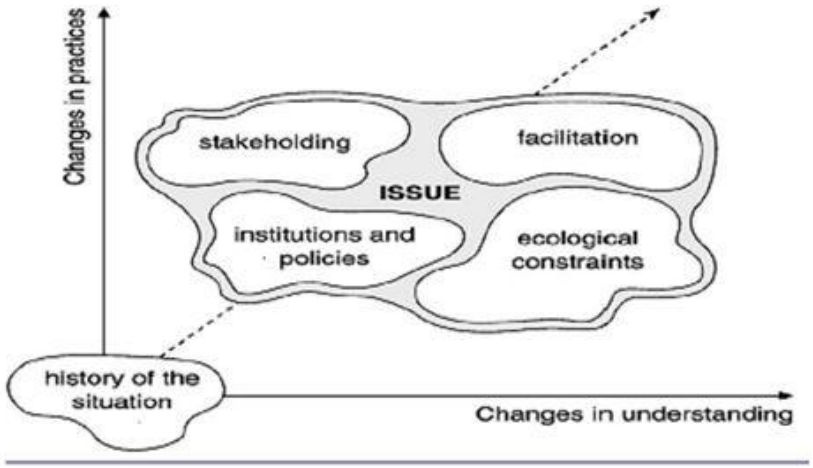


Figure 2.4: The six variables in the SLIM framework influencing the learning outcomes
Source: Ison and Watson (2007)

An example of a social learning as a process *and* an outcome can be seen from a river basin management project: Harmoni COP, or 'Harmonising collaborative planning'. It illustrates the key message of 'learning together to manage together' and conceptualises the outcomes as non-static and iterative (Figure 2.5). The different contexts or perspectives, i.e. governance structure, competing claims and disconnected stakeholders, are recognised (Pahl-Wostl et al. 2007; Tippet et al. 2005).

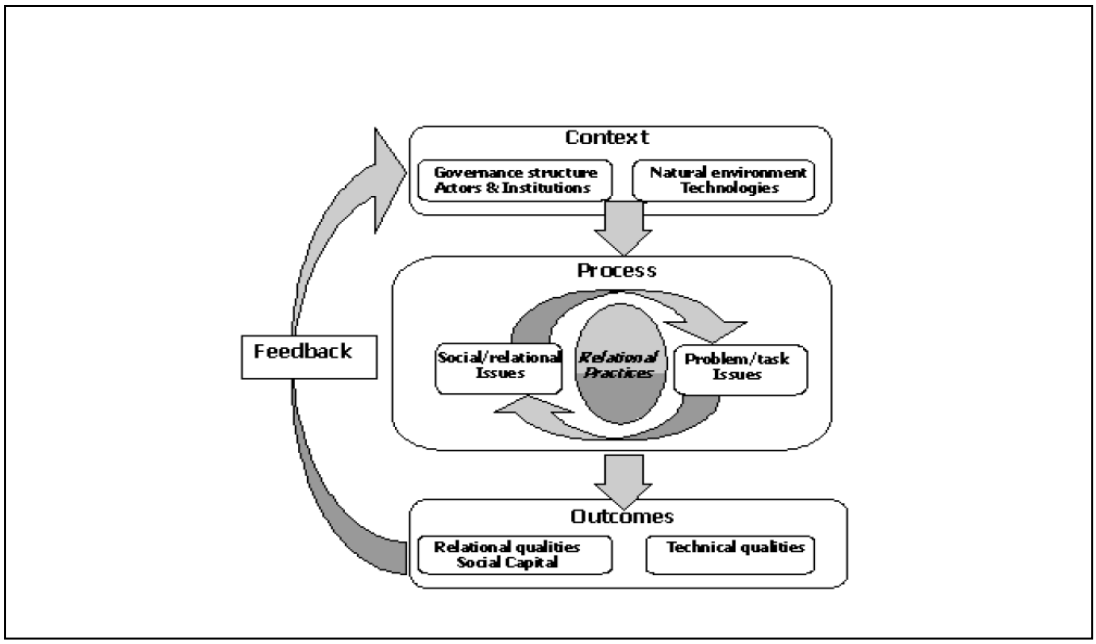


Figure 2.5: Harmoni COP's conceptual framework for social learning in resource management
Source: Pahl-Wostl et al. (2007)

2.3.3 Learning situations

In addition to the focus on the cognitive processes such as described previously, Woodhill (2002) contends that social learning outcomes are difficult to measure, while Armitage et al. (2008) also argue that learning outcomes in resource management are context specific and therefore can be difficult to generalise. This problematic situation leads Muro and Jeffries (2008) to posit that because the internal changes in social learning processes are hard to qualify, i.e. deciding whether they are an outcome or a process, they are hard to measure, thus designing of common indicators can be problematic.

An implication of a learning outcome from organisational learning theory is Argyris and Schon's idea of single- or multiple-loop learning (1974, 1978, 1996). 'Single loop learning' is about correcting errors from routines or a given set of variables for more efficiency (Easterby-Smith et al. 1999; Vare & Scott 2007). 'Double loop learning' involves *challenging* underlying assumptions, to advance changes in a broader sense (Keen et al. 2005; Sinclair et al. 2007). 'Triple loop learning' involves *changing* our underlying assumptions and *learning to do* alternative things to be more effective (Argyris 2002). Figure 2.6 shows an interpretation of this concept of single, double and triple loop learning (Argyris & Schon 1978, 1996).

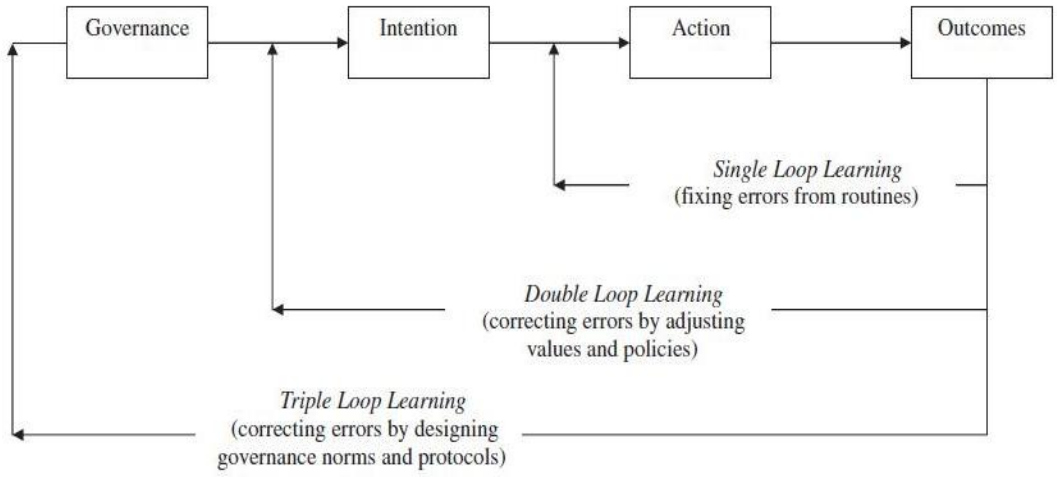


Figure 2.6: A multiple-loop learning framework
Source: Armitage et al. (2008, p. 89)

2.3.4 Facilitating social learning

From an environmental and resource management perspective, Keen et al. (2005) suggest that strong alliances and a commitment to processes that permit people to learn and work together (i.e. facilitating social learning) at all levels of the community are necessary for change and collective action to happen. In this regard, the elements constituting 'social learning' may affect a group or network that is open to new ideas, provided that the learning is continuous (Plummer & Fitz Gibbon 2007). The five strands or elements mentioned previously as the basis for many successful environmental management programmes (Brown et al. 2005; Keen et al. 2005) are also congruous to social capital building processes (Eames 2005). The 'bridging' of people or organisations enables alliances to be formed between individuals or organisations for a task that is for the public good, i.e. some form of 'networking' emerges

(Kanter 1994). According to Eames 2005, the networking or 'bonding' and 'bridging' in social capital embodies social learning elements.

In this regard, the elements constituting 'social learning' may affect a group or network that is open to new ideas, provided that the learning is continuous (Plummer & Fitz Gibbon 2007). The five strands or elements mentioned previously as the basis for many successful environmental management programmes (Brown et al. 2005; Keen et al. 2005) are also congruous to social capital building processes (Eames 2005).

2.3.4.1 Natural resource management

Examples of forms for facilitating social learning in natural resource management include the creation of multi-actor negotiation platforms to discuss competing claims for resources (Bommel et al. 2009), cooperative discourse panels (Webler 1995) and situations in which different stakeholders generate and evaluate options to recommend relevant policies. The literature suggests that formal ways of facilitating social learning (in the context of a governance mechanism) put emphasis on participatory processes (Armitage et al. 2008; Harmoni COP 2004; Marschke & Sinclair 2009; SLIM project 2004). In the SLIM water management project funded by the European Union (SLIM 2004), NGOs were involved in the facilitation of the overall process (of drafting a water bill) as consultants, hosts of seminars, Web reporters and providers of personal contacts (Ison & Watson 2007). The staff of the NGOs also made presentations to the stakeholders about the role of specific areas (Ison & Watson 2007). Another example of NGOs as facilitators of learning is from the Canadian Grand River watershed project, in which NGOs hosted public open houses for stakeholders for the purpose of discussions (Cherry 2003). Armitage (2003) contends that some of the local strategies and customary practices in decision making can be captured as participatory processes in natural resource management, such as in the 'Mosi penggawa', a community based mutual assistance mechanism for information dissemination that was advocated in a Sulawesi, Indonesia case. NGOs' involvement as 'insider experts' and facilitators for discussions and mediators of project implementation was also highlighted in a Bindura, Zimbabwe waste recycling programme (Johnson & Wilson 2000, p. 1898).

However, the literature also suggests that sometimes a participatory process may *not* lead to the emergence of social learning, i.e. that it is possible that no consensus of decision or action may result (Bommel et al. 2009). This is also posited by Reed et al. (2010), who argue that

social learning outcomes can still emerge in the *absence* of planned participatory processes. Instead, informal unplanned process initiatives (through mass media) or other alternative processes (e.g. informal social community practices) can also lead to a social learning outcome that contributes to change (de Laat & Lally 2003). In this regard, other processes, which are associated with financial incentives (Reed et al. 2010) or motivations (Krasny & Lee 2002), may lead to a social learning outcome such as pro-environment behaviour.

2.3.4.2 Environmental education programmes

Social learning through the development of collaborative programmes in environmental education (which can be informal out-of-classroom activities) is an increasing research topic (Aguilar & Krasny 2011; Roe 2007). Learning about the environment within a social context is highly related to forms of capacity building (Skoien 2006). Scott and Gough's model (2003) shows that five points lead to the building of an individual's capacity to manage resources sustainably through learning (Figure 2.7). This model posits that learning processes lead to capacity building, that social and institutional factors can inhibit or contribute to learning, that training helps people acquire necessary skills, that the choice of strategies employed must consider the nature of the issue, and that learning can happen in unplanned ways (Scott & Gough 2003).

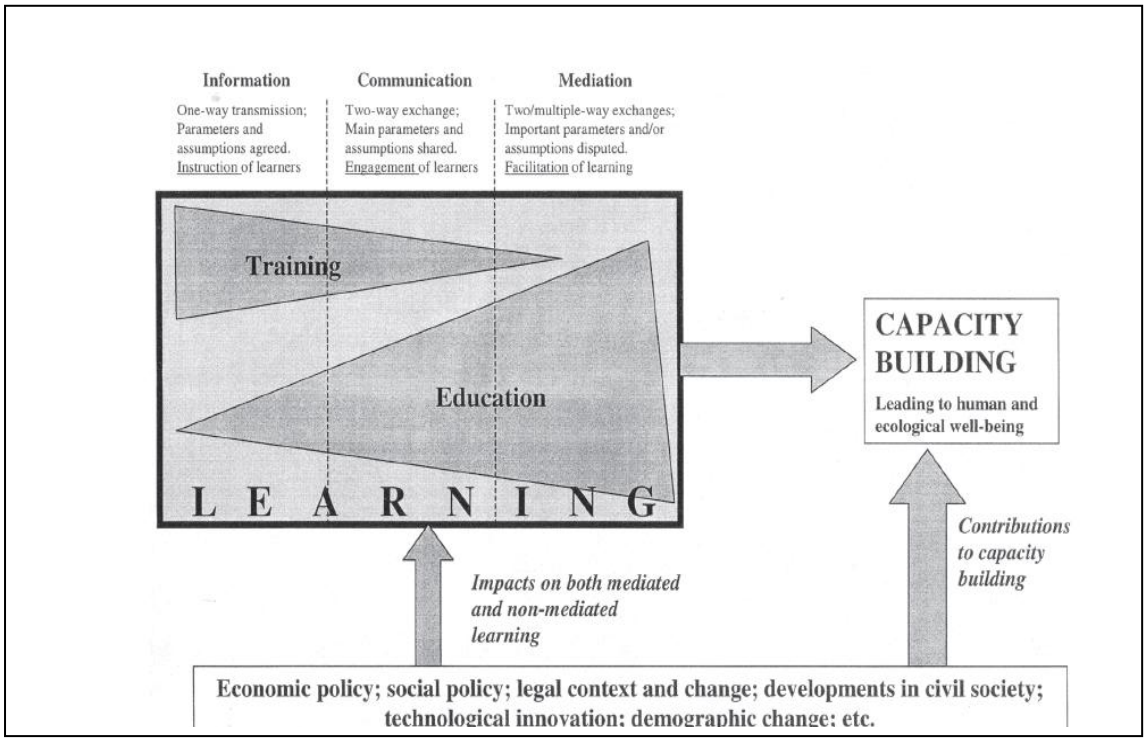


Figure 2.7: A model of a capacity building process
Source: Scott and Gough (2003, p. 217)

Facilitating learning in a social context involving children is also increasingly being researched (Chawla & Heft 2002). For example, Roe's (2007) research on a group of 6–10 year old children's involvement in neighbourhood landscape planning suggests that through informal forum discussions and using participatory methods of map making, drawings and discussions, children are able to express their thoughts about the environment, which can inform adults' decision making. However, she contends that despite this, adults often seem to ignore the potential of the younger generation's insights, owing to adults' 'lack of understanding' and 'listening' capabilities (Roe 2007). Similarly, Aguilar and Krasny (2011), who researched the dimensions of Wenger's community of practice framework, i.e. joint enterprise, mutual engagement, and shared experiences and knowledge in out-of-classroom education programme settings (i.e. non-formal situations) involving Hispanic school teenagers, found that the students who participated in their environmental clubs reportedly understood science better, took their learning and experiences into their lives outside school and provided a source for social capital by forming their own networks, relevant for their personal growth.

2.3.4.3 Sustainable waste management

Bull et al. (2008) contend that there are few empirical studies that explicitly discuss social processes, including social learning, in waste management issues. This thesis contributes to the discussion by describing and evaluating the processes from the two cases studied. Kurtz et al. (2007) argue that although there are significant studies to understand waste behaviour change using behavioural theories derived from learning paradigms, there are relatively few approaches to understand waste behaviour from a social context, i.e. variables within social capital theory that parallel social learning processes of building trust and networking through collaboration (Eames 2005;Woodhill 2002). An exception of an explicit reference to social learning application in waste management is the study conducted by Colon and Fawcett (2000).

The literature reviewed also highlights that the outcome priority in many community waste projects, e.g. community recycling programmes (Luckin & Sharp 2004), is on achieving tangible targets, such as an anticipated rate of recycling collection or a particular number of employment opportunities (Baud et al. 2001). 'Reduce, reuse and recycle', familiarly known as the '3Rs' of waste, are highly promoted as forms of sustainable waste management in both the developed and developing countries (Ngoc & Schnitzer 2009; Troschinetz & Mihelcic

2009; Suttibak & Nitivattananon 2008). This practice is posited as able to counter one of the most serious environmental consequences of urbanisation, i.e. the increasing volume of waste generated by the urban population (UNDP 2008). Although there are numerous studies contributing to the technological aspects of the 3Rs, there are fewer contributing to the social aspects, e.g. public awareness, public or stakeholder participation, and socio-cultural perceptions of waste (Mongkolnchaiarunya 2005; Suttibak & Nitivattananon 2008).

The literature thus suggests that there is a lack of empirical evidence that *explicitly* evaluates the learning processes in SWM, although cases are rising that *imply* the occurrence (or potential) of learning within a social context in which communities participate to manage waste (Charuvichaipong & Sajor 2007; Luckin & Sharp 2003; Marschke & Sinclair 2009; Phillips et al. 2003; Suttibak & Nitivattananon 2008). This thesis help fill this gap by evaluating the role of NGOs as facilitators involved in SWM projects with others in the community. The extent of effort made to advance the social learning processes were described in each of the two case studies and subsequently compared to develop a further understanding about the social learning processes applied within its local context.

The following is a review of several international case studies from the literature that suggest that social learning processes are being applied and facilitated, either by institutions or the civil domain. They highlight community participation in sustainable waste management practices that are based on the belief that learning can occur through participation in programmes of learning and doing, and through facilitation of discourses and reflection (Bawden 1999; Blackmore 2010; Johnson & Wilson 2000; Keen et al. 2005; Woodhill 2002).

Although they are internationally diverse, the case studies reviewed are similar in their focus: community waste recycling programmes and their potential to improve the public's awareness and behaviour towards sustainable waste management. The objective of the review is not to quantify the success of the programmes, which usually can be achieved by measuring a programme's recycling capture rate or the material's marketable value (Kiser 2003); rather it is to elicit what social learning strands (Keen et al. 2005) are applied that effect a change (or otherwise) in those involved in the community waste programme or intervention. This section of the review also seeks to explore the element of facilitation of the learning process (Marschke & Sinclair 2009; Kurz et al. 2007). Consideration is given to the questions of who learns, what is learned, how the learning is facilitated, who facilitates and

whether the learning has contributed to a change or improvement in understanding and behaviour (Armitage et al. 2008; Keen et al. 2005).

2.4 Community Waste Recycling Programmes: Interventions to promote learning in SWM

Although it is acknowledged that there are various other case studies with a similar focus, the following six recent case studies of community involvement in waste recycling programmes were selected from the literature to provide some understanding of participation in community waste management. They include programmes from both not-for-profit organisations and government institutions, and involve waste management delivery (Johnson and Wilson 2000; Sharp & Luckin 2006) and awareness building programmes (Perera & Chowdury 2007). Four are located in developing countries while two are from developed countries i.e. the UK and US. Despite the programmes being geographically diverse, their objectives are similar: to contribute to building stakeholders' capacity through the (learning) processes of participation, collaboration and sharing of knowledge to manage waste more sustainably, processes that are inherent in social learning theories (Blackmore 2010; Keen et al. 2005; Wenger 1998). And while it is recognised that each case is situated in different cultural and political contexts, both of which can influence the waste management system (Diaz & Warith 2006), each case study highlights the importance of community participation and the exchange of ideas to affect people's awareness and understanding about SWM.

The four case studies reviewed from the developing countries are Colon and Fawcett's (2006) study on Excellent Novel Radical's (EXNORA) 'zero waste management' scheme in two Indian cities; a community based recycling project, or 'Garbage for Eggs', in a Thai city (Mongkolnchaiarunya 2005); a community based SWM project led by volunteers and alumni of an educational institute in Hanoi, Vietnam (Perera & Chowdury 2007); and Johnson and Wilson's (2000) study of pre-conditions necessary for what they term 'institutional sustainability', using a pilot project involving multiple actor intervention on waste management in Bindura, Zimbabwe (Johnson & Wilson 2000, p. 1894). The two case studies reviewed from the developed countries are Luckin and Sharp's (2004) evaluation of the UK's community waste sector in service delivery, and Gutierrez and Cheryl's (2009) activities for collective problem-solving skills in recycling by American high school students. The text was carefully read, and inferences were made to answer the following queries: What kinds of

participation were involved? How was community participation facilitated? What were the outcomes?

2.4.1 EXNORA's 'zero waste management' schemes, Chennai and Hyderabad, India

EXNORA, which stands for 'Excellent Novel Radical', is an Indian NGO that since 1989 has facilitated marginalised communities to deal with common issues such as waste collection, street sweeping and composting facilities, while creating employment opportunities (Colon & Fawcett 2006). It is included in the *Best Practice Database* compiled by UN-Habitat and is considered a successful public–private partnership initiative by an NGO. EXNORA reportedly serves over a million people in India (Tayler 2005).

Colon and Fawcett (2006) indicate that there is evidence of participatory and collaborative processes in one neighbourhood (Jubilee Hills, Hyderabad) in which a CivicEXNORA (which was also a woman's association) had organised household refuse collection. Not only did resident committee members operate the scheme, other residents participated by paying the waste monthly charges of Rs 33 (approximately NZD1). The workers were former 'street children' supervised by the women on the committee, and good equipment and welfare were provided. The group received technical help from other experienced people and another local NGO which provided advice on more-efficient techniques of composting. Political support was also received. In this and another CivicEXNORA neighbourhood (Nungambakkan), greater civic consciousness, indicated by less littering, was observed to be an outcome (Colon & Fawcett 2006).

Colon and Fawcett's (2006) case study highlighted that the Nungambakkan, Chennai EXNORA club had less successful outcomes than that of Jubilee Hills, Hyderabad. In terms of participation in Nungambakkan, the more-educated middle class who participated had more opportunities to voice their concerns compared with the lower income earners, who did not participate. Colon and Fawcett (2006) also contend that although the EXNORA zero waste model is run by residents and is an ideal model to promote participative democracy in solid waste management, it fails in several aspects of economics and politics. Communities can face numerous difficulties in running an integrated waste management system with an uncoordinated and unviable financial structure, despite their motivation (Baud et al. 2001). Some of the obstacles that were highlighted in their study were a weak management

structure, inefficient use of composting facilities and low wages, which all led to a threat to the sustainability of the initiative. Results of the fieldwork by Colon and Fawcett (2006) found that, despite the problems, the residents involved in this initiative acknowledged that they had gained sufficient awareness of waste management to stop littering the streets. In particular, in the Hyderabad neighbourhood (where the women operated the initiative well enough for self sufficiency) it enabled the less marginalised to be employed and gain some income (Colon & Fawcett 2006).

2.4.2 Garbage for Eggs, Hatyai, Thailand

The study by Mongkolnchaiarunya (2005) contends that structured collaborative efforts from planning to the implementation stage can affect people's capabilities to learn alternative ways of solving problems. In the process, knowledge and responsibilities can be shared to effect changes in understanding, resulting, for example, in an improved environmental condition and even cultural and political changes (Mongkolnchaiarunya 2005). However, the efforts' sustainability depends on consistent policy and implementation support. This is parallel to the learning process model posited by Scott and Gough (2003) and mentioned in previous sections.

This case study by Mongkolnchaiarunya (2005) focused on a programme in a region in Thailand that required the community to collaborate with municipalities in managing their waste. In Thailand, most people do not separate wastes at home, owing to a lack of awareness, knowledge, facilities and incentives (Charuvichaipong & Sajor 2006). In addition, the Thai and most Asian countries' way of life tend to produce high amounts of waste material, such as disposable plastic bags used for carrying food from markets (Manaf et al. 2009). Cultural factors may even encourage littering, as many Thai people perceive that littering provides employment for others, e.g. sweepers or street cleaners (Mongkolnchaiarunya 1999). The attitude that municipalities will perform all public tasks (such as waste collection) further discourages people from being responsible about waste (Mongkolnchaiarunya 2005).

In this study by Mongkolnchaiarunya (2005), a programme that proved successful initially to alleviate flooding problems was applied in a pilot study to manage waste for communities in Yala, Thailand. The self-explanatory 'Garbage for Eggs' (GFE) project enabled the

community and municipality to collaborate and manage their waste with good financial support from the municipalities. Prior to project implementation, several community representatives and the Yala Municipal Authority staff attended two study tours, two training courses and two stakeholder forums. At the end of the study tours, the representatives and staff reported that they were able to reflect on, discuss and share what they had learnt and to work out the appropriate ideas (Mongkolnchaiarunya 2005). The government staff also gained basic knowledge of solid waste problems and solutions, technical skills, and which enabled them to implement the GFE soon after. Upon implementation, several outcomes were apparent. The first was that the environmental conditions seemed to improve, because a tremendous backlog of waste was removed from the area; secondly, residents benefited by obtaining eggs in exchange for recyclables; thirdly, the committed community leaders and municipalities received recognition for their efforts; lastly, residents reportedly became more responsible about their waste, as demonstrated by their willingness to pay for an increase in waste collection services (Mongkolnchaiarunya 2005). The case here has demonstrated similar learning processes emerging as those from the EXNORA projects, in that collaborative and participation efforts can effect a change, i.e. aspects of social transformation and an improved environment (Lave & Wenger 1991; Wenger 1998). However, the sustainability of the programmes requires a more efficient and consistent management structure than had been present, with committed participation and probably more-urposeful learning designs (Blackmore 2010; Snyder & Wenger 2010).

2.4.3 Community based SWM project, Hanoi Vietnam

In this case study, Perera and Chowdury (2007) contend that projects at the community level can fail if they are not facilitated by a change agent able to work closely with both the government and the community. Woodhill (2002) also argues that a major problem hindering effective social learning is the lack of coordination between different spheres of specialisation and disciplines. In the community based SWM project studied by Perera and Chowdury (2007), knowledgeable and skilful ‘change agents’ acted as a catalyst between the different stakeholders, namely the local government authority and the local community, to design and demonstrate appropriate learning interventions suitable to the needs of the community. The change agents collaborated with other project coordinators to organise environmental awareness workshops, and motivated the community to separate their waste. The hands-on training programme on waste separation, reuse and recycling was expected to impart useful

knowledge to motivate the households and sustain practices, through informal meetings and through training sessions. Snyder and Wenger (2007) posit that practitioners are optimally positioned to steward knowledge in collaboration with stakeholders. Communicating this knowledge must blend local and technical perspectives (Keen & Mahanty 2005), and in Perera and Chowdury's (2007) case study, the change agent managed to train 120 poor households in the Vinh Quynh commune of Hanoi in composting technique, while other residents attended on-the-job training during the operation of the composting plant. The compost produced was both used by the people in the community and sold to gain revenue for maintenance of the plant (Perera & Chowdury 2007).

2.4.4 Pilot project in waste management with multiple actors, Bindura, Zimbabwe

Colon and Fawcett's (2000) study highlighted that involving different stakeholders in discussing and reflecting upon a waste issue can reveal various, sometimes contradictory, concerns. This however can lead to identification of more-appropriate roles that each stakeholder can play, providing the structure for the project to continue (Colon & Fawcett 2000; Ison 1997). Involving different stakeholders in discussion can also lead to forging of partnerships that can influence effective social learning outcomes (Baud et al. 2001; Dyball et al. 2005; Ison 2005). With regard to this, Colon and Fawcett (2000) highlight that making different perspectives clear to everyone involved requires some kind of framework or tools. Typical tools used in resource management include community mapping of resources, stakeholders drawing diagrams that reflect social relationships (SLIM 2004), timelines (Keen & Mahanty 2005), Logframes (Bell & Morse 2004) and matrix ranking of priorities (Pretty et al. 1995). Various platforms have been highlighted by other scholars to enable dialogue, cooperation and transparency in decision making, or what Walkerden (2005) terms as 'making sense together' or 'co-learning' (Keen & Mahanty 2005), despite the highly complex economic, political and environmental considerations that are always attached. These include previously mentioned stakeholder workshops and training (Mongkolnchaiarunya 2005; Perera & Chowdury 2007), multi-actor social networking (Reed et al. 2010) and multi-actor platforms consisting of a committee that plans, implements and monitors the programme (Bommel et al. 2009). A key element to these platforms for learning is facilitators that are both knowledgeable and able to bridge different interests, to communicate well and to form trust (Brown & Pitcher 2005; Dyball et al. 2005).

2.4.5 UK community waste sector

Since 2000 a developing body of legislation in EU countries, including the UK, has forced rapid development of new waste policies and practices (Sharp & Luckin 2006). Accordingly, the EU Landfill Directive (1999) requires that the amount of biodegradable municipal waste disposed of in landfills must be progressively reduced to a third of its 1995 quantity by 2020. Since 2000 the UK government has introduced a number of targets for recycling and a landfill tax allowance trading scheme (Davies & Doble 2004). Generally, the impacts of these measures are the encouragement, with regulatory incentive, of local authorities to improve the extent of recycling in their areas (Davies & Doble 2004).

The study by Sharp & Luckin (2006), funded by the Economic and Research Council and Shell Better Britain Campaign, investigated the social, economic, environmental and community involvement achievements of initiatives such as community recycling companies, furniture reuse projects, computer refurbishment projects, a paint redistribution scheme and community composting groups. It looked at the role played by a variety of voluntary community waste projects.

Their study surveyed members of the Community Recycling Network (CRN), an umbrella organisation of community groups, cooperatives and not-for-profit businesses. Using questionnaires, Sharp and Luckin (2006) aimed to elicit information regarding the community waste projects' (CWP) objectives, volunteer involvement and funding sources. Further to this, semi-structured interviews were held with the organisations, involving members of management committees and volunteers. Their findings revolved around what services were offered by the community sectors compared with the services offered by the private sector. It also analysed their sources of funding and the wider societal roles contributed.

Their research showed that CWPs delivered a diversity of environmental services to low income groups and families, including kerbside waste collection, composting, waste education and management of civic amenity sites. The CWPs also facilitated schemes to reuse waste streams, such as furniture and paint (Luckin & Sharp 2004). Delivery of these services had training assistance from the New Deal or Intermediate Labour Market schemes, which cross-subsidised repair works. The CWPs were responsible for about one eighth, or 12.5%, of the total UK households' kerbside recycling (DEFRA 2002). Of this, 40% of

recyclables were sent to the civic amenity sites. A Friends of the Earth survey (FoE 2004) claimed that CWPs were a significant provider, delivering kerbside collection with participation rates up to 80–90% reported in Lichfield. The CWPs were also involved with giving talks and helping to establish on-site recycling facilities, while working directly with schools in educational activities. In 2004, the Programme Director of the UK government's Waste Implementation Programme suggested that the constituents of the community sector would become entities that either compete commercially for local authority contracts, or ones that contribute innovations and pass their skills to other sectors; most community sector providers can be seen now as fitting into the second category (Luckin & Sharp 2004).

The review of the study by Luckin and Sharp (2004) on the roles and contributions of CWPs in the UK showed a number of achievements that contribute to waste being managed sustainably, as it involved not only economic considerations, but social elements within an environmental concern. Despite garnering high participation from households and the community through their kerbside recycling collection service and receiving recyclables while managing the civic amenity centres, CWPs face the challenges of competition from the private sector and requirements from new and developing economic and environmental legislation. However, Luckin and Sharp (2007) contend that although these challenges may result in a local scale loss of high quality services, recent developments are likely to mean a gain in higher services provision (Sharp & Luckin 2006). What is significant from this study is that the CWPs seem to form a good 'alliance' and relationship with various actors, which further advocated for environmental concerns and incorporated the sense of more participation and voluntarism in the effort towards sustainable waste management.

2.4.6 Designing resource conservation and recycling activities with a school community in the US

Gutierrez and Johnson's (2010) study posits that activities with a hands-on approach, in which teenage students study the effects of open pit mining of bauxite in rainforest, promote student participation and critical thinking about recycling efforts. In addition, they contend that the activities encourage students to participate in brainstorming, and this promotes critical thinking and problem solving skills. The activities emphasise students learning about the connections between a product (i.e. aluminium cans) and the ecological source of the product (i.e. the rainforest), facilitated by their teacher. Their activities are part of Expanding

Your Horizons, an annual one-day event held at Missouri State University, and students reportedly gained a better understanding of the connection of a product to the process of its production. The process was qualitative (Lousley 1999), with students engaging with each other and having discussions about the ecological and scientific aspects.

The activities Gutierrez and Johnson (2010) proposed also involved students jotting down ideas to questions posed about the nature of bauxite (which is used to make aluminium cans) on large sheets of paper or a whiteboard. The students were asked to discuss and share their ideas. They then graphically interpreted what they understood from a given material (on the process of transforming bauxite gained from the rainforests into aluminium cans) and read out loud what they thought the right sequences for producing aluminium cans were. Placing particular emphasis upon understanding relationships between the natural ecology and human impacts on the environment, as in this case, can create a deeper awareness in school students (Grodzinska-Jurczak 2006). Guiterrez and Johnson (2010) suggested that throughout this process, the facilitator (i.e. teacher or tutor) continue to encourage students to think, correct any misconceptions, provide explanations where due and, finally, ask students about what constrains people from recycling more. This, the authors contend, can incite creative ideas in students and provide them with a more meaningful way to appreciate recycling cans, as students become aware that the process of producing cans is related to resource and forest conservation.

Guiterrez and Johnson (2010) also contend that the activities should be extended to visits to a recycling centre and setting up a recycling or environmental action club in the school. Reportedly, this programme garnered a positive response from the majority of the students involved, which alluded to their enjoying the activities and gaining a clearer understanding about the topic studied, i.e. why recycling is an important part of forest conservation (Guiterrez & Johnson 2010).

Discussion

Empirical evidence from various case studies in environmental management and assessments suggests that social learning can take place over time in various formal resource management situations (Bawden 2002; Checkland & Casar 1986; Ison 2005; Marschke & Sinclair 2009), and informal situations (Bommel et al. 2009; Reed et al. 2010). Actors involved in adaptive

management activities learn and contribute collaboratively towards a more efficient co-adaptive environmental management (Armitage et al. 2008; Bull et al. 2008). Muro and Jeffries (2008) also argue that these activities are platforms for individuals to learn *with* each other.

Most, if not all, the literature on learning suggests that to facilitate learning, at both individual and collective levels, there needs to be some platform where people can communicate with each other, share information and expertise and develop some relationship (Armitage et al. 2008; de Laat & Simons 2002; Lave & Wenger 1991; Plummer & FitzGibbon 2007). These participatory processes involve different people acting together on some shared goal to inspire learning in a social context (Wenger 2000).

The cases reviewed indicate the involvement of civic associations as mediators between the various stakeholders (Colon & Fawcett 2000; Johnson & Wilson 2001; Mongkolnchaiarunya 2005). Civic associations, mentioned previously, have been, historically and by their nature, concerned with social change and for public good (Handy 2005). Those involved in civil societies, such as environmental NGOs, in turn are funded by other stakeholders of various entities such as the World Bank, to collaborate with, and help communities with, various capacity building projects (McIlwaine 2009; Pretty & Ward 2001). The mode of operation often involves engaging with communities to transfer knowledge and skills (Marschke & Sinclair 2009). Through their programmes, NGOs, particularly those that are locally based, engage people in shared activities, such as segregating waste for recycling (Haigh 1998; ZeroWaste NZ 2003). Their educational programmes provide a kind of platform for communities to learn about sustainability matters and, some claim, they empower the community to act proactively to solve the issue (Skoien 2006). The activities themselves and the outcomes or goals intended are highly reflective of the learning process described in previous sections (Keen et al. 2005).

However, Reed et al. (2010) warn that social learning as a concept is often confused with methods to *facilitate* stakeholder participation and that these two are entirely different concepts. They argue this is because social learning can take place in the *absence* of formal participatory processes, e.g. through non-participatory means such as mass media or social networking (Reed et al. 2010). The varying evidence from the case studies implies that social learning is affected by various enabling and constraining factors. Scholars suggest more-

empirical evidence and studies in different systems or contexts are required to help clarify how social learning processes can be applied to yield more-effective and sustainable environmental management (Blackmore 2010; Woodhill 2002).

For this thesis, two case studies involving NGOs and a survey of school students' involvement with SWM programmes are reviewed. SWM is an important issue in urban areas. The cases include evidence of locally based implementation of a SWM programme, e.g. recycling programme initiatives run by civil society actors (two NGOs), to create awareness and promote actions to help resolve waste issues. Although recycling is widely acknowledged as a sustainable waste and environmental strategy, it can be problematic (Troschinetz & Mihelcic 2009). Scholars contend that issues can be due to a lack of public participation, weak partnerships between different players or stakeholders, ineffective public campaigns and information dissemination (Agamuthu et al. 2009; Barr et al. 2001; Bolaane 2006; Noor 1996; Shekdar 2009). Few studies actually look at the relevance or contribution of NGOs to help counter the problems (Davies 2007; Luckin & Sharp 2004). This thesis will attempt to contribute to filling this gap. In the light of the key concepts highlighted the methodology of doing the study is described in the following Chapter 3.

Chapter 3

Methodology

'. . . methodologies cannot be true or false, only more or less useful' (Silverman 2005, p. 99)

Studies with the relevant methodology can help build knowledge and justify arguments that contribute to understandings about human beings and their environment (Biesta & Burbules 2003). 'Research methodology' refers to the general approach to research execution: the choices we make about cases to study, research questions, and methods of data gathering and procedures of data analysis (Miles & Huberman 1994; Silverman 2005). According to Robson (2002), the components of a research design framework are: the study's purpose(s), research questions, relevant theories or concepts that inform specific instruments for data collection or analysis, and sampling strategy.

This chapter describes and explains the methodology applied in this thesis. There are five main sections. Section 3.1 describes the study location: District of Petaling, Selangor, one of the most urbanised and populated areas in Malaysia. Section 3.2 explains the purpose and motivations of this study. Section 3.3 considers the relevant theoretical paradigms that inform the study and provides the rationale for applying the 'third' research paradigm, i.e. pragmatism using mixed method (Johnson & Onwuegbuzie 2004). Section 3.4 describes and explains the procedures involved prior to data collection, including the steps taken to obtain ethical clearance, consent from potential respondents and permissions from the relevant Malaysian government agencies. It also describes this researcher's positionality in conducting the research. Finally, Section 3.5 clarifies the methods involved in collecting, analysing and the data: the qualitative method adopted using a case study approach (Yin 2003); the quantitative measures applied in conducting the survey; and the triangulation of data (Jick 1979). Here, the sampling strategy is considered, i.e. the criteria for selection of respondents, and measures of validity and reliability of the findings (Corbetta 2003; Onwuegbuzie & Johnson 2006; Maxwell 2002).

3.1 The study area in the context of waste management

This study was conducted in Malaysia in the State of Selangor, specifically in Daerah Petaling, i.e. the Petaling District. Selangor is located in Peninsular Malaysia at latitude 3° 20´ N and longitude 101° 30´ E. The climate is tropical, with humidity ranging from 80% to 90%, while temperatures range from 23 °C to 33 °C and average monthly rainfall is between 140 mm and 400 mm (Malaysian Meteorological Department n.d.). Selangor is one of the most economically developed states in the country (9th Malaysia Plan 2006–2010).

There are nine districts in Selangor and the most populous is the study area, Daerah Petaling (Selangor Structure Plan). Daerah Petaling is situated between Kuala Lumpur and Daerah Klang. Each district in the state of Selangor may be governed by a local authority. For example, Daerah Sepang is administered by Majlis Daerah Sepang (Sepang District Council). However, due to its size and high population, Daerah Petaling has three local authorities, each with its own administrative boundary: Majlis Bandaraya Petaling Jaya (MBPJ), Majlis Bandaraya Shah Alam (MBSA) and Majlis Perbandaran Subang Jaya (MPSJ). Within Daerah Petaling there are three main urban areas: Petaling Jaya, Shah Alam and Subang Jaya. Figure 3.1 indicates the location of these areas.

The study area was chosen because it was relevant to the topic of this research. The area, because of its high population, is estimated to generate the most solid waste in the state (Ministry of Housing and Local Government (MHLG) 2003). The State of Selangor itself has one of the highest populations in the nation, an estimated 5,102,600 in 2010, while Daerah Petaling's population in 2010 was 1,508,000 (Department of Statistics 2011).

Also relevant to the context of this study is the fact that many environmental NGOs listed under the Malaysian Environmental NGOs (MENGOs) Website, http://www.mengo.org/, have offices in the urban areas of Daerah Petaling. This researcher's relative familiarity with the urban areas was one of the primary motivations in choosing the location for the study.

Figure 3.1: Map of Malaysia
Source: http://www.yourchildlearns.com

Figure 3.2: Location of Selangor
Source: http://www.gomalaysia.net/selangor/selangor_history

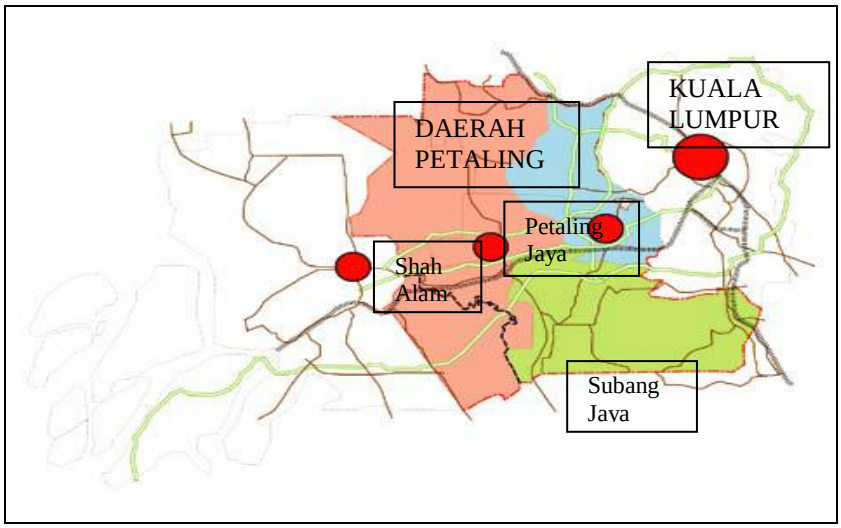


Figure 3.3: District of Petaling
Source: Local Plan Report for MBSA, MBPJ and MPSJ, Department of Town and Regional Planning (2002)

After Kuala Lumpur, the capital city of Malaysia, the State of Selangor, as a result of rapid urbanisation and large population, generates the greatest amount of solid waste in the country, an estimated 2,375 tonnes/day (Hassan et al. 2001). Municipal waste, i.e. waste from households, is more complex compared with the more homogeneous waste from industries and agriculture (Wang & Nie 2001). In Malaysia, municipal waste management is essentially under the responsibility of the Local Authority (LA), as stipulated in Section 72 of the Local Government Act 1976. Under this act, the LA is expected to provide directly, or by engaging a contractor, waste collection services equitably and to an acceptable quality to the urban and semi-urban communities within its jurisdiction. The municipal waste collected must then be disposed of in a sanitary manner. However, increasing operational and management costs have affected local authorities' operating budgets and have resulted in inefficient collection and disposal of waste by the waste contractors appointed by LAs (Hassan et al. 2001; Manaf et al. 2009). In addition, most local authorities in Malaysia, including those in Selangor, face problems with getting new disposal sites or dumping grounds. There are reportedly 11 dumping grounds in Selangor and most of these are classified as 'controlled tipping' sites or anaerobic landfills that are poorly managed (Idris et al. 2004).

Many of the existing dumping grounds within the nation are operating without proper environmental countermeasures (Manaf et al. 2009). For example, the dumps are insufficiently covered, with a lack of treatment for odour from decomposition, and with

smoke from fires that have been generated either spontaneously or purposely by scavengers (Idris et al. 2004).

Waste composition in Selangor, (of which 40–70% of the total could be recycled) has changed from mainly organic to more-complex, such as plastics, paper and packaging material (Agamuthu & Fauziah 2008; Saeed et al. 2009). For example, the compositions of garbage in Shah Alam and Petaling Jaya are, respectively, 20% and 27% paper/cardboard, while 17% and 19% are plastic and glass, all of which could be recycled (Wahid et al. 1996). However, due to various factors, such as public apathy to segregation of recyclable waste, inefficient collection systems, and a lack of regulation or of proper bins, only 5% of the total household waste collected is recycled, while the rest is sent to the dumping grounds or indiscriminately disposed of in drains (Chenayah & Takeda 2005; Idris et al. 2004; Murad & Siwar 2007; Othman 2002; UNDP Malaysia 2008).

Several authors have suggested that authorities and the public in developing countries should consider and implement both social and technical/administrative strategies towards more-efficient waste management systems (Agamuthu et al. 2009; Baud et al. 2001; NSPSWM 2005; JICA 2006; Troschinetz & Mihelcic 2009). However, some authors posit that, generally, the Malaysian public are uncertain about or unaware of recycling or any of these strategies (Haron et al. 2005; Hong & Narayanan 2006; Latifah et al. 2009; Noor 1996; Othman 2002). On the other hand, others contend that many Malaysians are aware of recycling campaigns launched by the government but few actually practise separating their waste in support of recycling (Omran et al. 2009; Saeed et al. 2009). This is due to various reasons, namely non-cooperation, lack of regulation, inconvenience and lack of proper infrastructure provision (Noor 1996; Omran et al. 2009; Othman 2002; Saeed et al. 2009).

Nevertheless, the strategy of raising the public's knowledge and awareness towards an environmental concern, e.g. recycling practices, has been empirically identified by several authors as one of the significant factors that encourage a more pro-environmental behaviour (Chenayah & Takeda 2001; Grodzinska-Jurczak 2006). In addition to the various motivating and disabling factors that influence recycling behaviour (Barr et al. 2001), other authors posit that the manner of relaying the information or facilitation of the relevant programme must take into consideration the target audience's perspectives, attitudes or dispositions towards the environmental behaviour of concern (Salhofer & Isaac 2002).

3.2 Locating the motivations of this study

This study was prompted by this researcher's general concerns for the environment and a desire to contribute to filling a gap identified in the current Malaysian national waste policy, the National Strategic Plan for Solid Waste Management (NSPSWM 2005). One of the action strategies stated in the plan is that:

> the government needs to intensify the message of the present public awareness campaigns, develop various SWM competitions at different levels with support by the highest government levels, involve communities, NGO's, schools and societies in these activities. (NSPSWM Executive Summary 2005, p. 12)

Although the NSPSWM alludes to NGOs, their role has not been clearly defined (JICA 2006). This study therefore seeks to understand *how* NGOs support this strategy, and, within its scope, *what* urban school students perceive NGOs' role to be. It also investigates *what* significantly influences students to be more pro-environmental; specifically, what motivates them to participate in recycling activities. This could inform more-relevant programme design and implementation.

Prior to the fieldwork involving interviews with two NGO key personnels, one charity home coordinator, an officer from an urban municipality and 17 secondary urban students, and the distribution of questionnaire surveys to 411 student respondents, this researcher had, on a separate occasion, conducted unstructured interviews and asked broad, open-ended questions to seven waste officials, each attached to a municipality, i.e. local authority, in Selangor. The work was initially an attempt at gaining some preliminary insights about the issue of SWM from the perspective of local waste officials in Selangor. The informal interviews allowed some insights into the perceptions or views of the waste administrators and their expressed attitudes over waste management and the lack of public participation in community based recycling programmes in Selangor. The administrators' views indicated, among other aspects, that they were more concerned about technical matters of waste management, e.g. collection and staffing, than promotion of 'social' obligations, i.e. raising awareness or educating urban communities on sustainable waste management, as the latter was perceived by them as an added responsibility. They also expressed views that other groups within the community, such as NGOs and urban schools, could support the idea of SWM. They were not aware of

other constraints facing NGOs, apart from those that were financial or funding related. (Kamaruddin & Omar 2011).

Another motivation to study recycling behaviour was the fact that this practice is not a norm in many developing countries, including Malaysia (Agamuthu 2001; Mongkolnchaiarunya 2006; Shekdar 2009; Troschinetz & Mihelcic 2009; UNDP Malaysia 2008), due mainly to a lack of public participation (Agamuthu 2001; Klundert & Anschiitz 2001; Omran et al. 2009; Shekdar 2009). In addition, there may be a lack of regulation to separate recyclables from non-recyclables. In Malaysia, the proportion of recyclables collected by the waste contractor from the amount generated daily by the public, as previously mentioned in Chapter 1, is only 5%. As noted above, two of the reasons for this meagre collection amount are apathy and lack of awareness. This assumption is based on this researcher's conversations with family members and colleagues about their household waste management behaviour. Other authors studying the Malaysian public's waste behaviour have supported this assumption using empirical evidence (Noor 1996; Murad & Siwar 2007; Omran et al. 2009; Othman 2002).

Another motivation was to contribute to filling the gap in knowledge of factors that influence recycling participation by school students (Meinhold & Malkus 2005). Students or adolescents are considered the leaders of the future, who will take over the responsibility for the environment and who, therefore, must be encouraged to be environmentally aware (Wray-Lake et al. 2010). Understanding what makes them more informed or what influences their participation in a specific behaviour, such as recycling, can contribute to more-relevant programme design and implementation (Barr 2001; Smith et al. 1997).

3.2.1 Researcher's positionality

In the process of undertaking this research, a 'researcher's positionality' was given due consideration. Positionality has been identified as a notion of personal values of identities, gender, race, class and other indicators of social positions that help shape a researcher's actions, and his/her understanding of the construct of others', i.e. research participants', responses (within the particular situational context) (Sanchez 2010, Dowling 2010; Sultana 2007). As experienced in this study, being a native of Selangor and currently working in a fairly known public university in the same state were advantageous to this researcher. In this study, most of the respondents who participated mentioned that they were either working or

studying in Selangor, and were familiar with the public university that employed this researcher. The position taken by this researcher was to act upon this knowledge to try and bond with the respondents as an 'insider', rather than as an 'outsider' (Sultana 2007). In this study, the researcher did not encounter much 'resistance' from respondents, i.e. the NGO coordinators, students, charity home coordinator or public officials (in gaining the respective consents to interview them). Upon reflection, this could also be attributed partly to respondents being made aware (by this researcher) that a consent had been obtained from the Economic Planning Unit of the Prime Minister's Department to undertake this research, and that, therefore, the study to be undertaken was a formal and worthwhile endeavour with the possibility to affect policies. The procedure for obtaining the consent from the Economic Planning Unit of the Prime Minister's Department and subsequent consents from other government departments are described in the subsequent sections.

According to Robson (2002), having an interest in investigating a problem involving a real-life situation, and past related research experience, can be legitimate influences on associated enquiries (Robson 2002). These may lead the researcher to formulate the relevant research question(s) (Denzin 2002) and, subsequently, to find the possible answer(s) with the appropriate methodology (Corbetta 2003). According to Schwandt (1989), we conduct inquiry through a particular paradigm because it embodies our assumptions and beliefs about the world, our values that we hold and our ideas about how to implement the enquiry. Locating the methodology of this study is described in subsequent paragraphs following an overview of the widely applied research paradigms in the field of research.

3.3 An overview of the relevant theoretical paradigms

A researcher is often guided by a research paradigm: the 'world view' (Guba & Lincoln 1994) that provides a kind of guide for 'viewing reality' (Silverman 2005). In the past three decades two research approaches have emerged: quantitative and qualitative (Creswell 2007). These 'paradigms' (Kuhn 1962) provide the structure of reference for organising and explaining our observations (Babbie 2005). Both models and 'methods of knowing' contribute to knowledge building (Grinnel & Unrau 2008). A third research approach increasingly being recognised currently is 'mixed-method' (Clark & Creswell 2008). Mixed-methods or mixed methodology can be defined as 'research in which the investigator collects and analyses data, integrates the findings and draws inferences using both qualitative and

quantitative methods in a single study' (Tashakkori & Creswell 2007 p. 4). Similarly, Johnson et al. (2007, p. 123), through an extensive review of the definitions, define mixed methods as:

> the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference technique for the broad purpose of breadth and depth of understanding and corroboration.

Johnson et al. (2007) illustrate that researchers who use the approach incorporate several overlapping types of methods (qualitative and quantitative) and this can be viewed in the form of a continuum (Figure 3.4). Researchers use mixed methods in social and behavioural research to communicate results that help inform decisions and extend understandings (Reichardt & Rallis 1994).

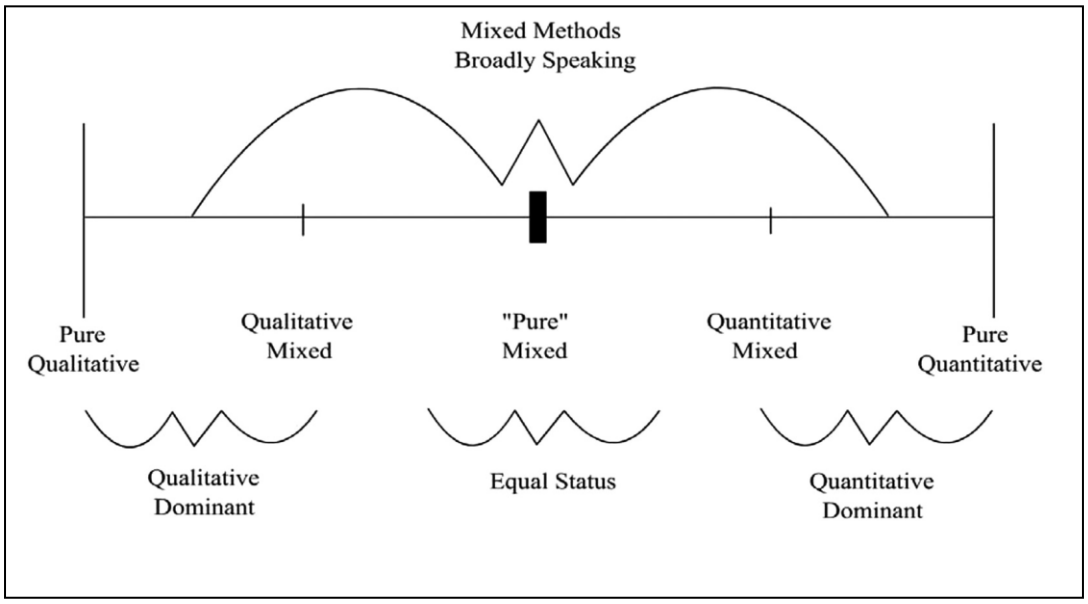


Figure 3.4: Graphic of the three major research paradigms, including subtypes of mixed methods research
Source: Johnson et al. (2007, p. 124)

Authors posit that both quantitative and qualitative methods are useful and can combine complementary strengths (Onwuegbuzie & Johnson 2006). The method chosen should strongly help to answer the research questions, to elicit themes and to formulate meanings and understanding relevant to the study (Silverman 2005). In this context, the mixed method design can be referred to as a procedure for collecting, analysing and reporting data, incorporating both research approaches (Caracelli & Greene 1993; Creswell et al. 2003; Sandelowski 2003; Teddlie & Yu 2007). Because of its flexibility to incorporate both

quantitative and qualitative research paradigms, researchers can apply this advantage in the approach in various phases of a study, i.e. in the determination of questions or hypothesis, in data gathering, in analysis and in inferences (Clark & Creswell 2008; Tashakkori & Teddlie 1998). An increasing number of researchers have begun to adopt the principles of paradigm relativism, i.e. the use of any methodological approach that works for the particular research problem under study (Tashakkori & Teddlie 2008). Mixed methods are a 'matter of course' and are being applied in most major areas of research, for example, in the humanities (Tashakkori & Teddlie 2008, p. 10).

There are four major types of mixed method designs within the literature: concurrent, embedded, sequential explanatory and sequential exploratory (Clark & Creswell 2008). The concurrent design involves simultaneously collecting and analysing both quantitative and qualitative data, merging both and combining them to best understand the research problem (Onwuegbuzie & Johnson 2006). The embedded design consists of including one method within a larger study that applies another method; for example, using a quantitative component to enhance a qualitative interpretation (Clark & Creswell 2008). The sequential explanatory and exploratory designs implement different methods in two separate phases, in which one 'follows through' the other (Creswell et al. 2003). Generally, the research designs are differentiated by the sequence of methods used, how the methods are integrated and the relative priority of the methods being used to address the study's objectives (Clark & Creswell 2008).

3.3.1 Locating the methodology of this research: Concurrent Mixed Design

3.3.1.1 Rationale

The research strategy employed in this study is Concurrent Mixed Design. The philosophy that quantitative and qualitative methods are both useful and can combine complementary strengths (Onwuegbuzie & Johnson 2006) mainly motivated the approach to this study. The overall aim of using this method is to address the relevant research question and 'offset the weakness inherent within one method with the strengths of the other method' (Creswell et al. 2003 p. 183). Silverman (2005) contends that research questions give a project direction, boundaries, focus, and framework, and point to the methods and data that will be needed.

Another main consideration in the choice of mixed method is its flexibility and sophistication for integrating the different types of data collected, i.e. for triangulation (Clark & Creswell 2008; Jick 1979). Triangulation advocates that quantitative and qualitative methods are compatible, and the goal is to improve the accuracy of the judgements made by collecting different types of data to address an issue (Jick 1979). He also argues that when different types of data are collected and then analysed, either independently or subject to multiple analysis, and the same conclusions are reached, they provide more certainty to the issue being studied. Authors suggest this is relevant to the validity aspect of the research and findings (Bloor 1997; Robson 2002).

Another rationale for the choice made was the aptness of applying methods employed by previously published studies that considered similar theoretical underpinnings and the case study approach. However, these previous studies differed in, among other things, the geographical context, the degree of qualitative analysis employed and the model developed (Skoien 2006; Ziebro 2000).

3.3.1.2 Concurrent Mixed Design

According to Onwuegbuzie & Johnson (2006) there are three conditions attached to concurrent mixed design: a) the quantitative and qualitative data are collected separately at about the same time; b) they are analysed separately; c) the results are not consolidated at the interpretation stage; and d) integration or inferences are drawn after the separate interpretations are made. In other words, this design requires that inferences are triangulated as a way of strengthening the findings or to explain any lack of convergence of those findings (Creswell et al. 2003). The basic definition of the design applies when the researcher uses two different methods to cross-validate or confirm findings (Creswell et al. 2003).

In this research, data analyses are described in Chapter 4: *Case Study A*, in Chapter 5: *Case Study B*, and in Chapter 6: *Survey on Factors that Influence Urban Secondary Students' Recycling Participation*. This study also extended the findings based on the concurrent mixed design method by synthesising them and consequently formulating a conceptual model of proposed strategies relevant to the study objective. These are explained in Chapter 7 and 8 accordingly. Figure 3.3 illustrates the overall research approach.

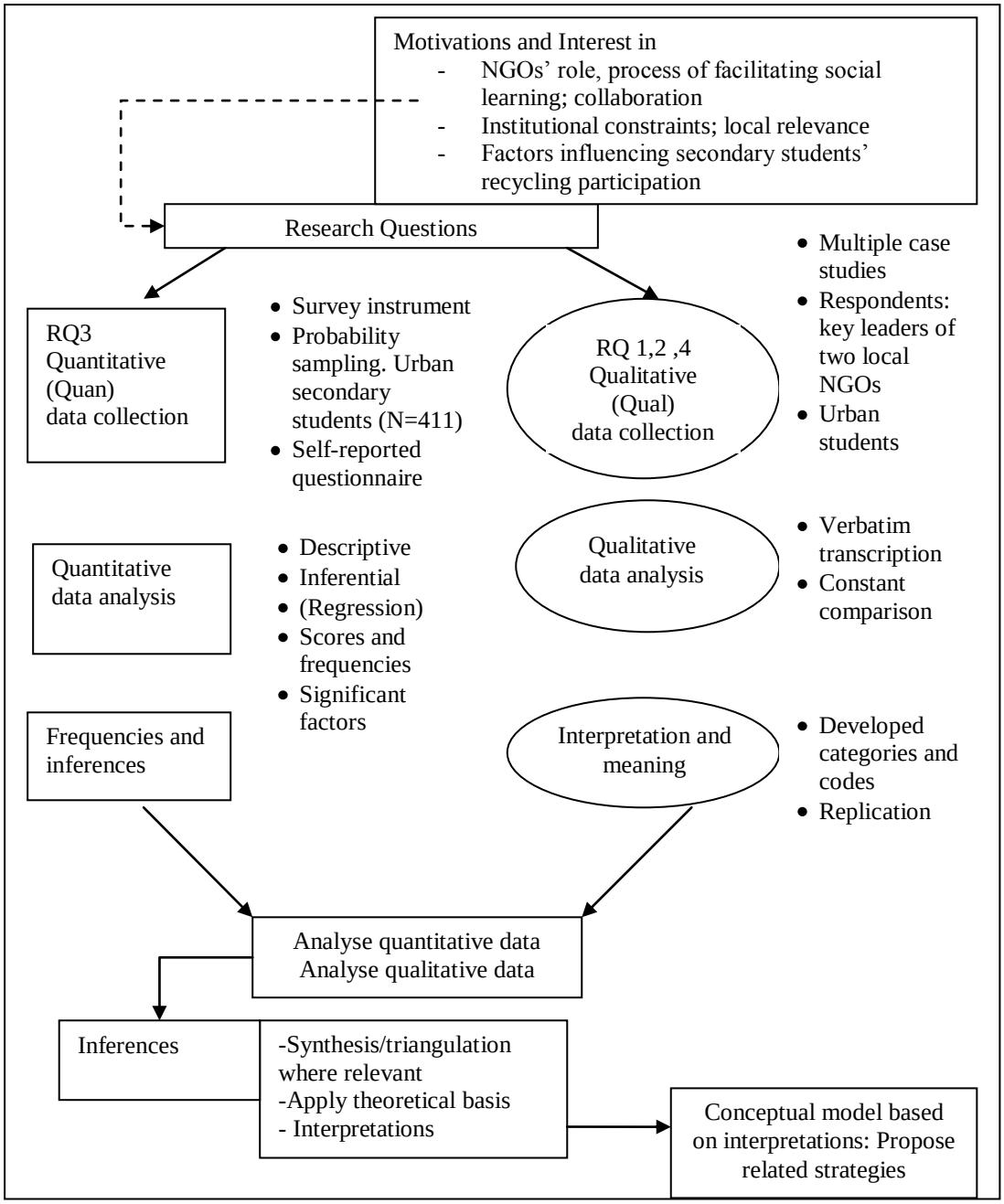


Figure 3.5: Diagram of the design process applying the Concurrent Mixed Design

3.4 Procedures prior to data collection: Obtaining ethical clearance and authorities' permissions; Identifying the case studies and unit of analysis; Preparing the case study protocol

There were several procedures prior to data collection and these are described in the subsequent sections.

3.4.1 Ethical clearance

According to Babbie (1979, p. 57) 'clearances' from several authorities are the *ethics and politics* of doing research when involving people and organisations. This researcher was required to obtain an ethical clearance from the University of Canterbury's Human Ethics Committee (HEC) prior to fieldwork or data collection and to uphold the five ethical principles (http://www.canterbury.ac.nz/humanethics). One of the main concerns of the Committee was that some of the proposed participants for the survey were 'minors'. This concern was addressed to the HEC by informing that prior to data collection, a consent letter would be gained from the school principals, considered responsible for their students. Similar concerns with regard to other respondents were answered by ensuring these participants, before taking part, would receive a project brief (or information sheet) and would sign a consent form that ensured the confidentiality of their responses (unless they agreed to be identified in the study). Examples of the HEC approval letter, consent form and project brief are included in Appendices 2, 6 and 8 respectively.

3.4.2 Malaysian authorities' permission

Also given due consideration were the institutional procedures for conducting a study in Malaysia. Babbie (1979) considers this a *political* aspect of research (p. 71), and contends that it deals with authorities' judgements about the research. In the process of data collection and prior to an intensive work in the field, this researcher had committed almost a month of research time to gaining permission from the Economic Planning Unit (EPU) under the Prime Minister's Department to conduct the survey and interviews in Malaysia, i.e. the intensive field work. This requirement was made known to this researcher by a colleague who had completed her field work using similar approaches, i.e. survey and interviews, but in a

different field of study. Malaysians attached to organisations located outside the country who wish to conduct research in Malaysia are required by the Government of Malaysia to gain EPU's permission to conduct the research. This procedure also applies to foreign nationals intending to implement research in Malaysia. The procedure for obtaining this permission can be viewed at the following link: http://www.epu.gov.my/undertaking. The letter of permission from the EPU is included as Appendix 1.

EPU requires that researchers gain consent from other authorities considered relevant. This researcher also submitted a general enquiry through e-mail to the Kementerian Pelajaran Malaysia (the Ministry of Education Malaysia) (MOE) at its Website on http://www.moe.gov.my. Upon explaining the intention of the research and attaching a copy of the permission letter from EPU, this researcher subsequently obtained a consent (via e-mail) from the Ketua Sektor Penyelidikan dan Penilaian (Head of Research and Evaluation Sector), to conduct the research, and this is listed under Appendix 3.

The third government authority's permission was obtained from Jabatan Pelajaran Negeri Selangor (JPNS) (the State of Selangor Education Department). This requirement was made known to this researcher by one of the school principals that had been contacted earlier. A telephone call, followed by a letter explaining the intentions of this research, were lodged to JPNS. This researcher also attached copies of the permission letter issued by the EPU and of the e-mail from the MOE. The approval was gained from JPNS soon after. JPNS also requested a copy of this study upon its completion. The duration taken for initiating, acting upon and following up with the various local authorities relevant in the process of data collection was approximately a month.

3.4.3 Applying the case study approach: Identifying the case study nominees, the units of analysis and the case study protocol

A case study can be defined as 'an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident' (Yin 2003, p. 13). A two-case study design can also apply the case study method. The difference between single and more than one case study is the rationale behind each approach (Yin 1994). Whereas the former is concerned

with the unique aspect of the case, e.g. meeting the conditions for testing a theory, the latter is concerned with replication (Robson 2002; Yin 2003).

The two-case study approach was used in this study to predict similar or contrasting results based on a theoretical framework (Yin 2003). In the process, replication or duplication of the findings was sought for the findings to be considered robust (Robson 2002; Yin 2003). Replication

> states the conditions under which a particular phenomenon is likely to be found i.e. a literal replication as well as the conditions when it is not likely to be found. (Yin 2003, p. 47)

In addition, the case study approach was considered appropriate to describe and explain the research topic, i.e. the role of local based environmental NGOs in promoting recycling, and *how* they initiated/implemented the related programme – within its context. Thus, as has been suggested, a *how* question of a situation or case can apply the case study approach to enable description and an explanation of the case(s) being studied (Yin 1994, 2003).

Only two nominees were chosen, and their status as some of the early pioneers in initiating community waste programmes was a prime consideration from a case study perspective, due to the resource- and time-constraints faced by this researcher and the criteria of selection applied. The two cases were carefully selected to serve the specific purpose of inquiry (Yin 2003, p. 47; Robson 2002). Thus, the two-case study nominees were chosen based on the following five criteria: establishment and registration as an environmental NGO for more than five years; non-profit orientation; initiation of and continued support for a recycling or SWM programme; collaboration with the local authorities; and having a base in the study area.

The first case was the environmental NGO Global Environment Centre (GEC) and its SMART Ranger programme, which facilitated a waste recycling programme with several urban schools. This case is described in Chapter 4. The second case was the environmental NGO Treat Every Environment Special (TrEES); its efforts in raising waste awareness were more varied. It is described in Chapter 5.

3.4.3.1 Units of analysis

In case study strategy, it is important to identify the unit of analysis, as doing so defines the limits of data collection and analysis (Yin 2003). The 'units of analysis', part of most research design, refers to the 'what or whom' we study (Babbie 2005, p. 95). The unit of analysis can also be an issue or concern, e.g. level of participation in a social activity (Babbie 2005; Grinnel & Unrau 2008; Yin 2003). The unit can also be determined by the purpose of the study (Babbie 2005) and by research questions (Sekaran 2003). Studying the units of analysis can help researchers identify the relevant information about the units being analysed (Yin 2003), thus helping to answer the research questions (Babbie 2005). For this study, each case, i.e. the environmental NGO chosen, runs several environmental awareness programmes, such as for the conservation of mangroves, lakes or forest. However, the unit of analysis is each environmental NGO's effort at promoting, to the general public, recycling as a sustainable waste management strategy. In this research, the first case study's target audience was urban school students, while the second case study's focus was urban school students and charity homes for the handicapped and hypermarkets.

3.4.3.2 The case study protocol

Prior to data collection, a 'case study protocol' was prepared (Yin 2003). This is a form of guide to the researcher for conducting the fieldwork, and is an attempt to increase aspects of reliability of the research (Robson 2002; Yin 2003). In the incidence that several research assistants are involved in data collection, the protocol or guidelines can help these investigators focus on the general agreed rules. This is imperative when there are more than one case being studied or the data are to be collected by several researchers (Yin 2003). In this study, however, this researcher was the sole data collector and there were two case studies involved. The protocol was relied upon for guidance when interviewing respondents. The protocol questions are 'reminders' regarding the information that needs to be collected and the reasons behind them (Robson 2002; Yin 2003). According to Yin (2003), generally the case study protocol includes an overview of the project (e.g. its objective and issues), field procedures, case study questions for collecting the data, and a guide for the report.

The case study protocol prepared for this study included a brief summary of the project and the case study questions. Background information about the project, a list of the issues being investigated and a copy of the letter from EPU regarding government permission were included. The inclusion of the questions to be queried was to 'keep the researcher on track'

(Yin 2003, p. 74) during the interviewing. The questions essentially formed the structure for the questioning. Field procedures included making a schedule of the data collection and alerting to uncontrollable factors such as the interviewees' schedules and availability. The list of interview questions is included as Appendix 10.

3.4.4 Designing the questionnaire

In this study, one of the main research questions is concerned with identifying *what* urban school children perceive to be NGOs' involvement in promoting recycling and raising waste awareness. The objective was also to explain *what* factors significantly influence the children's recycling participation in schools. The questionnaire survey instrument was considered an appropriate means for querying and enabling an insight into these aspects. Respondents were requested to 'tick' the best response to each query using a Likert type scale of '1', which represents a 'Highly Disagree', to a '5', which represents a 'Highly Agree' response (refer also to Chapter 6 under Section 6.1). This approach would enable analysis to complement the qualitative findings obtained from the two case studies in which the NGOs selected were involved with SWM programmes in schools.

The questionnaire was designed to minimise biases and to ensure a high level of appropriateness (Babbie 1984; Sekaran 2003), taking into consideration key factors suggested by Sekaran (2003): wording of the questions; principles of measurement, e.g. codes and scales; and general appearance of the questionnaire. The questionnaire was piloted on four teenage urban Malaysians. This alerted the researcher to the need to modify some terms unfamiliar to the teenagers, and allowed the gaining of some sense of the time needed to answer the questionnaire.

3.5 Data collection and analysis

There were two main sets of data produced: qualitative interviews through a case study approach and quantitative survey responses using a questionnaire. The rationale and processes involved in the analysis of these are explained in the following sub-sections.

3.5.1 Qualitative data

Qualitative data collection comprised interviews with the key personnel of the environmental NGO and secondary students. The rationale for choosing to interview only the key NGO staff was based on the nature of the research topic, the research questions formulated and the operational structure of the organisation selected for the case study. The key member of the NGO in the two-case study is considered an *expert* in the organisation, based on his/her occupational position, length of time with the organisation and the pertinent experience with their programmes (Wroblewski & Leitner 2009). Each was the director of the environmental NGO and had been involved in conceiving, implementing and monitoring the relevant programme for more than ten years. Each had detailed knowledge of the programme and of the structure or content of related modules.

3.5.1.1 Data collection

The technique for the qualitative data collection was face to face interviews. The objective was to gain an understanding of the NGO's input to recycling programmes in schools, based on the individual's perspective. Upon students' availability a total of 18 willing student respondents were also interviewed in this study, but their responses were analysed separately. In Chapter 4, five students relevant to Case Study A were interviewed, while in Chapter 6, 13 students were interviewed about their perception related to social aspects of waste management. There were no students interviewed in Chapter 5. Rather, in Chapter 5, students' responses or perspectives on community based programmes were derived from the questionnaire survey. This enabled some understanding about students' perceptions of NGOs' involvement in SWM. In addition, secondary data in the form of students' responses about the environmental NGO were obtained from the involved schools' official blogs/Websites. These were highlighted in Chapters 4 and 5. These complement the primary data/responses obtained from the expert knowledge.

3.5.1.2 Data analysis

The major steps taken to analyse the qualitative data were transcribing the text, establishing a preliminary plan for data analysis (Grinnel & Unrau 2008; Dey 1993), conducting first level coding (Grinnel & Unrau 2008) and second level coding (Corbin & Strauss 2008; Dey 1993; Richards 2008) and, finally, interpreting the data (Strauss & Corbin 2008; Grinnel & Unrau 2008; Richards 2005).

During the qualitative analysis, themes were derived from the text (transcribed interview responses) using a grounded approach method and a constant comparison method (Strauss & Corbin 2008). This approach involved categorising and coding the data. The interaction of data can enable both the dimensions and properties of the qualitative text to be developed (Strauss & Corbin 2008). The aim of qualitative data analysis is the discovery of patterns among the data, which enables further understanding (Babbie 2005).

As mentioned in previous sections, a two-case study approach was used to analyse whether elements within the social learning theoretical perspective were present, i.e. whether literal replication had occurred (Yin 2003). The replication logic was an attempt to establish validity of the findings (Yin 2003). For this purpose, a simple table was formatted, with column headings comprising the identified theoretical elements and row headings comprising the themes derived. A modified version of the 'logical framework' model (Bell & Morse 2008) was applied to highlight aspects and elements of the project, activities involved, outputs and assumptions considered. Any contrasting finding required an explanation of the conditions affecting the finding (Yin 2003). Another level of analysis was to highlight the themes' linkages, i.e. the relationships of the themes and the outcome of these. More-detailed data analysis descriptions are provided in Chapters 4 and 5.

3.5.2 Quantitative data

Prior to survey implementation a list of schools was obtained from the JPNS Website (http://www.moe.gov.my/jpnselangor/), and this indicated that there were 70 national secondary and 103 national primary schools in the District of Petaling, i.e. in the study area. Appendix 3 gives the full list of schools in the District of Petaling. There were also schools with a more specialised focus, such as vocational training, religion or those with special needs. Taking into consideration the time allocated for the intensive fieldwork for this thesis (four months) and the available resources influenced the decision to include a sample population of students in only the national type secondary schools, and to exclude those in primary and special-focus schools.

In order to obtain a representative probability sample a stratified sampling approach was applied to the list of 70 schools (Sekaran 2003). This involved stratifying the schools according to their municipality, resulting in a second list of schools according to municipality

and location, which resulted in only 11 schools being chosen. The main basis of stratification was their proximity to this researcher's home (in Selangor) and some previous personal familiarity with the school areas. Targeting the 11 schools lessened travelling time and costs. Table 3.1 shows the list of selected schools.

Table 3.1: List of selected schools, stratified according to their jurisdiction

Municipal Authorities	National Secondary Schools/ Sekolah Menengah Kebangsaan (SMK) selected for this study	Number of proposed student respondents
Within Petaling Jaya Municipal Council/ Majlis Bandaraya Petaling Jaya (MBPJ) area	1. SMK Kelana Jaya, Petaling Jaya 2. SMK Sri Permata, Petaling Jaya 3. SMK Damansara Jaya, Petaling Jaya 4. SMK Sri Utama, Petaling Jaya 5. SMK Damansara Utama, Petaling Jaya	50 50 50 50 50
Within Shah Alam Municipal Council/ Majlis Bandaraya Shah Alam (MBSA) area	1. SMK Seksyen 18, Shah Alam 2. SMK Seksyen 11, Shah Alam 3. SMK Seksyen 19, Shah Alam	50 50 50
Within Subang Jaya Municipal Council/ Majlis Perbandaran Subang Jaya (MPSJ) area	1. SMK SS17 2. SMK Subang Jaya 3. SMK USJ 4, Subang Jaya	50 50 50
Total		550

The next step was to extend letters to the principals of the selected schools, inviting their schools, i.e. their students, to participate in the survey. According to the protocol prepared, the project brief and the consent form were mailed from New Zealand to Malaysia to each school principal. Copies of the letters were also faxed from this researcher's study base in Christchurch, New Zealand. Copies of the letter and the consent form are provided in Appendices 6 and 7. Of the selected eleven schools that received the letter, only one school replied.

A representative sample size was obtained by referring to the table provided by Krejcie and Morgan (1970), commonly employed for estimating a sufficient population sample. Krejcie and Morgan (1970) had suggested (based on the National Education Association's sample size formula (1960)) that a minimum required sample size for a population of 100,000 or more is 384, which would remain relatively constant, and applicable to any defined

population. Taking into account that the area's population exceeded the above-mentioned figure, it was concluded that for this study, a minimum number of 35 students in each school would have to be surveyed to ensure a sufficient sample size. Taking this aspect into consideration, 500 questionnaires were printed to be distributed subsequently to the schools that agreed to participate.

3.5.2.1 Data collection

Upon the intensive data collection phase in Malaysia, telephone calls to the selected schools were made to arrange a suitable date to visit. These follow-up telephone calls to the school principal or the school counsellor were an effective method to make contact with the school, as some schools had not returned the consent form as had been hoped. Ten schools agreed to participate, on the conditions that the students' confidentiality was upheld and that the study had obtained the necessary consent from the State of Selangor Education Department/ JPNS. One school, however, declined to participate, and another requested a preliminary report of the findings related to their school. This report was subsequently published on the school's Website: http://gogreensmksp.blogspot.com.

The method of the quantitative data collection was through a personally administered questionnaire (Sekaran 2003). In every school that this researcher visited, a teacher was assigned (with authority from the school principal) to help distribute 50 questionnaires within the school. The only basic instruction given by this researcher to the teacher was that the questionnaires be randomly distributed to encompass students from different age groups. Random selection is considered the best sampling design when the generalizability of the findings to the whole population is the main objective of the study (Sekaran 2003).

3.5.2.2 Data analysis

The survey was undertaken to gain general perceptions of students' SWM related concerns. In addition, the objective was to infer from the findings the relevancy of recycling programmes' implementation in schools. The sampled students filled a self-reported questionnaire about their perceptions and attitudes towards waste recycling-related matters, recycling programme implementation and the involvement of entities such as NGOs in recycling initiatives.

The findings provide other insights about the topic being studied and a level of 'representativeness' of the sampled population's perceptions towards the issue (Babbie 1979; Sekaran 2003). The details are explained and described in Chapter 6.

3.5.3 Triangulation

Mixed-methods involve both qualitative and quantitative investigation that aims to triangulate findings from both processes to achieve a higher level of corroboration and validity (Jick 1979). Denzin broadly defines triangulation as 'the combination of methodologies in the study of the same phenomenon' (1978, p. 291). The goal of triangulation is to improve the accuracy of decisions or judgements made on an issue, by collecting different types of data (Jick 1979). In this study, the triangulation enabled a more complete picture to be captured of the situation being studied, i.e. a view from different angles or perspectives was gained (Jick 1979; Wolf 2010). When the findings reach the same conclusions, they provide more certainty to the issue being studied (Jick 1979). If, however, any of the findings do not converge or are dissonant, there needs to be an explanation of why this occurred. This lack of agreement can lead to further interesting results or thought development (Jack & Raturi 2006; Kaplan & Duchon 1988).

Fielding and Fielding (1986, p. 122) suggest that the use of triangulation should operate according to ground rules set out below:

- Always begin from a theoretical perspective or model.
- Choose method and data that will give you an account of structure and meaning from within that perspective.

Summary

For this study, both types of data (qualitative responses and quantitative self report) were collected and analysed separately, following procedures relevant and suggested in the literature to ensure *trustworthiness* was upheld (Robson 2002). The findings were interpreted or tabulated and are reported in the relevant chapters. The relevant findings were synthesised and corroborated to gain a further understanding from the perspective of the related theoretical framework considered in this study. The theoretical perspectives considered pertinent to this study are highlighted in Chapter 2 and syntheses of findings are reported in Chapter 7. These were then applied towards the formulation of a conceptual model of *best practice* relevant to this study, in which strategies for enhancing the current practices were proposed (in Chapter 8). To the best knowledge of this researcher, the relevant and appropriate procedures for data collection and analysis of the issue studied were adhered to using guides from established researchers in the field.

Chapter 4

Case Study A: SMART Rangers Waste Awareness Programme

Introduction

The case study in this chapter highlights the effort of an environmental non-governmental organisation (NGO) in promoting environmental awareness and sustainable waste management (SWM) activities with school students. The focus of this study is on how the coordinator of the SMART Ranger programme under an environmental NGO, Global Environmental Centre (Malaysia) (GEC), facilitates learning about SWM of an urban secondary school. The processes involved in the implementation of this programme were found to support the concept promoted by the social learning perspective highlighted in Chapter 2, i.e., that participation, collaboration, negotiations between and among individuals, and orientation to systems are necessary for an effective environmental programme implementation (Keen et al. 2005). In addition, the evidence indicates that involving students and co-acting with them in sustainability activities provides a platform for students to participate with different individuals and to reflect upon environmental matters. However, the insights gained also indicated that there were constraints perceived as limiting programme implementation (Ison & Watson 2007). Data were collected by interviewing the coordinator of the SMART Rangers initiative and several of the students involved. The method used to analyse the text data was 'directed content analysis' (Hsieh & Shannon 2005, p. 1281). The interpreted evidence was triangulated (Jick 1979) to gain an understanding of the different actors' perspectives. Where relevant, secondary evidence from other sources, e.g. government, media reports and school blog posts, was reviewed to validate the findings.

There are four main sections in this chapter. Section 4.1 provides a background for the chosen environmental NGO. Section 4.2 describes the unit of analysis, i.e. the SMART Rangers programme, including its module of activities, and interprets the rationale for the programme's implementation. This section includes the initiators' motivations and the perceptions of four students involved in the programme. For ease of referencing, a code was used to refer to the informants' statements. For example, the first group of statements is coded S4.1 and subsequent group of statements are coded as S4.2, S4.3 and so forth. The students were identified by a number assigned to each individual. Section 4.3 highlights the

constraints that the organisation faced in the process of implementing their activities. Section 4.4 explains the method involved in interpreting the qualitative evidence.

4.1 Background of an environmental NGO: Global Environmental Centre (GEC)

Global Environmental Centre (Malaysia) (GEC) is based in Selangor, Malaysia and was founded in 1998. Its slogan, 'Building partnerships for the environment', represents its concern and main mode of programme operation. It established four core programmes: three deal with activities related to natural resources conservation and management, while one focuses on establishing capacity building and networking with youths. The NGO's main objective is to provide the opportunity for individuals or groups to get involved in conservation and environmental management and to thereby improve the environment. It also offers training programmes to build communities' capacity to address sustainable environmental management issues. Currently, it has 19 staff (GEC 2011). The four core programmes are: the River Care Programme, the Forest and Biodiversity Programme, the Peat Land Programme, and the Outreach and Partnership Programme. The SMART Rangers programme, initiated in 2003, is part of GEC's River Care Programme (GEC 2011).

This environmental NGO receives funding support mainly from international grants; contributions also come from local government and corporate bodies. The GEC Annual Report 2006 indicated that the income from these bodies totalled RM 2,505,914.00, or NZD1,008,218.71, while the total expenditure was RM2,502,138.00, or NZD1,006,842.00. The strategies employed to meet its objective are building partnerships with similar-minded organisations, and creating coalitions with other sectors of the community, including local government bodies, while actively supporting other involved actors. Its Website invites the public to download or purchase environmental management related materials. For example, GEC has published several leaflets and booklets for those interested in being trained as SMART Rangers. A local aspect incorporated in the leaflets was to provide the information in four languages, i.e. Malay, Mandarin, Tamil and English (SMART Ranger 2011).

GEC has been recognised in the Malaysian school community for creating the first recycling programme for a school under the SMART Rangers programme (Ministry of Housing and Local Government (MHLG) 2006). GEC is also a member of the Malaysian Environmental NGOs (MENGO).

GEC provides technical and practical advice as part of its capacity building and training tasks. These are coordinated by its specialists/staff in environmental management. In the SMART Rangers programme, for example, students are given training on how to prepare composting and on making garbage enzyme.

GEC documents its work with schools; these records are published on its Web site. It also has an annual report, which includes its audited expenses (GEC 2006). Some of its environmental project reports are available upon request at minimal charge.

4.2 The unit of analysis: The SMART Rangers Programme

Initially, the Rivercare Programme, out of which the concept of SMART Rangers was developed, assisted local authorities in the rehabilitation of the lakes in Kelana Jaya, in the District of Petaling (Figure 4.1). This initiative focused on educating the public and school children in particular, about the need to manage natural resources, in this case water and rivers (GEC 2011). Another aim was to promote management collaboration with the communities living around the lakes. In the process, those involved realised that the major sources of pollution to the lakes were rubbish and contaminants from the residential and commercial drains that flowed into the lakes. The programme's working group, consisting of the NGO and representatives of two government bodies, decided that waste education was necessary and timely, in addition to the imposition of regulations. The result was the development of the SMART Rangers concept, and the first group of students identified as SMART Rangers were school students from Seri Kelana School (SMART Rangers 2011).

Figure 4.1: The location of the Kelana Jaya Lakes within the neighbourhood of Kelana Jaya, District of Petaling, and Selangor

Source: Google Map (2011)

4.2.1 Motivations for initiating SMART Rangers

According to the coordinator interviewed, a personal outlook and the government's less successful public recycling awareness campaigns motivated him to design the SMART Rangers Programme in 2003. The objective was to go beyond raising awareness (Barr 2001, 2005): to facilitate proper education for school children on solid waste management. The coordinator of the programme (Dr. Kalithasan), an environmental scientist, mentioned:

> In Malaysia, waste is often overlooked; waste is seen as a waste and not as a resource: a man-made resource . . . I was so frustrated because nothing was moving . . . Although we gave talks, nothing was moving. So we changed our attention to school children. In 2003, we designed the school programme – SMART Rangers. The objective was not [merely] to create awareness . . . because awareness alone is not enough; because it doesn't lead to anything. I studied why the recycling programme [campaigns] failed in this country. MHLG [the Ministry of Housing and Local Government] launched the recycling programme twice. [These] failed to achieve their objective. (S4.1)

In 2004, this NGO planned a more discerning programme on solid waste management, with a module that was developed to educate and *train* students to manage and reduce waste. The objectives of the module were:

1. To create and enhance students' awareness on managing their resources
2. To provide a way for them to contribute to environmental well being
3. To teach them the importance of reducing their waste and of recycling
4. To initiate a systematic and scheduled recycling programme for their school
5. To help generate revenue for classroom activities
6. To set-up a Recycling Collection Centre, where possible, in the school's grounds (SMARTRanger 2011).

Figure 4.2 illustrates the process of implementing the SMART Rangers programme.

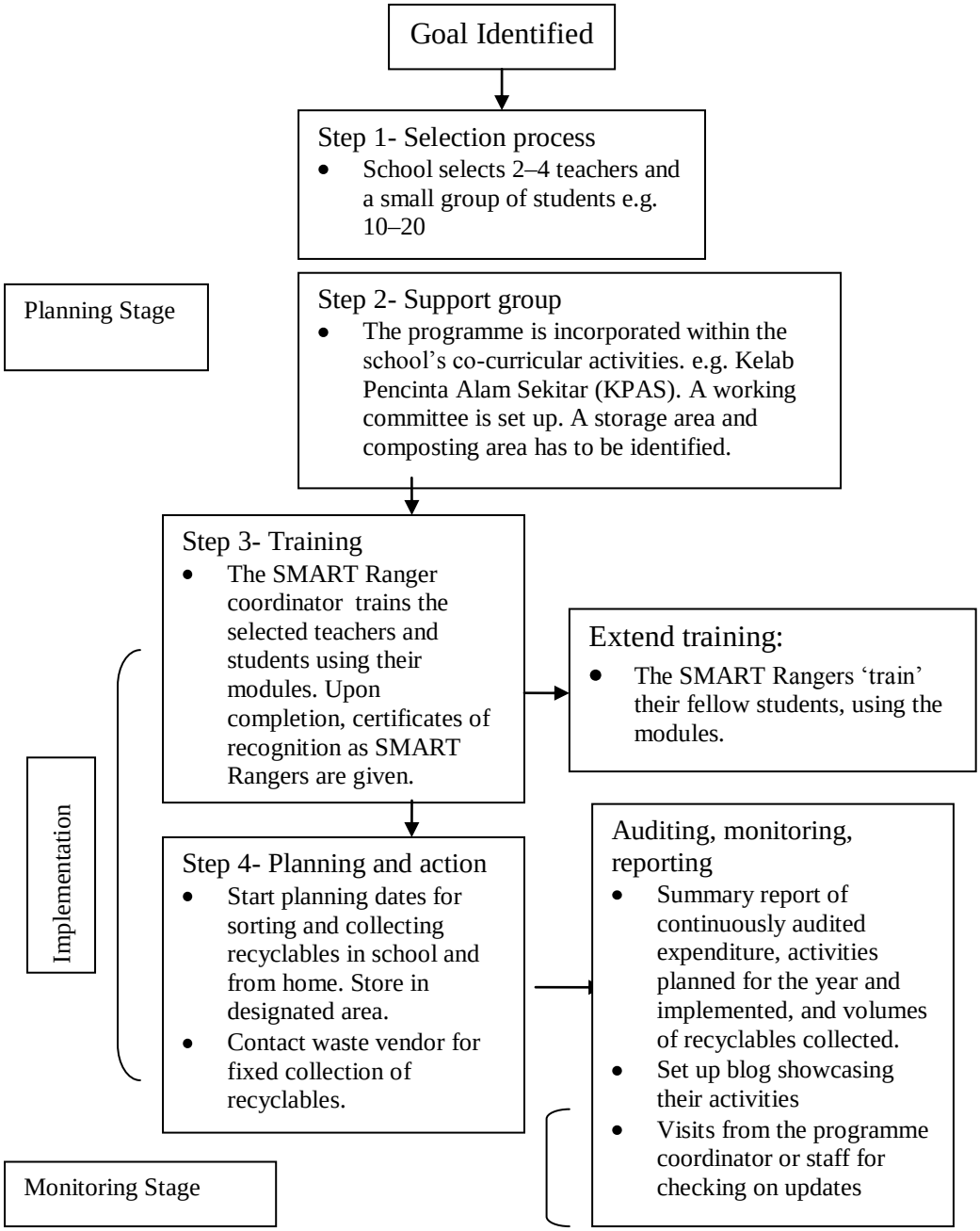


Figure 4.2: The steps to establishing the SMART Ranger Programme

4.2.2 Funding for projects

To mobilise and implement the activities, the SMART Rangers programme initially applied for and received financial assistance from the United Nations Development Program Global

Environment Facility (UNDP-GEF) Small Grant scheme. It also secured some funding from the Danish International Development Agency (DANIDA) (GEC 2011). Local banks also contributed financial support to this NGO's various programmes, including the SMART Rangers. As remarked by the coordinator of the programme:

> The nature of NGOs is we don't have funds unless we secure project funding .We can only carry out projects if we have funds . . . We give some money [to the school] to start off (S4.2)

4.2.3 Implementing the programme

Since its first recycling programme implementation in Sekolah Kebangsaan Sri Kelana Selangor (Sri Kelana National Primary School, Selangor) the SMART Rangers programme has been replicated by other schools, both within and outside Selangor. An international school in Kuala Lumpur has also implemented the SMART Ranger programme to manage its waste (GEC Annual Report 2006). To date, GEC has implemented its SMART Ranger waste management module in five schools in Selangor and another five in Kelantan, a state in the east coast of Peninsular Malaysia (SMART Ranger 2011).

The programme was built on the idea that with proper education, knowledge and skills (specific sustainability activities) younger generations can help to build a 'greener nation' – one that is conscious of and responsible about solid waste (GEC 2011). Its focus was to encourage students (school-level) to take positive action to conserve the environment. Implementation of the programme is achieved through four modules, i.e. information dissemination, specific knowledge building, hands-on activities and management capacity building. The steps outlined for establishing the programme and training the 'Rangers' are the selection process, support group development, training and action (refer to Figure 4.2). Students are also expected to prepare a report so that they can evaluate for themselves the volume of recyclables collected, and practise some management skills. They are encouraged to discuss their activities or issues in implementations and include these in their discussion during their school club meetings. The first school to apply the recycling programme module was SK Sri Kelana, a primary school (for students aged seven to twelve). Both students and teachers participated in the project (SK Sri Kelana SMART Rangers Blog 2009). Currently the programme is sustained and supervised by a teacher under the Kelab Pencinta Alam Sekitar (KPAS) (or Love the Environment Club), a co-curricular activity registered under the Ministry of Education Malaysia. Under the SMART Rangers programme school students are

invited to participate in simple activities to foster their environmental awareness, while being given simple training (Chan 2011). This is in line with the objective of the SMART Ranger Programme to train students and teachers to be 'recycling experts' of the school (SMART Ranger 2011).

According to the coordinator of the programme:

> The [past recycling campaign] approach [by MHLG] was creating awareness which government has made a lot of effort. This is not enough; [it] must be followed by knowledge. Rather than telling them don't throw rubbish, tell them why . . . where does rubbish end up? The third is skill. This is what we are lacking because of skill. Public is never taught how to recycle . . . It is not that easy . . . So we created SMART Rangers, not [just] to create awareness but to give them [school children] knowledge, a [guideline] module, programme. Half of the module is on [developing] the skill. When we have a one day training, half the day is the 'art of recycling': how to sort, the procedure, how to sell, sustainability, composting, [making] nature craft, overall waste management and not just recycling. (S4.3)

The module has four components and is implemented within the school compounds during the KPAS meetings. The first module comprises information dissemination and knowledge building. The second further drives the message to the audience of the importance of sustainable waste management, in particular, recycling. The third module focuses on implementing 'hands-on activities' in school and at home, while the fourth extends the activities to build students' management and communication skills.

In the implementation, the GEC/SMART Rangers' coordinator first makes visits to the schools involved and give talks to the general school audience about pollution matters and the consequences of unmanaged waste. The information materials distributed to the club members are written with consideration for the target audience, i.e. school children. In the initial stages of programme implementation, GEC furnishes club members with colourful 'assignment sheets' or materials relevant and useful to school children, e.g. bookmarks and a one-page 'list of sustainable things to do' that are designed with 'tick' boxes. This is done generally to attract the students' attention to sustainable environmental matters. Every member of the club is encouraged (by the teacher who coordinates the club) to complete and report their achievements in the next club meeting.

The first few 'assignments' are simple daily, yet sustainable, actions, including sustainable waste management practices that can be implemented at home by the child and his/her

parents. An example is alternative ways of packing groceries or food. The assignments are designed and written in such a manner that the task appears easily achievable.

The second module extends the assignments towards other behaviours, such as making a list of essential and less important consumables, and using reusable bags for shopping and packing food, such as in the school. The students involved in the activities then discuss and reflect upon their actions and make an oral report during their club meeting.

This is followed by training or skill building, employing hands-on activities with the help of the NGO staff. The activities range from demonstrating the proper way of sorting waste, to producing art and crafts from recyclables, to preparing the necessary conditions for composting waste. The module continues to encourage the school children to think and write about the best means for a zero waste system. For example, recyclables collected at Sri Kelana School (and recyclables brought from home by the school children) were sold to recyclables vendors (Figure 4.3 shows a recyclable 'store'). The sale of recyclables to vendors, along with prize money (from entering recycling competitions), contributed at Sri Kelana School towards the setting up of a RM2500 (or approximately NZD 1000) rainwater harvesting system (Figure 4.4). The system was used to water the plants that had been established in the school gardens by the school's children, teachers and parents. This further encouraged related activities and students' concern for the environment. Also, recyclables were used to build the plants' shelters (Chan 2011). These initiatives are considered some of the successes of the SMART Rangers programme. As the coordinator (Dr. Kalithasan) mentions:

> The beauty of this SMART Rangers is there is no copyright [no fixed design] attached . . . One of the end products is they must initiate recycling or composting in school and the collection of the activity must be used for the school activities and not management . . . We call it sustainability. (S4.4)

Plate 4.1: Recyclables collected every Friday at Sri Kelana School Recycling Centre
Source: Sekolah Kebangsaan (SK) Sri Kelana Blog (2009)

Plate 4.2: The rainwater harvesting system. The cost to implement was partially sourced from the sale of recyclables through the SMART Rangers programme in Sri Kelana School
Source: Chan (2011)

The volumes of recyclable waste collected in schools were recorded as a means of monitoring progress (SMART Ranger 2011); see, for example, Sri Kelana School's record for June to July 2009, posted on its school blog (SK Sri Kelana SMART Ranger). Table 4.1 indicates the volumes of recyclables collected by the schools involved with SMART Rangers (including Sri Kelana School).

Table 4.1: Volumes of recyclables collected from various schools

Schools in Selangor	Amount of solid waste generated (average kg/day)	Carbon footprint (average kg/day carbon emission)	Waste reduction (average kg/day)	% Waste reduction
SK Seri Kelana	27	72.63	from 27.0 kg to 21.0 kg= 6.0 kg	22%
SJK (Chinese) Yuk Chun	28	75.32	from 28.0 kg to 25.0 kg= 3.0 kg	10.7%
SJK (Tamil) Vivekenanda	47	126.43	from 47.0 kg to 40.0 kg= 7.0 kg	14%
SMK Bandar Sri Damansara 1	31	83.39	from 31.0 kg to 26.0 kg= 5.0 kg	16.1%
SMK Kelana Jaya	50	134.50	from 50.00 kg to 44.0 kg= 6.0 kg	12%

Schools in Kelantan	Amount of solid waste generated (average kg/day)	Carbon footprint (average kg/day carbon emission)	Waste reduction (average kg/day)	% Waste reduction
SK Tengku Muhd Fakhry Petra	57	153.33	from 57.0 kg to 42.0 kg= 15.0 kg	26%
SK Star	55	147.95	from 55.0 kg to 47.00 kg=8.0 kg	15%
SK Gua Musang	52	139.88	52.0 kg to 45.0 kg= 7.0 kg	13%
SMK Tengku Indera Petra 1	80	215.20	80.0 kg to 62.0kg = 18.0 kg	23%
SMK Tengku Bendarahara	31	83.39	31.0 kg to 22.0 kg = 9.0 kg	29%

Source: Adapted from SMART Ranger (2011)

4.2.4 Impact on students: Some insights

This section includes the survey responses of five students from Sekolah Menengah Kebangsaan Kelana Jaya (SMKKJ) school, who were interviewed at the end of August 2009. The respondents were willing and available to be interviewed. SMKKJ is a typical national (public) secondary school based in an urban neighbourhood, with multiracial students from various income earning families. The SMART Ranger programme had been only recently implemented, in this school, i.e. in early July 2009. The aim of the survey was to explore the students' perspectives of this programme and the extent that the programme had impacted on their understanding or actions in SWM. Although the programme could be considered 'new', the students' responses give some indication as to their initial concerns and how the programme could be improved, even in this early stage. Although only two of the respondents were members of SMART Ranger, while the other three were KPAS members, all were involved to some extent with waste recycling activities in their school and were aware of the SMART Ranger programme. While the SMART Rangers' recycling and waste management activities used a set of clear modules specific to waste management, KPAS activities were 'ad hoc' and generally encompassed all aspects of the environment.

Upon the researcher's receiving consent from the school's principal, the school counsellor selected the five students for interview. Although this method can cause a 'sampling bias' of respondents, it was necessary in order to meet the aim for the interview, i.e. to gain the insights of those that are known to be involved or to participate in environmental or SWM programmes in their school. According to Patton (2005, p. 10):

> Understanding the program's and participants' stories is useful to the extent that those stories illuminate the processes and outcomes of the program for those who must make decisions about the program.

All five students interviewed were 14 years old. According to the students, KPAS had been established almost two years before the SMART Ranger programme came to the school. When posed with the question of 'What is your perception on waste and recycling?', the responses indicated that the students thought waste was both a negative and a positive entity:

> It is unused waste [recycling]. Many [Malaysians] have an attitude and won't cooperate. (KPAS; member 1) (S4.5)

> Some waste can be recycled . . . Many do participate and have a positive attitude . . . [but] there is a lack of awareness and everyone has a role to play. (KPAS member 2) (S4.6)

> It is an eyesore. (SMART Rangers member 1) (S4.7)

> There is a lot of rubbish thrown in the river. (SMART Rangers member 2) (S4.8)

> Waste can be recycled and reused . . . is smelly and causes air pollution which affects the ozone layer, habitat and water supply. (KPAS member 3) (S4.9)

When asked what they gained from participating in SMART Ranger and waste management and waste minimising activities in school, the responses alluded to some improved comprehension and verbal skills:

> We have quiz activities and create activities. GEC donated RM2000 for us to start with these activities. I understand there are positive and negative impacts of waste . . . but [I think] there is a lack of awareness [among students]. (KPAS member 2) (S4.10)

> I think [I gained] some positive impacts, such as I learned how to communicate with friends and teachers [more]. (SMART Rangers member 2) (S4.11)

> It is hard to get students involved [in environmental activities]. Teachers help us out [when they can]. When we discuss in the club we sometimes argue about things. I think we learn some managerial skills, especially when preparing the folio [report on activities and progress made]. We learn how to make a proposal, contribute ideas, and work together. We try to understand each other and sometimes there is conflict. (SMART Ranger member 1) (S4.12)

When asked about the efforts of organisations external to their school to increase waste awareness, only one student (member of SMART Ranger) commented. It was noted that by nodding gestures, the others agreed.

> The local council can give more input to schools, and organise competitions, have media coverage and involvement, create events for school children . . . and the companies can also help out. (SMART Ranger member 2). (S4.13)

The main impacts to students based on the responses above indicate that being involved had raised more awareness of the negative aspects of waste and had simultaneously improved other skills, such as those related to communication, generating ideas and working with other students. The module-based activities suggested that participatory actions may encourage students to become more aware about SWM.

4.3 Programme constraints: SMART Ranger coordinator's insights

The main aim of this section is to describe the hurdles perceived by the coordinator of the NGO involved, in initiating and implementing the SMART Rangers programme. The constraints are mostly institutional and financial, i.e. they are related to sustaining the programme and overcoming general public indifference. The effectiveness of sustainable waste programme implementation with the general public can be constrained when there is a lack of support from officials (Refsgaard & Magnussen 2009). This section highlights the NGO's key respondent perspectives on why officials and the general urban public are not as enthusiastic about the programme as those involved in the programme. The coordinator also indicates that there is a lack of concern from officials for facilitating funding. This he perceived as due to a 'mis-match' or lack of understanding about the NGO's position and the waste education concept. He also perceived that some officials viewed supporting environmental NGOs' work as additional workload, and he recognised that some did give their support, although not wholeheartedly. According to the SMART Rangers project coordinator:

> Under LA21 [Local Agenda 21, a government policy], community participation is a must. Most communities want to be involved, but they don't know how. There is money available in this country but nobody knows how to gain access [to these funds] (S4.14)

> If you see, waste management falls under the jurisdiction of the PBT [Pihak Berkuasa Tempatan or Local Authority]. We work closely with the LA [Local Authority]. We manage to secure partnerships .

> . . . They provide all in-kind contribution, logistics, e.g. MBPJ [Petaling Jaya Local Council], MBSA [Shah Alam Local Council] . . . so they give full support. Lately when the Solid Waste Department was established, we also approached them [and] they also support us; they are also one of the funders. But in saying that it doesn't mean they give 100% support. (S4.15)

> The perspective of the NGOs, is that they [the Local Authority] should support funding; because we [NGOs] cannot generate income, so we cannot implement activities without funding. It's not only the launching, even to develop the activities, for, e.g., the time involved for us to go, it's consultative, they must buy in from both parties, and come up to common goals. It involves time, and time means money. The government must understand it is not just money in kind but the time [spent]. (S4.16)

When asked about the opportunities that GEC or SMART Rangers have gained to discuss the programmes with local authorities, the coordinator remarked:

> We have had some discussions but they [the authorities] still need time. Some are still thinking that NGOs should be doing it free. They [the authorities] are being paid to do their job but who are paying us? So these are the setbacks, constraints in the monetary support from the respective agencies. (S4.17)

When asked what the biggest constraints were, the coordinator pointed out that different motivations and a 'fixed' mind-set can affect the programme implementation:

> When government has projects [that involve communities] they won't approach anyone. Because they have no need [less priority] to spend or leverage. That is the biggest difference between government and NGOs. We try to leverage. This is what the government has to think. Cancer Society and HIV gets much [funding], but environmental NGOs not so much [funding]. Maybe because we go against development. They [the government] have that mind paradigm. (S4.18)

Bolaane (2005) contends the idea of 'maintaining the status quo' is rather prevalent among state officials, who are not easily changed. From a systems perspective, the different priorities, interests or motivations of different actors involved with programme implementation can be a source of conflict (Keen et al. 2005). This can form a hindrance to the implementation of actions. When asked what strategies would be appropriate to counter this issue, the coordinator contended that the officials have to move past traditional ways of thinking, i.e. responding only to public complaints, to solving the problem more holistically:

> Certain department has started to implement [funding for recycling programmes], except new departments. We are giving them time and we get kind contribution; if any other NGO approaches them, they can get money . . . but still some desk officers will find it difficult to digest. So, it's no more policy level; it is more on the implementation level. Some are in the old school thought and difficult to change. (S4.19)

> Now they are talking about KPI (Key Performance Index). The key [concern] is in the complaints [made by the public and officially reported to the relevant government department]. They [the officials] don't think about the solutions to waste management . . . just the complaints. That kind of mentality needs to change. (S4.20)

The urban public's indifference is another limitation to programme implementation, according to the coordinator. He observed:

> . . . even though they [urban public] are aware, and interested, there is no willingness to [be] involved. They give 101 ideas when we call a meeting. But when we call for action, there is no willingness. Because they believe it is part of the Local Authority's work: 'It is collection, so why should I carry out this and waste my time?' In Malaysia, we are lacking on that [practice of civic science as in developed countries]. Tertiary [having a degree qualification] is common in our country. But people in BMWs are the ones throwing the rubbish. So why [do] the highly educated people do this? (S4.22)

4.3.1 Current issues of implementation

Officials' lack of consideration for the objectives of the programme (refer to statements S4.15 and S4.18–S4.20) can give rise to tension or conflict between different actors (Brown, Keen & Dyball 2005). According to the coordinator in this case study, waste officials in general had a lack of knowledge about the total concept proposed by SMART Rangers. This suggests that a lack of understanding or miscommunication may be present in the process of implementation. The lack of knowledge about recycling among municipal staff, for example, was one of the reasons cited by Noor (1996) for the failure in initiating the recycling programme in Selangor. Local waste officials in Selangor were also generally less enthusiastic about 'social' aspects of SWM, i.e. raising awareness and initiating community involvement, and regarded this as additional work that should be taken up by NGOs (Kamaruddin and Omar 2011).

The officials are perceived to have the misconception that voluntary work by an NGO does not require funds to operate. This could impede the extending of funds. From an environmental management perspective, this lack of understanding may be due to a 'lack of awareness' among different stakeholders of the need to take social factors into account, thereby wasting the opportunity to enable learning (Ison 2005).

In addition, despite initiating consultations with the general public, SWM actions are not realised by many. The coordinator perceives urbanites to have a 'disconnection' between an

environmental concern and the willingness to act. Although the urban community is aware about environmental issues, such as waste and recycling, they are perceived as not prepared to act, due to indifference and complacency. Furthermore, there is no regulation to recycle (NSPSWM 2007), which further increases public apathy towards SWM (Othman 2002).

4.3.2 Strategies implemented

The NGO in this case study overcame limitations about funding support by approaching other organisations for funds. It collaborated with other 'like minded' organisations, such as the Danish International Development Agency (DANIDA), to obtain the necessary funding and support (UNDP-GEF 2007). It carried out consultations with the school community to extend the knowledge about sustainable waste management, and provided monetary and technical inputs (GEC Annual Report 2006).

> The consultation is by NGO . . . The consultation must involve [the relevant actors] before, during and after the project. Even the planning stage. We need to know the needs of the local people. We find the product based on the needs of the people [e.g. school communities]; not find the product for the space. The consultation is vital . . . So while we are in our project we are empowering the community to know their rights, what to apply, where to approve. There should be money for all people. (S4.23)

Based on the increasing number of school participants, obtaining programme support from the school communities was not an issue to the NGO (SMART Ranger 2011). In this case, the NGO acted its role as consultant or advocate by having discussions or consultations with the students, as mentioned in statement S4.4, and confirmed by the students involved in statement S4.10 and the activities reported in another school (Sri Kelana SMART Rangers Blog 2010). It identified the relevant communities' needs before any proposed project implementation. This is parallel to the process where 'meet, understand and manage', or 'MUM' (Holden 2008), enables different groups or individuals to exchange ideas and discussion, and to implement actions. It also supports the community of practice social learning strategy (Wenger 2000) that competencies that make up a system rely on mutuality in understanding, reciprocal engagement and shared routines, as referred to in Chapter 2.

4.4 Evaluating emerging learning themes: The role of the 'expert knowledge' facilitator

The aim of this section is to evaluate in a systematic manner, what concepts are important for a facilitator to enable an effective SWM-related awareness and management programme implementation. A relevant qualitative approach was used to enable the themes to emerge, so that inferences about them could be made. In addition, the objective was to interpret whether these themes supported the elements of social learning (Fazey et al. 2005). The themes or categories were evaluated and framed in a matrix format. In the process of analysing *how* the facilitator initiated and consequently implemented the programme, it was important that the researcher understood the underlying constraints faced. This would be useful for formulating potential strategies for improvement. Furthermore, *how* each dimension was interconnected would add some indication to the task of prioritising matters for more-effective implementation of a sustainable waste programme within this study's context. The data used for the analysis were the transcribed text obtained from the expert, i.e. the facilitator and coordinator of SMART Rangers with a background in environmental science, Dr Kalithasan.

4.4.1 Qualitative data analysis approach

The text analysis applied a content analysis approach (Krippendorff 2004; Weber 1990). A more detailed description and rationale for using this technique was given in Chapter 3. In general, content analysis is a technique to analyse text to provide meaning or understanding of the textual data in its context, and it can provide answers to the research questions (Krippendorff 2004). In other words, the analysis enables textual data to be explored, constructed into meanings and measured, providing understanding about some important considerations (Gephart 1993). For this thesis, a directed content analysis technique was applied (Hsieh & Shannon 2005). A key consideration for using this approach is to 'validate or extend conceptually, a theoretical framework or theory' (Hsieh & Shannon 2005, p. 1281).

According to Hsieh and Shannon (2005), the directed content analysis approach guides initial coding categories, and the findings can 'offer supporting or non supporting evidence for a theory' (p. 1282). The codes can also be determined taking the relevant theoretical variables into consideration (Hsieh & Shannon 2005). Following this line of argument, the analysis of the qualitative data in this chapter involved three steps. First, words were transcribed and coded into categories according to their obvious meanings, guided by elements in the theory

of a social learning process (Webler et al. 1995). This is shown in Table 4.2. Second, the categories were grouped according to similar meanings as interpreted by this researcher and shown in Table 4.3. Third, to gain some clarity and understanding about the findings, given that the social learning concept has remained vague and complex (Ison & Watson 2007; Ison 2005; Reed et al. 2010) and understood in different and overlapping ways (Bommel et al. 2009), the categories of evidence were framed within the variables identified within the social learning perspective as indicated in Table 4.4.

4.4.1.1 Text categorisation

Dey (1993) suggests that categorisation is a way to organise the complexity and specificity of qualitative data. The categories formed in the analysis of this study were based on this researcher's interpretation of the meanings of the statements derived from the transcribed text. Through a systematic classification process of coding and identifying themes, qualitative content analysis allows for the subjective interpretation of the content of text data (Hsieh & Shannon 2005).

At the first stage of categorisation, the statements were grouped for the first level of categories based on a literal description of the text, and assigned keywords. For example, the response, *We started with PJ Sri Kelana [school]*, was categorised as 'Involvement with school'; or *When we have training . . . art of recycling, how to sort, composting . . .* was categorised as 'Environmental educational activities'. And, although this provided a meaning to the response, this approach produced too many initial categories (a total of 19) (refer to Table 4.2). Grinnel and Unrau (2008) contend that analysing text for first level categorising of data is a necessary step in analysing qualitative data. This step can lead the researcher to develop more-meaningful and theoretically focused categories.

Table 4.2: Initial categories formed from the responses of the SMART Rangers coordinator

Categories	**Word count**
Advocacy and consultancy	299
Institutional barrier	285
Strategies to increase SWM behaviour	214
Environmental education	205
Personal motivation	130
Perception on waste	118
Factor to non-participation	105

Financial constraint	104
Objective of waste programme	93
Involvement with school	79
Knowledge dissemination	63
Partnership with Local Authority (LA)	59
Indicator of programme success	32
Factor to failure of recycling programme	29
Perception of waste	29
Motivation of community	20
Perception of recycling programme	18
Strategies to gain rural involvement	14
Financial support	7
Total	1903

Therefore, to maintain a clearer focus, this researcher decided to group several categories based on similar context and on the questions posed during the interview. The codes were derived from the words from the text that appear to capture key ideas (Hsieh & Shannon 2005), and interpreted based on the relevant social learning dimensions reviewed in Chapter 2. The first-level categories mentioned (a total of 19) were then grouped based on their similarities in meaning, and reduced to seven. For example, both 'Environmental education activities and 'Involvement with schools' were grouped with other pertinent categories to become 'Build capacity and understanding', as indicated in Table 4.3. Codes can be sorted into categories based on meaningful clusters, i.e. researchers can combine a larger number of categories into a smaller number of categories (Coffey & Atkinson 1996; Hsieh & Shannon 2005; Patton 2002).

The seven subsequent themes formed were: *Build capacity and understanding with community*, *Reflective capability*, *Identify institutional barriers*, *Advocacy role*, *Formulate strategies*, *Financial concerns* and *Build partnership with local authorities* (Table 4.3).

Table 4.3 Principal categories

First level categories	**Second level categories**	**Word count**
• Involvement with schools • Objective of waste programme • Environmental education • Strategies to gain rural involvement • Knowledge dissemination • Perception of waste vendor • Indicator to programme success	Build capacity and understanding	619

• Perception of waste • Personal motivation • Failure of recycling programme • Perception of recycling programme • Factor to non-participation	Reflective capability	420
• Identify institutional barrier • Financial support	Institutional barriers	269
• Motivation of community • Advocacy and consultancy	Advocacy role	266
• Strategies to increase SWM behaviour	Formulate strategies	133
• Financial constraint	Financial concerns	128
• Partnership with Local Authority	Build partnership with Local Authorities	68
Total		1903

4.4.1.2 Text Analysis

The next analysis conduced was to obtain the word count, which represents the frequency of occurrence of words used for each category. Assuming terms are important if they are repeated frequently (Jehn & Jonsen 2010) the counts help to indicate the extent of a particular position (Woods 2006), and in some instances, can be used to make inferences about matters of concern (Stemler 2001). However, Stemler (2001) also contends that there are counter-arguments that should be considered. For example, he mentions that some words may have multiple meanings. Thus, he suggests that researchers look at the words in their context, rather than merely at the word frequency.

The five most-mentioned keywords analysed here were those assigned to the *Build capacity and understanding* category followed by *Reflective capability*, *Institutional barriers*, *Advocacy role* and *Formulate strategies*; while the least frequently used words were in the categories *Networking with Local Authorities* and others , followed by *Financial concerns*. If assuming that having a higher word count related to a higher concern or interest for a particular issue, then the higher frequency of words related to building communities' capacity was expected, based on knowledge of the coordinator's years of experience implementing such programmes in schools. However, the low word count attached to the two categories with the fewest words contradicts this assumption, because in the interviews it was apparent

that there *was* a concern that Government staff could be more flexible and not have a 'set' way of thinking on the concept of waste awareness. In addition, although the *Financial concerns* category had the lowest word count attached, it *was* mentioned as the biggest concern for the NGO coordinator (refer to S4.18–S4.19). The coordinator perceived that the lack of partnerships or involvement of government agencies puts a constraint for interested organisations to access to funding, and therefore was a main concern.

4.4.1.3 Text linkage

The subsequent analysis is to determine the nature of the relationships between the categories. Morse and Field (1995) suggest that linking categories or themes can be based on their concurrence, antecedents, or consequences of addressing the specified outcome. In this case, the categories (which reflect the social learning variables) are linked to gain an understanding of the process involved that leads towards a positive outcome. This was implemented by considering the obvious reference from one category to another while reviewing the transcribed text (Hsieh & Shannon 2005). For instance, the following quotation from Dr Kalithasan indicates that there is a link between implementing activities (*Building capacity*) and funding required, but this can be constrained (*Financial concerns*) by some institutional limitations (*Institutional barrier*) or lack of understanding (about the process and concept):

> The perspective of the NGOs, is that they [the Local Authority] should support funding. because we [NGOs] cannot generate income so we cannot implement activities without funding. It's not only the launching, even to develop the activities, for, e.g., the time involved for us to go, it's consultative, they must buy in from both parties, and come up to common goals. It involves time, and time means money. The government must understand it is not just money in kind but the time [spent]. (S4.24)

Therefore this creates the need to collaborate with other organisations or find other means (*Formulate strategies*) to sustain the programme. These efforts illustrate the different forms of *participation* (Arnstein 1969) which also involved the target audience in the programme. The programme was designed to be *Integrated within the system* relevant to meet the individual or shared objectives more effectively, i.e. in this case, in support of social and educational actions in SWM. Thus, each category may have its own connotation within the context of this study, but each is indirectly or directly linked to the others. Figure 4.5 illustrates the nature of relationships that existed.

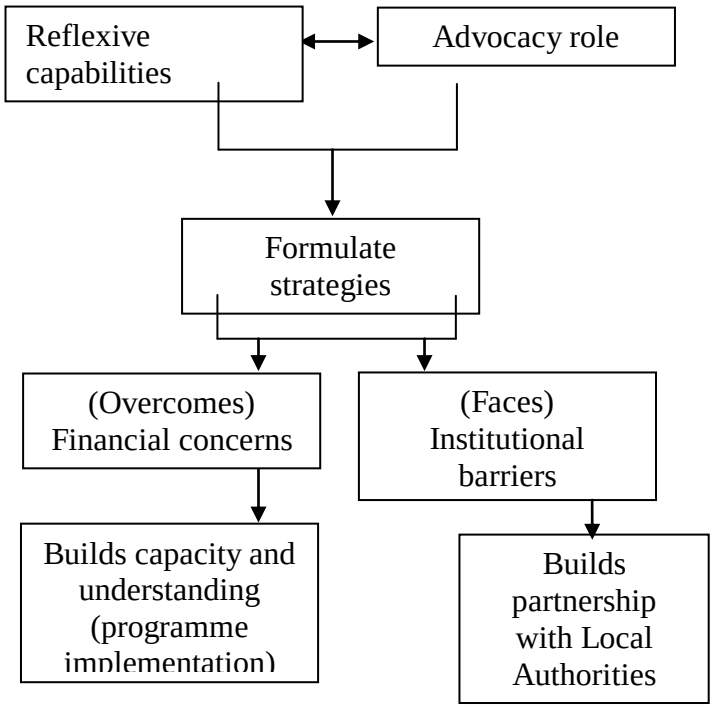


Figure 4.5: The relationships of reflective capabilities

4.4.1.4 Degree of involvement

The final analysis was to present the evidence and efforts made to facilitate this SMART Ranger programme and reflect the relevant themes pertinent to social learning. This is achieved by using a simplified and modified version of a 'logical framework' (Logframe) model (Bell & Morse 2008, p.122). The approach to this framework is to represent the project (of concern) in a format (usually in a form of columns or matrix) that highlights aspects of the project in formal or informal terms, e.g. the performance of the project, the activities, outputs and assumptions associated (Bell & Morse 2008). The evaluation is also guided by the definitions of the pertinent concepts highlighted in Chapter 2.

Table 4.4 highlights this researcher's interpretation of the elements of social learning (Keen et al. 2005) codified within the activities of the programmes represented by the efforts or actions implemented.

Table 4.4 Conceptual representation of the social learning dimensions with the processes related to the SMART Ranger programme

Reflections of learning dimensions				
Learning dimensions Themes	Participation (Co-acting and monitoring the programme)	Integration (Collaborate with other funding organisations)	Negotiation and communication (Negotiate with policy makers to overcome lack of knowledge)	System orientation (Consider current local context)
Reflective capability	A high degree of effort	A high degree of effort	A high degree of effort	A high degree of effort
Financial concerns	A high degree of effort	A high degree of effort	A high degree of effort	A high degree of effort
Institutional barriers	High	High	High	High
Build capacity and understanding	Medium efforts with LA Higher efforts with schools, corporate bodies and not for profit entities	Medium efforts with LA Higher efforts with schools, corporate bodies and not for profit entities	Medium efforts with LA Higher efforts with schools, corporate bodies and not for profit entities	Medium efforts with LA Higher efforts with schools, corporate bodies and not for profit entities
Advocacy role	A high degree of effort	A high degree of effort	Low to medium efforts with LA	Higher efforts with schools,
Formulate strategies	A high degree of effort	A high degree of effort	Low to medium efforts with LA	Higher efforts with schools,
Build partnership with Local Authorities	Low to medium efforts with LA	A high degree of effort	Low to medium efforts with LA	Low to medium efforts with LA

In this study, the social learning variables were placed within a specified context. For example, the variable 'participation' refers to the programme's monitoring and coordination effort made by the respondent, in this case the SMART Rangers programme. The degree of 'highness' or 'lowness' attached to the variables when compared with the particular category, e.g. *Reflexive capabilities* or *Build partnership with local authorities*, is interpreted as the level of support for facilitating social learning.

4.5 Discussion: Essential themes that support facilitating social learning

The evidence in this case study indicates that the learning concepts described in Chapter 2, i.e. involvement with different actors, facilitation of platforms for discussion, and negotiation to overcome constraints (Ison & Watson 2007; Keen et al. 2005) are embodied in the efforts made by the facilitator of the NGO involved. The findings indicate that personal motivation and experience of the initiator and effective forms of communication between two different actors are necessary for an effective programme implementation. A key is the participation it gained from other actors, i.e. the targeted audience (school students). Initiating consultations was necessary to gain support for the implementation of the desired actions. Knowledge disseminated was specific to the targeted population (Grodjinska-Jurczak 2003), and the process engaged people and improved understanding. Existing 'platforms', i.e. environmental clubs in schools, institutional mechanisms (co-curriculum in schools) and national strategies (NSPSWM 2007), played a role in enabling a SWM programme to be implemented.

Promoting awareness and actions in this programme required financial support from the state but faced a constraint from officials who had a lack of understanding about the goals of the programme. This suggests that the coordinator and his organisation could develop more ways to bond with those in authority, as they have proven to have done with the school community. Developing waste officials' capacity for understanding may require other relevant approaches (Rathi 2007). An example is through co-acting and engaging in knowledge activities with the officials (Arnstein 1969), playing the role of an advocate by negotiating and making contacts with others already in partnership with the state (Dyball et al. 2005).

The extent of teachers' involvement was limited to monitoring the club's progress periodically (refer to S4.11–4.12). The students' responses suggested that their teachers' involvement was minimal (refer to S4.12). Despite an educational programme's objective to build the capacities to involve both students' and teachers' leadership (York-Barr & Duke 2004), this is yet to be realised.

Another element identified within this process is related to 'how' the programme needs to be implemented, or what facilitating process is involved. The SMART Ranger programme was initiated parallel to the state government's policy to involve the community with local authorities in sustainability actions. Such a conducive policy context can support sustainability initiatives (Ison & Watson 2007). The NGO approached the schools and

incorporated the programme through the existing environmental clubs in the schools, relying on its own module (SMART Ranger 2011). This incorporated existing activities and 'expanded' on the existing mechanism or context for students to participate in sustainable activities. For example, training and information on waste management did not use external input but contributed by the GEC staff or the coordinator who had the necessary training and qualifications. The programme was also incorporated within KPAS (while maintaining a focus on waste management) and complemented it, rather than competing for space and manpower resources.

An issue of concern was the constraint in financial support for the programme. Funds were necessary to print the relevant materials and some initial start-up materials for various related SWM activities. These were obtained either through collaboration with other organisations or from school funds. Schools had limited budget from the Ministry of Education to run extra-curricular activities. Therefore, a strategy by this NGO was to source funding specifically for the SMART Rangers programme by seeking other organisations' funding support.

The finding here suggests that the lack of knowledge or general indifference from the authorities can constrain an NGO's facilitation of programmes for sustainable waste management. Although lack of finance can be solved by finding alternative means for funding support, overcoming the indifference of officials and the general urban community to the cause can be problematic. Regarding this, studies suggest programme facilitators should ensure means to have efficient communication, particularly with local authorities who may have their own agenda (UNDP 2008). This includes making an attempt to explain the pros and cons of NGO involvement towards waste SWM (Agamuthu et al. 2009). An explanation of roles may foster active communication and participation to affect a 'shift in personal understanding' between different actors (Ison 2005). Training municipal staff to be more knowledgeable of recycling (Noor 1996) may also increase their awareness to support NGOs' efforts for SWM.

Summary

This chapter has attempted to frame the steps that the facilitator of an NGO took to implement its waste minimisation module. In the process, it identified the constraints faced by the coordinator. The questions posed to the respondents in this case followed a set 'protocol' developed during the research design stage (Chapter 3: Methodology). The main

aim was not to obtain 'answers' for each question; rather, the objective was to gain some understanding of what the constraints were and how these were resolved. The primary data presented are the perceptions and expert knowledge of a key member of personnel attached to Global Environmental Centre (GEC), a not-for-profit organisation, and the perceptions of two SMART Rangers student members and three KPAS student members. The 'expert knowledge' gained from the focused interview with the coordinator of the programme was able to reveal perspectives not normally shared with others (Froschauer & Lueger 2009). The community based NGO of this case study can be categorised as an 'intermediary NGO' (Sanyal 2006), based on its characteristic of already having some links with the local municipality, and the fact that its activities included innovative programmes geared towards building the community's capacity in some issue. It also had continuing links with the local community.

The secondary data are from materials on the NGO's website, which are available to the public, and from published reports of the NGO. These are information in the form of leaflets, posters, brochures and newsletters, and they provide information on the organisation's goals, structure, activities, sources of finance and collaborative efforts. In addition, the information posted on the pioneer school blog related to the SMART Rangers programme was used to support the informant's evidence of the positive impact of the programme.

In a case study evidence can include a mix of qualitative and quantitative evidence (Yin 2003; Creswell 200). Therefore, in this case study, the frequencies of responses gained through the semi-structured questioning strategy were also quantified to enable this researcher to interpret the extent of the concerns identified by the main respondent. Themes derived from the analysis were linked to gain an understanding of the nature of linkages contributing to an outcome in social learning, i.e. building people's understanding and capacity (Brown et al. 2005). The categories coded were presented in a matrix format, and these formed the main themes. These elements of social learning, as reviewed in Chapter 2, were discussed in the context of strategies to overcome hurdles and foster better waste awareness, which are effective enough to create a sustainable change of behaviour.

This NGO's effort is shown to promote Government's strategy of instilling SWM awareness, but the NGO's coordinator perceived that, in the process, it faced institutional constraints that limited the forming of an efficient network or partnership, especially with authorities. The

coordinator and key informant of the NGO involved viewed that the waste officials were more concerned with the technical, and enforcement, rather than with the 'social' aspects of SWM. Despite the fact that everyone must give their support and play their role in SWM (NSPSWM 2005; UNCCC 2009) the 'fixed mentality' often associated with government officials is an issue not easily resolved (Ison 2005).

The findings from this case study will later be compared with those from another case study (Chapter 5) and the survey of students' recycling participation (Chapter 6). The findings will be synthesised and described further in Chapter 7. The understanding gained will be incorporated as part of the overall conceptual model to be discussed in Chapter 8 of this study. The model would be a guide to describing the role of an environmental NGO in implementing waste minimisation programmes and relevant efforts with communities.

Chapter 5

Case Study B: TrEES' community based SWM projects

Introduction

The case study in this chapter describes the contributions to the promotion of SWM by another environmental NGO, Treat Every Environment Special, or TrEES. This chapter further helps to clarify the role of an environmental NGO in a local context. TrEES is a Malaysian based environmental NGO established as a not-for-profit entity to advance environmental conservation awareness. TrEES was identified as one of the earliest NGOs and facilitators of community waste/recycling programmes in Selangor, Malaysia in the report prepared for the Ministry of Housing and Local Government (MHLG) (JICA 2006). TrEES is also acknowledged by MENGO (a group comprising 18 other environmental NGOs) as having initiated several community based SWM programmes (MENGO 2011). As mentioned in Chapter 4, environmental NGOs have facilitated communities to manage environmental resources and build capacity (Pretty & Ward 2001). From a 'social learning' perspective, a role of an environmental manager is to 'create learning experiences, to re-establish the mental connections between actions and environments, thus creating pathways for social change' (Keen et al. 2005, p. 4). This chapter seeks to describe how the environmental NGO in the case study performs this 'role' within its local context. The experiences of the community waste programme (CWP) coordinator in the implementation of two of its projects are described to meet the objective stated and to answer the research questions posed in Chapter 1. The descriptions and explanations help fill a gap identified in Chapter 1, i.e. that the 'role and responsibilities of NGOs' (in the context of SWM in Malaysia) need clarification to enable more-effective programme development (JICA 2006, p. 3).

There are four sections in this chapter. Section 5.1 provides a description of the methodology applied. Section 5.2 describes the NGO's profile, its aim, organisational structure and programmes' objectives. Section 5.3 focuses on the actions and processes involved in implementation of the projects under the Community Waste Management Programme (CWP) and the Programmes with Schools (PwS). Section 5.4 highlights the institutional and social constraints the coordinator of this NGO perceived in the process of implementation. Section 5.5 evaluates the evidence derived from the interview held with the coordinator, and the main

themes of concerns are framed within the 'social learning dimensions', as was identified in Chapter 2.

5.1 Methodology

The case study highlights two TrEES programmes relevant for the purpose of this thesis, i.e. the CWP and the PwS (TrEES 2011). Relevant primary and secondary evidence was obtained and analysed. Responses were gained from the TrEES coordinator (considered as an expert informant), from an environmental and waste officer of the Majlis Perbandaran Subang Jaya (MPSJ), or Subang Jaya Local Council, and from the administrator of one of the earliest charity homes to be involved with TrEES, Pusat Cahaya Kesayangan (PCK). The MPSJ officer was attached to the environmental and waste management enforcement unit of the local council, which had collaborated with TrEES in previous community waste related programmes, particularly those involving schools in the council area. The charity home administrator and recycling centre had collaborated with TrEES for the previous nine years. This researcher could not obtain a willing interview subject, i.e. a key informant, from the retailer concerned, Giant Hypermarket.

The interviews held with the key respondents were to obtain reflections on the experiences relevant to the programmes' implementation (Wroblewski & Leitner 2009). In this respect, the facilitator of TrEES, the charity centre administrator and the MPSJ officer interviewed fit the criteria of those with 'expert knowledge', as posited by Meuser and Nagel (2009). That is, they had knowledge 'which he or she may not necessarily [have] possess[ed] alone but which may not [have] be[en] accessible to other persons'; they had 'access to privileged information', were 'linked to a specific context and its functional requirements', were 'active participant(s) in community affairs', e.g. NGOs, and were public administrators who had 'acquired a special knowledge through their activities' (p. 24). According to Wroblewski and Leitner (2009), obtaining expert knowledge about an issue of concern is pertinent when the matter can be answered only by the individual(s) involved, as the information is rarely stated explicitly in published documents. In doing a single case study, Trellis (1997) suggests that 'a researcher must avoid being dependent on a single informant and seek the same data from other sources to verify its authenticity' (p. 11). Yin (2003) posits this as testing for construct validity by corroborating and augmenting evidence through the use of varied sources of information. For this case study, the responses of the TrEES coordinator (Christa Hashim)

were corroborated by data obtained from the interview with the local authority's (MPSJ) officer and those from the administrator of the charity home. Both had collaborated in SWM activities or programmes with TrEES. Moreover, secondary information from press releases, reports and various Websites was used to validate and augment the evidence. In addition, responses were obtained from a sample of students whose schools had participated in TrEES' PwS environmental outreach campaigns. This programme included recycling and reduction of waste projects.

The student sample chosen for this case study is part of a bigger sample survey as described in Chapter 6. However, for the purpose that is more relevant for this chapter, the sampled students' responses from a school in Subang Jaya, Selangor (15 respondents), and a school in Shah Alam, Selangor (40 respondents) were used. The aim was not 'to draw conclusions that would be generalisable to the population of interest', i.e. school students, but to conveniently gain useful information about students' perspectives that was relevant to the case study (Sekaran 2003, p. 280). Table 5.1 lists the participants interviewed or surveyed in this case study.

Table 5.1: List of participants

No.	Respondent	Organisation	Position	Data Collected
1	Christa Hashim	Treat Every Environment Special (TrEES)	Coordinator/Director/Founder	Responses obtained from face to face interview
2	Local Authority Officer	Majlis Perbandaran Subang Jaya (MPSJ) (Subang Jaya Local Council)	Environmental, Health and Waste Enforcement	Responses obtained from face to face interview
3	Indrani Doraisamy	Pusat Cahaya Kesayangan Charity Home for the Disabled	Administrator and Caregiver	Responses obtained through a phone interview
4	15 students	Sekolah Menengah Kebangsaan (SMK) USJ 4 Subang Jaya Selangor (National	Students of one of the schools involved with TrEES' school environmental programme. However, on an individual basis, may or may not have participated in TrEES' programme in their school.	Self reported responses extracted from the main questionnaire survey.

		Secondary School USJ 4)		
5	40 students	Sekolah Menengah Kebangsaan (SMK) Seksyen 18, Shah Alam Selangor (National Secondary School Section 18)	Students of one of the schools involved with TrEES' school environmental programme. However, on an individual basis may or may not have participated in TrEES' programme in their school.	Self reported responses extracted from the main questionnaire survey.

The evidence was analysed, interpreted in its context, and, for the purpose of further analysis, framed using the elements pertinent to the 'social learning' framework described in Chapter 2, i.e. 'reflection', 'participation', 'negotiations' and 'integration within a systems perspective'.

5.2 Background of the NGO: 'Treat Every Environment Special', or 'TrEES'

TrEES, a Malaysian based and registered environmental NGO, was founded in 1995 by two Malaysian women, Christa Hashim and Leela Panikkar, as a not-for-profit organisation to 'inspire and activate environmentally sustainable lifestyles among Malaysians' (Netto 1997). The founders of TrEES, i.e. the two women mentioned above, also coordinate all programmes under TrEES. They believe in 'engaging diverse sectors of Malaysian society, at both local and national level, to work together in conserving the environment' (TrEES 2011). The NGO is managed and operated by the two women, with the assistance of a supporting staff member who undertakes general duties, including transporting collected recyclables from various recycling centres under TrEES coordination, to be sold to recyclables vendors.

The directors of this NGO contended that the urban community, compared with the rural community, is the most 'disconnected' from the natural environment and increasingly places demands on both man-made and natural resources to meet urban lifestyles (TrEES 2011). The NGO's Website draws attention to the fact that the daily lifestyles of the Malaysian public are unsustainable and that, generally, the public perceives individuals as not being able to improve the situation (TrEES 2011). Thus, to encourage the public to be more environmentally responsible and to lead a more sustainable way of life, TrEES initiated some programmes that would enable the public to participate in environmentally relevant activities

(MENGO 2011). TrEES is a member of the Malaysian Environmental NGO (MENGO). MENGO is a coalition comprising 19 environmental NGOs based in Malaysia, and has been actively disseminating information and setting up information booths for the public to gain information about recycling and environmental conservation (MENGO 2011).

TrEES' organisational profile on its Website highlights two other programmes with the overall aim of conserving the environment and reducing the impacts of climate change and loss of biodiversity (TrEES 2011). They are: 'Conservation Programme' (CP) and 'Biodiversity and Climate Change Community Centre' (BCCCC) (TrEES 2011). The general aim of these programmes is 'to raise their [urban communities'] awareness on environmental issues and empower these groups to conserve and manage the environment responsibly' (TrEES 2011). A key component of these initiatives is to link with or involve the public in the implementation of each programme.

TrEES was one of the earliest environmental NGOs in Malaysia in the 1990s to pioneer community based recycling centres (TrEES 2011). Household recycling programmes were considered 'relatively new' at that time and still in the infancy stage (Noor 1996). In 1996, TrEES set up a community based recycling centre in Klang, Selangor, which partnered a charity home for the poor and handicapped. The NGO was highlighted as being active in promoting recycling with the public and supporting the MHLG's, or Ministry of Housing and Local Government's, recycling campaign in 2000 (Anonymous 2000). In 1997, the MPSJ council in Selangor selected TrEES as one of its partners to provide support in setting up recycling centres in the town of Subang Jaya (Urban Habitat 2002). Subsequently, in 1999, with the support of MPSJ, TrEES collaborated with a hypermarket in Subang Jaya, Giant Subang Jaya, to coordinate a recycling centre within the latter's premises. About the same time, TrEES also coordinated with the hypermarket's outlet in Pasir Gudang, in the state of Johor (Liew 2005). Table 5.2 lists the recycling centres that TrEES helped initiate through partnerships with other members of the community. This list featured on its Website (www.trees.org.my).

Table 5.2 Recycling Centres that collaborated with TrEES

Location (states in Malaysia)	**Charity organisation**
Selangor and Kuala Lumpur	• Pusat Cahaya Kesayangan • Rumah Kids • Persatuan Rumah Grace • St. Barnabas Home for Children • Pusat Kasih Sayang • Persatuan Spastik Kanak-kanak Selangor • Rumah Amal Cheshire • Pure Life Society Rumah Charis
	Retail centres
Johor	• Giant Hypermarket Plentong, Johor • Giant Hypermarket Tampoi, Johor - These were opened only at specific hours and on specific days.
	Residential area
Selangor	• MBPJ Car Park in Taman Jaya - This opened only every Saturday for three hours.

Source: TrEES (2011)

TrEES continues to support the government's SWM campaigns. For example, they participated in several environmental campaigns, such as 'Love the Earth Campaign 2011' (Ali 2011), and 'Sambutan Hari Kitar Semula Kebangsaan 2007', i.e. the 'National Recycling Day Celebration 2007', on which it set up an information booth with other environmental NGOs (Berita, Aktiviti, Peristiwa KPT) (MHLG 2007). TrEES is listed as one of the NGOs that provide recycling collection services by the recently formed PPSPPA (Perbadanan Pengurusan Sisa Pepejal dan Pembersihan Awam), or the Solid Waste Management and Public Cleansing Corporation. This department was established in 2008 by the MHLG to deal with SWM strategic planning, regulation and implementation (PPSPPA 2011).

5.3 Implementation processes of TrEES programmes: Community Waste Management Programme (CWP) and Programmes with Schools (PwS)

Of the four programmes listed on TrEES' Website, the 'Community Waste Management Programme', or CWP, was one the earliest efforts by a local environmental NGO to establish

'drop off' recycling centres with other stakeholders, namely welfare/charity homes for the poor or handicapped, and commercial retailers (JICA 2006; TrEES 2011). According to its coordinator (Christa Hashim):

> Back in '95 [1995], we [referring to herself and Leela Panikkar, the other TrEES initiator] realised that urban issues were critical, [and that] other NGOs were more nature based. But we said urban waste [and the consequences of unsustainable waste management] were becoming a problem. We looked at urban people, and we took waste as a manageable problem. We don't have to wait for the government about scheme, e.g. global warming. Back then there was no LRT, [light rail transport]; people threw waste everyday. The thing is, people just throw garbage, don't bag it, animals come and litter. So, we think we can address the issue. We don't know where it's going but we know it can be recycled. We see business running recycling for profit. The Petaling Jaya City Council or MBPJ had [piloted recycling programme] kerbside bins but it failed. So we looked at individual households and factories [and they] were generating waste, but [we thought] factories can segregate waste compared to households.

TrEES initiated the CWP as a response to the concerns and the realisation of both women that urban waste was increasingly becoming a critical issue to human health and environmental cleanliness and that action was needed to counter the problem. An issue during the 1990s (and still current) relevant to unsustainable waste management in urban areas was dengue disease. The disease had spread predominantly within the urban sprawl of the Klang Valley, i.e. the conurbation of Selangor and Kuala Lumpur (Hussin et al. 2005). The number of health cases related to this disease had increased from 1,487 in 1973 to 19,544 in 1997 (Ministry of Health, Malaysia, 1996). It was found that the vector mosquito, *Aedes aegypti*, had adapted to new breeding environments, including some in built-up areas, e.g. in residences (Kwa 2005). The mosquitoes could also breed in discarded waste products such as plastic bags, bottles, buckets, tyres, soft drink cans and garden watering cans: in any containers that collected rainfall. The government had over the years implemented awareness campaigns and had engaged NGOs and volunteers to help clear rubbish from neighbourhoods (e.g. 'kempen gotong royong') to fight the spreading of this deadly disease (Sekawi et al. 2005).

5.3.1 The recycling collection network

In the Malaysian context, collection and scavenging of recyclables are carried out without any regulation, i.e. informally, with minimal local authority involvement and knowledge

(Hassan et al. 2000). According to Theng et al. (2005), recyclable items have economic value and those involved in the recycling 'business' aim to make a profit for themselves. These include various small- and large-scale operators, known as 'middlemen' or 'traders'.

The 'scrap industry', which is synonymous with recycling activities (Minter 2011), appears to be a thriving business because of the availability of recyclable waste, e.g. paper, plastics and metals produced by industries, which can be sold to bigger recyclables traders (Theng et al. 2005). In the Malaysian context, recyclables are collected by various entities, i.e. by NGO-coordinated recycling centres, by individuals such as scavengers and by the waste workers employed by the authorities to collect kerbside household waste or that from industries (Hassan et al. 2000). The recyclables are then sold to the middlemen/sub agents (Hassan et al. 2000; Theng et al. 2005). The amounts of recyclables from the centres or individuals are small in comparison with the volumes obtained from industries (Theng et al. 2005). For example, the study by Theng et al. (2005) estimated that the volume of plastics recovered from a unit of recycling centre (including from various NGOs or charity operated centres) was 5.2 tonnes/month, while recyclable plastics collected by the traders from one unit of industry was 86 tonnes/month. In their study, the volume of paper collected from a unit of recycling centre was 116 tonnes/month, while the volume of recyclable paper collected from a unit of industry amounted to 825 tonnes/month. The difference in volume collected was mainly due to the scale of operation of the particular entity (Theng et al. 2005).

Upon collecting these recyclables the middlemen, or 'sub-agents', sell them to larger recycling agents. Subsequently, these larger-scale agents will transfer the recyclables in exchange for money to either the domestic or the foreign recycling industry (Hassan et al. 2000; Theng et al. 2005). Figure 5.1 illustrates how the flow of recyclables from each source reaches the recycling dealers, and is applicable to the situation in this case study.

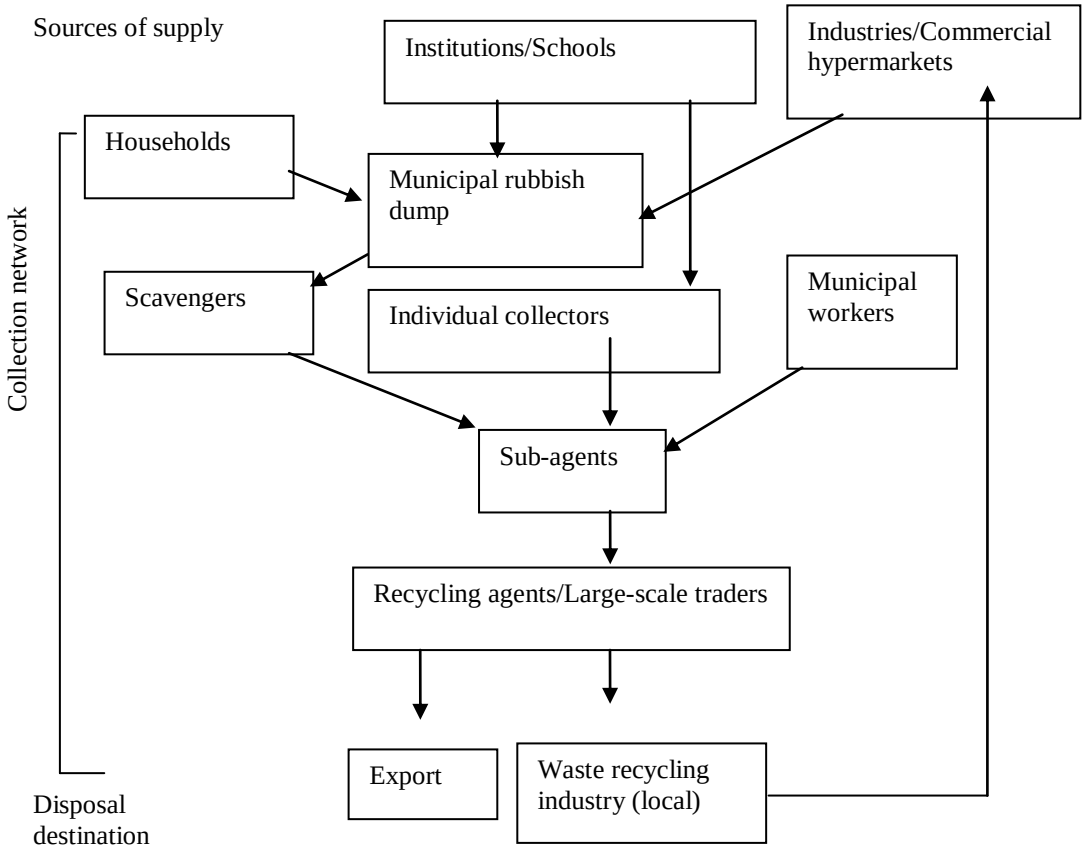


Figure 5.1: Existing waste collection network system
Source: Adapted from Nasir et al. (2000, p.325 and Theng et al. 2005)

Upon collecting these recyclables the middlemen, or 'sub-agents', sell them to larger recycling agents. Subsequently, these larger-scale agents will transfer the recyclables in exchange for money to either the domestic or the foreign recycling industry (Hassan et al. 2000; Theng et al. 2005). Figure 5.1 illustrates how the flow of recyclables from each source reaches the recycling dealers, and is applicable to the situation in this case study.

5.3.2 Partnering with others in support of SWM

TrEES observed that concurrent to the idea of recycling being an environmentally sustainable practice, the recycling business could open up potential income and employment opportunities for anyone, including those usually marginalised from some sectors of the community, i.e. the handicapped and poor. Relevant to the context of TrEES' initiative, community based SWM projects are viewed as a commitment to support the marginalised sections of society (Davies 2007). In addition, according to Luckin and Sharp (2003), community waste projects can both 'stimulate and provide a key outlet for volunteer activity'

(p. 3). Thus, TrEES' collaboration in recycling outlets with charity homes for the poor or handicapped was an attempt at opening up economic and social opportunities to the public. In addition, it provides the public a 'regulated' space to channel their recyclables (TrEES 2011).

5.3.2.1 Partnerships with charity organisations

TrEES initiated one of its first recycling centres in 1996 through partnership with a charity organisation, the Pure Life Society. This was followed by a collaboration with Pusat Cahaya Kesayangan (PCK), a home for women with disabilities located in the urban area of Klang, Selangor, where a recycling outlet or drop-off centre was placed (TrEES 2011). Location was a key consideration: the centre needed to be easily accessible to the public (TrEES 2011). Klang's population in 1991 was more than 400,000, and by 2003 it had almost doubled (Klang Municipal Council 2011). According to the Christa Hashim of TrEES:

> We came up with a drop-off system. We first approached [among others] the Pure Life [charity organisation] Society . . . and others [charity organisations]. Malaysians are good- hearted generally, so we and the Pure Life society set up [a recycling outlet] in 1996 and the launching [was] with the Minister of National Unity.

When asked about who organises the recycling activities in PCK, the administrator and caregiver of the charity home, Indrani Doraisamy, responded:

> We started this [recycling outlet at our charity home] about nine years ago with TrEES. We have caregivers – three full time and two part-time staff – to organise recycling in the centre. PCK is a centre for OKU [Orang Kurang Upaya, or people with disabilities] disabled girls. This recycling activity teaches them to separate the recyclables. It teaches them how to recognise the recyclables, for example, tins, paper, bottles and plastics . . . but glass bottles we don't take; we give [them] to the Majlis [local council] . . . it is sampah [non-recyclable waste].

TrEES' efforts with the various charity homes collected about 300 kg of household waste (including recyclables) in its first month of operation (Netto 1997). The recyclables donated by the public to the charity home's recycling outlet included newspapers, magazines, cardboard boxes, clothes and household furniture (Anonymous 2000). In the case of PCK, Indrani Doraisamy said:

> The public from the nearby neighbourhood donated clothes; people from Taman Gembira [in Klang] for example [donated household recyclables]. We do this activity [separating recyclables] once a week but the public donates recyclables anytime, and drops them at the gate and we take these into our storage area.

At the charity home of PCK, recyclables are further segregated, cleaned and then sold to recycling enterprises (TrEES 2011). According to Indrani Doraisamy, recycling activities are mostly handled by the occupants of the home under the guidance of the caregivers. When asked who does the segregating of recyclables at the centre, she replied:

> Because we have the girls [occupants of the charity centre] there are 34–35 girls . . . [they do most of the segregating of recyclables]. The volunteers help out with other things like cutting 'rambut' [hair] and some entertainment like singing [together]. The OKU girls do most of the activities for recycling here.

Actions to further segregate and clean the recyclables are necessary because the donated recyclables may have 'comingled', e.g. newspapers have become mixed with plastic bottles or clothes. Recyclables donated by the public could have been unwashed – technically termed as 'contaminated'. According to Porter (2002), those who run voluntary recycling programmes often deal with this problem and asking households to put in more effort, i.e. to clean or properly segregate, may risk 'getting less participants [and] recyclable materials' (p. 169). In the Malaysian context household waste, including recyclables, is highly comingled (Othman 2002) and may be contaminated by organic waste (food scraps), which contains high moisture content. This reduces the value of the recyclable items (Agamuthu 2001).

The income from the sale of recyclables to the traders provides some financial aid to the charity home, as indicated from the response of a charity home coordinator. For example, the average income from the sale of recyclables of PCK to recycling traders is NZD20–30 a month. Details of volumes of recyclables and revenue collected from the middlemen for this centre are not recorded, and Hassan et al. (2000) suggest that the selling price to middlemen for plastics was approximately USD0.006/kg (i.e. NZD0.07/kg), while for newspaper it was USD0.002/kg (i.e. NZD0.003/kg), depending on the currency exchange at the time. As the price for recyclables varies according to the type and market value (Theng et al. 2005), accurate income estimates of recyclables sold to traders are difficult to obtain (Hassan et al. 2000). However, income from the sale of recyclables is generally higher if the volume of

recyclables collected and sold is higher (Hassan et al. 2000), and income generated for the centres (which may be coordinated by NGOs or residents' associations, for example) is minimal because of the small scale and nature of the operation, which relies on public-donated recyclables (Theng et al. 2005). This fact is also confirmed by the TrEES coordinator (i.e. Christa Hashim). TrEES helps by providing advice and assistance, as indicated from her response:

> Residents [of PCK] have some tasks to do, [there are] fund raising [activities], spiritual obligations as well. We spearhead it [the recycling activities] but there is still a lot of garbage [to be handled].

In addition, TrEES had assisted in coordinating the collection and sale of these recyclables to the traders. The proceeds collected from the sale go to the relevant charity home, to be used for its own purposes (TrEES 2011). Figure 5.2 illustrates past recycling activities at the PCK's centre (TrEES 2011). According to Indrani Doraisamy:

> On average we get about 40–60 Ringgit Malaysia [NZD20–30) a month . . . Do you want to know the price for the recyclables? I will get you the list. We collect newspapers for [the price of] 0.30/kg., mixed 0.25/kg., carton or boxes 0.25/kg, BW paper 0.40/kg, computer forms 0.40/kg, aluminium cans 2.50/kg, steel cans 0.20/kg, plastic bottles 0.30/kg. But we don't get much money out of this [sale of recyclables].

When asked to elaborate on how TrEES had assisted PCK, Indrani Doraisamy responded:

> Well, they [TrEES] send the van to collect the recyclables, they fax us the latest price for the recyclables and pay us according to the price; they weigh 'betul-betul' [correctly and honestly]. TrEES is very well organised and they also invite us to their programmes. TrEES also donate to our charity; for example, once they got a lot of things from a factory and they gave these to us. TrEES also recommend us [our recycling outlet] to others and they distribute pamphlets to the neighbours about our recycling centre. TrEES also provided us with the tong [bins], pamphlets and publicity.

When asked if there were other organisations that helped them, Indrani Doraisamy said:

> In the beginning there was only TrEES helping us. Now there are some who help out by providing the girls with other assistance, such as Sime Darby [a property development corporation] [which] last week came and entertained the girls. That [the visit] made them [the girls] happy. But recycling activities are only done with TrEES.

Plate 5.1 Recycling activities at the 'Pusat Cahaya Kesayangan' (PCK), a charity home in Selangor for girls with disabilities
Source: TrEES (2011)

5.3.2.2 Impact on the targeted audience: The case of PCK recycling activities

The recycling centre and its activities in PCK have benefited the occupants socially and economically. According to Indrani Doraisamy:

> This activity [recycling at our centre] I think has four benefits. The first is it helps discipline the girls because it's difficult for them [the girls] to sit in one place . . . second is [the activities provide] exercise for their fingers and mind . . . third is [the activities promote] education because the activities help them to recognise the [different] things, [for] example, clothes for boys, girls; and fourth, is they learn words [associated with the clothes], for example, 'Punjabi' , 'baju kurung'; and it's a little money from the sale of recyclables.

When asked what she thought about public participation and TrEES' efforts, Indrani Doraisamy said:

> I think its [TrEES] effort [at helping to set up recycling centres] is a very good idea. If not we are throwing things into the 'tong sampah' [garbage bins]. Also, we get a little money, the OKUs [disabled occupants] are occupied [and one aspect that is] very important is discipline [for the girls].

> The public knows where we are located, we have a signboard in front of our charity home, and I think public participation is active; we do get clothes and many things donated, for example, radios and clothes, Punjabi suits . . . you know they are expensive to buy . . . 'Bermuda' pants [or] anything [that is] still good donated [by the public] we keep for the girls' or the centre's use.

Figure 5.2 locates TrEES' role as a facilitator in promoting SWM with a charity home. In addition to the obvious benefits to the charity centre, i.e. goods, activities and some income, the effort has contributed socially by providing the public a means to help the occupants, i.e. to volunteer with the recycling and other civic activities if required. Davies' (2007) study of small-scale community based recycling organisations (CBROs) also found that the primary goal, i.e. engagement with the marginalised group through recycling or SWM activities, was to support capacity building and a 'commitment to progressive support', rather than merely an environmental motivation (p. 56). This was also evident in this case study as reported by the administrator of the PCK, who included the recycling activities as part of the weekly tasks of the physically challenged occupants. The objectives of these activities as mentioned by the PCK administrator were to build the occupants' sense of self-discipline and understanding through engagement in simple acts, as previously described.

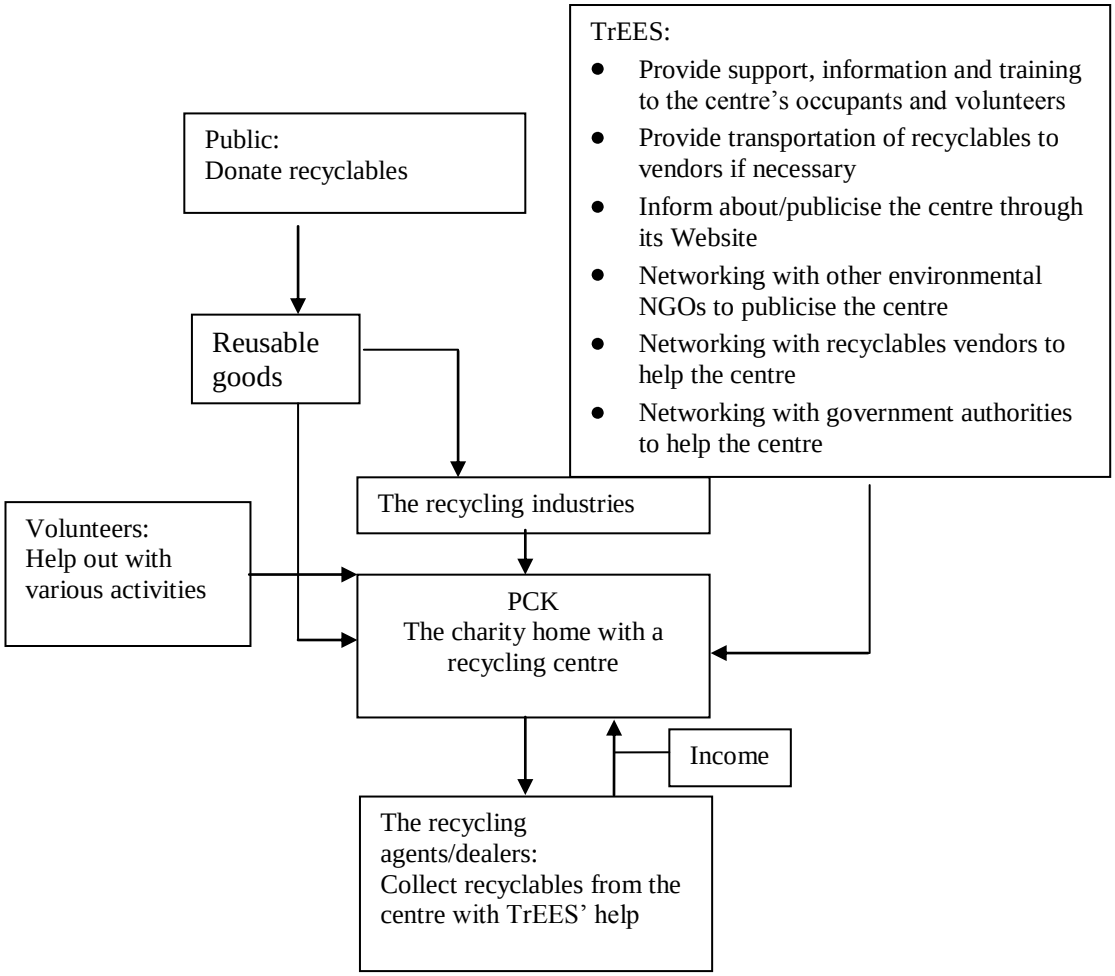


Figure 5.2: Locating TrEES' role as a facilitator in promoting SWM with a charity home

5.3.2.3 Partnership with hypermarkets

Following the success of the recycling centre in collaboration with charity homes, TrEES' second attempt at engaging the public in SWM activities was to set up a recycling outlet through collaboration with a hypermarket in Taman Melawati, Kuala Lumpur. The strategy was to partner with a hypermarket that was well known to the urban population and that was easily accessible within a residential neighbourhood. TrEES had approached the general manager of the hypermarket in Kuala Lumpur and had explained to him its objective and requirements. A recycling centre was subsequently set up in the hypermarket, with TrEES as the coordinator and part time helpers conducting the daily operations. As was reported in the press, the centre managed to collect a considerable amount of recyclables and those who sent in their recyclables were given shopping vouchers in exchange for their efforts (Netto 1997). As Christa Hashim remarked:

> The second [attempt at setting up a recycling centre] was [when] we approached Giant Melawati [a hypermarket]. We wanted a recycling programme. This hypermarket was 'brave' because recycling [had] failed everywhere. The [Majlis Bandaraya Petaling Jaya] MBPJ [then] had said recycling would fail. Mr. T (Giant Hypermarket) said, 'You ladies can have a space and run your activities, open selected hours, bring things recyclable.' But people didn't know how to separate recyclables. We had to spend a lot of time to re-educate, educating people, teaching them how to separate. This is not a dumping place, this is a recyclable resource, they have to clean the recyclables [before bringing them here]. The public came to the Giant [hypermarket] centre in Ulu Klang, [in Kuala Lumpur] and then Subang Jaya opened a centre [with the permission of the local authority, Majlis Perbandaran Subang Jaya] and Johor. Over the years we opened up almost 15 centres, at the welfare homes, at the power point in Old Klang Road, at the [hypermarket] Mall. We help set up, open the system, do the collection, provide bins and posters, infrastructure, and they 'have' [are suggested] to be with us for a year.

It was reported that on an average day, around 55 people brought in (i.e. dropped off) recyclables and about 2.5 tonnes of recyclables (from various sources, including the hypermarket's own retail activities) were collected during the opening hours (Netto 1997). The coordinator (Christa Hashim) also highlighted that this initiative may have encouraged another hypermarket to set up a similar recycling centre. As she put it:

> When we started our recycling [centre], we found that we had more people coming, at the buy-back centre [recycling centre] in Subang Jaya. Another hypermarket [administrator or manager] came to our centre in Subang Jaya [and] 'duplicated' it in Ampang [Kuala Lumpur]. Our model is we set it up [the recycling centre operation], [and] other people replicate it. There is more than enough garbage [for everyone].

TrEES coordinated with another outlet of the above-mentioned hypermarket in Subang Jaya, Selangor in 1999, with the support of the MPSJ. This was parallel to MPSJ's policy and programme with communities (UNCHS 2002). The local council had embarked on a recycling programme two years earlier (i.e. in 1997) in which the objective was to 'create awareness among the people on the need to reduce waste and sustain the environment' (UNCHS 2002). For the recycling programme, the council had identified that three sectors of the society, namely the community and not-for-profit entities, the government and the private sector, were integral to the council's programme implementation (UN Habitat 2002). In this effort, TrEES was identified by MPSJ as one of the NGOs to provide assistance and support, interpreted as sharing relevant recycling knowledge or advice based on their experience with their CWM programmes (UN Habitat 2002). This knowledge sharing was to encourage individuals or the public to better understand and learn the correct recycling practices, as was evident from the PCK's case.

Currently, there are several recycling outlets within the hypermarkets located in urban Subang Jaya and Selangor (refer to Plate 5.2). These were also initiated through collaborative efforts between the mall or commercial outlet, MPSJ, and the private (profit oriented) waste collector, e.g. Alam Flora (the Federal Government-appointed waste contractor). Only one of these (with the Giant Hypermarket) was initially coordinated by an NGO, i.e. TrEES (TrEES 2011). However, under the current management the recycling outlet has temporarily ceased its operation (Christa Hashim 2011, pers comm, 1 November).

The hypermarket that collaborated with TrEES provided shopping vouchers in exchange for recyclables. On the other hand, based on this researcher's own experience it can be said that the recycling outlet in the 'Carrefour' hypermarket had provided cash in exchange for electronic recyclable waste such as old personal computers and printers. This hypermarket's effort appeared in a press release (Anonymous 2004). Another 'sister' outlet of the Giant hypermarket located in the state of Johor had also partnered with TrEES, and it provided vouchers to the public who sent in recyclables to their centre; the vouchers could be exchanged for school stationery (Liew 2005). Figure 5.5 illustrates the TrEES–Giant Hypermarket recycling centre in Johor Bahru, Johor.

Plate 5.2: Illustrations of various recycling outlets in Subang Jaya hypermarkets that collaborate with the Subang Jaya Local Council (MPSJ)

Source: MPSJ (2010)

Plate 5.3: A TrEES recycling centre in collaboration with a hypermarket in the state of Johor
Source: Liew (2005, p. 80)

The amount and type of recyclables collected by the MPSJ and the organisations involved (including TrEES) during the recycling programme (UN Habitat 2002) are listed in Appendix 12. The total amount of recyclables collected for 2001 was 746 tonnes, compared with 125,000 tonnes of municipal waste collected. This indicated that almost 0.6% of recyclables had been successfully collected from the total waste generated by residents in the municipality through the above-mentioned 'drop off' recycling programme. The hypermarkets collectively obtained 521 tonnes, while the rest of the recyclables were collected from the participating schools. However, the breakdown of individual hypermarkets' recyclables collections (for instance, the hypermarket that coordinated with TrEES) was not made available.

Providing incentives other than cash, e.g. eggs or canned foods, in exchange for recyclables has successfully been implemented in other countries, which recorded higher collection for recyclables than usual within the community (Mongkolnchaiarunya 2005). In this case study, the hypermarket's provision of vouchers in exchange for recyclables can be considered an incentive for the public to participate in this behaviour. It also displays a form of 'corporate social responsibility' (CSR), i.e. efforts that aim to encourage and support environmental and social issues (Auld et al. 2008). According to Auld et al. (2008), profit motivated entities or 'firms' may interact with the government *and* the NGO to address a common problem. In this case, the hypermarket is displaying its CSR by providing space and incentives to encourage public recycling behaviour. CSR environmental and social programmes by retailers vary, and support for recycling activities – by providing recycling drop off outlets within their premises for their own and customers' use – has been adopted in the UK and the US (Iles 2007;

Goldmark 2010). Many CSR strategies have proven that commercial oriented partnerships with other non-commercial-based organisations, such as environmental NGOs, can be profitable to the firm's development, i.e. they enhance reputation and appeal positively to the public and consumers (Roberts & Dowling 2002). According to Abdulah (2009), one of the key drivers for business success in Malaysia, including that of the hypermarkets, is the pivotal role of corporate relations in building a favourable reputation with the public.

The collaboration of TrEES with the MPSJ and other community based organisations is highlighted as a 'good practice' in the UN Habitat Best Practice Database (2002), as mentioned. Despite each actor's different motivations, they collaborate to implement the programme. The MPSJ council played its role as the responsible policy- and decision-maker, while TrEES, being the not-for-profit organisation, supported MPSJ as a 'consultant and advisor' to the programme (UN Habitat 2002). The profit-motivated retail outlet provided a space for the public to participate in recycling activities, which supported the community based programme and parallels the idea in CSR of taking measures that appeal to the public (Roberts & Dowling 2002). Figure 5.3 locates TrEES' role in its collaborative effort with the retail outlet mentioned above.

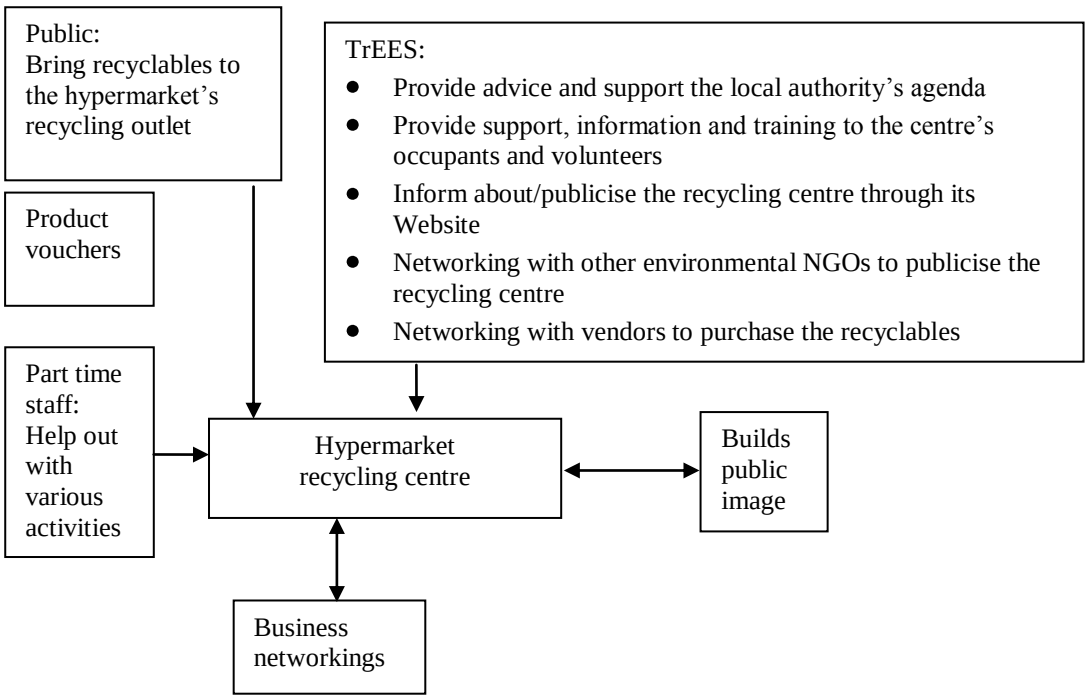


Figure 5.3: Locating TrEES' role as a facilitator in promoting SWM with a commercial hypermarket

5.3.2.4 SWM Programmes with Schools (PwS)

One of TrEES' earlier (and current) efforts at reaching out to the public and promoting SWM awareness was to organise relevant programmes, including recycling competitions for school students (TrEES 2011). Initially, the programmes were in collaboration with the implementation of the Local Agenda 21 that had been adopted by several local authorities, including MPSJ (UN Habitat 2002). The Local Agenda 21 proposed that local authorities collaborate with private, public and non-government or non-profit entities to uphold the concept of sustainable development (UNCED 1992). Sustainable development contains two concepts: 'needs', particularly of the poor or marginalised, and 'limitations' imposed by the 'state of technology and social organisation on the environment's ability to meet present and future needs' (World Commission on Environment and Development 1987, p. 43).

This researcher met an officer who was attached to the environmental and waste management enforcement unit of the MPSJ. She confirmed that TrEES was involved with SWM programmes in schools and had organised recycling or other SWM competitions. According to this officer, TrEES had provided the prizes, such as computers. However, she was not sure whether the TrEES programmes have continued but thinks schools now organise their own or collaborate with the waste contractor employed by MPSJ.

Secondary evidence and that gathered from the interview with its facilitator indicate that TrEES continues to promote environmental programmes with schools. TrEES has facilitated and encouraged individual schools to remain active with their recycling activities. The publicly accessed 'Facebook' accounts set up by the school student members currently involved in TrEES-organised programmes, for example, 'TrEES SMK USJ8' and 'TrEES SMK USJ4', indicate this. The Web pages show students promoting and actively participating in recycling activities. Innovative social media approaches through internet based tools such as 'Facebook' or 'Twitter' are currently used to help students to communicate effectively with others (George & Dellasega 2011). Their effort was part of the environmental activities in school and in preparation for the TrEES' organised school programme in 2010 called 'Connecting the Community to Taman Negeri Selangor', in which recycling and SWM were an aspect of the project. This programme, which aims to develop interest in nature and environmental conservation in general in students (particularly those from urban areas), includes SWM as part of the overall goal of achieving a more sustainable quality of life (TrEES 2011). In this programme, relevant hands-on activities further develop

students' skills and knowledge about the environment and offer students the opportunity to participate in environmental activities and to develop their management, communication and reporting skills (TrEES 2011). Plate 5.4 shows students from TrEES SMK USJ8 involved in their recycling programme.

Plate 5.4: Activities of members of the TrEES SMK USJ8 at Sekolah Menengah Kebangsaan (SMK) USJ8, Subang Jaya Selangor

Source: TrEES SMK USJ8 (2011)

Plate 5.5: Students from Sekolah Menengah Kebangsaan (SMK) Wangsa Melawati with their recyclable newspaper collection
Source: Mohamad (2010)

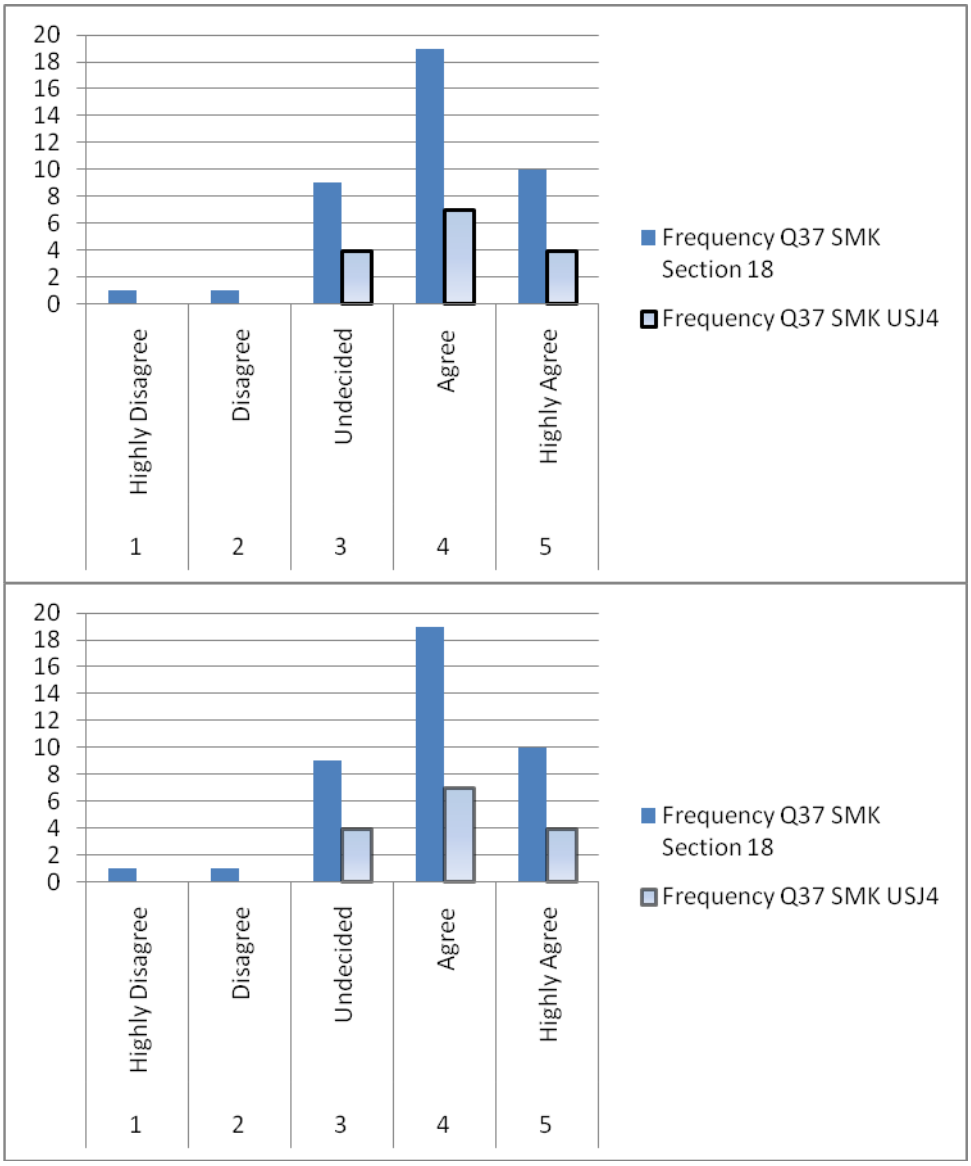
TrEES' programmes are pertinent to raising students' awareness and understanding towards nature conservation and SWM. In 2009, a total of 14 schools participated in the school programme organised by TrEES, in which the aim was to increase students' awareness of environmental conservation and to enable students to learn skills such as project planning and management, teamwork, and public speaking (Lim 2010). The year-long school programme was run in partnership with the Forestry, Minerals and Geoscience Department, and the Selangor Water Management Agency, with the approval of the education ministry (Lim 2010). With the main funding support of a local corporate bank (CIMB), this programme was continued in 2010. TrEES again organised the programme, which included competitions in various categories relevant to the theme of the programme. It attracted more schools this time than in the previous year, i.e. 24 schools in Selangor and Kuala Lumpur. The overall winner was SMK USJ8, which netted RM4000 (NZD2000), with SMK Section 18 Shah Alam in second place and SMK Wangsa Melawati (SMKWM) in third, while another school (Sekolah Menengah Kebangsaan USJ 12 or SMK USJ 12) was given a special award for successfully reducing its waste by 50%. SMK USJ 12 achieved this by collaborating with the school canteen operator to eliminate the use of Styrofoam and plastics to package food (Loo 2010). The principal of another school that participated, i.e. SMK Wangsa Melawati, Kuala Lumpur, contended that the competition had raised her students' awareness of SWM (Mohamad 2010). Recycling competitions in schools have been organised in many parts of the developed and developing world. Most aim to increase the participants' awareness of SWM, to motivate the participants to get involved and to develop their interest in the subject of concern, while reducing waste (Peckham 2010). Authors contend that adolescents who are more aware of environmental issues such as SWM are more concerned with SWM issues such as reducing, reusing or recycling resources, and will behave and act pro-environmentally (Grodzinska-Jurckzak 2003; Meinhold & Malkus 2005; Pariyawong et al. 2007; USEPA 2003).

The following paragraphs highlight some responses to four key questions about students' general perception of NGOs' involvement in SWM. These questions and responses were extracted from the full descriptions of the survey conducted, described in Chapter 6. The students sampled were from two schools selected from a larger survey sample (refer to Table 3.1 in Chapter 3). These two schools had been involved with TrEES' environmental programmes. The schools' involvement with the environmental NGO was confirmed through an email correspondence by this researcher to the TrEES coordinator. The sample selection

from these two schools may be biased and is not representative of the population (Babbie 1979). York (1998) defines selection bias as 'any characteristic of a sample that is believed to make it different from the study population' (p. 239). However, the aim here was not to generalise the findings to the population; rather it was to gain an insight into students' perspectives of recycling and NGOs' involvement in SWM. Sekaran (2003) contends that sometimes it is necessary to obtain information from specific target groups. The students, i.e. respondents from the two schools were randomly picked (as described in Chapter 3) and individually may or may not have been involved or participated with TrEES environmental programmes. The samples from the two schools, i.e. SMK USJ 4 and SMK Section 18 Shah Alam, comprised 15 respondents and 40 respondents respectively. For the purpose of this chapter, only four questions from the questionnaire that alluded directly to NGOs' role in SWM were considered. However, the full set of questions from the questionnaire can be referred to in Appendix 11.

The findings enable an insight into what these sampled students mainly thought about NGOs' involvement in the context of SWM programme in their school. The analysis below quantitatively describes the responses of students from both schools with regard to specific questions posed.

Q37– ‘I think voluntary community programmes supporting 3R (Reduce, Reuse and Recycle) are lacking in our neighbourhoods.’



Question 42: ‘If more people participate, initiate and run these community based environmental programmes, more people will appreciate, understand and put effort to care for the environment.’

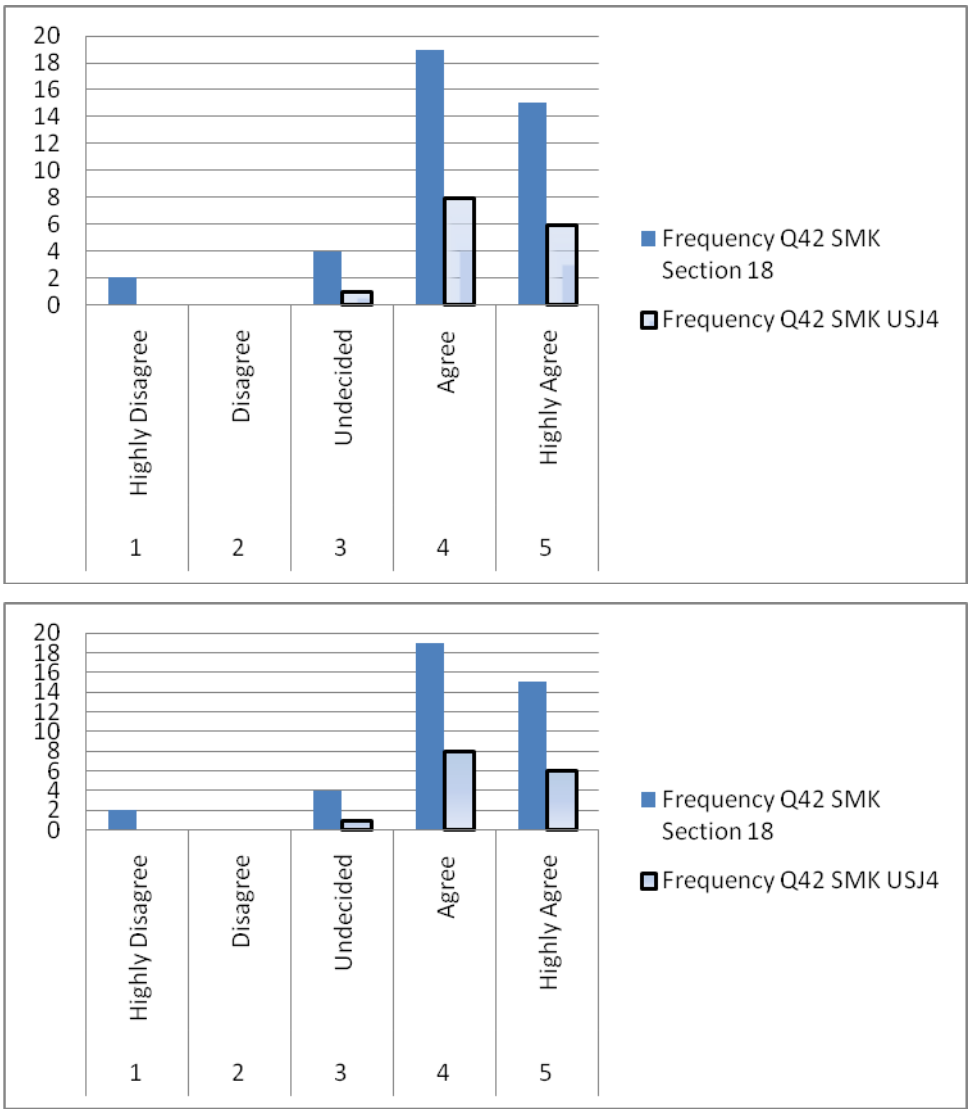
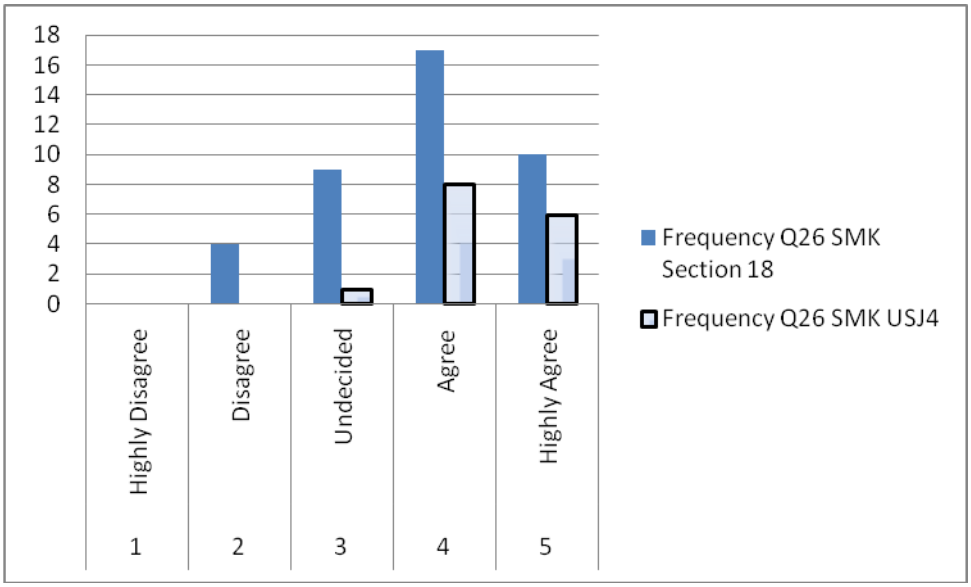
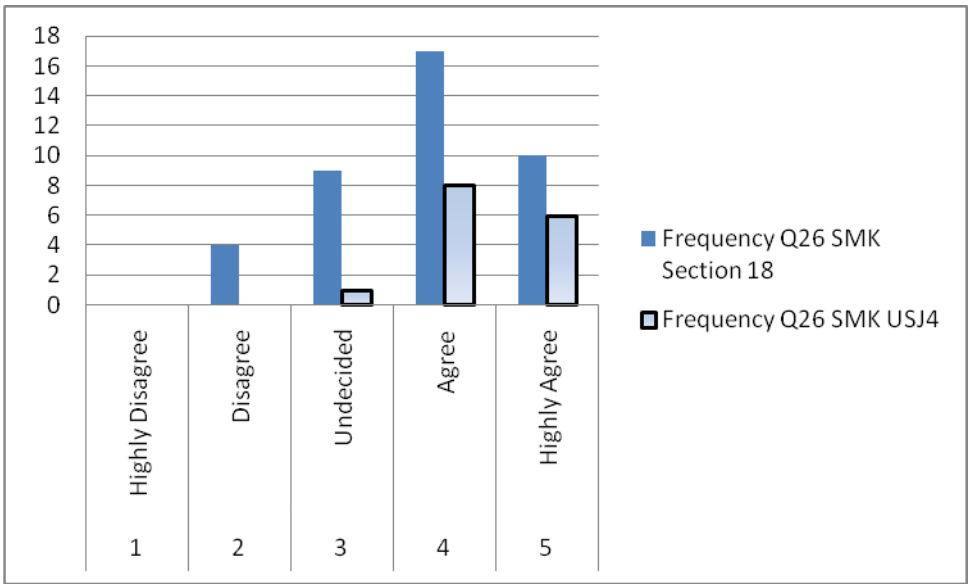


Figure 5.4: Frequency of responses from sampled students from SMK Section 18 and SMK USJ4 to Questions 37 and 42

Question 26: ‘I like participating in my school’s recycling programmes because it is fun and useful’





Question 43: 'Community based programmes including school clubs are good platforms to discuss ways to protect and improve the environment.'

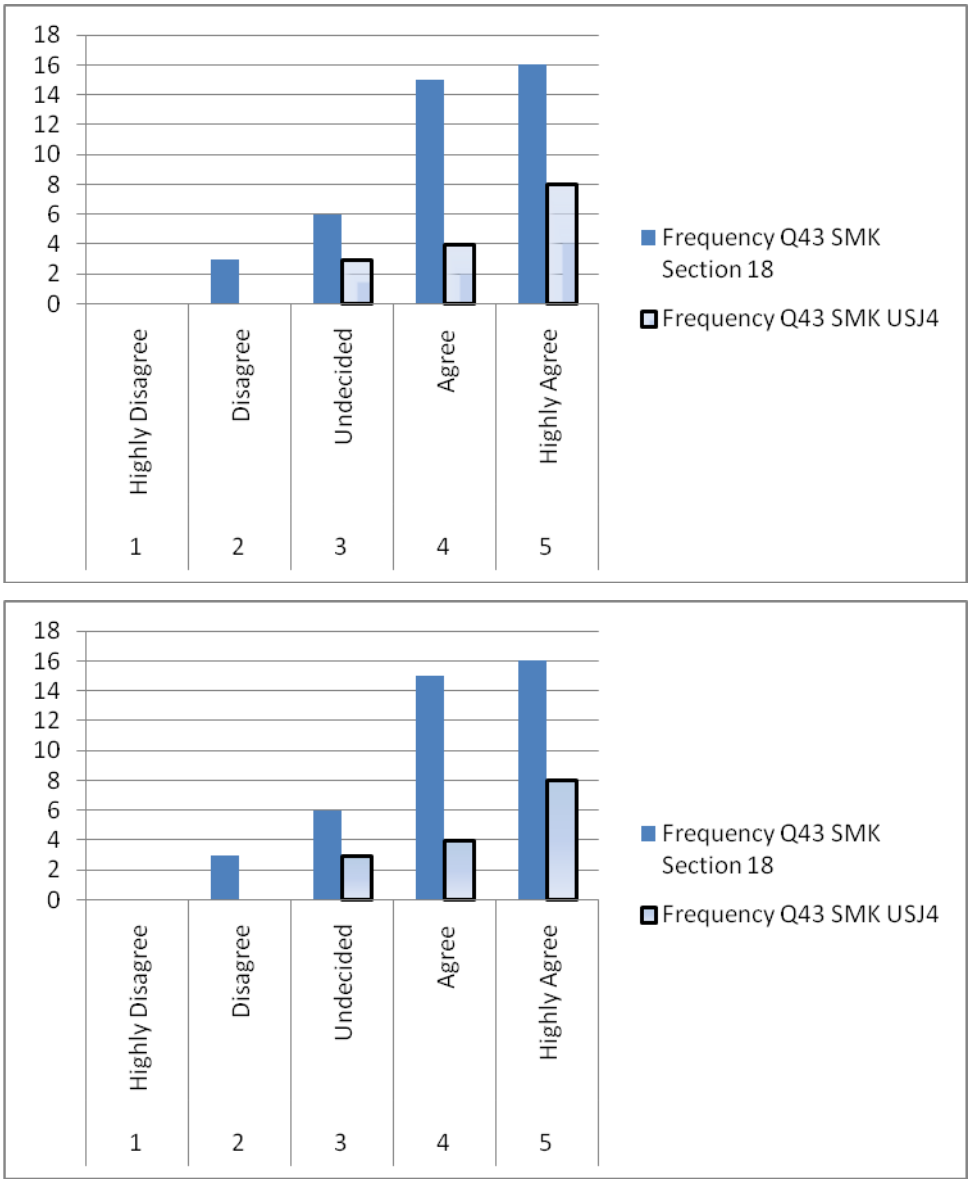


Figure 5.5: Frequency of responses from sampled students from SMK Section 18 and SMK USJ4 to Questions 26 and 43

The findings as shown in Figure 5.4 of both school samples indicated that students thought that community based waste programmes are lacking in their neighbourhoods and that public participation is key to enabling more people to understand and care for the environment. Figure 5.5 also indicates that the majority sampled enjoyed participating in their school recycling programmes and perceived that this was a good platform to discuss environmental matters. These findings suggest that the SWM programmes facilitated in both schools by the organisation involved, i.e. TrEES, had created an impact that positively affected the students'

thoughts and awareness about SWM. With regard to this aspect, the following Chapter 6 further investigates a larger sample of urban students' perspectives and factors influencing their recycling participation.

5.3.3 Obtaining funding support

An important effort in the implementation process of the CWP in this case study was obtaining funding support. Generally, a key to the success of a community based waste programme implementation is sufficient funds to purchase the necessary infrastructure, such as appropriate recycling bins, and to cover basic utility costs (Colon & Fawcett 2007). Insufficient funding and resources can be a debilitating factor to the sustainability of a community based recycling programme, particularly those organised by civil society, such as an NGO (Davies 2007). However, the NGO in this case was successful in this aspect, as evidenced by the collaborative efforts of their programme funding.

TrEES was rather efficient at identifying the need and sources for funding. This is evident from the various corporations acknowledged in their Website as sponsors to their programmes, and from the secondary evidence previously mentioned. Although details of costs were not explicitly stated, the funding was necessary to pay for minimal but appropriate infrastructure, for utility and operational costs, including printing, and for minimal allowances to staff at the recycling stations (TrEES 2011). Proper bins were necessary to contain the recyclables so that these recyclables would not pose a nuisance to their surroundings. This was especially pertinent to the charity homes, because of limited space. Fliers were printed and disseminated to inform the public of the location and collection schedule of the recycling. This was because recycling activities were relatively new to the community at the time of implementation (Noor 1996). As the hypermarket that collaborated with TrEES provided only space, personnel had to be employed (on either a part- or full-time basis) to manage the operational aspects. As experienced by Christa Hashim:

> It was hard when we had the buy back [i.e. recycling] centre [at the hypermarket in Subang Jaya]. We couldn't manage it [alone, without assistance from others]. The funding was limited. Administrative cost was high. We couldn't run without manpower; it's the people who run this. How do we make programmes a success without staff? People really need to look at that.

Some funding was obtained from the local government, other well established corporate organisations and local private companies. Christa Hashim said:

> Back then Malaysia was less developed. UNGF [United Nation's (UNDP) Global Environment Facility Small Grant Programme (GEF SGP)] helped all environmental NGOs; it was the in thing of the 90s and dropped [became less frequent], now a bit coming up [interest in environmental funding is increasing]. Environment is intangible, but the companies are, however, changing, more willing to give back; but it's not so easy, when they give one hand they want five hands. We are lucky because [we had assistance] from Total Health [a local health food company]; they were good to us.

> The Selangor state government, the Subang Jaya Municipal Council or MPSJ, gave a bit [funds] for the school programmes. It [fundings] came and went. Two years ago [2007] we got funding from MNRE Ministry of Natural Resource and Environment [through GEF] for our 'Biodiversity' programme. Now [2009], foreign funding is dried up but local CIMB [a private financial institution] came up with a foundation. Environment [issues pertaining to the environment] is small but we get some small grants. YTL [a local property corporation] also gives some small grants. Foreigners [funding organisations] say we have enough money so why not look locally.

Similar to the situation faced by the NGO in the case studied in Chapter 4 of this thesis, the coordinators of TrEES also approached various other environmental civil organisations, including overseas organisations, for grants to fund its projects, including those related to CWP. This was reflected by Christa Hashim, who commented:

> [The funding we received] was from some outside sources. Small sources from Canadian, Japanese [civil organisations/NGOs] helped with funding. We would buy the bins, distribute flyers, have training [for volunteers], and [hire part time staff to] man the centre at the hypermarket.

A main source of funding for TrEES programmes was the 'Global Environment Facility (GEF) Small Grants Programme (SGP)', developed by the United Nations Development Programme (UNDP) (2006). TrEES was eligible for funds (USD50,000) under the GEF SGP for its 'multiple operational programmes', including the various projects mentioned. The GEF SGP considered TrEES' projects as relevant to supporting the environment through community actions and that TrEES had satisfactorily completed their programmes (UNDP 2006). Several funding organisations currently sponsor TrEES' 'Programme for Schools', indicated by the acknowledgement of the NGO on its Websites to these funding organisers, as well as by mention on the funding organisations' Websites (Bursa Malaysia Berhad 2010;

CIMB 2011; Maybank 2011). The CWMP acknowledges a Malaysian property corporation, YTL Corporation Berhad, as its sponsor (TrEES 2011). YTL funds TrEES' CWMP and other NGOs as one of its 'corporate social and environmental responsibility' agenda items in support of community based and environmental projects (YTL 2008).

5.4 Perceived constraints to CWP implementation and sustainability

According to Luckin and Sharp (2003), community waste projects are generally adaptive entities but they are constrained by the context within which they operate. Other authors contend that the lack of support or recognition from the government and government officials, i.e. decision makers (Davies 2007; Kironde & Yhdego 1997), lack of civic awareness (Charuvichaipong & Sajor 2006), and competition from profit oriented organisations could lead to a community based waste project's unsustainability (Sharp & Luckin 2006). Others have also cited dearth of funding and general public apathy to SWM as hurdles to advancing the development of people-oriented SWM programmes (Bolaane 2006; Mongkolnchaiarunya 2005). These constraints were similarly faced by the coordinator in this case study. An analysis of the coordinator's responses is described quantitatively in Section 5.5.1. However, the evidence also suggested that despite these constraints, the coordinator had taken steps to overcome them.

5.4.1 Administrator's attitude

The facilitator of the CWP in this case study perceived several challenges, which in the beginning limited the process for an effective facilitation of a community waste project. This was explained by the coordinator:

> [Initially], the federal government [i.e. Kementerian Perumahan dan Kerajaan Tempatan] MHLG was not helpful because we [referring to herself and Leela Pannikar] were too small. Our ideas were not supported, [but] after that they saw what we were working on, most of the NGOs received assistance. The MBPJ [however] was [slightly more] supportive. The then MBPJ mayor gave us a meeting with all the YDPs [Yang diPertua or local council and district mayors] in the area; [he asked us to] talk to them, and hopefully [the YDPs] will work with you.

Charuvichaipong and Sajor (2006) contend that in most developing countries, traditional institutional approaches, i.e. socio-political circumstances or style of governance, can

undermine the mobilisation of 'people' oriented waste programmes. The coordinator, however, mentions that through negotiations and communications with the local authorities, the officials subsequently became more aware about TrEES' objectives. When asked how she communicates with officials, Christa Hashim remarked:

> [We have to] remain diplomatic [in dealing with the government authorities] . . . We invite them [to our programmes], they come to the launch, the logo is there [local council emblems are printed on the posters or pamphlets], bureaucracy takes hold. We want them to be 'happy' because they give us the permission [to implement our recycling activities] and we are quite fortunate.

When asked whether collaborating with the various government authorities was important, the coordinator remarked:

> Yes . . . and who you know; if you are friends with the right people. But we want to go by merit. The funders are happy with our programmes, [with] tangible results. We can say we have collected a certain amount. In general, we don't keep details.

The situation faced by TrEES in the initial stage of the CWP implementation suggests that waste administrators' lack of interest or lack of support for the idea may be due to what Bolaane (2006) contends is a tendency of officials to place less priority on activities not within their scope of work. Waste administrators were found to place more priority with ensuring waste was collected by the contractors employed and perceived that community based activities related to SWM should be 'championed by' other organisations, e.g. NGOs, with minimal intervention from the authorities (Kamaruddin & Omar 2011). The environmental officer and waste management enforcer interviewed in this case study also suggested that authorities are generally open to NGOs' involvement in SWM but that their scope of work placed more emphasis on technical matters such as administration, enforcement, collection and management of waste, rather than on social or community improvements. This was indicated by the remarks translated:

> As an authority, I think the community should get involved [in recycling or SWM community based programmes] because we [referring to the government officials] have to handle other things related to costs, manpower, and we are restricted by 'by laws' [scope of work/duties]. The local authority is bound by the laws and we can't [or don't want to] be creative [about this] . . . so if the public gets involved, they can create many interesting programmes and not be constrained by the regulations or laws.

Despite some waste officials' lack of interest in community based programmes, the coordinators of TrEES were able to approach the government institutions to endorse their programmes, and relied upon 'less formal' ways of communication. As Davies (2007) contends, governments are more supportive of civil society initiatives when these are perceived to be unobtrusive and not challenging their authority.

5.4.2 Other perceived challenges to CWP sustainability

A challenge that the TrEES community waste management programme faced in the beginning was general public lack of interest in recycling, or what Chenayah and Takeda (2005) posit as apathy among the Malaysian public for recycling. This was reflected in the TrEES informant's remarks when asked what conflicts or issues they faced:

> Public attitude . . . trying to coerce people, [provide a carrot] to recycle. But if you want to do [a recycling programme] in a big scale, the government must come in. Also [an issue of concern to raising public awareness for SWM is] to shape people to compel them to develop a better attitude [towards SWM]. [The] population is increasing . . . before we did not have so much biodegradable products.

Another challenge TrEES faced with regard to the sustainability of the CWP was perceived as the 'competition' from the recycling middlemen/small traders. These traders, as mentioned previously, are solely profit oriented and because there is no regulation on recycling activities, middlemen can provide collection services and offer better financial incentives. Thus, they are perceived by the general public as financially attractive compared with charities (Murad & Siwar 2007).

The public's perception that selling recyclables provides monetary gain was evident in Klang, Selangor (Anonymous 2000), where small-scale traders operate. These businesses have been known to collect recyclables from residential neighbourhoods using light-load lorries, and, depending upon the type of recyclables, may pay a small amount in exchange for the goods (Othman 2002). On this aspect, Christa Hashim remarked:

> Despite this [traders who buy from households] we had [through our CWP] educated many households [about how to separate and clean recyclables]. Thus we had achieved the objective of TrEES, i.e. to

> create awareness and encourage people to change to more sustainable behaviour] and our primary objective was not to make money. We are not interested to make money.

Another 'issue', but more of a perceived annoyance, was having to face the attitude of recyclables traders. As the coordinator puts it:

> We don't understand [these traders]. They [referring to the male dominated small-time recyclables buyers] say, 'You are just two girls; women can't manage this [recycling efforts] ,' and [they] try to do 'funny' things. That was a problem too . . . maybe. But in business and in life, it's normal . . .

The efforts of TrEES CWP, which were towards raising public awareness and developing the community's capacity rather than for making a profit, have been successful. This is indicated by the sustained charity recycling outlets, e.g. PCK, school programmes and subsequent similar actions undertaken to promote SWM. TrEES initiatives were also acknowledged (SGP GEF UNDP 2006). As remarked by Christa Hashim:

> [Our prime aim is about] education [we managed to disseminate information], and awareness 'went to their head' [the public and traders are now more aware that recycling activities can create different benefits for different people]. Our goal was not to make a waste management company. [For example] Alam Flora took [advanced] our ideas and they went with their own [setting up other CWPs].

TrEES' CWP is similar to Seyfang and Smith's (2007) notion of 'grassroots innovations' for sustainability in which community-led initiatives, including ones led by environmental NGOS, have the potential to respond to local environmental situations.

5.4.3 Lessons learned

In the process of planning and implementing the programmes, the coordinator learned some lessons relevant to sustaining the relationships developed. When posed with the question, 'What have you learned as a person and as an initiator?', the TrEES coordinator reflected that in dealing with local authorities or government departments and staff, diplomacy and persistence and an 'unobtrusive' approach, coupled with luck, were important to ensure things could get done. She remarked:

> [I learned a] few things. We were dealing with several government bodies, the bureaucracy [to maintain their status quo]; each group was secretive, although they are all within Selangor. We have

> found out that we can 'get a lot of honey with a teaspoon of sugar' and, importantly, through diplomacy [and], persistence.
>
> Treat Every Environment Special or TrEES as an organisation [is an NGO] [and] when people look at it are surprised that it's only the two of us. [I believe we had] Divine intervention. One person can really make a difference. We are like the 'mosquitoes'. People also never thought us a threat. But because the world is male dominated, they never saw us a threat. [We managed to collect] tonnes of recyclables and they were surprised.

The coordinator also believed that communication and the manner of approach were key to all the negotiations held, especially those with local authorities. In addition, the coordinator learned that acknowledging the support of the funders was pertinent to sustaining the collaboration. For example, she mentions that TrEES accomplishes this by featuring the company's or department's logos and stating the financial support given by these bodies to their programmes on their Website, brochures and pamphlets. In addition, she remarked that key personnel of the sponsoring bodies are often invited to the programmes' events as key speakers or panellists on juries. These key people have included representatives from CIMB and the Forestry Department. As observed by this researcher, a key representative of the main financial institution that had sponsored the school environmental programme was invited to be the main speaker at the closing ceremony held for the associated competition. This ceremony was attended by the media and the schools involved. As remarked by the coordinator, the main lessons learned were:

> [As coordinators or facilitators to environmental programmes we must have] persistence and diplomacy, especially in Malaysia. Compared to some NGOs with 'acid' approach [they] would have failed miserably, but because we always talked to them; we always communicated with the [Local Authority's Executive Council] EXCO members . . . Even among the NGOs, we [are] also trying to help out other NGOs; [for example] we collected several hundred signatures for MNS – Malaysian Nature Society – [and] we created [this] awareness [about other environmental NGOs] at our recycling centres.

5.5 Data analysis: Deriving relevant themes of social learning

The objective of this chapter is to investigate how the coordinator of this NGO facilitated the opportunities for learning, or for 'creating learning experiences' (Keen et al. 2005, p. 4), and this section evaluates whether variables pertinent to the social learning perspective were applied, based on the evidence observed. As previously highlighted in Chapter 2, forms of

'participation', 'negotiation and the 'integration' within the current 'system' (i.e. the existing institutional context) are important considerations that facilitate a positive outcome (affecting a change in people's understanding and subsequent behaviour or actions) (Ison 2005; Keen et al. 2005). Another relevant theme pertinent to the evaluation made here was that 'bridging' with other stakeholders or different groups of actors is necessary in the development and implementation of a programme (Pretty & Ward 2001; Woolcock & Narayan 2001). A qualitative analysis approach was considered appropriate to derive the themes from this case study's evidence.

5.5.1 Text categorisation

The strategy used for analysing the text of the previous case study in Chapter 4 (i.e. Section 4.4) is similarly applied in this case study. The analysis is based on the responses of the environmental NGO coordinator. Once a pattern is identified, it is interpreted in terms of the social learning theory context. This enables the researcher to move from descriptions to a more general interpretation of the meanings (Neuman 2003). The approach used in Chapter 4, i.e. a directed content analysis (Hsieh & Shannon 2005), was applied to evaluate the qualitative evidence here. The evidence focused on the coordinator's efforts and experiences at initiating, implementing and advancing the CWP, taking into consideration the elements of the social learning perspectives within its local context. This would help in addressing the research questions posed and with development of the theory of social learning applied in this particular localised context.

The analysis of the qualitative evidence in this case study involved two stages of categorisation of data. First, the text was classified into main categories, based on meanings in context (Grinnel & Unrau 2008). The latter involved 'merging' the initially varied derived categories into fewer but still meaningful groups of themes. This step was conducted to reduce redundancy of the number of themes that had initially emerged. Then, a simple quantitative approach was used to note the frequency of words in each category (Popping 2000). This process was implemented using the qualitative analysis software (QAS) tool, which provided an inference to what was important to, and considered by, the respondent, in a quantitative manner (Jehn & Jonsen 2010). At all stages, the transcribed text was constantly reviewed and notes about the links were made.

The first step, categorisation, provided some meaning to the responses, but this approach produced many initial categories (a total of 22) (refer to Table 5.3). First-level categorising of data, however, is a necessary step in analysing qualitative data (Grinnel & Unrau 2008). In this first step, the counts represent the frequency of occurrence of words used for each category. As previously mentioned in Chapter 4, terms are assumed to be important if they are repeated frequently (Jhen & Jonsen 2010). The frequency of words used helps to illustrate the extent of a particular position or understanding (Popping 2000). In this first step, the five categories with the most-mentioned words were found to be: *Educating the public, Strategise for networking, Incorporating elements of SWM, Perceiving institutional barriers,* and *Having personal motivations.*

Table 5.3: Initial categories formed

	Cateogories	**Word count**
1.	Educating the public	292
2.	Strategise for networking	202
3.	Incorporating elements of SWM	120
4.	Perceiving institutional barriers	131
5.	Having personal motivations	125
6.	Partnership with Local Authorities	89
7.	Perceived competition from others	87
8.	Financial support from Malaysian corporations	86
9.	Administrative and management issues with initiative	78
10.	Perception of public attitude	73
11.	Advocacy and consultancy	68
12.	Reflect on environment	62
13.	Strategy to increase SWM behaviour	57
14.	Reflect on urban issues	54
15.	Perception of recycling for profit	51
16.	Emulated by others	40
17.	Issues with the public	30
18.	Location strategy	33
19.	Perception of waste	27
20.	Financial support from other organisations	22
21.	Perception of Government's recycling programme	17
22.	Financial support from corporations	14
	Total	1758

For the second level of categorisation, several categories from the first step were grouped and interpreted based on their similar context. The procedure in this second step brought forth six

main categories: *Building capacity and providing advocacy*, *Having reflective capabilities*, *Institutional barriers, Networking with Local Authorities and other actors, Obtaining funding support* and *Location strategy.* The categories are shown in Table 5.4.

Table 5.4: Main categories

First level categories	Second level categories	Word count
• Educating the public • Advocacy and consultancy • Incorporating elements of SWM	Building capacity and providing advocacy	480
• Having personal motivations • Perception of public attitude • Reflect on environment • Reflect on urban issues • Perception of recycling for profit • Perception of waste • Perception of Government's recycling programme • Emulated by others	Having reflective capabilities	449
• Faced with institutional barriers • Faced with administrative and management issues • Perceived competition from others	Institutional barriers	326
• Partnership with Local Authorities • Strategise for networking	Networking with Local Authorities and other actors	291
• Financial support from Malaysian corporations • Financial support from other organisations	Obtaining funding support	122
• Location strategy • Strategy to increase SWM behaviour	Location strategy	90

The frequency or words derived from the interview of the key respondent (the TrEES coordinator) in the above table is interpreted (by this researcher) as an indication of the issues that were considered important by the coordinator. For example, a low frequency in the text analysis about 'funding' in its context would suggest that the respondent *chose* not to mention too much about this but did not necessarily suggest whether this issue was more important than others or that it was *the* most important as compared with that identified in Chapter 4.

5.5.2 Linking themes for meanings of relationships

The next stage of analysis was to connect each dimension or category to add more meaning to the linkages inferred (Popping 2000). Making 'connections' between the emerged themes enhances the understanding of the nature of the relationships between them (Bazely 2009). The QAS tool allowed the different sets of relationships to be linked, and the outcome is represented in Figure 5.6. The aim here was to find out how each category is related to the others and to frame the process involved in a more organised form. In this study, the text that formed the major categories was again constantly reviewed in context, i.e. as the responses to the questions posed during the interview. From here, linkages were formed based on obvious connections, and they were interpreted using a 'cause and effect' approach. For example, the statements that appeared in Section 5.3.2.1 indicated that there was a clear link between the category of *Having reflective capabilities* and that of *Networking with Local Authorities and others*; and taking into consideration pertinent factors such as *Obtaining funding support* and *Location strategy* contributed to the development of *Building capacity and providing advocacy*, i.e. the implementation of the programme initiated to the targeted audience. Another example is the group of statements posed in Sections 5.3.2.2–5.3.2.3, which suggested a similar pattern of linkages, but the forms of (Faced with) *Institutional barriers* mentioned posed a constraint that threatens the advancement or sustainability of the programme involved.

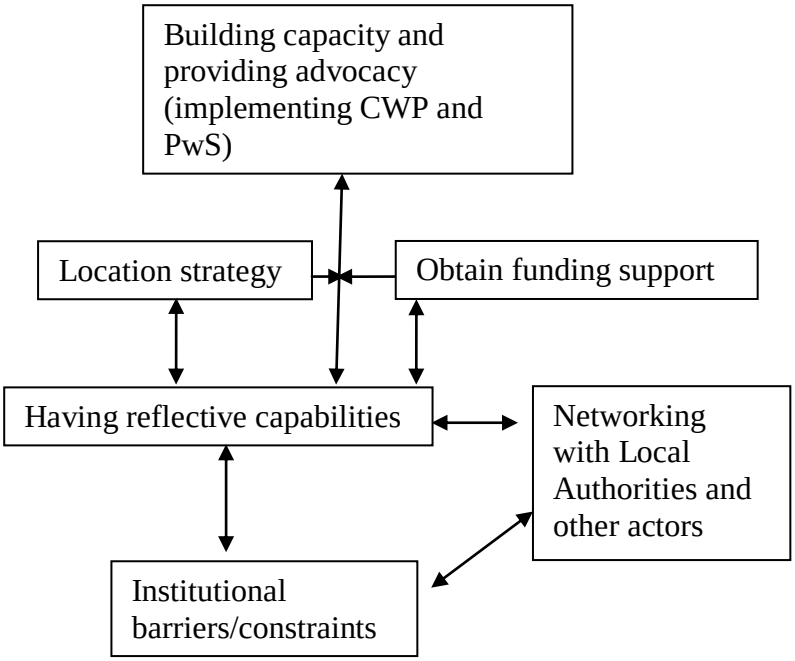


Figure 5.6 Illustration of the themes being linked

5.5.3 Interpreting the themes of social learning in the process of facilitating the programme

The final stage of analysis was to present the evidence derived that embodies the relevant themes of social learning, using a simplified and modified version of a 'logical framework' (Logframe) model (Bell & Morse 2008, p. 122). The concept of Logframe is about representing the project (of concern) in a manner (usually in a form of columns or a matrix) that highlights aspects and elements of the project in formal or informal terms, e.g. the performance of the project, its activities, its outputs and its associated assumptions (Bell & Morse 2008). The evaluation is also guided by the operational definitions and concepts as highlighted in Chapter 2. Applying this approach, Table 5.5 highlights this researcher's interpretation of the elements of social learning codified within the activities of the programmes facilitated by the key informant. It essentially identifies the degree of effort made by the facilitator that parallels the elements or approaches within social learning that contribute to effective programme implementation. However, where minimal or medium effort is interpreted, further strategies of improvements could be formulated. The interpreted evidence and insights suggest that considerations taken in the process of promoting SWM awareness with the communities parallel the social learning concept as described in Chapter 2; that is, an effective and sustainable resource management outcome involves various actors, the facilitation for negotiation and collaboration, and a reflexive capacity of the initiator to

integrate the project within the system (Brown & Pitcher 2005). The analysis also enabled the identification of which aspects can be improved upon to lead to a better project performance (Bell & Morse 2008). For example, funding facilitations proved an important aspect in SWM programme implementation, as the nature of a CWP, i.e. recycling, involves operational and managerial costs, while the PwS often involves a certain number of monetary incentives being offered to the schools and students. For a non-profit entity, a lack of funds may pose a threat to a programme's sustainability. One strategy taken to overcome this was to obtain funding through collaborations or negotiations with those who were financially able and who shared the NGO's objectives or cause.

Table 5.5: Conceptual representation of the social learning dimensions with the processes related to TrEES' SWM programme implementation

Reflections of learning dimensions				
Themes derived from evidence obtained (facilitator's experience in context)	Participation (Co-acting with others and monitoring the programme)	Collaboration (Collaborate with other funding organisations, e.g. corporate bodies)	Negotiation and communication	Integration within the current system (Consider current local context)
Reflexive capability	A high degree of effort	A high degree of effort	A high degree of effort	A high degree of effort
Building community capacity and providing advocacy With charity homes, schools and retailers	A high degree of effort	A high degree of effort	A high degree of effort	A high degree of effort

Networking with Local Authorities (LAs) and others	Medium efforts with LAs Medium efforts with recycling traders and waste contractors Higher efforts with schools, corporate bodies and not-for-profit entities	Medium efforts with LAs Medium efforts with recycling traders and waste contractors Higher efforts with schools, corporate bodies and not-for-profit entities	Medium efforts with LAs Medium efforts with recycling traders and waste contractors Higher efforts with schools, corporate bodies and not-for-profit entities	Medium efforts with LAs Medium efforts with recycling traders and waste contractors Higher efforts with schools, corporate bodies and not-for-profit entities
(Faced with) institutional barriers	Less experienced with schools, corporate bodies and not-for-profit entities thus high participation achieved as programmes are designed for the targeted audience Some constraints experienced with LAs and mainly due to administrators' lack of concern or interest	Medium efforts to solve the issues with LAs Higher efforts with schools, corporate bodies and not-for-profit entities to solve these (barriers)	Medium efforts to solve the issues with LAs Higher efforts with schools, corporate bodies and not-for-profit entities to solve these (barriers)	Medium integration with LAs
Obtain funding support	Higher efforts with schools, corporate bodies and not-for-profit entities	Higher efforts with schools, corporate bodies and not-for-profit entities	Lower efforts with LAs Higher efforts with schools, corporate bodies and not-for-profit entities	Higher efforts with corporate bodies and foreign not-for-profit entities
Location strategy	Higher efforts with schools, and not-for-profit entities	Higher efforts with schools, and not-for-profit entities	Lower efforts with LAs Higher efforts with schools, and not-for-profit entities	Higher efforts with schools, and not-for-profit entities

Another perceived constraint to the advancement of the programmes, which has remain unresolved, is the perceived lack of interest from government administrators, i.e. their minimal practical support for the NGO's programme. Another study by this researcher indicated that this 'lack of interest' did not suggest a lack of support for the idea of the NGO's involvement in SWM; rather, that waste administrators were more concerned with

their immediate technical duties for managing waste. Furthermore, social engagements in SWM were perceived as not being a main part of their formal scope of duties and thus were less of a priority. However, these administrators agreed that NGOs' involvements have contributed to general SWM awareness and have encouraged public participation (Kamaruddin & Omar 2011).

Summary

For this thesis, in this chapter it was found that efforts to engage people to participate in pro-environmental actions required strategies that appealed to the targeted audience. For example, in the case of PCK, its location, the availability of manpower, and its existing network made possible by the facilitator's initiatives, along with funding from various sources and an efficient administrator, helped sustain its efforts. The CWP recycling outlets in collaboration with the charity homes and hypermarkets provided additional opportunities for the public to participate in SWM activities, which complemented the public- and private-sector service provisions. In the process, the programme has engaged the public in activities that raise awareness to manage waste more sustainably and has provided opportunities for volunteering work. These kinds of programme also open up possible economic and employment opportunities for the less fortunate (Davies 2007). The PwS has sustained the interest of those participating to implement SWM activities. The annual TrEES school environmental programmes incorporating wider environmental concerns and not solely SWM have increased sponsorship and participation by schools and corporate organisations. This gives an indication of the potential and success of this effort in promoting active participation and awareness in environmental issues and SWM among school students, particularly urban school students.

Forms of partnerships, initiating communications, strategising involvement with different institutions, i.e. collaborating and negotiating with different actors, taking into consideration the local norms, were observed in the process of implementing the CWP and the PwS in this case study. The findings indicated that TrEES' consistent strategising for a 'win–win' situation from project initiation to implementation with various actors effected an outcome that benefited the environment. Figure 5.7 illustrates the process of programme implementation that takes into consideration the findings and interpretations made above.

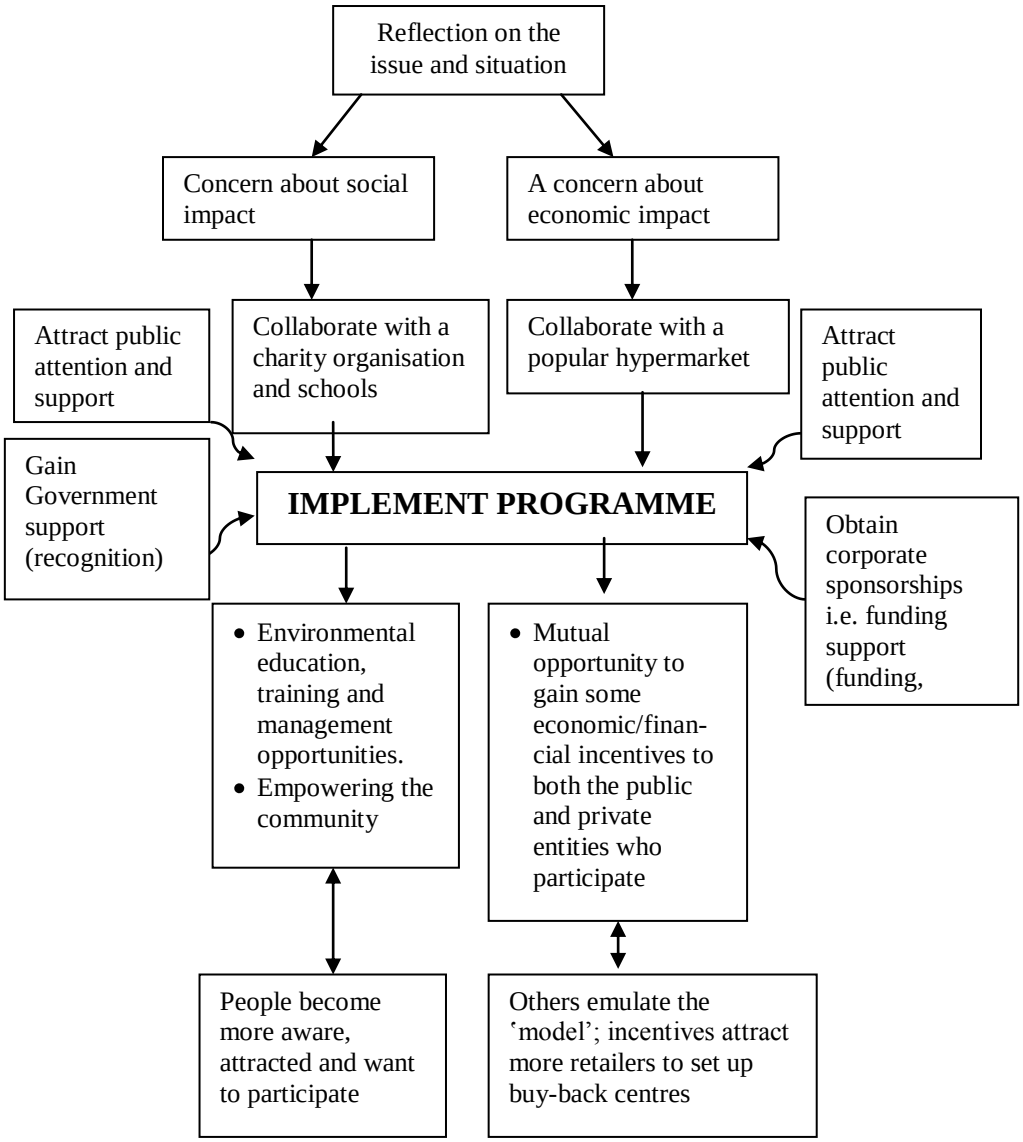


Figure 5.7 Programme implementation process

Chapter 6

Perspectives and factors that influence recycling participation among urban secondary students

Introduction

This chapter describes the findings from a survey and interviews about students' general perceptions of SWM and their involvement in recycling activities within the context of schools' recycling programmes. Section 6.1.2 of this chapter includes a regression model evaluation which was published (Kamaruddin 2010) and used for the purpose of this study. The evaluation includes a comprehensive account of the descriptive aspects of the data and these are included here. The quantitative analyses are further developed to complement the qualitative data obtained from available students interviewed.

Recycling is widely accepted as a sustainable waste management activity (Barr et al. 2007; UNDP 2008) and recycling participation in the community is an indicator of the success of a recycling programme (Suttibak & Nitivattanon 2008). With regards to children and youth, they have a stake in the environment and various programmes have been developed to promote environmental conservation including SWM (Meinhold & Malkus 2005). Students' opinion on environmental related matters especially waste management or recycling is rarely studied (Meinhold & Malkus 2005; Ojala 2007). However, their opinions and perception about these issues offer a glimpse into future environmental policies (Wray-Lake et al. 2009). Young peoples' views can act as `signals' of change and are highly relevant to their communities as they will become future national and global leaders (Carpini 2006).

Understanding what influences pro environmental behaviour of adolescents can be important to policy makers and those concerned such as environmental NGOs who are involved in facilitating, designing and implementing educational SWM programmes with schools (Grodzinska-Jurczak & Read 2006; SMART Rangers 2011; TrEES 2011; USEPA 2003). Having this knowledge can contribute to a better understanding of more efficient channelling of resources for programme development (Suttibak & Nitvattanon 2008). In addition, those involved, particularly environmental NGOs that are actively engaged, can design more relevant programmes based on the information gained.

This chapter is divided into two main sections. The first section (Section 6.1) describes the analysis procedures and interpretation of the quantitative data. Where relevant, the findings are complemented by the qualitative data obtained from available students. Both data sets were analysed in order to gain a more comprehensive understanding about the issue of concern. These are described and illustrated with relevant tables and figures. Section 6.2 illustrates the implications of the findings in the context of enhancing strategies to improve participation and collaboration, two key elements within the social learning perspective often given due consideration by environmental NGO programme facilitators.

6.1 Interpreting students' perception of SWM, NGOs involvement and identifying the factors that influence students' participation in recycling

In this section both quantitative and qualitative data were obtained from urban secondary students (aged 13-18) within Selangor. The descriptions here provide some understanding of the phenomena being studied (Babbie 1979). Table 6.1 indicates the respondents involved. As reported in Chapter 3, a total of 500 questionnaires were distributed to urban secondary students from ten schools in the District of Petaling, Selangor in July-August 2010. The returning response rate was 82% (411 were returned). The responses or data, were `cleaned' (Sekaran 2003) and keyed into a computer worksheet. The questions were designed to provide an indication of students' basic demography, perception of waste and relevant social aspects related to SWM. The questionnaire is included in this thesis as Appendix (11).

In addition, 13 students (10 from SMK Permata in Petaling Jaya and three from SMK SS 17 in Subang Jaya) were willing to be interviewed about their experience in SWM or particularly, recycling participation. The two schools were in the list of schools identified for the survey and responded that their students were willing to be involved in the interview session. The respondents were questioned about their nature of involvement in SWM activities in their school, what they have learned by being involved and strategies for improving participation in SWM activities in their school. As described in Chapter 3, only a few students were willing to be interviewed as others were (at that time) occupied with revising for their mid-year examinations or the trial Sijil Pelajaran Malaysia (SPM) examination, thus were not prepared to participate.

Table 6.1: Respondents involved

Respondents	Method of Data Collection	Type of sample	School	Location	Number of respondents
Secondary students from urban schools in Selangor	Questionnaire Survey	Probability sampling	10 schools	Petaling Jaya, Subang Jaya, Shah Alam	411
Secondary students from two urban schools in Selangor	Group Interviews -Each interview consisted of 5 students. Face to face individual interview	Available students and randomly selected	School A (location: Petaling Jaya) School B (location: Subang Jaya)		10 3

For this study, the questionnaire distributed comprised four sections. The first section included questions related to the respondents' gender and age and was given categorical scales. The second consisted of statements designed to evaluate the students' self-reported attitudes toward recycling. Generally, the attitude toward a specific act determines if an individual is for or against behaving in that manner (Valle et al. 2005). Since attitude and awareness about recycling cannot be directly observed (Sidique et al. 2009), a scale was developed in this study to measure attitudes toward recycling. It consisted of 10 items related to different aspects of recycling. The statements were formed in consideration of the situational and logistic aspects involved (i.e. that the school's recycling activities or programmes are an ongoing feature in school, that infrastructure or posters about recycling had been put in place, and that at least three recycling bins were already in the school compound). These are aspects or "intervention strategies" (Schultz et al. 1995 p. 109) designed to increase recycling behaviour. In order to explore the respondents' general perceptions of the current situation of waste management, the third section included nine statements pertaining to their perceptions of waste and waste collection. The fourth section consisted of 13 statements, formed to elicit respondents' views about involvement with other organisations and possible improvements to the programme. The questions were also

constructed based on considerations from past personal interviews with local municipal officers in Selangor and review from the relevant literature (Isa et al. 2005; Suttibak & Nitivattananon 2008). The items in all sections were measured on a five point Likert-type scale: (1 = *Highly Disagree*, 2 = *Disagree*, 3 = *Undecided*, 4 = *Agree*, 5 = *Highly Agree*).

6.1.1 Obtaining students' perspectives on recycling and SWM through descriptive statistics and interview methods

To be useful to the purpose of the study and because quantitative data are generally numbers representing the measurement of selected variables for a group of individuals, data need to be *described* (Grinnel & Unrau 2008; Hinkle et al. 1988). The description of data has to be presented in such a manner to enable an understanding towards the characteristics of the larger population being represented (Babbie 1979). In this section, a descriptive analysis of the data was conducted and obtained the frequency distribution of each variable i.e. the statement posed. In addition and pertinent to the type of data collected, the pertinent mode of each variable was identified. The evaluation of the frequency of distribution allowed this researcher to 'get a feel for the data' and ensure there is variability to the responses. The correlation analysis using Cronbach alpha for inter-item consistency and reliability was also applied (Cronbach 1946) to the variables within each group constructed to test for its reliability and validity prior to testing the hypothesis formulated (Sekaran 2003). This is further highlighted in section 6.1.2.

6.1.1.1 General Demography

The first set of `variables' to be described is the 'Demography' category which are nominal and measured according to their exclusive category (Babbie 1979). These are age range, gender and type of dwelling (terrace link, single or multi storey types). Because of their `exclusive' nominal attribute, measures of their central tendency (mean, median or mode) and variation (range, deviation, variance) would not be applicable (Babbie 1979 p. 143) and no assumption is made regarding its normality of distribution (Sekaran 2005). However, their frequency of distribution and cross tabulation can be described. It is normally the first step in quantitative data analysis. For this study, the frequency distribution of the data is indicated according to their percentages. Table 6.2 indicates the number of respondents involved in the survey and Figure 6.1 graphs the sampled students' age and gender distributions.

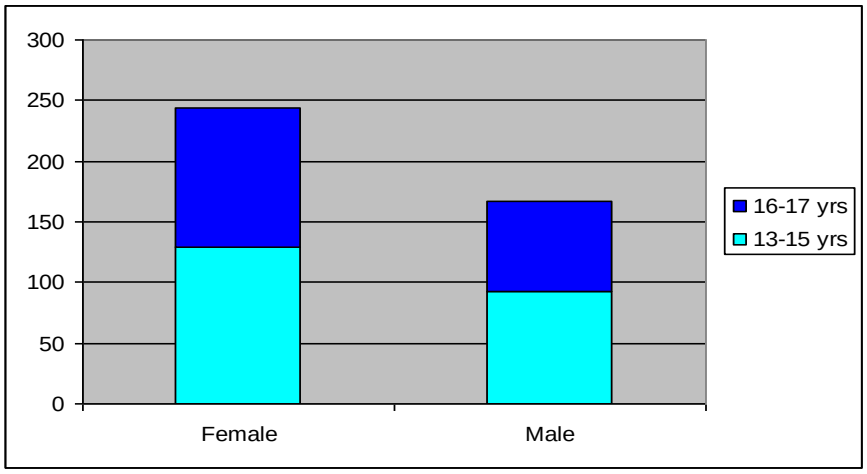


Figure 6.1: Distribution of Students by age and gender

Table 6.2: Frequency of Distribution (Age Range)

Age	Frequency (Female)	Frequency (Male)	Total (by age)	Percentage
13-15	129	93	222	54%
16-18	115	74	189	46%
Total	244	167	411	100%

The data shows that the sample (randomly selected) consisted of more female students than male and slightly more were in the 13-15 age range. A non-parametric test applied conducted that there was no significant difference in the proportion between age and gender.

6.1.1.2 Attitudes towards recycling

The second set of variables (10 items from the questionnaire) is those that relate to the students' self-reported attitudes toward recycling. To gain an insight on their attitudes towards recycling the relevant questions were posed in the questionnaire. These were further divided into sub groups and described in section 6.1.2. The frequency distribution and mode of the variables involved are shown in Table 6.3. These observations are useful to be described as they provide an insight into the sampled students' preference of the variable in question related to their attitudes. For example, location and distance to recycling centres within or outside school's premises were a concern to those who want to send recyclables to the centre. The table indicates that the majority of students (61% or 250 respondents) disagreed to the statement *"I will send recyclables to the centre if it is in walking distance'*.

This suggests that distance could be a deterrent factor to participate in recycling behaviour. Infrastructure facilities were a consideration to the majority of students sampled. Almost half of the respondents sampled i.e. 47% (193 respondents) disagreed that the (recycling) bins were visible in their school. A majority of the students sampled when combined (64% or 263 respondents) reported that these recycling bins were not fully used or were unsure if they were used. As remarked by the students:

> The three bins are difficult to access and hard to see. (Student 8 –School A)
>
> Yes we have recycling bins at the back of the school. In class we label a box for papers plastic but not used properly. (Student 6-School A)
>
> The recycle bin is far. They [students in school] throw everything [in them]. (Student5 –School A)

Table 6.3: Frequency distribution of students' self reported 'Attitudes towards recycling' (n=411)

Statement	***Disagree***	***Undecided***	***Agree***	**Mode**
	%			
I will separate waste if required by law	60	15	25	'2'
I only send recyclables to the centre if I have time	43	25	32	'2'
I will send recyclables to the centre if it is in walking distance	61	15	24	'2'
The recycling bins are highly visible in school	47	14	40	'1'
Many children and staff use these bins	29	35	36	'3'
I know where the recycling bins are in my neighbourhood	42	31	27	'3'
I like to collect and sell recyclables	50	18	32	'2'
My family sometimes sends recyclables	53	20	26	'2'
Although my school has some kind of recycling programme, I have not started to recycle	20	21	58	'4'
Although my school has some kind of recycling programme, I have not encouraged my family to recycle	23	20	58	'4'

Note: '1' and '2' denote the responses of *Disagree*; '3' refers to *Undecided* and '4' and'5' refer to the responses of *Agree.* The 'Mode' is an indication of the most type of response chosen by the sampled respondents.

Only 27% or 111 of the students sampled reported that they knew the location of the recycling bins in their neighbourhood while the majority (73% or 300 respondents) reported that they disagreed which suggests that they did not know or were unsure of the location of the bins within their vicinity. Only about a third of the sampled respondents (32%) 'like to collect and sell recyclables while half of the students sampled (50%) responded 'Disagree' to the statement *'I like to collect and sell recyclables*'. On the other hand, the interview conducted on 13 students (randomly selected and willing to be interviewed in a group setting) indicated that they were aware of the location of recycling centres within their

neighbourhood. When asked by this researcher if they knew where the recycling centres were located, they remarked:

> Yes, [I know there is a recycling centre] near Old Town [in Petaling Jaya] near the library (Student 1-School A)
>
> At the orphanage, at the pasar [market] (Student 2-School A)
>
> I thought it was an old folks' home [referring to the SS3 Community Recycling Centre]. (Student 3-School A)
>
> At my condominium, once a month a group of people will come up each floor to collect recyclables. [It is] voluntary work. Not the residents' efforts but outside [non resident organisation] (Student 4-School A)
>
> My condominium [high rise higher end apartment] also has [recycling activities]. After a few months, the newspapers can be sold. (Student 5-School A)
>
> [There is one at] SS3 I think. (Student 9 -School A)
>
> We don't have one in our neighbourhood. The place that I stay [where I live]. We don't have one [recycling centre]. (Student 6 -School A)

The survey also found that more than half of the students (58% or 242 students) from the sample reported that although their schools had some kind of rcycling programme , they have not started to recycle and a similar percentage of students responded that they have not encouraged their family to recycle. On the other hand, from the interviews, students reported that their families 'sometimes' helped out. To the question of whether their families are involved in SWM activities, those interviewed replied:

> I did [the food waste] enzyme at home. Just me [only me]. My parents, sometimes [helped]. But I do most of the work. They know about it. But it failed. My parents don't feel comfortable with the enzyme, they said it smelled [the odour from the process of producing the enzyme. I *sometimes* bring [newspaper] to school. (Student 8–School A)
>
> I sometimes separate the newspapers, cans.. and bring it to school, or keep it. My parents send them to the recycle centres. (Student 6-School A)
>
> I bring newspapers to school. (Student 7– School A)
>
> We bring newspapers [and other recyclables] from home [my parents know about it]. We have [recycling] boxes at the end of our class. (Students 1-School A)
>
> My family is more into it [recycling]. [They like to recycle. (Student 4-School A)
>
> No, not that much [my family doesn't recycle much]. [I think] It is too troublesome [for them] generally they don't do things with me. (Student 2-School A)
>
> I think when we get something new, [knowledge about recycling or enzyme making] we do it, then it wears out. Off and on [inconsistently] (Student 4 –School A)
>
> Actually they [family members] used to encourage me. (Student 1-School B)

> I think it's [recycling activities] mostly from upbringing. A culture. I know a girl who won't use plastic bag. She is passionate about environment. But some are not exposed to this. Parents, family and how they are raised. How you raised your children. Yes, [it's] the culture [that influences one to recycle]. (Student 2-School B)

6.1.1.3 Perception of waste and waste collection

The third section consisted of nine statements were formed to gain some insights into urban based secondary students' perception on waste and collection. These are indicated in Table 6.4 and some interesting insights were obtained. The findings indicated that the majority of students' sampled (61% or 251 respondents) disagreed that waste has a value and 54% (222 respondents) disagreed that it could be a valuable resource. Only 25% of the sample (102 respondents) thought that waste has value and 32% (102 respondents) of the sample responded that waste could be a valuable resource. On the other hand, the general perspective that waste was valuable was perceived by the available students interviewed. When asked about their perception on waste, the students interviewed as a group remarked:

> Waste can be changed to products and if we can do recycling, it will be a better world. No [less] pollution] (Student 1 -School A)

> I think waste is really useful [can be a resource]. We should convince people to help out. Maybe once in a while, pick up a trash.. (Student 2-School A)

> I think we should have more recycling bins everywhere. [Then] We won't [have to] keep it [garbage] in the bag [garbage bag] (Student 3-School A)

> I actually think recycling should be the new cool thing, because if you make it attractive, the older people will follow. If you make the younger people really want to recycle, the older people might want to follow and recycle more. (Student 5-School A)

> I think that everybody eats from food packet and this [packaging] creates [adds to environmental] pollution during and after process. I think there is too much food packaging. The supermarket should encourage less plastic bag. But the green bag is not nice [visually appealing] though. (Student 5-School A)

Another finding was that 56% (230 students) and 15% (61 students) reportedly disagreed or were unsure if waste that ends up in landfills, or dumping grounds in the case of Malaysia, can cause environmental pollution. Only slightly more than one third or 33% (135 students) of those sampled thought otherwise. Of the students sampled, 26% or 107 students thought that the municipal workers i.e. employed by the Local Authority are the ones responsible to ensure waste is segregated after collection. Of the students sampled, 38% (156 students) thought that the municipal council or garbage contractor is efficient in carrying out their

duties while 41% (169 students) disagreed and 22% (90 students) were undecided over this matter.

Table 6.4: Frequency distribution of students' self reported 'Perception of waste and collection' (n=411)

Statement	*Disagree*	*Undecided*	*Agree*	Mode
	%			
I think waste has value	61	14	25	'2'
I think the final destination of waste is the landfill.	40	26	34	'2'
I think waste in landfills can cause environmental pollution.	55	15	30	'1'
I think some waste can be turned into valuable resources.	54	14	32	'1'
I think people like prefer to sell recyclableso sell to vendors who come to the doorstep	60	15	25	'1'
I think the collection of household waste is the responsibility of the Local Authority or the private contractor depending on residential area.	58	18	24	'2'
I think waste will be segregated by the municipal workers after collection	44	31	26	'3'
Our local municipal council or the garbage contractor is efficient	41	22	38	'3'
If there is a regulation to separate waste with provision of the bins or bag by the local council, I will segregate waste.	61	15	25	'2'

Note: '1' and '2' denote the responses of *Disagree*; '3' refers to *Undecided* and '4' and'5' refer to the responses of *Agree.* The 'Mode' is an indication of the most type of response chosen by the sampled respondents.

Another interesting insight is that 61% (250 students) of the sample disagreed that they will segregate waste even if there is a regulation to do so and currently in Malaysia, there is no regulation to separate waste before collection by the waste contractor or local authority. These insights suggest that while the government and environmental NGOs are keen to advance recycling participation among the general public and youths, there is an apparent lack of concern and apathy about performing acts pertinent to recycling such as segregating waste even if regulation is imposed. When asked if regulation imposed would encourage people to separate waste, the students also remarked that the public would not. Their responses were:

> Self motivation is better [to implement the act] but it [the act of separating waste] is not happening (Student 1-School A)

> Definitely [regulation would encourage people to separate their waste]. If you get fined, so many people will do it [separate waste] Student 3-School A
>
> I don't think so [I don't think having a regulation will make people segregate their waste] Student 2 – School A)
>
> Malaysians are generally not responsible in separating their waste (Students 8-School A)

6.1.1.4 Involvement with other organisations

The fourth section comprised of 13 statements, and was formed to elicit respondents' perspectives regarding their involvement with other organisations relevant to supporting SWM. These statements were further grouped for the purpose of the regression modelling as described in Section 6.1.2. In this section, the frequency of distribution of the variables involved are shown in Table 6.5. This table also reflect the range of students' perspectives for improvements to the programme. Only 29% (119 students) of the respondent sampled reported that their schools are involved with other schools' recycling programme. Only 27% (110 students) sampled reportedly agreed that they had 'fun' being involved in recycling programmes in school while 51% (209 students) disagreed. Only a quarter of the sampled urban students reported that they "gained more knowledge on how to protect the environment by participating in their school's recycling programme" while the majority sampled i.e. 62% (254 students) disagreed. The high frequency of sampled student who disagreed to this statement could be attributed to the fact that they may not be members or did not participate in any environmental club activities despite the fact that an environmental club is common to every urban school i.e. every school in this survey had a Kelab Alam Sekitar (Environmental Club) or Kelab Pencinta Alam Sekitar (Love the Environment Club). Similarly, more than half i.e. 57% (234 students) of the respondents sampled disagreed to the notion that community and school recycling programmes are good environmental discussion platforms. This is to be expected as not being members of any environmental club they may not had the opportunity to partake in any discussions held in the club's activities. In the interview conducted with students from School 'A' it was also found that despite having a recycling programme in school, not all students were motivated to participate. The following indicates the conversation during the interview between this researcher and the students.

> This researcher - Do you know about the importance of recycling? Do you think the students generally get information about this?
>
> Every week [referring to their school assembly], the principal will make announcement.
> All students [nodding in agreement] – They [students generally] don't care about recycling.(Student – School A)

This researcher- What about your recycling programmes? Does each class have these recycling boxes? What about the volume collected?

There are two bins, plastic and paper. [The volume collected] is not constant. (Student- School A)

If they [the students] feel like it [involve in the programme]. They don't make the effort. If we have the opportunity we will do it. But we [referring to other students] don't make the effort. (Student 2 –School A)

The BP challenge [an eco green conservation programme sponsored by a company] school's team also don't have the 'semangat' (spirit/self motivation). At first they have activities but the 'semangat' (spirit/self motivation)gets less and less. (Student 5 –School A)

Researcher – so do you need leadership? Push?

Maybe the teachers are not finding the right people? (Student 3 –School A)

Everyone must have the interest so I think the school should build our interest (Student 5 –School A)

Table 6.5: Frequency distribution of students' response to 'Involvement with other bodies of organisation' (n=411)

Statement	***Disagree***	***Undecided***	***Agree***	***Mode***
	%			
My school's recycling programme is involved with other schools' recycling programmes.	45	26	29	'1'
I have fun participating in my school's recycling programme	51	21	27	'2'
Activities in my school's recycling programme help generate my environmental awareness	59	14	27	'2'
I gain more knowledge on how to protect the environment by participating in my school's recycling/environmental programme.	62	13	25	'2'
Our school gets some revenue by selling recyclables to outside vendors.	38	39	23	'3'
I think the government's recycling goal to achieve a higher recycling rate is realistic	53	24	24	'2'
I think more people should participate in environmental community programmes.	48	29	22	'3'
Community and school recycling programmes are good environmental discussion platforms.	57	16	27	'1'
Community recycling centres are a benefit to the community.	49	29	22	'2'
Public participation in environmental community programmes is low.	52	25	22	'2'
There is a lack of support for community recycling programmes from the public.	48	29	22	'3'
If more individuals participate in environmental pro-community programmes, more will care for the environment.	60	13	27	'2'
The support from government for community recycling programmes is welcomed	60	13	27	1.00

Some of the key highlights of the above responses (with regards to community recycling programmes) were that 22% (90 students) of those sampled perceived that there is low public participation and similarly, 22% of respondents thought that there is a lack of support for these programmes. Only 27% of the students sampled reported that they think more people should participate in environmental community programmes and this suggests a general lack of concern by the majority of students sampled regarding community programmes participation.

6.1.2 Quantitative analysis: Inference on the significance of variables affecting students' recycling participation

The previous paragraphs (Sections 6.1.1.2 - 6.1.1.4) described the frequency of distributions to students' responses towards recycling. The subsequent sections aim to infer from the data, what factors might influence students' recycling participation in the context of school's recycling programme implemented in schools. Schools' recycling programmes (such as coordinated by TrEES or SMART Ranger) place an emphasis on encouraging the students to collect and bring recyclables from home to the school's recycling programme. Each school may have different activities or approach to implementation. As previously highlighted in Chapter 4 and 5, collecting recyclables from home to bring to the school's recycling programme is one of the projects implemented in the schools' environmental, SMART Ranger's or TrEES' coordinated programme. Examples of recyclables brought from homes include old newspapers, plastic or glass bottles or aluminium cans. Often the programme involves students and their classes competing against each other to collect the most amounts of recyclables recorded.

The literature suggests that generally, people's, including adolescents' recycling participation is influenced by many factors. However, these factors can be equivocal in different social settings and contexts. As mentioned in Section 2.3.1 a 'value-action' gap (Blake 1999; Fahey & Davies 2007) i.e. the discrepancy between concern and action may be influenced by both individual and social related factors. Examples of internal factors may include (a) attitude, (b) perception, (c) motive, (d) knowledge, (e) pecuniary needs (Ebreo & Vining 2000), and (f) the desire to gain approval from parents, as was the case in a study of children's pro-environmental behaviour (Meinhold & Malkus, 2005). External factors include (a) provision of logistics and infrastructure (Sidique et al. 2009); (b) financial incentives, (c) lack of

storage space, and (d) regulations imposed (Othman 2002; Refsgaard & Magnussen, 2009). Barr et al. (2001) stated that the predictors of recycling behaviour can generally be grouped into three categories of attitudes and values: (a) environmental, (b) situational, and (c) psychological. These factors are often interrelated, and studies have shown that some factors are more significant than others (Barr et al. 2001; Ojala 2008; Valle et al. 2005). Identifying these factors is a step toward identifying what is needed for further improvements in recycling participation.

To evaluate what factors influence students recycling participation in the context of school, a model was tested or estimated using multinomial logistic regression. In this study, this was used to estimate the effects of independent variables on the dependent variable (DV) (Dakin et al. 2006). The model here indicated two outcomes: (a) *No* over *Yes* or (b) *Undecided* over *Yes*. The model assigned a DV code of *Yes* = 1, *No* = 2, and *Undecided* = 3. In this study, 1 = *Yes* was selected as the reference category (i.e. student participate in recycling). The independent variables assigned were (a) *attitudes toward recycling (Attitudes)*, (b) *social influence in school and familiarity with logistics (SISFL)*, (c) *indifference to programmes (Indifference)*, (d) *perception of waste (Perception)*, (e) *involvement with others and benefits (InWOB)*, (f) *perceived financial incentives (Financial)*, and (g) *information received on recycling (Info)*. Multinomial logistic output showed (a) the comparison of those who do not participate in recycling with those who do and (b) the comparison of those who are undecided about participation in recycling to those who participated. This model could analyse any existing relationship and compare the effects of underlying factors derived from the principal component analysis (Cohen et al. 2003). The self-reported act of bringing recyclables to school was used as the dependant variable (DV) as an essential indicator of recycling participation. Figure 6.2 indicates the breakdown of respondents according to gender and their responses to the dependant variable statement.

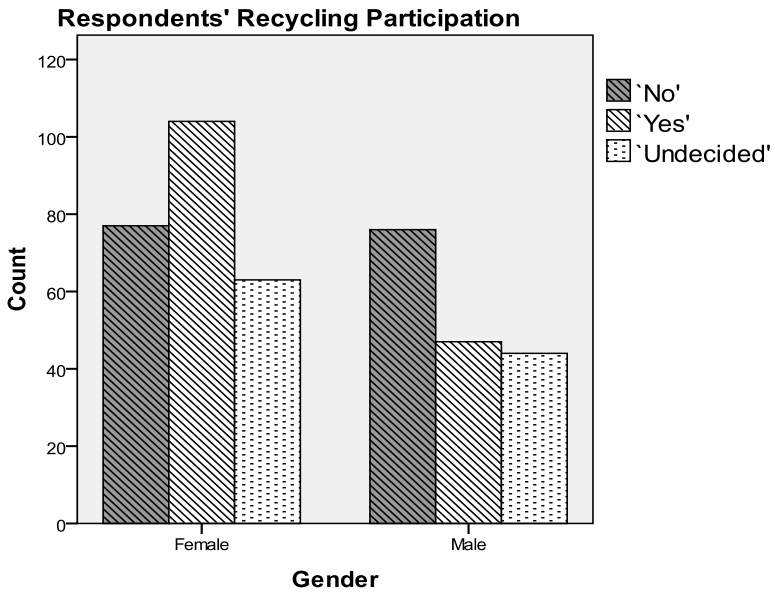


Figure 6.2: Respondents' recycling participation response

Prior to the logistic regression modelling, factor analysis was used with principal component analysis (PCA) to group initial variables into smaller, interpretable underlying factors to be analysed. Factor analysis was carried out on three constructs comprising items that assessed the attitudes toward and perception of waste and perceived involvement in recycling. As mentioned previously in Section 6.1.1.2 – 6.1.1.4, the first construct consisted of 10 items, the second construct consisted of 9 items, and the third consisted of 13 items. As suggested by Hair et al. (1998), the Kaiser-Meyer-Olkin (KMO) sampling adequacy test and the Bartlett's test of sphericity were computed to assess the suitability or adequacy of the data for factor analysis. The KMO sampling adequacy test predicts if data will factor well, and a KMO measure value of more than 0.6 is considered acceptable (Sidique et al. 2009; Vicente & Reis 2008). Bartlett's test evaluates the null hypothesis that the correlation matrix of variables is significantly uncorrelated. If the hypothesis is rejected (P-value < 0.05), then PCA can be applied.

The data analysed met the requirements for factor analysis for all three constructs. To decide which factors should be retained before proceeding with other analysis, the researcher used the Kaiser eigenvalue criterion and the scree test as recommended by Nunally and Bernstein (1997). If the eigenvalue is greater than 1, the factor is retained, but if the eigenvalue of the factor is less than 1, it is considered an insignificant factor and is excluded. A scree plot, which plots the eigenvalue magnitudes on the vertical axis against the number of components

on the horizontal axis, was generated as a graphical interpretation of how many factors should be retained. The same procedure was conducted for the second construct of perception of waste, but only one factor was retained based on its internal consistency and larger share of variance (Wang et al. 2009). The third factor analysis of constructs for involvement with others revealed that two factors should be retained. The Varimax rotation method (Kaiser 1958) was also used to rotate the retained factors in each application of analysis, and the loadings are indicated in Tables 6.6, 6.7 and Table 6.8. Rotating factors increases their interpretability (Wang et al. 2009) and indicates the proportion of variance for each factor rotated. The variables with greater than 0.5 loadings were considered important to appropriate groupings. The highest loadings in each factor were used as the basis for assigning the new variable's description. Cronbach's coefficient alpha was computed for each factor to test the reliability of the items' scales or consistency. Constructs that indicate higher than 0.5 are considered acceptable for an exploratory study (Nunnally 1978).

Table 6.6 indicates the 10 items related to students' attitudes toward recycling participation. They were computed using factor analysis with PCA and brought forth three new dimensions. The first factor is labelled *Attitude.* This factor describes the students' attitudes toward recycling related to perceived constraints on the behaviour. The second factor is labelled *Social influence in school and familiarity with logistics (SISFL)*. The loading in this factor signifies the users of the recycling bins and the students' familiarity with the locations of the three coloured recycling bins and centres. The third factor is labelled *Indifference to programme (Indifference)* as it relates to the students' indifference toward the recycling programme. The three components together account for 58% of the initial variance (KMO = 0.7; Bartlett test of P-value = 0.000; Cronbach's alpha ranging from 0.5 to 0.7).

Table 6.6: Factor analysis on *Attitudes* toward recycling

Components	Loadings
Component 1: Attitude (Variance explained: 30%; Cronbach's alpha: 0.71)	
• I will send recyclable waste to the centre if the centre is near.	0.81
• I will separate recyclable waste if required by law to separate in the bins provided.	0.80
• I only send recyclables to school if I have time.	0.72
Component 2: (SISFL) (Variance explained: 15%; Cronbach's alpha: 0.68)	
• Many teachers and friends store recyclables in the recycling bins at school.	0.76
• The bins are visible in my school compound.	0.70
• I know where the recycling bins are in my neighbourhood.	0.62

• My family and I send recyclables to the recycling centres. • I like to get some pocket money from selling recyclables.	0.58 0.52
Component 3: Indifference (Variance explained: 13.4 %; Cronbach's alpha: 0.5) • Although my school has some kind of recycling programme, I have not started to recycle. • Although my school has some kind of recycling programme, I have not encouraged my family to recycle.	 0.82 0.74

- All loadings are after Varimax rotation

Table 6.7 lists the items regarding students' perception of waste and factor analysis was computed using similar statistical procedures. Three factors were revealed, but only one factor was acceptable using Cronbach's alpha of reliability; thus, the other two were not considered. This factor accounted for 25% of the initial variance (KMO 0.6; Bartlett test of P –value = 0.000 Cronbach's alpha 0.77).

Table 6.7: Factor analysis on *Perception of waste*

Component : Perception of waste (Perception) (Variance explained: 25 %; Cronbach's alpha: 0.77)	Loadings
• Waste in landfills can cause environmental pollution. • Waste has value. • Some waste can be turned into valuable resources.	0.84 0.83 0.82

- All loadings are after Varimax rotation

In Table 6.8 the factor analysis of the 13 items related to students' perceptions of financial incentives of recycling brought forth two new dimensions. The first factor is labelled *Involvement with others and benefits* and includes statements that relate to becoming more aware of the importance of recycling to the environment and gaining more knowledge of how to care for the environment. The second factor, labelled *Social concerns*, deals with responses that reflect students' perception of the public's general lack of concern toward recycling participation. The two components together accounted for 63% of the initial variance (KMO = 0.94; Bartlett test of P-value = 0.000; Cronbach's alpha ranging from 0.63 to 0.74). The scores of each factor were computed for subsequent regression analysis as an option in exploratory factor analysis by a simple non refined method (DiStefano et al. 2009). The factor scores for each individual were averaged by summing raw scores corresponding to the items that loaded on the factor. This method is considered acceptable for most exploratory research (DiStefano et al. 2009; Kurz et al. 2007).

Table 6.8: Factor analysis of *Incentives*

Components	Loadings
Component 1: InWOB (Variance explained: 55 %; Cronbach's alpha: 0.9)	
• My school's recycling programme is involved with other schools' recycling programmes.	0.77
• I have fun participating in my school's recycling programme.	0.75
• Activities in my school's recycling programme help generate my environmental awareness.	0.72
• I gain more knowledge on how to protect the environment by participating in my school's recycling/environmental programme.	0.72
• Our school gets some revenue by selling recyclables to outside vendors.	0.70
• I think the government's recycling goal to achieve a higher recycling rate is realistic.	0.65
• I think more people should participate in environmental community programmes.	0.63
Community and school recycling programmes are good environmental discussion platforms.	0.63
Component 2: Social concerns (SC) (Variance explained: 8%; Cronbach's alpha: 0.9)	
• Community recycling centres are a benefit to the community.	0.74
• Public participation in environmental community programmes is low.	0.74
• There is a lack of support for community recycling programmes from the public.	0.72
• If more individuals participate in environmental pro-community programmes, more will care for the environment.	0.64
• The support from government for community recycling programmes is welcomed.	0.63

- All loadings are after Varimax rotation

The respondents' self-reports of recycling participation were analysed through a logistic regression (multinomial), with the five factors derived from the factor analysis and two other variables obtained from the data (i.e. *Information received* and *Perceived financial incentive*). The obtained model was analysed by statistical software (SPSS 17) using several procedures. The Pearson and deviance goodness of fit test (Menard 2002) and the likelihood ratio test corresponded to a statistic output for a well-fitting model which is statistically significant ($p < .05$).

An assessment of multicollinearity was also diagnosed using indications of the variance inflation factor (VIF) scores and tolerance scores. The literature suggests that multicollinearity is an issue when the VIF scores above 10 and the tolerance value (1/VIF) is less than 0.1 (O'Brien, 2007). The linear regressions computed for each predictor over the others for this study recorded no VIF factors above 10, demonstrating inconsequential multicollinearity.

The analysis conducted in this study compared the *Yes* responses of the dependent variable against the *No* and *Undecided* appraisals. The estimates of the coefficients and odds ratios calculated represent deviations from a *Yes* response. The coefficients or parameter estimates

of the choice between outcomes *No* over *Yes* were calculated separately from the estimates of the choice between outcomes *Undecided* over *Yes*. No direct comparisons were made on effects that had an impact on a *No* outcome to effects impacting the *Undecided* outcome. In this study, the outcome was regressed against the following variables noted: (a) *attitudes toward recycling (Attitudes)*, (b) *social influence in school and familiarity with logistics (SISFL)*, (c) *indifference to programmes (Indifference)*, (d) *perception of waste (Perception)*, (e) *involvement with others and benefits (InWOB)*, (f) *perceived financial incentives (Financial)*, and (g) *information received on recycling (Info)*.

6.1.2.1 Results

Table 6.9 presents the estimated predictors determining the outcome decisions. In this analysis, the outcomes (*Yes*, *No*, or *Undecided*) was regressed against the following seven variables: (a) *attitudes toward recycling (Attitudes)*, (b) *social influence in school and familiarity with logistics (SISFL)*, (c) *indifference to programmes (Indifference)*, (d) *perception of waste (Perception)*, (e) *involvement with others and benefits (InWOB)*, (f) *perceived financial incentives (Financial)*, and (g) *information received on recycling (Info)*.

Table 6.9: Parameter estimates of the Regression Model

Variable	β (Coefficient)	Exp β (odd ratio)	P value
No vs. *Yes*			
SISFL	-1.39	0.25	0.000
InWOB	-0.65	0.52	0.000
Perception	1.08	2.96	0.000
Indifference	0.27	1.31	0.070
Attitude	-0.24	0.78	0.290
Social concerns	0.15	1.16	0.570
Financial	-0.25	0.77	0.079
Info	0.03	1.04	0.772
Constant	2.67		0.013
Undecided vs. *Yes*			

SISFL	-0.42	0.66	0.049
InWOB	0.50	1.65	0.054
Perception	0.25	1.28	0.240
Indifference	0.22	1.25	0.121
Attitude	-0.37	0.96	0.866
Social concerns	-0.24	0.78	0.358
Financial	-0.18	0.83	0.192
Info	-0.18	0.84	0.131
Constant	0.00		0.996

Dependant variable references 1=*Yes: I send recyclables to my school centre*; 2 = *No: I do not send*; and 3 = *Undecided*. Subtracting 1 from the relative odd ratio (β) and multiplying by 100% gives the percentage change in the probability of an outcome being *No* or *Undecided* for every unit increase in the independent variable (Dakin et al. 2006). The coefficients are in natural log odd units and are converted into odd ratios by exponentiation of the coefficient.

This analysis suggested that *SISFL* and *InWOB* had a significant impact ($P < 0.05$) on all outcomes of students' decision while *Perception* was statistically significant ($P < 0.05$) to those who responded *No* when compared to the referent group. The analysis also suggested that students' decisions did not differ in terms of the importance given to the other non statistically significant variables, namely (a) *Attitude*, (b) *Indifference*, (c) *Social Concerns*, (d) *Financial Incentive*, and (e) *Info*. In other words, these factors were not determinants in explaining students' propensity to exhibit recycling behaviour.

The presence of one unit of *SISFL* reduced the probability of non participation and indecision by 34-75% ($p \leq 0.05$). A one-unit increase in the predictor variable *SISFL* reduced the probability of non participation rather than participation by 75% ($p < 0.00$) and reduced the probability of the outcome *Undecided* relative to the referent group by 0.42 or 30%. This can be interpreted as meaning that when students observe, *Many teachers and friends store recyclables in the recycling bins at school,* they *are* aware of who uses the bins and the bins' location. The responses also indicated that they (students*) know where the bins are in the neighbourhood,* and know that they can *get pocket money from selling the recyclables.* When the student's family was also sending recyclables to the centres, the propensity to participate in recycling was higher. This finding is also consistent with the findings of Sidique et al. (2009): people who are more familiar with the bins and the recycling centres and know what

materials can be accepted will drop off recyclables more frequently than those who are not familiar with the bins and the recycling centres and know what materials can be accepted.

The perceived level of *InWOB* played a significant role in the decision between non participation and participation ($p = 0.000$). However, it has been posited that the significance level indicated ($p = 0.054$) found for this variable between the *Undecided* and the referent group is insignificant ($p = 0.054$; Dakin,et al.2006). An increase in level of perception of *InWOB* reduced the probability of non participation (*No*) rather than participation (*Yes*) by around 51%. The analysis indicated a negative coefficient to *InWOB* to those who reportedly did not participate in recycling activities, suggesting that they have minimal involvement with activities in the recycling programme. The result suggests that if more students (a) get involved with their schools' recycling programme or other recycling groups, i.e. actively participate, (b) gain knowledge, and (c) gain enjoyment from participation, the propensity to participate in recycling could be expected to increase.

The analysis indicated that the increase in a unit of *Perception* significantly *increased* the probability of a non participation outcome when compared to a participation outcome. The model indicates that the predictor variable was statistically significant ($p < 0.05$), although negatively so. The interpretation is that despite the students' reportedly knowing (a) that some waste can be turned into valuable resources, (b) that some waste has value, and (c) that waste in landfills can pollute the environment, the propensity to *not* participate in recycling is high. This paradox is interesting as it suggests that having a general knowledge about waste does not mean having the propensity to recycle it and more knowledge about waste or exact knowledge may be required for the desired outcome to be achieved (Barr et al. 2001).

In addition, this analysis also estimated that the three variables *SISFL*, *InWOB*, and *Perception* made significant impacts on those who responded *Yes* to participating in recycling. The only differences were the interpretation and direction of the regression coefficients. The positive coefficients to the variables *SISFL* and *InWOB* indicated that those who participate in recycling view (a) being aware of where the recycling bins are, (b) knowing who uses them, and (c) being involved with others in the programme (which implies those involved in the programme, including programme facilitators) as impacting their propensity to participate.

6.2 The implications of the findings in the context of social learning

One of the three statistically significant variable construct in this study that predicted the probability of students to participate (or not participate) in recycling activities was found to be 'InWOB' or '*Involvement with other bodies'*. The variables of this construct were previously indicated in Table 6.8 and the construct included students' involvement in their school recycling programme with others, such as other schools. The qualitative evidence also suggests that the recycling programmes are aimed at involving all students rather than individuals i.e. the programme is targeted to all students in the respective school. From a social learning perspective, the recycling programme is a form of 'platform' for students to get involved in social oriented activities pertinent to SWM i.e. a 'process that increase awareness, capacities, and repertoires of action amongst actors in a social domain' (Brown & Timmer 2006 p.3). As mentioned in Section 6.1.2.1, the results from the analysis suggests that if more students (a) get involved with their schools' recycling programme or other recycling groups, (b) actively participate, (c) gain knowledge, and (d) gain enjoyment from participation, the propensity to participate in recycling could be expected to increase. These processes are pertinent to the concept of social learning as an approach to impact upon a positive outcome i.e. participation in recycling. According to Krasny and Lee (2002), this concept of social learning may be useful in environmental education, particularly when 'the focus is on *actively* engaging multiple audiences in resource management rather than teaching ecological concepts' (p.3).

From another perspective, the facilitators of these programmes, either environmental NGOs such as TrEES or SMART Ranger, can use this finding to further refine their programme designs for implementation and achieve the objective of advancing an environmental concern and learning about SWM with students. NGOs often facilitate environmental protection or recycling programmes while youths are known to be active agents in these programmes (Wray-Lake et al. 2010). In this respect, students' perceptions and opinions on resource management can provide an indication for future environmental policies (Meinhold andMalkus 2005).

Summary

The aim of this chapter was to obtain students' perspective on SWM, particularly related to recycling activities and help fill the gap or scarcity of studies on youths recycling perceptions and behaviour (Ojala 2008). The qualitative evaluation of the perception of students about waste management matters for example provided an insight into how students perceived others' involvement i.e. family, school friends, teachers and NGOs role in this context. The analysis also hypothesised that involvement with others (including NGOs that facilitate their school's environmental programmes) *does* make an impact on students' recycling participation but other factors also play a role. The regression analysis revealed that this was the case.

As mentioned, the analysis conducted can allow a researcher to examine and make inferences and sense out of the data (Hinkle et al. 1988). In this study, using a mixed method approach, qualitative data were collected to describe, complement and corroborate (where pertinent) the quantitative evidence. A mixed method approach can minimise the weakness and build upon the strengths (Johnson & Onwuegbuzie 2007) of both quantitative and qualitative approaches. This was highlighted in Chapter 3. This researcher applied a `concurrent design study' as described by Tashakkori & Teddlie (1998) in which a quantitative survey was conducted in parallel to interviewing several students to obtain their responses and perceptions on waste matters and to gain an understanding of the nature of their involvement in sustainable waste management activities.

Obtaining students perception on what matters to them can also help inform environmental NGOs such as TrEES or SMART Ranger as they are actively involved with facilitating students' environmental and SWM programmes e.g. recycling programmes in schools. Recycling has been touted in the literature as benefitting both the environment and the economy (Vicente & Reis 2008), while the involvement of the public, including youth, is cited as integral to the sustainability of any pro-environmental programme (Meinhold & Malkus 2005). The findings highlight aspects of recycling which motivates or hinders students' involvement with the behaviour. In this manner, NGOs could take these as cues to develop more relevant strategies for future implementation and facilitation of waste programmes with schools.

Chapter 7
Synthesis

Introduction

This chapter aims to integrate the qualitative evidence obtained from the analysis conducted in Chapter 4 and Chapter 5 with the quantitative evidence gained from the evaluation made in Chapter 6. The rationale was to identify how social learning themes were supported or similarly embodied in the process of programme implementation, i.e. to discover whether there were 'literal replications' of evidence that increased its robustness and enabled the arrival at a common conclusion (Yin 2003). The evidence is framed by the elements considered as being pertinent to a social learning approach, i.e. the themes in social learning relevant to this thesis, which had been derived from the evidence of Chapters 4 and 5. In the second stage of synthesis, the aggregated evidence from the first stage of synthesis is triangulated with the quantitative descriptions derived from Chapter 6. The rationale for this second phase is corroboration of evidence (Jick 1979).

The processes involved incorporated the following considerations: the research questions formulated, the theoretical positions put forth in Chapter 2 and the relevant procedures for synthesising evidence. In the next and final section, Chapter 8, the interpretations derived from the syntheses are incorporated in the development of a conceptual model of social learning application within the context of this thesis.

7.1 Synthesis of key evidence from Case Study A and Case Study B: Comparison for matches or contradictions in application of the social learning themes

The synthesis process involves evaluating the extent of similarities of the key evidence, i.e. the perspectives of the key respondent in Case Study A (Chapter 4) and those of the key respondent in Case Study B (Chapter 5). The five strands of activity (i.e. themes) integral to social learning defined in Chapter 2 highlighted in the two case studies are again applied here to frame the evidence for the synthesis. The themes are *Reflection* (experiencing and developing a deeper understanding), *Participation* (co-acting and monitoring the programme), *Integration* (connecting people) *Negotiations* (consulting with others), and

Systems orientation (taking into consideration the waste management system in the current local context).The operational definitions were indicated in Chapter 2 under Section 2.3.2.

In analysing evidence from 'two-case' studies, Yin (2003, p. 133) suggests that a 'cross case synthesis' technique is relevant. This technique treats each individual case study as a separate study, but an attempt is made to establish any similarities. In addition to this idea, this researcher used a method similarly applied by Brunton et al. (2006), but with modification; this is described below. The general conception of qualitative data analysis flow posited by Miles and Huberman (1984, p. 23), i.e. data reduction, data display and conclusion drawing/verification, was also useful in this synthesis approach. Using the framework matrix format, the summary responses of the two NGO facilitators were compared according to the theme identified. Making comparisons can distinguish what in the particular programme is important and may be worth improving upon.

7.1.1 The process of synthesising the evidence

The summarised evidence from both case studies in addressing the particular theme was compared and coded based upon this researcher's interpretation of the degree of similarity in the NGOs' efforts towards programme implementation that embodied the particular theme of social learning. In the table (Table 7.1), the first column includes the operational definition of the theme. The next column highlight the nature of comparison with the particular code. Le Compte (2000) suggests that using some meaningful criteria or rules created especially for the study, or use of a set of reliable guidelines, can assist in making comparisons. This researcher determined the nature of comparisons made, by using a simple code format: Code *M* was used to indicate a 'match', and Code *C* indicated a contradiction in responses. The third column highlights the main constraints faced by both facilitators. The subsequent paragraphs provide the explanation to the descriptions in Table 7.1.

Table 7.1: Matrix summary of synthesis

Synthesis Stage 1: Interpreting and comparing similar actors' perceptions

Themes from qualitative case study	**(M) –Matching each other's perspective** **(C) – Contradicting the other's perspective**	**Main constraint**
Systems orientation	M	• Limited platforms for discussion
Integration	M	• Limited integration with local authorities
Negotiations	M	• Changing people's mindset • Changing local authorities' management mindset
Participation	M	• Lack of public participation
Reflection	M	• Limited discussion with only those involved or willing to participate

The first theme to be addressed in the comparison was *Systems orientation*. As operationally defined in Chapter 2, 'systems orientation' thinking focuses on the relationships (of actors, or of activities) that connect the parts within a system (in this case the waste management system). Based on the evidence obtained from Chapters 4 and 5, the two NGO facilitators were found, in the process of implementing their SWM programmes, to have made efforts to foster a relationship with various actors, including decision makers, i.e. government officials. This is parallel to the social capital theory reviewed in Chapter 2, which highlights the importance of building 'bridges' or investing time and effort to establish useful relationships between different actors (Bordieu 1985; Putnam 1995). However, each NGO facilitator faced some lack of interest or 'indifference' about their programme from officials. The respondents' general view was that some waste management administrators did not fully understand the aims and methods of their programme and were apprehensive about the role of NGOs, i.e. about their function as social and environmental facilitators. Authors posit that the perceived 'roles' and 'boundaries' placed by different actors may sometimes lead to different understandings, which constrain productive interactions (Ison 2005; Keen et al. 2005); and with different stakeholders often having a stake in the resource, power dynamics frequently come into play (Woodhill 2002). From a social learning perspective, these can be interpreted as a 'mismatch' of understanding about the issue, which, in this case of NGOs' role in SWM, could be due to a lack of communication or knowledge, conflicting commitments or non-existence of avenues to hold productive dialogues (Ison 2005).

Operationally defined in Chapter 2, *Systems orientation* also considers the interacting relationships and viewpoints of those involved (Bawden 1999). This can be demonstrated through some form of platform for discussion (Bull et al. 2008; Cross 1981; Korten 1990). Comparing the evidence obtained (i.e. both key respondents' accounts), it was found that both key respondents did not elaborate in detail, the nature of their relationships with authorities. However, both acknowledged that, generally, the Government was supportive of their programmes. In addition, administrators (Government) were perceived by both facilitators to be more concerned with their assigned duties, which in the local waste management system reflect a prioritisation of technical and enforcement responsibilities. Meaningful discussions to foster further understanding about different roles, values and aims were reportedly rare in both cases. Funding or technical support from Government was also reported to be minimal in both cases. Each key respondent acknowledged the limited opportunities for discussion with authorities, but both experienced more opportunities to communicate with other actors, such as personnel of schools, charity homes and retail hypermarkets.

Both key respondents acknowledged their organisations' status as not-for-profit, and were concerned mainly with improving the public's capacity, including its awareness of sustainable waste management. Both agreed that economic return was not the main driver. For example, in Case Study A, (SMART Ranger programme) schools were provided with 'seed money' to set up the programmes in the school and any money gained from the sale of recyclables was used to set up other environmental projects, such as the rain harvesting system; while in Case Study B (TrEES CWP) the responses alluded to some minimal economic returns for the charity homes, which benefited the residents of the homes. The recycling programmes implemented with the retailers were also not for profit, per se, which supported the hypermarkets' 'corporate social responsibility' (CSR) agendas.

The second theme to be addressed in the analysis of comparison was *Integration*. This theme is concerned with the efforts or processes to 'connect' people, skills and knowledge (Brown et al. 2005). In this study's context, both NGOs were successful in their efforts at 'reaching out' to schools. The evidence from both case studies also showed that both NGOs were actively involved with schools and each structured their programmes to promote 'active participation' among school students. The programmes also included aspects to 'build the capacity' of students through developing their decision-making and oral and written

presentation skills, and through arts and crafts projects. In both cases the SWM module may be integrated in the school's 'Kelab Pencinta Alam Sekitar (KPAS)' or environmental club activities. In Case Study B, the NGO organised recycling competitions and integrated SWM activities as part of its forest conservation awareness programme and competition among schools. In terms of 'reaching out' to the general public, i.e. to other actors, the key respondent in Case Study B (TrEES) and the organisation that she coordinated appear to have had more success than the NGO in Case Study A (SMART Ranger); but the latter was successful in extending its SWM programmes to students outside of Selangor, i.e. to students in less urbanized areas. Thus, despite the NGOs' targets to integrate with different sets of audiences, their objectives were similar, i.e. to connect or 'bridge' with more individuals, to promote SWM awareness through relevant programmes, and to build students' and the targeted community's capacity and development, including skills and understanding about SWM.

The third theme, *Negotiations,* is closely related to the previous theme in its definition and is focused on processes that make possible the connections or integration of the different actors, knowledge and skills. This can similarly be seen as the efforts involved to 'bridge' the identified entities. Often in the process of negotiation, collaborative efforts or partnerships that apply the relevant knowledge and skills are required in order to take the necessary action(s) (Keen & Mahanty 2005). In the process of programme implementation, both key respondents reflected that, generally, negotiations were more successful when there was mutual understanding about the outcome of the actions to be implemented. From a social capital theoretical perspective, negotiations are ways of developing a more durable network, of achieving cooperation, and of initiating bonding (Coleman 1990; Fukuyama 1995; Putnam 1995). For example, the NGOs were successful in negotiating for recycling space and funds, which also benefited others involved.

In addressing the next theme, i.e. *Participation,* defined in Chapter 2 (Section 2.3.2) as being involved in various stages of activities, from dissemination of information to knowledge sharing and actions implementation, both key respondents perceived that the 'traditions of understandings' (Ison 2005, p. 23) can constrain effective participation. Both key respondents posit that participation is a key element to facilitate 'learning' as a means to general sustainability. However, gaining public participation or, rather, facilitating means for discussions, was not an easy task. There were not many platforms available for discussions

with the general public about SWM. The general public apathy, and the perception of waste as being the authorities' responsibility, i.e. a lack of understanding with regard to 'why' one should recycle when there is provision for garbage (including recyclables) collection (Othman 2002), were perceived as barriers to advancing SWM activities such as segregation of wastes. Both facilitators cited a lack of 'civic consciousness' and general public apathy. However, the evidence points to more-successful efforts of facilitating learning through participation, including discussions among the school students. Through the activities implemented in schools, the students took the opportunity to discuss their concerns and implement their aspirations. The students also participated in current and creative ways to sustain the programmes, i.e. extending recycling to water conservation projects, blogging, social networking, reporting and being consistently involved with monitoring the development of their activities, as indicated from their social Web pages.

Reflection was defined as a process of experiencing and developing a deeper understanding about our actions and ideas (Bull et al. 2008). In this study, both facilitators believed that through their experiences they had learned to overcome the constraints faced, by taking into consideration the local context and the appropriate actions that can lead to positive outcomes. From the perspective of the facilitator of NGO A, his organisation's initiatives *were* parallel to the overall civic drive, which is to transform the public to become more responsible about the environment. The expert also reported that students were enthusiastic and learned to take more responsibility for the environment, a view that was corroborated by the interview held with a few students and from the sampled survey results. His SWM module continued to incorporate materials relevant for the targeted audience and for sustainability of the programme; it involved both action and management aspects. In the case of NGO B, the coordinator believed that small efforts, which are made despite the constraints faced, can create a big impact, but in the process, many considerations must be observed. This relates highly to understanding the existing system's elements that define the local institutional and social context. However, both respondents viewed that people's varied understandings or misperceptions of an NGO's role can constrain the efforts in promoting SWM as a social agenda item. The evidence from both case studies that allude to students' perspectives (gained either from the sampled survey or from the interviews with students) revealed that students were opened to many challenges and outdoor activities, that 'learning' was experienced through 'doing', and that the students gained better understanding by being involved in discussions. In relation to this, both the inside and the outside of schools'

'learning' spaces need to be utilized to foster learning and actions, and this is a key consideration to foster awareness and change. Both informal and formal settings for intervention programmes can have a different degree of impact upon young people's learning and behaviour (Hacking et al. 2007). A 'formal' module/guideline provided by NGO A relied on a systematic approach to implementing and monitoring SWM programmes, while the more informal approach by the NGO B attracted students to participate in SWM in school.

The evidence derived from Chapters 4 and 5 indicated that, in each case, the facilitator reflected upon and believed in their objectives to work towards an improved identity, one that is responsible, civil (Dekker 2009) and social (Putnam 1989), as opposed to irresponsible, apathetic and selfish (Fukuyama 2000). Committed to their objectives, the NGOs in the case studies integrated other actors through negotiations, and encouraged participation in SWM, while taking into consideration the current systems in context.

7.1.2 Framing the comparative findings

The following paragraphs integrate the evidence further to identify what patterns of constraints were faced by both facilitators, and to interpret the actions taken as a type of learning outcome according to the learning loops idea (Argyris 1999), discussed in Chapter 2 in Section 2.3.2.2. The nature of the learning outcome provides an indication as to what forms of actions can or could be taken to resolve the issue or constraint of concern.

The evaluation is indicated in Table 7.2. The first column contains the summarised perceptions of constraints faced by both key respondents; the second column indicates the forms of actions taken by the NGO of concern to overcome the perceived barriers; and the third identifies the 'type' of learning outcome from the perspective mooted by Argyris (1999; 2002). There were four main constraints faced by both NGO facilitators, and these are summarised in the following two paragraphs.

There was minimal networking with government officials, except to source funding for educational environmental activities. There is little mention of interaction, or of forming a relationship, between the NGO respondents and government officials in waste-related issues. From informal discussions with waste administrators it was apparent that government officials perceived that recycling was part of a 'technical' waste management collection system, rather

than a 'social' responsibility. However, the NGOs' activities did not face any opposition from the authorities. This was because the NGOs were apolitical and not in opposition to any government policy. The expert respondents opined that what was important was to maintain the good relationships (even weak ones) to enable sustaining and development of their social and environmental activities and agenda.

Some activities, such as consultations with neighbourhood residents, for example, could not be followed through, because there were not enough funds for employing staff (Case Study A). Both expert knowledge respondents reported that what funds were available were used mostly for costs related to management and operations. For example, in Case Study B, maintaining the recycling outlets was constrained by limited funds: volunteers were difficult to obtain and sustain, and the ability to hire paid staff was limited. Transferring the responsibility (for maintaining and managing of centres) to the actors involved, i.e. schools, charity homes and retail management, was a solution taken to resolve this issue of limited staffing. The constraint in funding for NGOs' initiatives has been cited in other studies involving NGOs' capacity building initiatives (Colon & Fawcett 2006; Davies 2008).

Table 7.2: Summary of constraints and the resultant actions taken

Constraints faced in facilitating learning about SWM	**Actions taken by both NGOs**	**Type of learning outcomes interpreted, based on the idea of Argyris (1999)**
Limited 'platform' for collective discussion or reflections on SWM, especially with waste officials.	Participation in Government's recycling campaigns to show and give support Obtaining of recognition from the media, or other forms of media communication, to help highlight NGO's presence Initiation of contacts with other international environmental based NGOs that are involved with the government	'Double loop learning'– making changes to advance changes 'Triple loop learning'– changing normal assumptions to do alternative things and become more effective
Established 'institutional boundaries' (Colon & Fawcett 2000; Ison 2005)	Employment of non-contentious approaches,	'Single loop learning'

Limited financial resources	Obtaining of funds from local government allocations for social activities, but mostly from international NGO sources and local banks or corporations with an established CSR agenda.	'Double loop learning'
Sustaining programme activities	Delegating responsibilities, but with continuous monitoring	'Single loop learning'– following/taking a routine solution

The course of action taken by each NGO facilitator in overcoming the issues identified can be interpreted as the enabling of different types of learning outcomes. By identifying these outcomes, which imply a more complex understanding of the issues or challenges, the organisation (or individual) may become more conscious of other creative and effective actions or means to solve the issues or challenges (Argyris 2002). For example, the evidence from the programme facilitators suggested that there was a limited platform for deliberations between them and government officials, which was acknowledged by both key informants as a challenge. This situation did not seem to hinder much their efforts with other actors in the community, but resolving this challenge could open up other opportunities to advance their initiatives. This could become a potential strategy to advance a better understanding about NGOs' role in SWM to others, while initiating a relationship as a basis for future collaborations. However, this strategy should be considered while bearing in mind that, at times, deliberations with policy makers may not produce the expected outcome, i.e. of consensus, or of development of the resource's management (Bommel et al. 2009; Reed et al. 2010).

7.2 Triangulation: Synthesis of case studies' themes and survey findings

The purpose of triangulation as mentioned in Chapter 3 was to 'improve the accuracy of the judgements made of an issue' (Section 3.3.1.1). NGOs' involvement with schools were perceived to have encouraged school students to practice sustainable environmental behaviour such as recycling participation (Kamaruddin and Omar 2011) and this perception was confirmed from the findings inferred from the questionnaire survey regression analysis and the interviews with the students.

The descriptive analysis based on the questionnaire (Chapter 6 Section 6.1.1.2 – Section 6.1.14) and interview responses (from students) suggested that that their perceptions (about SWM practices, including on the involvement of NGOs) were varied. Thus, to evaluate what factors or variables could impact upon their recycling behaviour, a regression analyses was conducted in which the constructs i.e. variables mentioned in Chapter 6 Section 6.1.2 were regressed with a variable, indicating the sustainable behaviour of recycling. The 'dependent' variable was derived from a question posed in the questionnaire i.e. 'I participate in recycling'.

The constructs of variables *INWOB* and *SISFL,* comprised of queries that 'tap' a student's sense of social involvement and learning with others, were found to be influential in impacting upon a student's recycling participation. The regression analysis conducted in this study also indicated that the construct of 'Attitude towards Recycling' was not statistically significant but 'Perception of Waste' was statistically significant to influence students' recycling behaviour.

Jehn and Jonson (2010) contend that comparing results from mixed-method evaluations has the advantage of providing an insight into what is similar and what is inconsistent. The results achieved in Chapter 6 suggested that the efforts made by NGOs (indicated in Chapter 4 and 5) to encourage the 'social' aspects of participation or involvement and learning thus are found to converge i.e. parallels with the constructs that are considered significant by students to influence them to participate. On the other hand, less involvement with others (external organisations such as NGOs included) and a lack of social influence in school or familiarity with recycling infrastructure may contribute to a non-participation in the particular behaviour.

In addition, the students and NGO facilitators interviewed perceived that, generally, Malaysians have low civic engagement; thus the low participation rate in community based environmental programmes. Other authors have also found that the lack of civic consciousness is positively related to a lack of participation in community based environmental programmes (Grodzinska-Jurgzak 2002).

In this second part of the synthesis, the reported summary of relevant responses of the expert knowledge NGOs generally converges with the relevant responses from the students' survey.

The former have taken actions to 'reach out' to the targeted audience in innovative ways to promote and establish SWM activities. The latter group, as the *receiving end*, responded that participating with others in recycling/environmental programmes *was* a statistically significant factor in influencing students to act pro-environmentally. These insights may be useful in the context of facilitating more-effective environmental educational programmes designed particularly to encourage more students to participate in recycling as SWM behaviour.

7.3 Summary of the processes

The processes involved in programme implementation of both environmental NGOs in the two case studies were compared, and similarities were noted. The synthesis framed the processes involved and based them using the important social learning elements. The two organisations had similar objectives, i.e. to increase the general public's SWM awareness, and the approach taken by each facilitator was similar, although the target audience was more varied in the programmes in Case Study B (TrEES). Despite their selection of audience, the two NGOs had similar challenges and constraints. One was the lack of opportunities or platforms for discussions with officials. A second was related to the need to source funding for their programmes because of their status as non-profit entities. This researcher also referred to Argyris' (1992; 2002) use of the multiple loop learning model as a guide to frame the current findings from the comparisons and triangulations made. This will be taken up in the next chapter and discussed as the strategies for improvement.

Chapter 8
Proposed Strategies, Conclusion and Future Research

This chapter develops a conceptual model that considers the evidence and findings (presented in the previous chapters) and proposes strategies to help to overcome the main issues of concern identified in the case studies and to address the research questions. These strategies could further establish the social learning processes with regards to the study's context, i.e. facilitating awareness-raising and the practice of SWM. The theoretical underpinnings highlighted in Chapter 2 form the main structure of the strategies proposed. This chapter also highlights the study's limitations and concludes by suggesting future research that could be developed in support of the National Solid Waste Management Plan (2005) and SWM in general.

8.1 Development of proposed strategies and framework model that support social learning in SWM

Based on the findings of the previous chapters, there are two perceived constraints to achieving outcomes of social learning and meeting the objectives of the NGOs. These are decision makers' or waste officials' lack of understanding about the role of NGOs, and the NGOs' facilitators' concern for sustaining the programme and the interest of the intended target group. The proposed strategies to overcome these constraints are related to establishing more-effective 'bridging' or networking with waste officials, and developing more-creative and pertinent projects or activities that encourage participation and build capacity, i.e. knowledge and skills. Two other strategies proposed in this chapter that are especially pertinent to the second concern are: gaining inputs and support from other organisations, such as the university community and resident- and youth-led associations; and drawing on current practices in promoting SWM behaviour with youths, but attuning these to the local situation.

The strategies have taken into consideration the theoretical concepts reviewed from Chapter 2, which emphasised that a positive learning outcome requires the participation, integration (within a system orientation), negotiations and understanding (i.e. reflection) of those involved, which are, by themselves, processes that are subject to change (Blackmore 2010; Keen et al. 2005). The strategies formulated in this study are limited to its focus within its geographical and social context, and they help address the research questions posed in

Chapter 1. In this study, the focus is on NGOs' facilitation of learning about sustainable practices in SWM that encourages people, in particular, school students, to get involved. The framework model is shown in Figure 8.1.

8.1.1 Strategy 1: Establishing more-effective 'bridging' or networking with waste officials

A proposed strategy is to suggest that the NGO facilitator formulate creative and effective ways to involve the local waste administrators and decision makers in the process more effectively. This helps to address Research Questions 1 and 2 of this thesis. Some level of 'unwillingness' of administrators to be more involved in discussions was reported in the case studies. Attempts to initiate some kind of network had been made, but did not develop. Some scholars contend that administrators, or the public sector, when dealing with other actors in general, prefer to maintain their 'status quo' (Bolaane 2005) of a 'top down' perspective with minimal or nonexistent concern for participation (Charuvichaipong & Sajor 2006). One reason could be the waste officials' placing a higher priority on enforcement and technical matters of waste management, i.e. on waste collection rather than *sustainable* waste management, which *includes* waste education (Chenayah & Takeda 2001; Shekdar 2007). This lack of interest could be due to local waste authorities' lack of understanding about civil organisations' role in the waste management system, or due to a scope of work that does not include social aspects of waste (Charuvichaipong & Sajor 2006). Explanations for this lack of interest from other empirical studies include: the public sector's deficiency of understanding of alternative mea and perspectives (Ison 2005); traditional styles of leadership, with low diffusion of democratic processes, which thus restricts redistribution of power (Charuvichaipong & Sajor 2006); and low tolerance for change (Mezirow 2003).

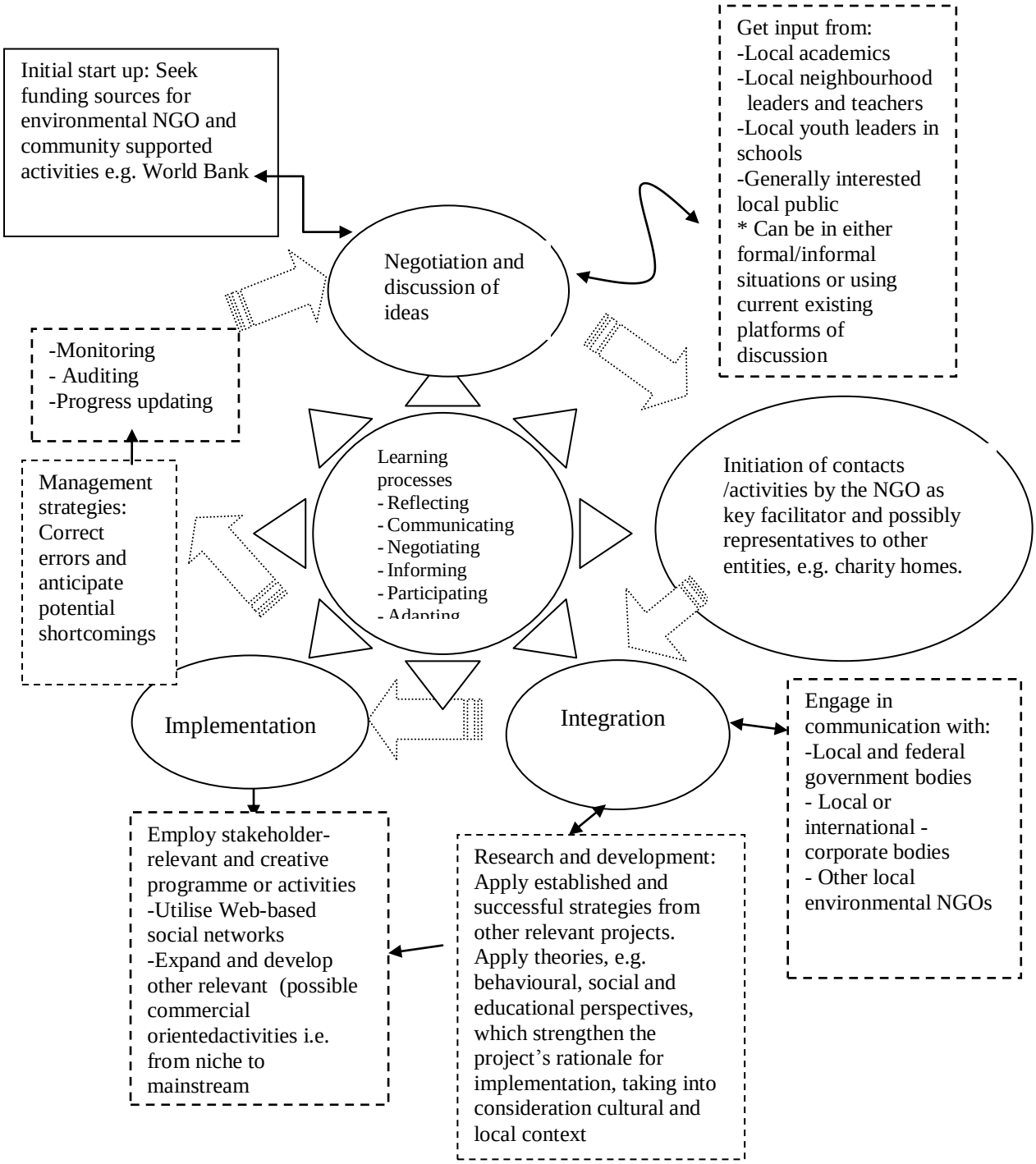


Figure 8.1 Proposed strategies in developing the conceptual model

It is proposed then that discussion sessions with waste officials could be done separately within a neutral environment, e.g. at training sessions on SWM (Mongkolnchaiarunya 2005). This can enable 'pre-conditioning' the officials to look at SWM as a 'social' process rather than as just technical waste collection for which they are responsible or have authority. The separate session is proposed as it could encourage officials to participate in a less conflicting, or 'neutral', environment without the 'power dynamics' mentioned by other authors (Colon & Fawcett 2000; Ison 2005). This could provide an opportunity also for officials to gain more knowledge about what the NGOs have successfully implemented and the constraints they are facing. It also could be a training session and an opportunity for the officials to learn other aspects of SWM, i.e. the social or human behavioural aspects of recycling (Noor 1996; Suttibak & Nittivattananon 2007; Troschinetz & Mihelcic 2009). If officials' decisions and involvement are considered important to sustain NGOs' environmental social programmes, their 'fixed' mentality of non-participation suggested by scholars (Bolaane 2005; Charuvichaipong & Sajor 2006) has to be transformed. Bommel et al. (2009) suggest that when actors can rethink their positions, interest and responsibilities, convergence of ideas can then take place Leeuwis (2004, p. 173) suggests that this 'rethinking' is a 'pre condition' of learning that enhance feelings of 'inter-dependence'. Involving decision makers in the learning processes, especially in collective based resource management, can help build their knowledge and capacity to understand the situation from another perspective, i.e. socially (Ison & Watson 2005) and not only authoritatively (Mongkolnchaiarunya 2005).

There is evidence that key decision makers can support NGOs' efforts when there is a better understanding of the issue, when the works conducted by the NGOs are generally not in conflict with government policy, and when the general community (general public) is more involved (Colon & Fawcett 2005; Marschke & Sinclair 2007; Suttibak & Nittivattananon 2007). Facilitating discussions, conducting activities, transferring information through innovative means, involving the locals and consistent monitoring and updating of progress are all key aspects to ensuring the continuous fostering of the learning process, and these parallel Kolb's learning theory of continuity (Kolb 1984). When cooperation between differing sets of people is developed, it provides the chance for relationships and trust to be built and this establishment of relationships of people enhances 'social capital' (Putnam 1995; Fukuyama 1995). Although time is required for the network to develop, this form of capital can help generate stronger networks between different people, leading to a more enhanced sense of responsibility to others and to the environment (Eames 2005; Putnam1995;

Pretty & Ward 2001). A step taken to help inform Malaysian policy makers', i.e. government, about NGO's involvement in SWM is to submit the findings of this thesis to the Economic Planning Unit, Prime Minister of Malaysia's Department, which was one of the requirements in undertaking research in Malaysia as mentioned in Chapter 3.

8.1.2 Strategy 2: Developing more-creative and pertinent projects or activities that encourage participation and build capacity, i.e. knowledge and skills

The second strategy is related to employing more-creative means to improve the younger generations', particularly school children's, pro-environment interest and rate of participation, in particular in sustainable practices. The following explanations contribute to addressing Research Questions 3 and 4. Children, as stakeholders in the environment (Hacking et al. 2007; Chawla 2002), are concerned about the quality of the environment (Haron et al. 2005). Children use their experience of learning to develop their understanding about the environment and can be critical as a result of their experience (Hopwood 2007). This was supported by the evidence from this study (data from the interviews of students aged 14 to 18), which highlighted that those who participate in their recycling programmes were concerned about sustainable practices and the lack of participation by others in their school. In this respect, initiatives taken by other countries could be emulated by programme initiators (but suited to local i.e. Malaysian teenagers' perspectives and current interests) to stimulate young people's interest in appreciating the value of waste through creative or artistic purposes. These include production of recycling clothes and jewellery made from recycled material and marketing them through various current means including use of social media tools on the internet (e.g. Trash Palace NZ; http://raisingceokids.com/).

As facilitators of environmental education activities with schools, NGOs could develop their own understanding of the underlying factors that enhance the targeted group's environmental behaviour. Gaining the relevant knowledge or understanding could enable the NGO facilitators to think of more-creative forms of activities or of changing the norm to attract students to participate in environmental activities (Aguilar & Krasny 2011). For example, evidence from this study indicated that while students were initially attracted by activities such as the sustainable waste recycling module, competitions and poster tasks, these activities could come to be considered 'normal', mundane and uninteresting, which could lead to less participation. Therefore, a strategy for the facilitator to find other means to update their

module or activities could be through more-creative channels, such as the Web 2.0 platform and other technology (O'Reilly & Battelle 2004), where students can interact and provide their input or say what matters to them, albeit in an environment that may be moderated by a responsible student facilitator This strategy had been applied in several schools that were approached in this study (as observed from comments on the school blogs and conversations or comments that appeared in the Facebook accounts), but had not been developed in all schools.

Also, the design of the infrastructure may be either an encouragement or a discouragement to students and the general public when it comes to using it (McDonald 2003; Werner & Rhodes 1998). Thus, while basic infrastructure for a particular sustainable behaviour, i.e. recycling, was provided, as indicated in Chapter 6, the location of the recycling bins was in non-strategic or not easily visible sites. Taking these into consideration, the current NGO-facilitated SWM activities could be expanded to enable the more creative students to develop these inputs of design. Infrastructure design considerations to encourage people to use the recycling bins have been shown to be successful in other countries, as demonstrated by Volkswagen's 'The Fun Theory' campaign. Within the study's context, this may encourage the urban based students to employ more-creative means to encourage other students to participate in recycling.

Related to the strategies proposed is the issue of evaluating the progress of programmes. This involves programme monitoring. This phase is considered essential because it can inform the facilitator about the degree of effectiveness (or failure) of the programme: what works, what are the shortcomings, what aspects may need adapting to improve effectiveness. Monitoring is highly related to the moral and legal obligation of the NGO to its funders (Tanden 1998): NGOs must be accountable for the funding on which most of them rely, at least in part, to sustain their programmes (Lewis & Sobhan 1999).

More-effective monitoring also provides a platform for the facilitator, i.e. the NGO, to legitimise its role further, for example to the funders. For example, in Case study A, one school was allocated two thousand Ringgit (approximately NZ$850) to fund materials and operational costs. The NGO involved recorded the expenditures and had these externally audited to ensure everything was accounted for. On the other hand, and from a bigger perspective, monitoring mechanisms provide a means of legitimising (Jepson 2005) the

programme itself (e.g. the recycling programme in schools or in the charity homes) to the stakeholders involved. For schools, the stakeholders are the school population in general, including teachers and parents' boards, while for charity homes it is their boards of trustees.

This monitoring phase is important as it enables feedback from the participants (i.e. school students or the actors involved) and, more importantly, the identification of any shortcomings faced by the participants. As an example, in Case Study A, facilitators monitored the progress of the programme (recycling activities) by having periodic meetings with students. However, partly due to time and staffing constraints, the facilitator expected students to 'self regulate' (Zimmerman 2002) in the context of their engagement with the activities of their environmental club. While the conditions for self-regulatory participation may have been established (modules prepared and periodic discussions with the students involved) not all students would be willing or have the capacity to ensure the objective of the programme was achieved. This was also confirmed from the interviews with the students who thought that not all members of the club were willing to lead efforts to get others involved in their recycling activities. This may be due to what authors contend is a 'lack or poor self efficacy or motivation' (Bandura 2000; Cleary & Zimmerman 2004). Therefore, with more-*effective* monitoring, the underlying issues could be more clearly understood which could lead to more-effective approaches, e.g. leadership training or adjusting the approach in the module. These then feed back into the initial process of discussion (as in Figure 8.1) and continue as a process of learning (Kolb et al. 1984). Effective monitoring and its mechanisms e.g. documenting, reporting, auditing, and use of simple indicators can be a strategy that improves the programme's credibility, quality and sustainability.

8.1.3 Other strategies for implementation

By involving others who have relevant knowledge, in this case local academics studying waste management information can be shared and knowledge gained. The NGO as the facilitator should emphasise to the academics that involvement should be a voluntary effort rather than on a consultancy basis. Scholars suggest that those with voluntary intentions to help others are more likely to act for the environment (Eisenberg & Miller 1987). Voluntary work is synonymous with civil society work and is a relevant approach in this situation because there may be insufficient resources available to pay for consultancy.

Involving other knowledge holders can enhance already existing knowledge (Brown et al. 2005) and enable shortcomings previously unnoticed to be corrected or improved (Pahl-Wostl et al. 2007). For example, brainstorming sessions or discussions in informal settings could elicit new knowledge (Keen et al. 2005; Reed et al. 2010). With the combining of knowledge, expansion of focus and of knowledge beyond one's discipline could also result (Argyris 1973). Involving others is also a form of 'bridging' efforts, which can encourage a sense of networking and trust, which is posited by scholars as parallel to learning in a social context (Eames 2005; Wenger 1998). While this is advantageous to idea building and parallels a task-oriented problem solving approach, other scholars contend that discussion sessions may lead to disagreement and no change (Bommel et al. 2009; Johnson & Wilson 2000).

However, this situation could be avoided if those involved in the discussion are willing to develop their skills of 'communicative learning', i.e. those of trying to understand the view or information that others are putting across, with the objective of reaching some common ground rather than of just obtaining knowledge (Mezirow 2003). And in situations where discussions are facilitated (e.g. by the NGO facilitator) and exchange of ideas is expected, tolerance, sensitivity and critical reasoning are required from the facilitator, so that more-productive communication, leading to transformative learning, can take place (Armitage et al. 2008; Mezirow 2003, p.58).

8.2 Limitations and constraints of the study

The strategies proposed here are limited to the evidence collected and analysed within its local context, i.e. SWM activities initiated by two urban based NGOs in collaboration with a small group of people. They were proposed to help fill the gap in the current Malaysian national SWM policy strategy, i.e. to clarify potential steps for enhancing public participation through involving NGOs as facilitators (NSPSWM Executive Summary 2005). This study does not claim to have included every strategy possible.

There were some constraints and unanticipated events during the conduct of this study. They were more apparent during the more intensive data collection stage of June–October 2009. Contact with respondents was limited by the occurrence during field work of 'swine flu' in the case study area. During that period, schools in Selangor where an incident of the flu had

been reported were given the option of closing temporarily, taking into consideration the severity of the situation in a particular school's area. If any student or school staff member was diagnosed with fever, they were asked to return home. Although the situation was under control, it did place a restriction on this researcher and it limited the time available for one-to-one contact with the students. Another unanticipated situation was that the data collection period coincided with the Sijil Pelajaran Malaysia (SPM) (equivalent to the NCEA in New Zealand) trial school examinations, which may have contributed to the lack of willingness of more students and teachers to participate or be interviewed for this study, as students were occupied with attending extra classes and teachers were busy with invigilation and other administrative duties.

8.3 Conclusion and future research

The conclusions or summary of findings below were drawn from the evidence from the literature reviewed, the two case studies, the students' survey and the synthesis. These were developed to address the research questions posed, and the objectives identified, in Chapter 1.

Learning (highlighted and defined in Chapter 2) in the context of this study, is generally concerned with a person or groups of people making a change from unsustainable to sustainable practices (Milbrath 1984). Learning can be fostered by the appropriate actors through relevant means of facilitation on both informal and formal platforms (Keen et al. 2005). Several authors discuss means of facilitating learning in a social context, i.e. through social forums, discussions, conferences or participation platforms (public environmental assessment procedures), which are normally formal approaches. Others highlight informal workshops between non-governmental bodies and sections of the general community (Colon & Fawcett 2005) or a specific target groups, such as school students (Suttibak & Nittivattananon 2008). In this study, the platforms for facilitating learning about SWM were in the form of intervention programmes aimed at enhancing the targeted groups' awareness and knowledge about recycling in particular and the environment generally. The focus was on two NGOs that were facilitating ways for sustainable waste management to be practised and better understood with the targeted group.

The processes involved in facilitating learning often revolve around themes of participation, negotiation, integration and understandings between different actors within a 'system', and

they are therefore complex as the model (Figure 8.1) illustrates. However, evidence from this study indicated that the processes can foster creative leadership and management, enabling individuals to become more responsible and to better understand their roles to manage complex situations (Armitage et al. 2008; Crabbe et al. 2010; Marchke & Sinclair 2009). The processes also helped informal networks develop further, supporting forms of social capital attuned to their own local context (Johnson & Wilson 2000; Mongkolnchaiarunya 2005). The evidence from the case studies highlighted that the civil society actors, i.e. the NGOs facilitating this process, created links with different actors in their community, initiated modules that were applied by their targeted group, provided a place for people to send their recyclables and therefore supported the government's SWM policy of improving participation in SWM (Executive Summary NSPSWM 2005).

The NGOs' efforts in the case studies highlighted are considered successful, based on the recognition of their work by others (the schools involved, the students, the media and other entities) and the response obtained from the survey and interviews conducted with the students. The NGOs' motivation is largely that of other NGOs' goals, i.e. to pursue their interest for social and public good and, in the process, to attract or influence others to this goal (Edwards 2009). Despite facing issues of relevancy and limited resources, they have managed to initiate environmental programmes, often with minimal support from the state, i.e. government.

What have the facilitators in this study learned? From the context of this study, and through their intervention programmes, both facilitators reported that they had learned that different approaches (to promote sustainable practices) appeal to different groups of people, while, generally, the Malaysian public is still ambivalent about sustainable behaviour. It is also evident in the cases that they only approached those groups that were keen to support and implement the initiatives, leaving or creating a gap between the NGOs and those that had the potential to be included, e.g. local waste administrators and academics.

Several constraints were reported in the case studies. These included the lack of staffing and finance to sustain the programmes, constraints that had also been cited in other empirical studies (Colon & Fawcett 2006). Programme implementations vary, with some civil organisations expanding towards more economically viable activities (Luckin & Sharp 2003; Suttibak & Nittivattananon 2007), while others contend that for these kinds of organisation to

sustain programmes, viable partnerships should be fostered (Colon & Fawcett 2006; Baud et al. 2001). Another constraint is institutional in context in which the traditional 'top down' approach of government waste administrators and the existing hierarchy of the waste management system offer minimal or non-existent opportunities for public participation (Charuvichaipong & Sajor 2006), despite public participation being cited as a strategy in the waste policy (NSPSWM Executive Summary 2005). Mezirow (2003, p. 58) contends that effective implementation efforts are built up over time, based on the assumption that rational understanding, objective reality and technology are in most part the solution to most resource management problems.

Learning, as discussed in previous chapters, is a process (Kolb 1995) and people can change (their understanding or actions) by getting involved in the process. The process involves people participating and discussing, usually through some kind of platform, e.g. recycling programmes (Mongkolnchaiarunya 2005; Pretty & Ward 2001). Learning can also be considered as an 'outcome' (Argyris 2002) in which actions are taken to fix or remedy an error (single loop learning) or changing the variables affecting the outcome (double loop learning). For different actors in different contexts, 'learning' and the associated processes can affect different outcomes (Ison 2005; Johnson & Wilson 2000). Alternative ways, thoughts, policies or decisions are made to change the solution and can be considered as 'triple loop learning' (Bommel et al. 2009). Because learning is considered a never-ending process (Kolb et al. 1984), it can be assumed that ways of *facilitating* learning will vary.

Environmental activists, natural resource managers and other practitioners working in community based groups could view the findings of this research as valuable and helpful for the development and implementation of their work. The findings document the processes involved in facilitating learning or changes, the opportunities in promoting learning and some of the constraints perceived by the not-for-profit organisations. For facilitators of community activities or programmes motivated by their social concern for change, creative ways of thinking and acting are necessary; to foster creativity is to foster the motivations of people (Pahl-Wostl 2002). The two case studies and the survey provided an insight into what is currently working 'on the ground', and strategies were proposed for what can be improved for SWM. The study adds to the literature on approaches taken in the overall drive towards a better quality of life. Community leaders, other NGOs and local authorities concerned for social development may be interested in the experiences described. Decision makers, waste

administrators and local councillors can identify more clearly what gaps NGOs can fill, in particular to advance SWM awareness, education and activities.

However, evidence as reported by the respondents from the case studies showed that despite gaining the acknowledgement of some local authorities of their (NGOs') efforts, there was still limited bonding or networking between officials and NGOs. Initiating or even making the networking requires both manpower and financing, which are both limited resources. They also require stronger elements for *building* 'social capital' to effectively enable and sustain the networking. Scholars currently suggest different forms of partnerships between civil society actors, which place economics as an important aspect to sustain (Baud et al 2001; Luckin & Sharp 2004). Economic based partnerships between community based organisations and local authorities (Baud et al. 2000; Luckin & Sharp 2004) thus can be further researched. The NGO initiatives especially as illustrated in Chapter 5 suggest that the interventions i.e with charity homes and hypermarkets are moving towards more mainstream activities involving more structured public-civil-private partnerships with an objective that every actor could gain some form of benefit, either social or economic.

Social actions in environmental management remain distinct from more technical or management actions of local authorities (Bolaane 2005; Davies 2008; Johnson & Wilson 2000). This may lead NGOs to be 'left out' of possible contributions towards decision making and to be discouraged from taking 'bigger' steps towards enhancing government policy related to sustainable environmental management. Exploring ways that NGOs can contribute, and evaluating, for policy making, their impacts on promoting efforts for sustainable environmental management (Crabbe et al. 2008) can be a future research programme.

The proposed strategies also can be the basis of other possible future research. This relates to exploring ways of enhancing people's sustainable waste behaviour, and exploring more-effective monitoring mechanisms linked to accountability and waste governance, including strategising possible ways for strengthening the current practise (as described in Chapter 5 particularly) towards mainstream SWM. Further research to quantify the impact of NGOs' efforts in intervention programmes could also be conducted, leading from the qualitative evidence shown in this study. NGOs in the two cases, and the varied literature reviewed, have proven that NGOs' role in promoting SWM and environmental awareness programmes has

to a certain extent created a positive impact on people's (in this case, students') understanding, i.e. learning and sustainable actions. However, more pro environmental activities can be initiated and implemented by various other actors in support of current environmental NGO programmes. These include strengthening collaborations from both public and private organisations and expanding the environmental programmes or initiatives to more schools that include non urban schools and universities. Further research can also be conducted to further develop the model conceptualised in this study, which may better inform future national waste policies.

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UNIT PERANCANG EKONOMI
Economic Planning Unit
JABATAN PERDANA MENTERI
Prime Minister's Department
BLOK B5 & B6
PUSAT PENTADBIRAN KERAJAAN PERSEKUTUAN
62502 PUTRAJAYA
MALAYSIA

EPU
ECONOMIC PLANNING UNIT
PRIME MINISTER'S DEPARTMENT, MALAYSIA

Telefon : 603-8888 3333
Telefax : 603-888

Ruj. Tuan: *Your Ref.:*

Ruj. Kami: *Our Ref.:* UPE: 40/200/19/2385

Tarikh: *Date:* 13 February 2009

Siti Mazwin binti Kamaruddin
48 SS 5C/1 Kelana Jaya
47301 Petaling Jaya
Selangor
Email: mazwin1016@yahoo.com

APPLICATION TO CONDUCT RESEARCH IN MALAYSIA

With reference to your application dated **6 January 2009**, I am pleased to inform you that your application to conduct research in Malaysia has been *approved* by the **Research Promotion and Co-Ordination Committee, Economic Planning Unit, Prime Minister's Department.** The details of the approval are as follows:

Researcher's name	:	**SITI MAZWIN BINTI KAMARUDDIN**
Passport No. / I. C No:		**680303-10-6702**
Nationality	:	**MALAYSIA**
Title of Research	:	**"DEVELOPING A FRAMEWORK OF SOCIAL LEARNING TOWARDS SUSTAINABILITY; CASE STUDY: HOUSEHOLD WASTE MANAGEMENT PROGRAM UNDER LA21 IN MALAYSIA"**
Period of Research Approved:		**THREE YEARS**

2. Please collect your Research Pass in person from the Economic Planning Unit, Prime Minister's Department, Parcel B, Level 4 Block B5, Federal Government Administrative Centre, 62502 Putrajaya and bring along two (2) passport size photographs. You are also required to comply with the rules and regulations stipulated from time to time by the agencies with which you have dealings in the conduct of your research.

3. I would like to draw your attention to the undertaking signed by you that you will submit without cost to the Economic Planning Unit the following documents:

a) A brief summary of your research findings on completion of your research and before you leave Malaysia; and

b) Three (3) copies of your final dissertation/publication.

4. Lastly, please submit a copy of your preliminary and final report directly to the State Government where you carried out your research. Thank you.

Yours sincerely,

(**MUNIRAH ABD. MANAN**)
For Director General,
Macro Economic Section,
Economic Planning Unit.
E-mail: munirah@epu.gov.my
Tel: 88882809/2818/2958
Fax: 88883798

ATTENTION

This letter is only to inform you the status of your application and **cannot be used as a research pass**.

C.c:

Ketua Setiausaha,
Kementerian Pengajian Tinggi,
Aras 7, Blok E3, Parcel E,
Pusat Pentadbiran Kerajaan Persekutuan,
62505 Putrajaya
(u.p: Pn. Hjh Raihanah bt. Hj Khudri) (Ruj. Tuan: KPT.R.620-1/1/1Jld.11(6)

UNIVERSITY OF CANTERBURY - HUMAN ETHICS COMMITTEE

APPLICATION FOR REVIEW AND APPROVAL

This form should be completed in the light of the Principles and Guidelines issued by the Human Ethics Committee. Applicants must read those before filling out the application form. The latest versions of both the Guidelines and the Application Form can be found on the website of the Human Ethics Committee.
website: http://www.canterbury.ac.nz/humanethics

NOTE:- This electronic copy may not have sufficient space for completion of all parts of the form if downloaded as a blank copy of the application form. It is intended as a template for use by those staff and students who have access to a word processor. When typing in please type where the paragraph marks start after each question, not in the actual boxes.

Staff members are reminded that the guidelines and the application form are subject to occasional amendment.

PLEASE SEND **twelve** printed or typed copies of the completed form, duly signed by applicant and supervisor or Head of Department, and of the relevant documents referred to in questions 3, 7, 8, 9, 10, 11, 15 to the HEC Secretary, Level 6, The Registry

---

1. PROJECT NAME: Social Learning towards Sustainability

2. NAME OF APPLICANT: Siti Mazwin bt. Kamaruddin

   Contact Telephone No: 0210617666

UNIVERSITY DEPARTMENT (or other contact address): Geography

email address (if available): siti.kamaruddin@pg.canterbury.ac.nz

STATUS OF PROJECT (e.g., EDUC XYZ class project, M.A., M.Ed., M.Sc., Ph.D., Staff research study)
PhD

SUPERVISOR: Prof.Eric Pawson and Assoc.Prof Simon Kingham

OTHER INVESTIGATORS: None

SIGNED BY: Applicant: ..... Date: 15.5.09

HOD/Supervisor: ..... Date: 15.5.09

A check page at the end of this application must also be signed by the applicant and, if the applicant is a student, by the applicant's supervisor

---

E CHECK LIST

Please check the following items before sending the completed form to the Committee. Circle N.A. i.e., Not Applicable, where appropriate.

All the necessary signatures on page 1 have been obtained.	**[√]**
All the necessary approvals under Q 3 have been obtained or are the subject of correspondence of which copies are attached.	**[√] or N.A.**
A copy of any questionnaire, with an appropriate rubric at the beginning or accompanied by an appropriate covering page, is attached.	**[√] or N.A.**
A list of interview topics and, for a structured interview, a reasonably detailed list of questions, is attached.	**[√] or N.A.**
A copy of any advertisement, or notice, or informative letter asking for volunteers is attached.	**[√] or N.A.**
A copy of each information sheet required is attached.	**[√] or N.A.**
A copy of each consent form required is attached.	**[√] or N.A.**
A copy of the required debriefing sheet is attached.	**[ ] or N.A.**

Attention to the preceding check list is intended to ensure that the application and its documentation have been thoroughly reviewed by the applicant and (where applicable) by the supervisor and that the preparation of the project is up to the standard expected of and by the University of Canterbury.

The signature of the applicant will be understood to imply that the applicant has designed the project and prepared the application with due regard to the principles and guidelines of the HEC, that all the questions in the application form have been duly answered and that the necessary documentation has been properly formulated and checked.

APPLICANT'S NAME :- **Siti Mazwin bt. Kamaruddin**
and SIGNATURE:- Siti Mazwin

The signature of the supervisor will be understood to imply in addition that, in the judgment of the supervisor, the design and documentation are of a standard appropriate for a research project carried out in the name of the University of Canterbury or for training in such research.

SUPERVISOR'S NAME:- **Eric J. Pawson**
and SIGNATURE:- E.J. Pawson

For HEC use.
Comments.

Recommended action
(1) Approve
(2) Approve subject to some action **(SPECIFY)**
(3) Defer approval until applicant and/or supervisor have responded to points raised.
(4) Withhold approval and return the application for redrafting and resubmission.
(5) Reject the application and return it to the applicant with reasons given.
(6) Refer the applicant to another authority, e.g., Health and Disability Ethics Cttee.

Secretary, Human Ethics Committee

APPENDIX 3

جابتن فلاجارن سلاغور
JABATAN PELAJARAN NEGERI SELANGOR
Jalan Jambu Bol 4/3E, Seksyen 4, 40604 Shah Alam
TEL : 03-5518 6208 FAKS : 03-55129704 E-mail jpnsel@sel.moe.gov.my
Website;http://www.moe.gov.my/jpnsel

Rujukan Tuan :
Rujukan Kami : JPNS/SPS/PPN/A25090/06/25/JLD 53 / (38)
Tarikh : 04/08/2009

SITI MAZWIN BT. KAMARUDDIN
48 JALAN SSC/1 KELANA JAYA
47301 PETALING JAYA
SELANGOR DARUL EHSAN

Tuan,

KEBENARAN MENJALANKAN PENYELIDIKAN / KAJIAN DI SEKOLAH-SEKOLAH DI NEGERI SELANGOR

" DEVELOPING A FRAMEWORK OF SOCIAL LEARNING TOWARDS SUSTAINABILITY : CASE STUDY : HOUSEHOLD WASTE MANAGEMENT PROGRAM UNDER LA21 IN MALAYSIA "

Dengan segala hormatnya merujuk kepada perkara di atas.

2. Jabatan ini tiada halangan untuk pihak tuan / puan menjalankan kajian/ penyelidikan tersebut di sekolah-sekolah dalam Negeri Selangor seperti yang dinyatakan dalam surat permohonan.

3. Pihak tuan/puan diingatkan agar mendapat persetujuan daripada Pengetua / Guru Besar supaya beliau dapat bekerjasama dan seterusnya memastikan bahawa penyelidikan dijalankan hanya bertujuan seperti yang dipohon. Kajian / Penyelidikan yang dijalankan juga tidak mengganggu perjalanan sekolah serta tiada sebarang unsur paksaan.

4. Tuan/Puan juga **diminta menghantar senaskah hasil kajian** ke Unit Perhubungan & Pendaftaran Jabatan Pelajaran Selangor sebaik selesai penyelidikan / kajian.

Sekian, terima kasih.

" BERKHIDMAT UNTUK NEGARA "
" KEJUJURAN DAN KETEKUNAN "

Saya yang menurut perintah,

(HAJI ABDUL RAHMAN BIN TAN SRI DATO' HASSAN)
Penolong Pendaftar Sekolah Dan Guru,
Jabatan Pelajaran Selangor.
b.p. Ketua Pendaftar Sekolah Dan Guru,
Kementerian Pelajaran Malaysia.

s.k. 1. Fail

Table of costs and source of funding

No.	Items	Amount	Unit	NZD cost	NZD cost	Funding source
1	Tuition Fees	3	Year	4869	14,607	MoHE
	Living Cost	3	Year	24,972	74,916	MoHE & UiTM
	Research					
	a. Interlibraru loan				500	Dept. of Geog UC
	b. Photocopying				700	
	c. Publications				1,000	
	Fieldwork					
	a. Air tickets return	1	Person		2,000	MoHE
	b. Research asst				3,000	Dept.of Geog UC
	c. Official reports acquisition				800	Dept.of Geog UC
	d. Questionnires				300	Dept.of Geog UC
	e. Maps				200	Dept.of Geog U
	f. Accomodation	3	month		600	Dept.of Geog UC
	g. Internet				300	
	h. Stationaries and printing				500	
	Equipment					
	a. Laptop				3,500	
	b. Camera				500	
	c. Tape recorder	1			300	
	d. MultiCriteria DecisionMaking software	1			600	Dept.of Geog UC

				Total	**104,223**	
	Funding Sources					
	Min.of Higher Edu Malaysia (MOHE)			57,555		
	Uni.of Technology MARA Malaysia(UiTM)			31,968		
	Dept of Geog UC			7,900		
	Personal			4,800		
			Total	**104,223**		

APPENDIX 5

NGO- INTERVIEW CONSENT FORM

Study title: " Facilitating Opportunities for Social Learning towards Sustainable Waste Managemen"

I have read the project brief and the researcher has explained the purpose of her study. Thus, I give consent for her to interview and audio record this session.

I understand that I can at any time withdraw from this interview and retract any information released. I also understand that my name will be kept confidential and not published in the study without my consent.

Name: _____

Organisation:_____

Signature: _____

Telephone: _____

Date: _____

* This information is for the researcher's records only.

Project: Facilitating Opportunities for Social Learning towards Sustainable Waste Management

Date: _____

APPENDIX 6

PRINCIPAL's CONSENT FORM

The researcher abovenamed has briefed me about her project and I give her permission to interview the students and for the students to answer the questionnaire, solely for her research purposes. I also consent to the interview being audio recorded. I understand that student's anonymity will be guarded for confidentiality.

The students can withdraw from this interview session at any time and stop relaying further information they may feel is not appropriate.

I understand that this research project has been approved by the Economic Planning Unit of the Prime Minister's Department Malaysia on 13.2.09.

Principal Name:_____

School Address:_____

Signature:_____

I acknowledge that my personal identity is solely for the researcher's own record purposes.

Project Brief

Facilitating Opportunities for Social Learning towards Sustainable Waste Management – Evaluating 3R programme

Introduction

Waste management is one of the biggest challenge worldwide and most waste end in landfills which can deteriorate the environment while occupying considerable valuable land space. Reducing, recycling and reusing (3R) and other waste minimisation practices are accepted as the more sustainable alternatives to managing waste and many countries are opting towards the idea of Zero Waste. In Malaysia however, the regulation for the public to 3R has not been imposed and recycling or composting is often limited to the few who do so either voluntarily and out of a true concern for the environment or due to accountability.

From personal observation, the few groups who seem to embrace this are either schools or other smaller groups of community eg. NGOs or religious groups. To the general public, they will only practice recycling or waste minimisation if there is a monetary gain or incentive attached to their efforts. This has been proven in a few studies conducted on recycling behaviour of Malaysians[1].

This proposed study acknowledges that various internal and external factors such as perception towards waste, personal motives, infrastructure and regulations can either influence groups of individuals to practice 3R or not. It will consider these factors but its focus is on which could facilitate 3R and how this involves social learning.

Aim and objective of study

The aim of this study is to explicit the factors for a positive change in understanding and behaviour towards 3R.

Objectives of this study

1. To obtain feedback from different groups of communities regarding the background of their programmes, roles, issues or constraints faced, attempts to facilitate participation and any decision making involved
2. To assess their programmes using performance indicators
3. To assess the learning outcomes of participants;
4. To obtain feedback from sample respondents in school regarding their perception on waste ,what kinds of programme they think could motivate more people to practice 3R and if any factors have influenced them to practice sustainable behaviours related to waste management.

Methodology and data

Respondents – Primary Data

For this study, two methods will be employed to obtain the data. The first is through interviewing the committee members of the school's 3r or environmental education club.

[1] See Murad and Siwar 2004

The second method of data collection is through questionnaires. This is to gain responses and insight from ordinary members of the community.

Documents – Secondary Data

Documents to be reviewed include project proposals, reports, minutes of meetings, presentations, log book of events, school's organisational plans, job descriptions and local media reports. These records, minutes and reports are important sources of information because they highlight the discourses, views, debates, arguments or consensus of the stakeholders or members involved.

Malaysian Government approval

Application to the Economic Planning Unit, Prime Minister's Department has been sent and approval to conduct this research has been received on 13/2/2009. Please see Appendix 1.

Contribution to Malaysia

This research is expected to contribute to further understanding of the factors underlying different community based programmes' performance and any learning outcome for sustainable resource management. This would then be critically analysed towards the formulation of a best practice guide targeted for planners, policy makers and the stakeholders involved, rarely undertaken in Malaysia.

APPENDIX 8

The Principal

SMK Jalan Kebun

Batu 7 Jalan Kebun Seksyen 32

40460 Shah Alam

Selangor D.E *SAMPLE LETTER*

Date:

Dear Sir/Madam

Request for students' opinion on the 3R programme in schools

I, Siti Mazwin bt. Kamaruddin am a student researching for my PhD studies at the Department of Geography, University of Canterbury, New Zealand. My research is to identify the success or constraints involved and evaluate the performance of the 3R programme in Selangor. I will be in Malaysia from 16th of June 2009 to 30th October 2009 for this field study. I would like to interview key students and staff involved with the 3R programme and also conduct a questionnaire survey of other students. Ideally, I would like 50 up to 100 students from each school to participate in answering the questionnaire. The interview would take approximately 30 minutes and the questionnaire answering will take 30 minutes.

Your school is one of the schools selected to provide your opinion which would be evaluated further. I would appreciate if you would allow me to come to your school and distribute the questionnaires (see attached sample, Appendix 1).The questionnaires are completely **confidential** and student's names will never be identified.

Your input and participation is most important to my study and I hope that the evaluation of findings can be used as a guideline to motivate and encourage other schools who have not started on these environmental awareness and learning programmes. This study has received approval from economic Planning Unit, Prme Minister's Department, Malaysia dated 13.2.09. Please see Appendix 2.

Please fill in the attached approval form on the next page and return it by fax to any of the fax numbers below. Upon receipt of this, I will contact you personally by phone or visit you at your office to make appointment to conduct the interview and send you the questionnaires.

If you have any questions, please feel free to contact me via email at smk45@student.canterbury.ac.nz or mazwin1016@yahoo.com.

Thank you for your kind assistance in this matter

Sincerely,

Siti Mazwin bt. Kamaruddin

Department of Geography

University of Canterbury

New Zealand

Tel:0643642987 ext 8839; Fax: 064 3 3364 2907 (NZ) Fax:006 03 6140 3013(Malaysia)

Supervisors:

Professor E.J Pawson and Assoc..Prof . S.Kingham

REPLY SLIP

To be faxed to: Siti Mazwin bt. Kamaruddin

Fax: 064 3 3364 2907 (New Zealand) or

Fax: 006 03 6140 3013 (Malaysia)

- We agree/do not agree to participate in this study titled `Facilitating Opportunities for Social Learning towards Sustainable Waste Management"

Please contact the school at this number _____

to set an appointment.

- On behalf of the school, we allow/do not allow for the name of the school to appear in the study.

Principle’s Signature : _____

Principle’s Name: _____

*School:_____

_____

*(The information given here is for the purpose of the researcher’s records only and should not appear in the study without the consent of the school board or Principle)

Interview questions for the School committee/NGO/Local Authority representatives:

Perception towards waste

1. What do you think of waste?
2. Who do you think are responsible to collect household waste?
3. Where do you think most household waste ends up?
4. What do you think the impacts are from this?
5. Why do you think Malaysians are `slow' at embracing recycling or reusing?
6. Do you think Malaysians will reduce their consumption of products with packaging?eg use of plastic bags?
7. Do you think 3R is a positive initiative? Why?
8. Which is more important: learning to manage waste or being required to manage waste?

Historical context:

9. Describe this programme you are involved in

-What are the objectives or targets of this programme?

-How long has this programme operated in your school?

-Has there been an increase or decrease of members?

-What activities have you organised?

- How often do you meet?

-Who funds the activities?

Actors

Committee members:

Clarifying the nature of involvement

10. How did you get to be involved in this programme and why?
11. Was it voluntary or were you asked?

12. What is the nature of your involvement? How much time allocated, satisfaction level
13. Who are involved in the planning, implementing and monitoring this programme?
14. What do you think are the factors required to ensure the success of this 3R programme? What do you think are the factors to continue to operate?
15. What do you think can contribute to the success of this programme?
16. What do you think are constraints affecting this programme?

Perceived impact

17. Do you think you have learned anything from being involved in this programme?
18. What have you learned from participating in this programme?
19. Do you think you have increased your understanding of managing your waste
20. Do you think you have practiced more sustainable behaviour such as recycling in your daily life
21. Have you shared what you have learned form being involved in the programme with your siblings , parents or family and friends?
22. Are you involved in other similar programmes outside your school?
23. Do you think your involvement in this school's programme has improved your ability to take part in other civic engagement programmes?
24. What do you think could have been done differently for you to learn more?
25. Do you think these programmes are a good initiative of the school ?
26. Do you think that with your experience and involvement you can lead other civic based programmes in the future?

Clarifying other actors involvement:

27. Who outside the school are also involved with your programme?
28. How often do you meet? And what do you discuss? Are these discussions minuted and do you have a log book?
29. From the meetings, what decisions have you made?
30. Who do you forward your decisions or ideas to?
31. Do you know of other programmes apart from your school's programme that intends to educate the public in 3R?
32. Do you think being involved in the decision making has helped you learn more?
33. Is this is a good platform for decisions to be discussed and forwarded to the policy makers?

Institutional context

34. Has the municipal authority helped support this programme in any way? In what way?
35. Has other organisation provided any forms of support? In what way?
36. What kinds of other contribution do you think any organisation or institution can support your programme?
37. Do you know if there are other programmes similar to your programme involving adults?
38. Do you think all residential neighbourhoods should have a 3R programme? Why?
39. Do you think that the governments efforts to educate Malaysians to recycle or other waste minimisation practice is sufficient?
40. Do you want to forward any other ideas?

Project Brief

Social Learning towards Sustainability – Evaluating 3R programme

Introduction

Waste management is one of the biggest challenge worldwide and most waste end in landfills which can deteriorate the environment while occupying considerable valuable land space. Reducing, recycling and reusing (3R) and other waste minimisation practices are accepted as the more sustainable alternatives to managing waste and many countries are opting towards the idea of Zero Waste. In Malaysia however, the regulation for the public to 3R has not been imposed and recycling or composting is often limited to the few who do so either voluntarily and out of a true concern for the environment or due to accountability.

From personal observation, the few groups who seem to embrace this are either schools or other smaller groups of community eg. NGOs or religious groups. To the general public, they will only practice recycling or waste minimisation if there is a monetary gain or incentive attached to their efforts. This has been proven in a few studies conducted on recycling behaviour of Malaysians[2].

This proposed study acknowledges that various internal and external factors such as perception towards waste, personal motives, infrastructure and regulations can either influence groups of individuals to practice 3R or not. It will consider these factors but its focus is on which could facilitate 3R and how this involves social learning.

Aim and objective of study

The aim of this study is to explicit the factors for a positive change in understanding and behaviour towards 3R.

Objectives of this study

5. To obtain feedback from school children regarding the background of their school's 3R or environmental programme, roles, issues or constraints faced, attempts to facilitate participation and any decision making involved
6. To assess their programmes using performance indicators
7. To assess the learning outcomes of participants;
8. To obtain feedback from sample respondents in school regarding their perception on waste ,what kinds of programme they think could motivate more people to practice 3R and if any factors have influenced them to practice sustainable behaviours related to waste management.

[2] Murad, W., & Siwar, C. (2007). Waste Management and recycling practices of the urban poor: a case study in Kuala Lumpur city,Malaysia. *Waste Management & Research, 25*, 3-13.

Methodology and data

Respondents – Primary Data

For this study, two methods will be employed to obtain the data. The first is through interviewing the committee members of the school's 3R or environmental education club.

The second method of data collection is through questionnaires. This is to gain responses and insight from other members of the school community.

Documents – Secondary Data

Documents to be reviewed include project proposals, reports, minutes of meetings, presentations, log book of events, school's organisational plans, job descriptions and local media reports. These records, minutes and reports are important sources of information because they highlight the discourses, views, debates, arguments or consensus of the stakeholders or members involved.

Malaysian Government approval

Application to the Economic Planning Unit, Prime Minister's Department has been sent and approval to conduct this research has been received on 13/2/2009. Please see Appendix 1.

Human Ethic's Committee approval

This project has been reviewed and approved by the Human Ethics Committee, University of Canterbury (ref no:HEC Application 2009/72).

Contribution to Malaysia

This research is expected to contribute to further understanding of the factors underlying different community based programmes' performance and any learning outcome for sustainable resource management. This would then be critically analysed towards the formulation of a best practice guide targeted for planners, policy makers and the stakeholders involved, rarely undertaken in Malaysia.

Confidentiality

This study will be incorporated towards the researcher's Phd thesis and is solely for academic purposes. All respondents in the interview will be given the opportunity to review the transcript of the interview if they wish, and their identity will be kept anonymous and their names will never be revealed in any report.

APPENDIX 11

Research title: Social Learning towards Sustainability

Section A – This section comprise of statements regarding perception of waste and attitude towards recycling. Please tick (√) one response that describes the statement best. There is no right or wrong answers.

No.	Statement	Strongly Disagree	Disagree	Undecided or Not Applicable	agree	Strongly agree
1	Household waste has value.					
2	The collection of household waste is the responsibility of the Local Authority or the private contractor depending on residential area.					
3	Our local municipal council or the garbage contractor is efficient					
4	The final destination of waste is the landfill.					
5	In my household, we don't segregate our waste					
6	I think waste will be segregated by the municipal workers after collection					
7	If there is a regulation to separate waste with provision of the bins or bag by the local council, I will segregate waste.					
8	My family and I are aware about recycling from the media (newspapers) including the internet					
9	My family receives pamphlets about recycling from the Local Councils					
10	Some waste eg. Newspapers, glass and plastic can be recycled or food waste can be turned into a valuable resource eg.compost					
11	Zero waste is impossible					

12	All plastic containers can be recycled					
13	Waste in landfill can cause environmental pollution to underground water and air					
14	My family sometimes sends recyclables to the collection centres					
15	I collect recyclables from home and brings them to the school recycling bins					
16	I like to collect recyclables and sell them to get some pocket money					
17	I will send recyclables to collection centres or my schools' recycling programme even if there is no financial reward.					
18	I only send recyclables to these centres or my school recycling bins if I have the time or transport					
19	I will send my recyclable waste to the centre if it is in walking distance.					
20	I know where I can find the three coloured recycling bins in my neighbourhood					

Section B- This section comprise of statements regarding your involvement in your school recycling or environmental programme. Please tick (√) one response that describes the statement best.

No.	Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
21	There is an environmental club in our school and collecting recyclables is one of the activities.					
22	The 3 coloured bins are highly visible in my school compound					
23	Many children and staff use					

	these bins to store recyclables					
24	The recyclables are sold to small vendors					
25	My school has been involved in recycling programmes with other schools or other organisations					
26	I like participating in my schools recycling programmes because it is fun and useful					
27	I think by participating in this programme or club activities I learn more how to help protect the environment					
28	I think we can still learn to be environmentally responsible without joining the club or organisations					
29	Although I am not a member of the club, the activities organised such as the recycling programme has made me more aware about ways to protect the environment eg. through recycling					
30	I don't know of any other environmental awareness and education programmes outside my school					
31	Although my school has some kind of recycling programme, I have not started to recycle or reuse					
32	Although my school has some kind of recycling programme, I have not encouraged my family members to recycle and reuse					

Section C This section comprise of statements regarding possible improvements . Please tick (√) one response that describes the statement best.

No.	Statement	Strongly Agree	Agree	Undecided/Not Applicable	Disagree	Strongly Disagree
33	If separating waste is imposed on each household i.e it becomes a regulation, there is no need for school or other voluntarily run community recycling collection centres					
34	Community centers run by local authority or NGOs or other group based recycling programmes provide a benefit and alternative for people to channel their recyclable wastes					
35	People don't want to send the recyclables to the community centres because there isn't any financial incentive or the incentive is low					
36	People prefer selling old newspapers for money to recycling vendors who come to the house					
37	I think voluntary community programmes supporting 3R, are lacking in our neighbourhoods					
38	As far as I'm aware, there is no such community programme supporting 3R except maybe at schools					
39	I think the government needs to work closely with the neighbourhood residence or the resident association to plan, monitor and manage community recycling programmes more frequently for it to be more effective					
40	Malaysians have low civic engagement thus the low participation rate in community based environmental					

	programmes					
41	Regulation is a more important factor than a true concern for the environment which influences a person to separate waste or practice 3R					
42	If more people participate, initiate and run these community based environmental programmes, more people will appreciate, understand and put effort to care for the environment					
43	Community based programmes including school clubs are good platforms to discuss ways to protect and improve the environment					
44	Malaysia's target to increase recycling from 5% to 20 % or more by 2020 is realistic					

Finally, Section D : Your profile. Please circle the answers

45 Gender :

1- Female

2- Male

46 Age

A- 13-15

B- 16-17

47 The type of dwelling you are living in

1- Terrace Link

2- Semi Detached or single unit bungalow

3- Apartment or multi storey

THIS BOOK MARK IS FOR YOU FOR PARTICIPATING IN THIS SURVEY. HAVE A NICE DAY. THANK YOU!

WASTE COLLECTED AND RE-CYCLED IN YEAR 2001 IN SUBANG JAYA MUNCIPALITY

Â MONTH	WASTE COLLECTED (in metric ton)	RECYCLED WASTE (in metric ton)
JAN	6,442.36	36.47
FEB	9,494.63	29.43
MAC	10,072.18	76.97
APRIL	10,020.47	68.94
MAY	10,516.10	80.37
JUN	10,483.41	67.92
JULAI	10.559.10	62.41
AUG	11,496.00	78.74
SEPT	10,366.49	74.38
OKT	11,228.13	57.75
NOV	11,592.01	60.13
DIS	12,327.22	52.89
TOTAL	**124,598.17**	**746.40**

MONTHLY RE-CYCLED ITEMS

NO	MONTH	RECYCLED ITEMS IN (KG)				
		Glass	Paper	Card- boxes	Plastic	Aluminium
1	JANUARY	1,879.78	31,183.52	60.00	311.54	250.00
2	FEBUARY	1,208.67	25,439.55	157.70	439.32	183.00
3	MARCH	2,168.87	70,099.57	88.90	740.68	399.60
4	APRIL	2,699.49	61,778.93	115.30	1,033.56	293.90
5	MAY	2,967.13	71,984.26	44.60	1,717.92	486.30
6	JUNE	2,874.67	60,532.89	119.60	1,420.24	521.80
7	JULY	4,045.50	52,147.38	1,197.10	3,417.68	1,195.68
8	AUGUST	2,991.91	68,055.60	508.50	5,287.17	405.60
9	SEPTEMBER	3,549.93	66,420.83	544.00	1,957.19	410.00
10	OCTOBER	3,621.71	50,538.56	215.40	1,911.75	422.00
11	NOVEMBER	3,654.43	50,868.66	-	2,242.42	412.00
12	DECEMBER	4,023.84	44,111.24	-	2,193.08	349.30
Â	Â TOTAL YEAR 2001	**35,685.93**	**653,160.99**	**3,051.10**	**22,672.55**	**5,329.18**