AN EVALUATION OF THE CITY OF CAPE TOWN MUNICIPALITY'S WASTE WISE SUSTAINABLE EDUCATION AND SCHOOL RECYCLING PROGRAMME

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COMPULSORY DECLARATION:

This work has not been previously submitted in whole, or in part, for the award of any degree. It is my own work. Each significant contribution to, and quotation in, this dissertation from the work, or works of other people has been attributed, cited and referenced. The conventions of the American Psychological Association as outlined in the Sixth Edition of the Publication Manual of the American Psychological Association were used for referencing.

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Executive summary

This dissertation examines the City of Cape Town municipality's Waste Wise Programme. It examines one of the three models, namely the Sustainable Education and School Recycling model and consists of a theory as well as a process evaluation.

On commencement of the **theory evaluation,** the evaluator investigated the plausibility of the programme theory. In order to extract this information, a literature review on international and local literature was completed to answer the evaluation questions. The literature review suggests that the programme theory is plausible but that it could be further enhanced by incorporating a few additions to the programme. It investigated the Waste Wise Programme's impact theory, the service utilisation and the organisational plans, and found that, with a few minor amendments, the beneficiaries of the programme may benefit more.

The process evaluation method consisted of interviews and observations completed by the evaluator. It analysed the programme's service utilisation and organisational plans. The conclusion of this part of the evaluation suggests that the programme is credible and that implementation fidelity occurred.

Recommendations for the theory evaluation include: the benefit of a more structured approach to implementation for the educator, the learner and the curriculum; completing an outcomes evaluation to assess the programme's impact; the lack of local literature on waste topics should be seen as an opportunity for additional evaluations; an improved record and data management system; and a programme sustainability section which refers to a system that is positioned inbetween cycles until the following cycle commences.

Recommendations for the process evaluation include: activities should be aligned to demographics of the target audiences and the city's socio-economic characteristics; and the organisational plan could employ additional staff to implement.

The evaluation suggests a good, sound programme theory but that it can benefit from minor adjustments, such as clear outcomes for activities; specific outputs and activities for specific programmes; and measurable targets set for the programme.

Glossary of Terms

BoR	Bill of Rights, Chapter 2 of the South African Constitution (1996)
City of Cape Town municipality	One of the spheres of government that is considered the nearest to the people and the implementer of service delivery
Eco-schools	An international programme of the Foundation for Environmental Education that aims to empower students to be change agents for the environment
Green programme	Refers to environmental consciousness initiatives
Green Zone model	A community that lives in a healthy, clean and green environment that is sustained through community participation and engagement
Model	One of the three sub programmes of the Waste Wise Programme. It refers to a new concept developed by the programme staff to be tested by the service provider to determine its success
NEMWA	National Environmental Management & Waste Act (NEMWA) promulgated during 2008
Programme	A set of activities aimed at ensuring the long term goal of the programme is achieved
Programme manager	A City of Cape Town staff member who is the funder as well as the overall programme manager of the WWP
Project manager	A City of Cape Town staff member who is responsible for one model of the programme
Public awareness and education	To inform, update and notify residents on waste related information
Service Provider	A contractor who has legally been awarded the tender to implement the WWP project for a period of three years
Sub council	An extension of the municipality's service delivery administrative services that is found in various local areas that allows local residents easy access to municipal facilities
Sustainability	Refers to the long-term maintenance of current environmental aspects by not compromising future needs
SWMD	Solid Waste Management Department of the City of Cape Town

Waste minimisation	Refers to any initiative or programme where waste is reduced from going to landfill, such as recycling
Waste stream	Refers to the different types of waste that can be recycled, e.g. paper, metal, e-waste
WCED	Western Cape Education Department
WWP	Waste Wise Programme

CHAPTER ONE – INTRODUCTION

Outline of Chapter one

The dissertation is written in a research dissertation format as prescribed for this degree programme. The dissertation is divided into four chapters with relevance to the Waste Wise Programme evaluation. The chapters read as follows:

- Chapter one – The Introduction
- Chapter two – Theory evaluation
- Chapter three – Process evaluation
- Chapter four – Limitations and recommendations

Chapter 1 introduces the programme and present waste in a local and international context. It further discusses the Waste Wise Programme (WWP) by making reference to the Australian and South African WWP.

Background

Global perspective on waste

Solid waste can be defined as materials arising from human activities that have been discarded as unwanted (Plesea & Visan, 2010). Solid waste management encompasses the production, generation, collection, transfer, storage and disposal of solid waste in accordance with public health, conservation and environmental legislation considerations (Plesea & Visan, 2010). These comprehensive management aspects of waste contributed to the development of the waste hierarchy during the 1977 European Union's Second Environment Action Programme (Wilson, 2007), and is considered the basis for most waste management strategies. Figure 1 refers to the waste hierarchy which is a hierarchical classification and showcases the most feasible waste minimisation strategies. It refers to the most preferred option of waste minimisation; being the total eradication of waste; to the least preferred option being waste disposal at landfill.

Figure 1. Waste hierarchy

Image supplied by:
http://www.bing.com/images/search?q=waste+hierachy&id=5464A28FC4485C61DF2CA6B8591ECD36D2ED901C&FORM=IQFRBA#a

Figure 1. Waste hierarchy utilised to chart the process of waste.

During the early 1800's, Wilson (2007) documented that global waste trends were influenced by resource consumption by both the poor and the rich. These trends were influenced by factors such as the rapid increase in waste production, waste consumption and significant economic growth (higher living standards and more disposal products). A few developed countries recognised the need to preserve resources and reduce environmental impacts. These communities developed a growing awareness and suggested that waste disposal can be reduced through waste recovery at source. These global trends, and the environmental awareness in developed countries, contributed to influencing pioneering legislation such as the 1848 Public Health Act in London, which linked waste to public health diseases. This act institutionalised waste by mandating local municipalities to introduce a once a week waste removal service (Wilson, 2007). The 1848 Public Health Act in London became a stepping stone for new environmental protection legislation during the 1960's in both Europe and America (Wilson, 2007) and it augmented waste and created an awareness that saw the development of the "3R" Principle: Reduce, Reuse, and Recycle, in many developed countries (Plesea & Visan, 2010). In addition to the 3R's, it influenced current legislation, encompassing concepts such as "closing the loop" which refers to 'sustainable consumption and production' (UNEP

2005; Watson, 2007) and extended producer responsibility, which refers to institutional responsibilities (Watson, 2007; Integrated waste Management amended by-law, 2010).

Subsequently, both developed and developing countries participated in the 1992 United Nations Conference on Environment and Development, hosted in Rio de Janeiro, Brazil. During this conference, various governments and nations developed and adopted an action plan that will guide the world on the path to sustainable development. This action plan is known as *Agenda 21* and is a blueprint for the most important environmental issues. *Agenda 21* documents actions that may alleviate environmental degradation from occurring. Consequently, it has also developed the biggest global partnership on environmental issues (Fien & Tilbury, 2002; & Sitarz, 1993). *Agenda 21* is of particular interest, as section 4.26 of the *Agenda* makes special reference to how sustainability should be achieved. It suggests that education and public awareness programmes should play an important role in changing waste behaviours (http://sustainabledevelopment.un.org/92393A3B-CB86-4D04-BF6D-70F0508C3AC6/FinalDownload/DownloadId-70FEF10AE6F0F3B14B2269E526036AEC/92393A3B-CB86-4D04-BF6D-70F0508C3AC6/content/documents/Agenda21.pdf).

With the implementation of numerous global legislations, policies and action plans, countries needed to inform the residents about new legislation and the responsibility from both government and resident. Over time, the public's responsiveness to waste increased and a demand to change people's understanding as well as their behaviour towards waste needed to change. Even though the relevant legislation was being put in place, a number of mechanisms were required to change waste behaviour of which public awareness and education is one such vehicle. Table 1 is a waste declassification list which assist in understanding the different streams of waste.

Table 1: Waste declassification

Waste generator type	Industry audience	Types of waste generating
Commercial	Finance	e-waste, paper, commercial waste
Non residential	Industrial, business and commerce & industry	packaging material, builder's rubble, medical waste, industrial waste, etc.
Residential	Residents	household waste, garage waste, greens, etc.

Table1. The waste declassification table divides the industry waste and breaks it down to showcase the waste streams relevant to that particular industry.

Due to the demand created by certain countries, public awareness and education initiatives form part of current legislative requirements. Recently, agencies such as the United Nations Environmental Programme (UNEP) included strategies which incorporate various public awareness and education programmes aimed at different and diverse target audiences (UN, 1992).

Wilson (2007) identified public awareness as one of six drivers that impacts waste development to ensure an integrated, institutional and sustainable approach to waste reduction. Wilson suggests that public awareness is an important factor in changing people's attitude and behaviour. However, Grodzinska-Jurczak, Bartosiewicz, Twardowska, and Ballantyne (2003) and Swilling (2010), suggest that little historical data on formal and informal waste education and awareness programmes exist within developing countries. This creates a disparity between Wilson and Grodzinska's statement as it is challenging to suggest that public awareness is a driver in the absence of formal and informal data to substantiate this, especially if developing countries have not implemented behaviour change programmes. Wilson (2007) further proposes that public awareness and education has an important function in the dissemination of appropriate waste information.

Cape Town's perspective on waste

During the past two decades, the municipality has undergone restructuring, of which the latest occurred during 2000. During 2000, the City of Cape Town municipality was re-demarcated from seven local municipalities to a unified unicity (Swilling, 2010). This restructuring affected the Solid Waste Department and the

reorganisation presented the department with a platform to reduce existing disparities in utility services, namely; waste, water, sanitation & electricity. It allowed the new Solid Waste Management Department (SWMD) to introduce a comprehensive waste management service and include informal areas and townships that received minimal or no previous waste services (Miraftab, 2004). Presently, the municipality's SWMD is responsible for all residential waste collection services in Cape Town (NEMWA, 2008).

The restructuring saw the development of 13 directorates for the City of Cape Town municipality. The 2013 executive structure promotes the 13 directorates and each directorate comprises of additional departments. The directorate of Utility Services includes the departments of Water, Electricity and Solid Waste Management (Appendix A). One aspect of the SWMD's overall goals are to promote reducing waste going to landfill through waste education programmes which is one of the goals for the Waste Wise Programme (WWP). In addition to the above similarity, the WWP promotes the 3R's; reduce, re-use and recycle; which is central to the Waste Wise education programme and the waste hierarchy. With the new structure of the SWMD, the department subsequently developed a waste bylaw to regulate waste services in Cape Town.

To locate Cape Town's waste bylaw, a contextual framework is given on the South African waste legislative arena. South Africa's introduction and adoption of global waste legislation principles have influenced the approach in which residential municipal waste is managed. The Bill of Rights (BoR) states that all residents have the right to an environment that is not harmful to their health and an environment which is protected (RSA, 1996). This piece of legislation has subsequently laid the foundation for legislation such as the National Environmental Management Act (NEMA), which is the umbrella Act for all environmental legislation in South Africa and which includes waste. It subsequently gave birth to additional legislation such as the Integrated Waste bylaw of Cape Town. This legislation has been further enhanced by government setting standards such as the Domestic Collections Standards and the National Waste Management Strategy (2012).

The National Environmental Management Waste Act (2008) is a regulatory framework that regulates waste management activities and services in South Africa and to protect public health and the environment. It provides institutional measures and norms and standards for waste management services applicable to all spheres of government. This includes the prevention of pollution, safeguarding against ecological degradation and ensuring ecologically sustainable development; the remediation of contaminated land, the national waste information system; and waste compliance and enforcement (National Environmental Management Waste Act, 2008).

The National Waste Management Strategy (NWMS) (DEA, 2011) was promulgated during 2012 and is a legislative requirement of NEMWA (2008). The primary purpose of the NWMS is to achieve the objectives of the Waste Act. It identifies numerous challenges faced by waste management institutions and attempts to address these challenges through an eight goal framework, of which 2 are referenced in this dissertation (DEA, 2012).

Within the South African waste legislative framework, the NEMWA (2008) serves as the overarching framework that provides for the development of norms and standards for local municipalities and was used as the guide for the development of the Cape Town Integrated Waste bylaw. The Cape Town municipality's Integrated Waste bylaw allows the municipality to implement what is mandated by the national sphere of government in a manner that is appropriate to the geographical and demographical status quo of the City of Cape Town.

Cape Town's Integrated Waste bylaw was promulgated during 2009 and is aimed at regulating and controlling the management of waste within the City of Cape Town. It has been aligned to other South African legislation, such as the National Waste Management Strategy (DEA, 2011), the City's Integrated Waste Management Policy (2006) and the National Environmental Waste Management Act of 2008 (RSA, 2009). The bylaw guides Cape Town's local government and its residents on waste management services and include: municipality's obligations pertaining to waste cleansing; the responsible disposal of waste that cannot be recovered for recycling; collection and recovery for recycling, and the processing and treatment of waste and

recyclable materials. Additionally, the bylaw provides waste management guidelines to commerce and industries, businesses, government departments and major events organisers (CoCT, 2009).

Cape Town's population currently stands at approximately 3 740 025 million residents with a service area of approximately 2 461 km^2 and with 1 068 572 households (Census 11, Statistics SA). The City currently has an estimated 204 informal settlements with an approximate 190 006 households residing within these settlements (L Van Oordt, personal communication, March 2013; Swilling, 2010). Urbanisation, migration (Small, 2007) and lack of formal housing (Wilkinson, 2000) are viewed as contributing to the establishment of new informal settlements in the City (L Van Oordt, personal communication, March 2013; Swilling, 2010). Due to these contributing factors, the City's population has grown by 37.5 percent since 2001 (Census 11, Statistics SA). This adds an additional strain on Cape Town's landfills. Equating waste generation increase with the population growth, the City's landfill air-space is unable to sustain this growth as it is estimated that the current household generates 2.3 kilograms of domestic waste per day (Scheinberg, Spies, Simpson, Arthur, & Mol, 2011).

In Cape Town, due to the increase in waste generation ratio per person over the past few years (L Van Oordt, personal communication, March 2013) the escalation has affected future projection for landfill site use. Projections suggest that Cape Town's landfills are showing a greater decrease in landfill lifespan (L Van Oordt, personal communication, March 2013) which implies that the City's landfills are filling up quicker than anticipated. This trend is ascribed to various reasons, including people's consumption habits, purchasing power, and technological developments (Ojeda-Benitez, de Vega & Ramirez-Barreto, 2000). Trend studies are seen as good indicators for future waste requirements and improved waste education would, if properly identified and developed, be able to address these trends. Wilson (2007) refers to trends and already showcased how waste behaviours change. He refers to the "end of pipe" concept, and currently; South African legislation speaks to the concept of Expended Producer Responsibility (EPR). These trends are, such as the EPR, are then introduced into educational strategies and public awareness programmes to inform residents thereof.

Waste Wise programme description

The department's WWP was launched during 2002, with the target population being the Cape Town residents (Rossi, Lipsey & Freeman, 2004). The WWP is a waste education platform introduced by the SWMD of the City of Cape Town (L Van Oordt, personal communication, 30 March 2013). This education framework's primary goal to reduce waste going to landfill and the programme is used as a vehicle through which the WWP's goals, its objectives and its activities are implemented. The programme utilises a service provider to implement the WWP and works within a three year cycle. Within these three years, the service provider is contractually bound to complete certain targets as set out by the programme (L Van Oordt, personal communication, 30 March 2013).

A programme which can be viewed as the implementing part of the WWP is the Think Twice© programme (Appendix B). It is a kerbside collection programme and creates awareness with residents about what can and cannot be recycled. It appeals to the resident to Think Twice© about generating, producing, handling and disposing of household waste. Think Twice© is a pilot programme initiated by the City of Cape Town municipality and its primary function is kerbside collection. The programme is rolled out in phases with only certain areas selected to participate. Residents were initially supplied with clear bags and educated around what recyclable items to place in the bag. Subsequent to the initial phase, the pilot programme was extended and residents in other chosen areas were issued with a 130 litre bin. The City collects the recyclable materials on allocated days and divert it from going to landfill. It promotes various waste minimisation projects, such as; recycling, separation at source and the 3 R's; reduce, reuse and recycle. The WWP and Think Twice© works in synergy to promote anti littering and dumping and reducing waste going to landfill. (http://www.capetown.gov.za/en/SolidWaste2/Pages/default.aspx).

As indicated in the WWP content document (2011), the programme consists of three models and is underpinned by an implicit theory which speaks to creating a sustainable environment. The explicit goals of the programme are to support and integrate all efforts to reduce waste, illegal dumping and littering within the City; to encourage communities to take ownership; and responsibility for their environment

through good waste management practices; and to inform and educate residents about the realities and consequences of poor waste management, and to promote economic opportunities. The programme was developed to guide residents to implement any waste related activity in a sustainable manner. These three broadly defined goals are displayed in the proposal's three separate, but interrelated models (L Van Oordt, personal communication, 30 March 2013):

- Sustainable Green Zone (GZ) Partnership Model
- Broader public awareness for implementation of waste bylaws, and
- Sustainable Education and school recycling model

Implementation of each model is not interdependent but the three models have been developed to work independently as well as one holistic system.

The programme utilises the term "model" to describe the three different sub projects implemented under the WWP. According to the programme manager, "model" refers to a new concept being tested by the service provider. Once testing has been completed and amendments and feedback received from the service provider, the "model" will allow local communities to utilise these guidelines to implement community waste programmes (L Van Oordt, personal communication, 11 October 2013). The three models are discussed below:

1. Sustainable Green Zone Partnership Model

As per the WW content document (2011), the primary aim of this model is to create a sustainable Green Zone community through engaging, participating, enabling, facilitating and establishing partnerships to provide an integrated approach in service delivery in targeted areas. Three Green Zone communities were preselected by the programme manager and implementation of this model will be driven by the local sub council and local community. The community takes ownership and manages the programme. The sustainability of the programme is entrenched in community participation that will benefit the community on a long term basis. Through the process of ownership, management and community participation, a Green Zone Waste Wise (WW) community that will live in a healthy, clean and green environment, is established (Waste Wise content document, 2011). The programme

is dependent on five interdependent objectives elements which is critical in delivering this model. Figure 2 makes reference to these interdependent objectives:

Figure 2 - Five elements of the WWP model

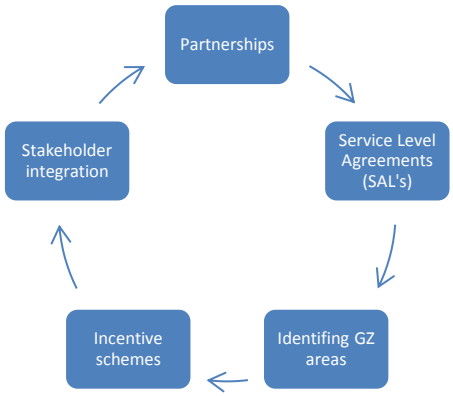


Figure 2: represents the five elements of the WWP programme that is required to ensure that delivery of the programme is achieved

In order to ensure that coherence is achieved on this model, the objective should be disaggregated as it will allow each objective to consist of its own set of outcomes and targets.

2. Broader public awareness for implementation of waste bylaw model

Cape Town was the first to introduce a local waste bylaw which was promulgated as the City of Cape Town's Integrated Waste Bylaw (2009). The bylaw is aligned to the National Environmental Waste Management Act and it gives powers to the City of Cape Town's municipality to implement various waste initiatives, such as law enforcement, accreditation of local recyclers and recycling collectors, and the role of public awareness and education. With this bylaw, the City confirmed its responsibility to align its implementation strategies with various international and national legislation. The WW content document (2011) reflects that the primary function of this model is to communicate the content of the bylaw to the broader public using various education and communication methods, such as leaflets, workshops and presentations. It further aims to align all departmental communication to the bylaw by promoting various waste minimisation initiatives with a long-term goal of reducing waste going to landfill.

This model utilises Zibi, a waste warrior mascot to promote anti-littering and dumping messages through various communication strategies to the broader communities (Waste Wise Communications and Marketing Plan, 9 February 2011).

3. Sustainable Education and school recycling model

As per the WW content document (CoCT, 2011), the model aims to increase waste knowledge at school level through education and awareness programmes in the form of activities. Activities include waste audits and waste clean-ups which can be linked to the school's curriculum. This should progress to develop a sustainable school recycling facility that is independently supported and maintained by the school. In addition to the explicit aims, the model consists of two implicit outcomes for the sustainability concept:

- creating a culture – learners will receive waste education which should be inculcated in their everyday behaviour, and
- financial independence - by allowing schools to become independent by utilising monies collected from the recycling facility.

The educational activities of the school recycling facility will be discussed in more detail in Chapters 2 and 3 of this dissertation which deals with the programme plausibility and programme fidelity.

Target audience

The Demarcation Act (1998), in conjunction with the NEMWA (1998), defines the target audience for the programme as the act stipulates and determines municipalities' boundaries and roles and responsibilities. The eligibility criteria for participation in the WWP is any resident residing within Cape Town's geographical boundaries utilising the City's waste management services. This criterion has been applied to the WWP and participants have been divided into three groups, depending on the model they are participating in. Table 2 refers to each model and the designated beneficiaries (Waste Wise content document, 2011):

Table 2. WWP target audience per model

Model number	Model	Target Audience
Model 1	Sustainable Green Zone Partnership Model	Preselected communities: • SC5 - Bonteheuwel • SC12 – Mitchell's Plain • SC 18 - Retreat
Model 2	Broader public awareness for implementation of waste bylaws model	Any resident who is utilising the waste services of Cape Town municipality
Model 3	Sustainable Education and school recycling model	Schools

Table 2. Is a representation of the three models that completes the full WWP programme.

Model 1one refers to the Sustainable Green Zone Partnership Model and the target audience has been pre-selected and includes three sub council areas as referred to in Table 2.

Model two refers to the broader public awareness for implementation of the waste bylaws model and is inclusive of any resident utilising the City of Cape Town municipality's waste services.

Model three refers to the Sustainable Education and school recycling model and as Model one, has a specific target audience. The target audience includes any school within the boundaries of Cape Town who is interested in initiating a recycling programme.

Geographical reach of programme

The City of Cape Town is a local government sphere and its boundaries are clearly defined within the Demarcation Act (1998). The City has four operational areas, namely; Atlantic, Two Oceans, Impuma and Tierberg and the boundary stretches from Malmesbury to Gordon's Bay (Appendix C). The predetermined geographical periphery determined the area in which the evaluation was completed.

Service Provider selection criteria

It is stated in the WWP content document that the service provider's team should have extensive experience in the field of waste education and/or environmental engagement. The WWP service provider's proposal outlines the team's experience on two levels of intensities; the strategic team which ensures that alignment and direction are given to the programme and the implementation team who ensures execution of programme activities. This is further augmented by the programme sponsor's project team who are considered experts within the field of waste management.

The above three models' primary aim is to present an integrated support structure that will augment the overarching long term outcome of reducing waste going to landfill. It aims to create a sustainable green zone area where communities can become self-sufficient and independent.

Programme documentation

This dissertation utilises two sets of primary documentation to respond to the evaluation questions. The programme concept document was developed and authored by the programme manager and is one of the documents which will be utilised in the theory evaluation. The programme manager's concept document is the foundation document and used as a guide for the implementation plan of the programme.

A second important document which will be utilised is the service provider's proposal document. This document stems from the programme manager's concept document of which the service provider used elements from the three models and developed an implementation plan. This plan outlines the activities as well as the timeframes for the programme implementation.

Waste Wise programme evaluation overview (rationale)

Synopsis of full programme evaluation

According to Armstrong (2004), the inception of the Waste Wise Programme (WWP) in Australia during 1997, has subsequently contributed to global sustainability initiatives by creating a platform for schools to sustain their waste programmes and by setting sustainability and waste education standards. On implementation of a WWP in South Africa, it has extended the environmental and more specifically, the waste educational benefits to the residents within Cape Town with the primary aim of the programme being waste behaviour change.

To date, the Cape Town WWP has not, in its entirety or in part, been evaluated. This dissertation will evaluate one of the three models of the WWP, the Sustainable Education and School Recycling model. This dissertation aims to examine the model's theoretical underpinnings and its plausibility as well as implementation fidelity.

As previously stated, the WWP has not been exposed to any evaluation. This lack of evaluation has an effect on accountability (Chen, 2005). This accountability stretches from the local ratepayer to government departments and from theory appropriateness to programme implementation. The rationale for selection of the Sustainable Education and School Recycling Model for evaluation has been suggested by the programme manager during various one-on-one conversations. The lack of evaluation since inception of the programme during 2002 has been due to the programme theory being altered and modified every three years. The theory is author dependent, which means that after each cycle, the programme may be rewritten, amended, omissions of certain sections of the programme may occur or new "models" may be included by a new programme manager. The one stable factor of the programme is the distal outcome of reducing waste going to landfill as this is in line with the SWMD's vision (L Van Oordt, personal communication, 30 March 2013). Since the possibility exists that each cycle could bring a new programme theory, the distal goal has aided the decision in focussing the evaluation on the past three years of the programme. The distal goal of reducing waste going to landfill has been the

one aspect of the programme that remained constant since inception of the programme.

Synopsis of theory and process evaluation

The Sustainable Education and School Recycling Model has been the most constant in its programme theory. The implementation method may have been revised but the premise has been maintained and improved (L Van Oordt, personal communication, 30 March 2013). This allowed for a thorough evaluation to be completed.

The Sustainable Education and School Recycling Model have, due to its constant performance, been implemented more regularly compared to the other models. It is the model where most progress and continuous achievements have been noted and made since inception. Therefore, due to the current cycle coming to an end, the programme staff required additional information on activities, service utilisation and organisational planning to improve the programme theory.

Over the past few years, the model has seen a greater human resource capacity allocation. The cycle for 2010 – 2013 saw the City, in addition to the service provider; allocate one programme manager to manage the programme and additional City staff to manage each model and its operational requirements. This allowed the evaluator to examine the organisational plan of the programme.

The programme staff suggested that the behaviour of the Cape Town resident towards waste is very negative, as the City spends millions of Rands on cleaning up after illegal littering and dumping (L Van Oordt, personal communication, 30 March 2013). Based on residents' negative waste behaviours, programme staff requested the evaluation to identify the programme's effect. However, based on additional meetings, it was established that a programme fidelity evaluation is more appropriate.

Conclusion

Armstrong (2004) reported that the current Australian WW school recycling programme exists in over 900 schools in Australia and suggested that in order for this programme to be fully sustainable, it requires a holistic approach. This approach should be inclusive of the school's environmental, educational, social and economic issues as well as the programme's key outcomes. As a result, this chapter suggests that, for the City of Cape Town's WWP to be a successful programme, a focused and inclusive approach should be followed. This focused and inclusive approach will be investigated and discussed in chapters two and three of this dissertation.

Engagement with programme staff established that a process evaluation should be preceded by a theory evaluation. The discussion led to permission for a theory evaluation (Chapter 2) to investigate the plausibility of the City of Cape Town's WWP through documentation investigation as well as a literature review. It compared, investigated learnings of other similar programmes, highlighted other programmes implementation challengers and reflected on feedback on programmes which was less successful and those that have been sustained over time.

In addition, a process evaluation (Chapter 3) examined the programme fidelity. It analysed programme activities, implementation of those activities and the success rate of the types of activities implemented. It investigated both the service utilisation as well as the organisational plans of the WWP in order to ascertain compatibility, effectiveness and resource allocation.

Finally, it was determined that a comprehensive evaluation of all three models would require a longer timeframe and a bigger resource allocation.

CHAPTER TWO – THEORY EVALUATION

Overview to chapter

Chapter 2 investigates the programme theory on one of the three models of the WWP, namely the Sustainable Education and School Recycling model. It describes what the programme impact theory is, the service utilisation plan and the organisational plan and examines the appropriateness of these on the programme. This chapter further investigates the question of plausibility of the programme theory of the model. It demonstrates the method followed by the evaluator during the evaluation and how these findings are substantiated through the literature review. It makes reference to recommendations on improving the current programme theory.

Introduction to programme theory

"Programme theory, is the construction of a plausible and sensible model of how a programme is supposed to work" (Bickman, 1987).

Defining programme theory

Programme theory refers to the programme conceptualisation which includes the assumptions, the expectations, the concepts and the goals and objectives which makes up the rationale of the programme structure (Bickman, 1987; Rossi et al., 2004). Programme theory assists with ensuring that the implicit, fragmented assumptions and expectations are made explicit, through a logic model. Programme theory also provides a rationale that the implementation of the programme theory will lead to the expected results. Bickman (1987) further suggests that programme theory is developed as it lays down the platform for the programme's measurements and design plans (Bickman, 1987).

Chen (2005) suggests that programme theory is a method to clarify and simplify the programme's objectives, rationale and programme plan and to identify the relationship between them.

Rossi et al. suggests that programme theory development unpacks three interrelated components of a programme theory: the programme impact theory, the service utilisation plan, and the programme's organisational plan. The programme's impact theory refers to the change process as well as the improved conditions the programme is expected to bring about. The programme theory is a measure to look at either the causal link or at causality of the programme through making the implicit, explicit. The service utilisation plan looks at the target audience, their interaction with the programme, the services they have received, and how the programme has reached them. This refers to the programme-target transactions and it describes the interaction from the programme participant's perspective. Finally, the programme's organisational plan refers to all the programme resources that will be utilised to execute the programme (Rossi et al. 2004).

Function of Programme theory

Programme theory differs on two levels in that; 1) different theories may be applied depending on the discipline being evaluated and 2) programme theories differ on the application of explanatory variables used within an evaluation (Bickman, 1987). Within one evaluation, in the first instance a psychologist may use a cognitive programme model compared to an economist who will use a financial programme model. In the second instance a psychologist will look at an employee's attitude towards his work, while an economist may look at the employee's financial contribution in term of productivity. In addition to the above, programme theory portrays various benefits and the following benefits were developed by Bickman (1987), of which some are mentioned below:

- Programme theory adds to the social science knowledge base
- It assists policymakers in their direction on developing policies
- Allows evaluators to clearly distinguish between programme failure and theory failure

- It identifies the problem and target group
- It provides a detailed programme description by uncovering unintended effects and specifying moderator and/or mediator variables (Weiss, 1997)
- It improves the use of formative evaluation
- It clarifies measurement issues
- It improves consensus formation

Developing a programme theory

Developing a programme theory assists the evaluator with attaining a clearer understanding of the evaluand. The evaluator is then able to conceptualise the problem, select the evaluation design and develop a platform to tailor the evaluation questions Rossi et al. (2004).

Various evaluation theorist developed techniques that can elicit an implicit programme theory. A few examples of these techniques include Wholey's repeated stakeholder engagements, McClintock's maps of subjective stakeholder theories, Conrad and Miller's questionnaires and Weick and Bougon's cognitive maps (Bickman, 1987).

According to Rossi et al., the first step to developing a programme theory is to assess and extract the description of the assumptions, expectations, concepts and the goals and objectives that make up the programme structure and operation. Bickman (1987) concurs by saying that the basic constructs of the evaluation topic, the assumptions of the problem and the limiting conditions of the problem could be extracted. This step allows the evaluator to articulate the important aspects of the programme by improving on an existing programme theory that is agreed upon by all relevant stakeholders (Rossi et al. 2004).

In addition to the above, Wholey (2010) developed an easy step-wise approach to build a logic model to create a programme theory. Wholey's (2010) step approach include: 1) Collect the relevant information, 2) define the problem clearly that the programme will solve and its context, 3) define the elements of the model, 4) draw the model, and finally 5) confirm with stakeholders (Wholey, 2010).

Based on the information above, it is evident that an evaluation of the programme theory will assist programme staff by enhancing their understanding of the programme. It will provide them with an understanding of similar programme theories both local and international; they will be able to compare it to other theories and will have an understanding of how the local WWP can be improved. The WWP will benefit from a theory evaluation as it will ensure that an improved version of the programme exist for execution to the target audience.

Method

In order to elicit the programme theory, the following method was followed, which is followed by the results and discussion of the results.

Evaluation questions

Rossi et al. recommend that each evaluation requires a different approach and design. They propose that each evaluation question should be tailored to complement the evaluation. This is due to each evaluation presenting its own set of characteristics, assumptions and rationale. For the purpose of the theory evaluation, the questions to the evaluation were tailored to ensure that specific questions were developed to guide the evaluator to soliciting specific information. Information that required soliciting pertains to the rationale and the implementation of the programme (Rossi et al. (2004), Chapter 2).

The evaluation questions for the theory evaluation are:

1. What is the programme theory?
2. What is the plausibility of the theory?

Evaluation approach

In order to address the above questions, the WWP evaluation takes the form of a theory evaluation. The aim of this type of evaluation is to analyse the causal theory, which looks at how the programme works and the cause and effect of the programme (Weiss, 1997). This allowed the evaluator to construct the foundation for

the process evaluation (Chapter 3). The theory evaluation investigated and provided insight into how the programme is able to improve its design, implementation and efficiency (Rossi et al., 2004) through other similar programmes.

The evaluation questions were answered on a two tier level to demonstrate the functions of both programme staff and service provider. The primary documents utilised are the programme manager's concept document and the service provider's proposal document, which is considered the implementation plan.

Data sources

Once the decision was agreed and verbal permission was received from the programme manager to evaluate the programme, written permission was requested and received. After permission was granted in writing (Appendix D), the evaluation commenced.

Three types of data sources were utilised during this evaluation:

- Social science literature on international, national and local waste education programmes in schools
- Programme records and documentation
- Interviews with selected programme staff

Information search

A literature review was completed on social science literature to inform, contrast and compare similar waste programmes to establish if the current programme theory applied, is best suited for the programme. The literature review is then documented after the programme theory of the WWP has been extracted. Donaldson & Lipsey (2006) states that utilising social science literature contributes to the knowledge of the relevant subject. It is typically used to review best practised strategies to deal with a phenomenon, to compare how a programme theory is equating to other similar programme theories and to understand what advantages and disadvantages exist when using a particular programme theory. It has relevant teachings for

evaluators in assessing the plausibility of a programme theory in that it allows the evaluator to determine plausibility of a particular programme (Donaldson & Lipsey, 2006).

Search parameters for evaluation

Locating waste management education within a set literature review criteria exposed its own set of challenges. It has to date, largely been categorised within the environmental genre and very often perceived as a leg of environmental education. In order to disassociate waste from environment education, but not discussing it in isolation, the search parameters have been determined to highlight waste education.

Firstly, to ensure that a concise literature review on waste education was completed, key word searches inclusive of the following words were searched: *waste education, waste education in schools, evaluations on waste education, evaluation on waste education in schools, behavioural change education on waste* and *waste education effectiveness.* These words are indicative of the aim of the evaluation of the school recycling model to establish plausibility.

Secondly, once word searches were identified, a cut off year was determined to ensure that recent and updated literature was utilised for this evaluation. This is relevant as, within the past decade, South African waste management services has significantly improved and progressed on its waste management legislation, its context and locating waste within its own field. Waste literature from the year 2000 onwards will be utilised and anything prior 2000 will be deemed dated. This faced its own challengers as many studies were completed prior to 2000.

Thirdly, the format of literature information used was gathered through peer review articles, books and in some cases webpages. This would ensure that all information used within this evaluation originated from a reliable source.

Data collection

For the purpose of the theory evaluation, two particular methods were used to collect data from data sources, namely Wholey's (2010) repeated stakeholder engagement and Conrad and Miller's questionnaires (Bickman, 1987).

The actual data collection process commenced after written ethical clearance was given to the evaluator (Appendix E). Data collection commenced during June 2013 and continued until September 2013. The evaluator had access to hardcopies of the majority of programme records in possession of the programme manager. Documentation in possession of the service provider was not available to the evaluator for analysis.

Programme records

Prior to developing the programme theory, programme records were carefully selected based on their relevance to the programme. This documentation were analysed and evidence was collated based on documentation received. The evaluator was given full access to limited programme records in possession of the programme manager. All hardcopies given for analysis had to be returned to the programme's archiving cabinet.

Programme records were used as secondary data sources. These programme documentation for the cycle 2011-2013 was requested from the programme and project managers to be examined. This request was to articulate a description of the programme's assumptions, conceptions and expectations, including its goals and objectives (Rossi et al. (2004), Chapter 5). Table 3 reflects the data sources utilised to solicit the desired information.

Table 3 – Data sources for theory evaluation

Document details	Document Date
Internal documentation:	
Waste Wise content document	2011
External documentation received from programme manager:	
Waste Wise consultant's proposal	2011
Minutes of monthly meetings	2011, 2012 & 2013
Monthly reports submitted for payments	2011, 2012 & 2013
Yearly annual reports	2011, 2012 & 2013

Table 3: represents the documentation which will be used for the theory evaluation. It distinguished between the documentation of the programme developers and that of the service providers

The documents listed in Table 3 was utilised as the primary data sources for the theory evaluation. Records such as monthly invoices, monthly reports, annual reports and minutes of meetings were utilised by the evaluator to assess the programme theory. External documentation refers to documentation submitted by the external service provider to the programme staff as evidence for work completed. Due to the evaluator examining "third party" documentation, it can be viewed as a threat. This threat exists as some information may be omitted, may not be available due to information being erroneously recorded or information being discarded based on programme staff's bias. These threats may lead to undercoverage of the programme (Rossi et al., 2004).

The WWP content document and service provider's proposal were analysed to examine the assumptions about the change process that has been expected to occur and the improved conditions expected to have been achieved. The additional documentation was utilised to examine who has received the provided services, i.e. service utilisation plan, as well as resource allocation in the form of human, financial

and physical resources, i.e. organisational plan (Rossi et al. (2004), 2004, Chapter 5).

Interview procedure

After careful analysis of the programme records, it was determined that additional information was required. Interviews for the theory evaluation were completed only after documentation was examined and found to be insufficient. This is due to the programme manager not being in possession of all programme documentation. Interviews were concluded within approximately twenty minutes and were completed at the City of Cape Town municipality offices. Interviews were recorded on paper and subsequently transcribed to extract information relevant to the evaluation questions. A questionnaire (Appendix F) was developed and utilised to assess process fidelity as omitted documents included participation logs, contact dates and other record keeping information (Rossi et al., 2004). Permission was granted by the programme manager for programme staff to participate in interviews. The relevant project manager was approached and an appointment was confirmed. Interviews were completed as agreed upon. This assisted the evaluator in extracting information from the most relevant person(s) in the programme for the school recycling model.

The programme sponsor and service provider archived different documentation. The evaluator had access to the programme sponsor's documentation only, which included invoices, monthly and annual reports, artwork for resources developed and agreements with partners. This limited accessibility by the evaluator was due to the service provider's financial requirements for attendance of additional meetings which were not budgeted for in the initial programme proposal. Due to the limited accessibility to documentation, a questionnaire was completed by two project staff of the City of Cape Town municipality.

Participants

As previously stated, permission for participants to participate was required and received from the programme manager. Two project team leaders for the schools

recycling model were interviewed to attain clarification and an in-depth understanding of certain aspects of the programme. Participants are considered a primary source.

Procedure

For the interview procedure, Wholey's repeated stakeholder engagement approach was utilised (Bickman, 1987). The evaluator found that in order to answer the programme's plausibility question, Wholey's approach was the most economical to follow and apply. The initial step of Wholey, being, the collection of relevant information, was applied. Numerous meetings were held with the programme manager and project staff to elicit information (Wholey, 2010).

Initial consultations

Wholey's (2010) initial step is to collect the relevant data, and prior to commencement of data collection, the evaluator had several meetings with the programme manager of the WWP. The initial meeting was to determine their evaluative requirements, the scope of the evaluation and prompt as much information about the programme for evaluation purposes. Subsequent meetings stimulated additional information about the programme, determined the level of access to documentation, availability and access to programme staff and possible engagement criterion. After several meetings, permission granted to the evaluator to commence with the evaluation.

Pre administration

The evaluator was given full access to documentation in possession of the programme manager's administrative system. The programme manager was requested to complete and sign a permission contract that gave the evaluator authorisation to complete the evaluation.

Ethical clearance

Once the proposal for the evaluation has been presented, accepted and submitted to the Ethical Clearance Committee of the University of Cape Town (UCT), written permission were given to the evaluator to begin with the evaluation and with data collection. Ethical guidelines were upheld through this evaluation process. Participants were treated in a professional, respectful, and confidential manner. Details of the service provider and participants are being held in strict anonymity and details will not be divulged to any other party.

Information review

Documentation listed in Table 3 were examined and analysed and subsequently utilised to develop the programme theory. For this section, an information review on various literatures was completed to determine plausibility of the programme.

Results and discussion

The WWP programme theory

In the procedure section of this chapter, the evaluator followed Wholey's (2010) initial step to collect data to elicit as much information on the programme theory from the programme staff. This was followed-up by a detailed analysis of all programme documentation available to the evaluator. It allowed the evaluator to extract the logic model currently being utilised which is referred to in Figure 3. Figure 3 can be considered the building block for the new, revised programme theory developed in Figure 4. Figure 3 refers to the complete existing programme theory utilised by the current WWP programme staff. The complete programme theory is displayed to showcase how the Sustainable Education & School Recycling model fits into the complete programme and how it is linked to the long term outcome of the programme. It is a visual representation of the programme's conceptions, assumptions and expectations. The outputs of the programme staff is clearly defined in this logic model.

Figure 3: Current programme theory logic model

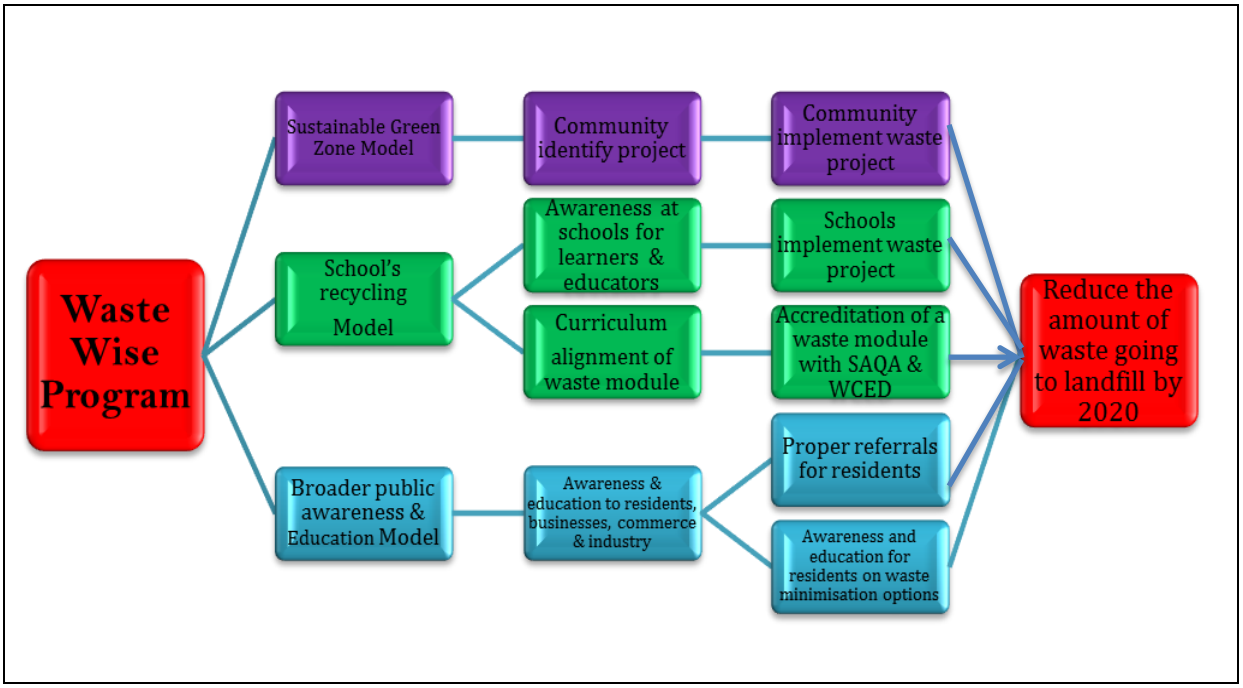


Figure 3. Waste Wise programme's existing programme theory which is inclusive of all three models

Figure 3 makes reference to the three models as described in Chapter one. In order to understand the existing WWP programme theory, the impact theory; the service utilisation plan and the organisational plan will be analysed below (Rossi et al., 2004).

As previously stated, the Cape Town WWP has a three year cycle and since its inception in Cape Town, the programme theory has been amended from the previous cycles of 2007-2010 and from 2002 – 2005, but the long-term outcome of reducing waste going to landfill has been maintained. The gap between cycle years is due to internal City of Cape Town municipality administrative and procurement requirements. During this gap, the programme could be rewritten with a new programme theory, submitted for procurement scrutiny, be advertised as per the City of Cape Town's Supply Chain Management (SCM) policy and then awarded to a successful service provider. This process could easily transpire over one or two years.

The initial step in this evaluation was to complete a revised programme theory for the WWP as stated in Figure 4. This theory was carefully constructed from analysis of all

programme documentation supplied by both programme funder and service provider. Some implicit factors exist, which were in possession of the programme manager only. These implicit factors were brought to the fore after numerous meetings with the programme manager and the evaluator could incorporate these factors into the revised programme theory as seen in Figure 4. One implicit outcome of the WWP is the utilisation of the school education and recycling model as a blueprint to be implemented by other schools. The revised programme theory consists of programme activities, outputs and short and long term outcomes.

The programme is currently funded by the City of Cape Town municipality and is implemented by a service provider. Due to the above, the evaluation questions will be answered on two levels: that of the programme manager and/or project staff member from the City of Cape municipality; and the service provider's perspective. However, limited information exists on the service provider's response to the programme theory, as no engagement between the service provider and the evaluator occurred due to reasons previously stated. The information used was extracted from the service provider supplied to the programme manager, including the WWP consultant's proposal (2011).

a. Programme funder's programme theory

An informal meeting held with the programme funder revealed that the development of the programme theory for the WWP was developed from previous experiences, prior exposure to the waste environment and on historical experience accumulated over the past few years. The previous WWP had a robust marketing plan which promoted the programme to local residents compared to the current WWP which had a more holistic implementation approach to the programme (L Van Oordt, personal communication, 3 July 2013).

b. The service provider's application of the programme theory

The WWP proposal document stipulates that the programme theory is based on a collective array of theories, which includes:

- The service provider's consortium team's prior experience in the field of waste education. The team consists of members who have accumulated various waste skills over the past few years and has become specialists in their field.
- Legislative requirements, such as The Municipal Systems Act, Section 78(3) and the Integrated waste management bylaw and Policy, which was used as a guide for the implementation, and
- Various websites and waste literatures, including books that influenced the different models.

Additional programme concepts used have been incorporated to augment the programme theory and its implementation. These concepts are:

- The Participatory Rural Appraisal (PRA) tool that was utilised to train the facilitators. This method was utilised to train facilitators to work with communities and to develop the concept of ownership and pride
- The Community based social marketing principles used to market the programme as a "green" programme and to create additional awareness through social mass media
- The service provider's proposal makes reference to The United National Environmental programme document "Decade of Education for sustainable Development (2005 – 2015, UNEP, 2003) which was utilised as a guide for various implementation strategies (WWP consultants proposal document, 2011).

The literature review revealed that various international municipalities, such as Australia's Department of Environmental and Conservation (ADEC) have implemented a similar Waste Wise programme with the specific target audience being schools. The local WWP's theory is based on a similar process stream as that of the Australian version which is inclusive of partnerships, collaborations with other community organisations, businesses, government programs and community members (http://education.dec.wa.gov.au/waste-wise.html) and school recycling initiatives. The theory differs on various aspects with the most noticeable being the Australian version's unchanged theory since its inception during 2002. Secondly, the difference is the criterion that is used for becoming a WW school. All schools follow the same criterion which has been developed specifically for the programme, and is not dependent on the type of school or the type of programme being implemented.

Thirdly, the difference pertains to the implementation methodology as it is dependent on the type of programme implemented. The South African programme theory version is underlined by the following legislative framework:

The National Waste Management Strategy (2012) (NWMS) was developed as a regulatory framework to guide local municipalities and consist of eight general targets to direct the South African government. Of the stipulated eight targets, two are of particular interest; Goal number one speaks to the promotion of waste reduction through mechanisms such as recycling. It stipulates that by 2016, a 25 percent reduction in waste going to landfill should be achieved. Currently, in Cape Town, an estimated 10 percent of waste is diverted from landfill (A. Davison, personal communication, 15 July 2013). Davison (2013), reports that during the past financial year end, the biggest contributing waste stream to the reduction in waste going to landfill was the chipping of greens (trees, leaves, grass, etc.) at City drop off facilities and landfill sites. The least contributing stream to the percentage was builder's rubble (A. Davison, personal communication, 08 August 2013). However, on analysis of the information, it is possible that an under-estimation of waste being diverted exists. The information supplied by Davison (2013) reflects tonnages of the City's waste initiatives only and does not include any external institutions that diverts waste going to landfill, such as NGO's and recycling organisations, recorded figures.

The above analysis of goal number one reflects that the City has three years remaining to achieve the fifteen percent of the 25 percent as set out by the National Waste Management Strategy. A possible strategy is to complete a baseline study of all City waste minimisation initiatives and investigate if the current initiatives are sufficient to achieve this target. Should these initiatives be inadequate, the City should possibly explore additional waste minimisation initiatives that are inclusive of external waste reduction organisations. This will ensure that a more detailed and comprehensive database exists that is able to create a conclusive statistical data set.

The City of Cape Town proposed that waste education programmes could contribute in reaching this target by its stipulated timeframe. As previously stated, the municipality's diversion rate currently stands on 10 percent of waste being diverted from landfill but it is challenging to ascribe any part of the change to the WWP.

Goal number 4 of the National Waste Management Strategy stipulates that eighty percent of schools should implement waste awareness programmes by 2016. The WWP has, over the years interacted with various schools who show interest in initiating any type of recycling programme. However, according to programme staff, the City has not developed a database nor documented schools who are either a waste drop off facility, waste collection facility, or who has any type of recycling programme operating at the school. The only list available was from the WWP. The WWP service provider must submit a list of schools which they have interacted with after each cycle. This list consists of schools who have received some type of education but the list does not make reference to any programme being implemented at school level.

The above legislation is primary contributors to the programme theory as it is the guiding documents for the waste industry. All municipalities are bound by legislation and would be subject to retribution if found to be in contradiction with the law.

The NWMS, as well as other legislation such as the National Standards for Domestic Collections, speaks about community participation. Petts (2000) documented four case studies which look at the role “participatory democracy” as well as “social learning” plays in waste management and how this affects waste management strategies. These studies are of particular interest as it speaks to possible influences to the programme theory’s long term goal. Both concepts speak to waste education and possibly offer a new approach to dealing with waste communication.

Programme impact theory

The programme’s impact theory is aimed at reducing the amount of waste going to landfill, through implementation of legislative mechanisms such as NEMWA, the NWMS (2012) and Cape Town waste bylaw. The overarching aim anticipates that waste will be reduced before it is disposed of at landfill and that resident’s behaviour pertaining to waste awareness increases. The Sustainable School Recycling model requires schools to take ownership and show pride in their waste behaviour and to make an impact on the immediate environment. It is anticipated that with the

implementation of the WWP at schools, schools will initiate recycling programmes in order to become independent institutions.

For the past few years, one school in particular, namely Bergvliet High School, situated in Bergvliet, Cape Town, has set the standard for sustaining a recycling programme. They have benchmarked the process of how to successfully sustain, develop, manage, implement and broaden a recycling facility to the broader public (L Van Oordt, personal communication, 17 July 2013; N Johannessen, personal communication, 17 July 2013; http://www.bhs.org.za/about-us/recycling). This school has not been linked to the WWP programme theory but their programme has been in existence for almost twenty years. This is an example of a successful school recycling programme which has been sustained over a long period.

Figure 4 represents the simplified and revised version of the causal theory of the WWP. Figure 3 represents the current programme theory utilised by the service provider. However, do to the far-reaching and general activity requirements of the current programme theory, the evaluation proposed a new restructured programme theory which would have a more stringent approach for implementation. Programme staff suggested that the revised programme theory be more structured in order for follow-up to occur once the programme reaches the end of its cycle. This allowed the evaluator opportunity to tailor activities by developing a logical flow chart for the programme. Figure 4 should be viewed in concurrence with Figure 6. The purpose for this proposal is that the Figure 4 may provide an improved programme theory but Figure 6 provides a revised and detailed service utilisation plan for the programme.

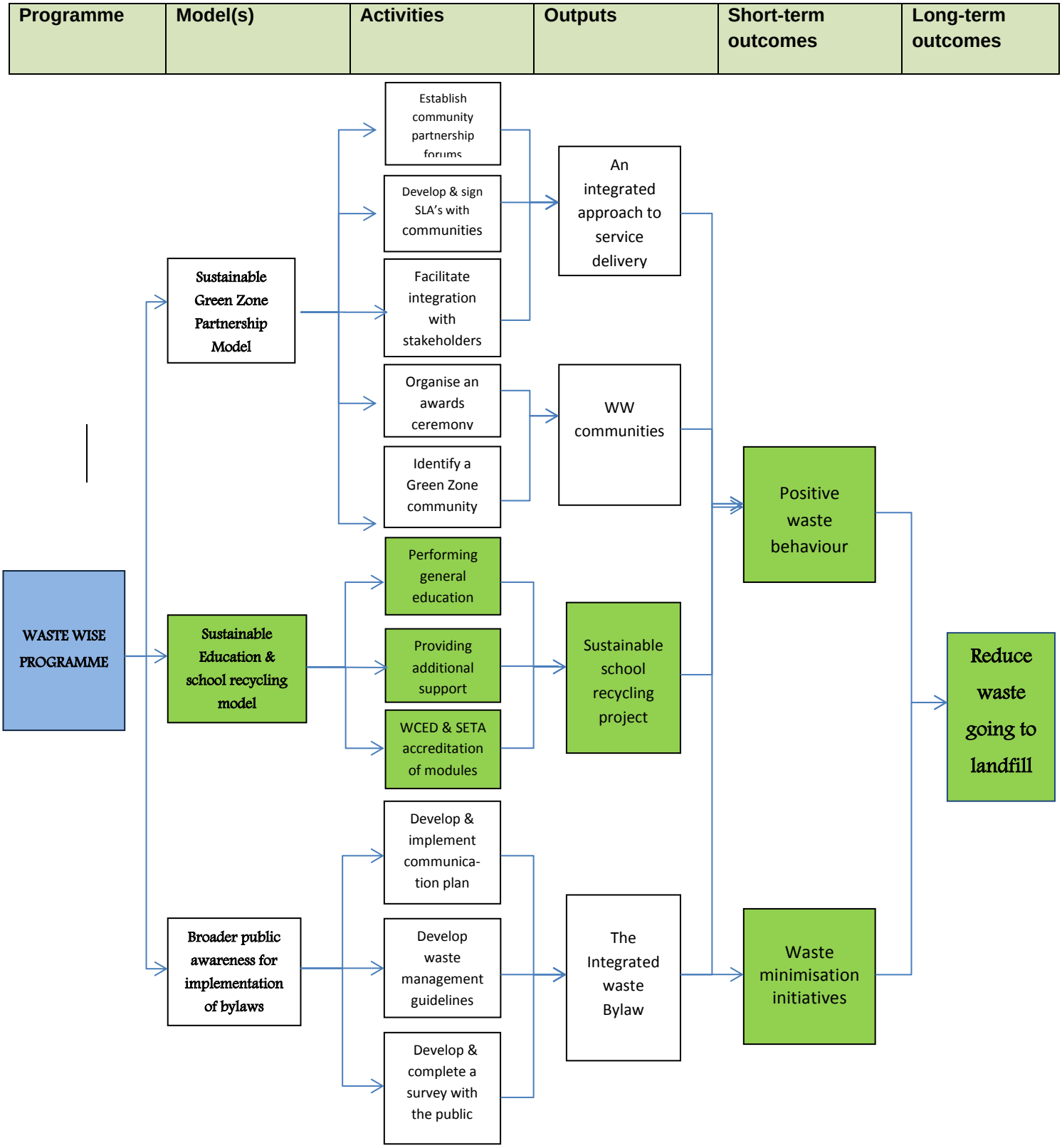
On developing the logic model, input from the programme staff was required and received. This information was incorporated and a new revised version was presented. The revised programme theory of the Sustainable Education & School Recycling, which is represented in green, provides an improvement to the programme staff. The revised programme theory disaggregated the information to ensure that each activity is achievable, doable and has a measurable outcome. Table 4 attempts to differentiate between the types of education supplied to schools and how it would be enhanced. It attempts to look at the 3 most important aspects of school recycling and allows the programme staff to separate and then improve on

these activities. The 3 revised programme theory streams took into consideration who the relevant role-players would be that could benefit the programme, who the beneficiaries are and if the programme would have programme staff available to assist in implementing the revised theory. In addition to this, it proposes that each activity should be more structured and that certain implementation criteria be assigned. Some criteria include:

- Depending on the activity, a minimum amount for each activity should be documented to ensure that fidelity of the programme can be evaluated.
- Each activity has to have a timeframe attached for completion to ensure that activity is completed within a certain timeframe and that follow-up occurs as stipulated
- In all 3 sub-programmes, activities should be described in detail to ensure that no ambiguity exists or that activities are not misrepresented or omitted
- All activities should have targets set to ensure that the maximum benefit is reached
- In the revised theory, the educator and learner education has been placed under one heading but should be differentiation between educational activities for the educator and educational activities to the learner should occur once an activity based plan are developed.
- Activities should include technology, such as social media, to disseminate the information

Building on from the ADEC programme, the evaluator extracted the implicit factors, establishing the rationale of the programme and by ameliorating the current theory, the revised WWP theory in Figure 4 was developed. On completion of the revised theory, it was presented to the programme staff which concurred that the information within the revised programme theory is achievable.

Figure 4 - Waste Wise Revised programme theory



Plausibility of the programme theory

Subsequent to the existing programme theory being elicited from initial engagement with the programme staff and programme documentation, a detailed revised programme theory was developed. This programme theory disaggregated the activities in order for the programme to have three clear strategic projects. These projects have an inherent set of short, medium and long term outcomes. Figure 4 represents the new revised programme theory.

As stated by Donaldson & Lipsey (2006) the plausibility of any programme is in the assumed relationships between the intended outcomes of the programme and the programme itself. They further state that programme theory has probability to contribute to the understandings of change processes in programmes. Therefore, in order to assess the plausibility of the WWP programme theory, a literature review will be conducted on waste education. This waste literature search will focus on local, regional and international literatures with a specific foci on South African literature. The review will analyse the WWP and compare other waste programme theories to establish if the current model used by the WWP is best suited for Cape Town resident's requirements.

Based on the new revised programme theory for WWP as presented in Figure 4, the Sustainable Education & School Recycling has three primary activities which require implementation.

1. Providing general education
2. Providing additional in-depth support, and
3. Ensuring WCED & SETA accreditation of modules

a. Programme funder

According to the WWP concept document, activities are not articulated nor specified as the programme manager decided that activities should not have a "one shoe approach". The "one shoe approach" suggests that each participant should receive a set of activities that have been specifically developed to suit their programme and socio-economic circumstances. It further suggests that a standardised set of

activities will not be as effective due to the difference in South Africa's demographic information. This decision is based on demographic diversity of the geographical areas the programme has worked in. Broad guidelines are given to guide the service provider to achieve certain objectives (L Van Oordt, personal communication, 3 July 2013).

b. The service providers

The programme records; including the proposal, monthly reports and annual reports; it reflects that the "programme's educational programme" was implemented at various institutions and were not confined to the school environment. Facilities such as the local library, local organisations or the school were used to implement the programme. The "programme's educational programme" are not set, does not follow a sequence, specifies no minimum amount for implementation, does not have to be implemented at school level nor is any activity obligatory to implement at any stage. The only criteria for the School Recycling programme is that schools must be recruited and "additional" assistance must be given. This "additional" assistance is not specified nor does any guideline on how to execute this, exist. On analysis of the educational programme activities, the service provider has performed presentations at a holiday programme and the project team has accepted this as a method of achieving the objective of achieving broad education.

The service provider's reports distinguish between a holiday programme which is facilitated at a local institution and a school programme which is facilitated at school. According to programme records, Table 4 is a representation of reported activities completed by the service provider, in no chronological importance.

Table 4 – Current programme activities

Description	Activity	Assumption underlying activity	Minimum sessions required to be facilitated	Hosting facility:
Holiday Programme	Zibi Drama Performance	General awareness raising on waste	1	Library, community centre or non-governmental organisation
	Presentation on recycling		1	
	Screening and watching of a waste video		1	
School programme	Waste Audit	Developing baseline for schools to initiate a recycling project	1	School
	Zibi Drama Performance	Initial waste education interaction with whole school	1	
	Presentation on sorting of waste stream items	Focussed education aimed at eco club members to initiate programme	1-2	
	Tour of the Athlone Resource & Transfer Station (ARTS)	Exposure to a waste facility to experience waste	1	
	Presentation on composting	Focussing on "how to make compost" and utilising it in the garden	1	
	Arts & crafts	Showcasing alternative designs made from discarded waste	1	
	Initial (1st) meeting	Introduction to programme	1	
	Follow-up meetings	Give support and assistance to schools	Amount determined between school and WWP coordinator	

Table 4: Differentiates between the activities documented for the two educational programmes. It reflects which activities were completed for the holiday programme and which activities were completed for the school programme.

The ADEC website is a guide which can be used by the local WWP to enhance their activities by ensuring that each activity type and waste programme is aligned and has guidelines in place to achieve a sustainable programme. This document serves as a resource for referrals to various matters, financial guide as to how much budget

will be required to implement a programme and a “how to” guideline for implementation by both learner and educator. Goldfields (undated), suggests that the Australian Department of Environmental and Conservation (ADEC) is the facilitator of the WWP and that it is a guide to schools on various aspects of waste. The Cape Town WWP follows a similar stream, except that the city also assists and supports with implementation of the programme (Goldfields, undated). The local WWP uses the Eco School criteria for recruitment of schools into the programme which suggests that the local programme does not have criteria in place for recruitment.

The website is a resource on its own for the WWP as it has various other literatures which makes reference and promotes the Waste Wise Schools programme. This reference guide has been developed by the Australian Waste Wise Schools programme and managed by the Department of Environment and Conservation of case studies on various schools recycling programmes. The Australian WWP’s primary aim is to promote the 3R’s and to promote the sustainable use of natural resources to schools (http://education.dec.wa.gov.au/waste-wise.html). The programme implementation of the ADEC has remained constant with the only difference occurring on implementation. Implementation was based on the different types of waste programmes implemented by each school as referred to in Table 5. Table 5 details the different types of waste programmes currently found and what it encompasses. According to ADEC, the waste programme determined the type of activities, types of interactions and engagement as well as incentive programmes.

Table 5 - Possible waste programmes

Programme	**Details**
Recycling programme	Separation of various waste streams e.g. paper, cans, etc.
Collection facility	Collection of various waste streams in order either resell or reuse
Composting	How to make composting for school
Food garden	How to make a food garden from organic waste
Worm farming	Producing worms for composting

Table 5: The different waste programmes require different education. Table 9 reflects details the programme type and the activity defining the programme.

The Australian WWP does waste education to both educator and learner and has a support programme in place for both. They are a registered entity and schools belong to the programme which substitutes as a body with various facets. Both these aspects are absent in the current South African WWP as it only performs broad education (http://education.dec.wa.gov.au/waste-wise.html) with schools.

The programme content document does not outline nor consist of any "intended activities". As previously stated, it allows the service provider to determine activities based on a specific programme (L Van Oordt, personal communication, 3 July 2013). Reviewing the service provider's implementation plan, it reflects that activities are not predefined but that school's action plans are used and intensified.

There are no collective activity lists that inform the education activities of the programme. It is dependent on the person who is performing the education to suggest a sequence and flow of activities. The service provider completed two activity groups as referred to in Table 4 which is known as the holiday programme and the schools programme:

- Holiday Programmes activities followed the following sequence:
    - watching videos on waste,
    - Making of crafts (does not stipulate if the material is recycled or used but some examples reflects that used ice cream bowls were used)
    - question and answer sessions on anti-littering and dumping
- Waste presentations by linking waste to other programmes.

Even though the plausibility of the programme is sound, the programme may require additional input on various aspects of the programme. These inputs would include guidelines on a structured activity programme and ensuring proper monitoring of activities. This will ensure that a plausible programme theory is strengthened by aspects that improve the outputs of the programme.

Grodzinska-Jurczak, et al. (2003), completed a study on waste education in schools and states that the education programme followed a "pedagogy" hands on approach

and assisted learners and educators. The use of “pedagogy” in this instance was a reference to the teaching style utilised by the environmental educators to ensure that learners were stimulated and encouraged to learn and subsequently act upon their learnings to improve and enhance the environmental. The educational programme was divided into four packages with each package containing a set of four activities (16 in total) and each activity utilising similar standard formats. The four “packages” were: waste generation, waste management, waste management decision-makers, and public effect upon municipal solid waste. Their study examined the impact of a waste education programme of a school in Poland, what impact student participation in the program had and how it influenced their own, the educator and the parent’s attitudes and behaviour. The study concluded that the school’s waste management education programme impacted positively upon student’s waste knowledge.

In another study, Ayodeji Ifegbesan (2010) examined the level of awareness, knowledge and practices of secondary school students with regard to waste management in Nigerian educational institutions. One of the outcomes of the study showed that different variables; such as sex, class and age of students affected waste management practices significantly. The study consisted of three parts. The first part had five items determining students’ knowledge and waste management practises. The second part consisted of seven items and the third part thirteen items. This result supports the findings of Hines et al. (1986) which suggest that the level of consistency between attitude towards environment and behaviour is affected by a person’s knowledge and awareness, public verbal commitment and their sense of responsibility (Desa, Kadir, and Yusooff, 2011).

Based on ADEC and studies presented, it is clear that the current WWP theory is a plausible theory but that it requires additions to improve the programme. A few requirements needed are:

a) Guidelines – the Cape Town WWP (CTWWP) will significantly benefit by implementing guidelines to schools. These guidelines includes:
    - Membership criterion to becoming a Waste Wise member
    - Types of activities aligned to a specific waste programme, and
    - Frequency of activities

b) Learner support programme
c) Educator support programme
d) Curriculum alignment processes which includes subject matter activities

Based on the above legislation and case studies, it is clear that the WWP plausibility is sound in its theory. However, the theory could benefit from following a structured approach as this will assist and guide schools in their programme implementation. It further suggests that school education on waste if applied in a structured format and if specific types of activities are defined and applied, different target audience can benefit.

Education Activities

In the context of the WWP, an education activity refers to any means of information exchange occurring between WWP staff and the school. The activities can take the form of presentations, drama performances and meetings. It does not have a minimum or maximum frequency and can occur between one or more members.

Gralton, Sinclair & Purnell (2004), completed a research which focussed on the impact of environmental education initiatives on learners' attitudes, beliefs and behaviours. The review had two recommendations which is that evidence suggested that environmental education can be associated with learners short-term beliefs and attitude changes and that little evidence exists to substantiate the understanding that environmental education initiatives leads to behaviour change.

Malone (2003) promotes Winnocott's concept of a "holding environment" which is a concept which speaks to global sustainability by creating an environment where children require a space, a place and an opportunity to engage with the environment first hand. This speaks to the broader environmental education and this concept can be utilised to promote waste education in schools.

The literature review recommends that the current programme theory, as it stands, requires additional input to ensure that a better fit is achieved. It is able to stand unaccompanied, but the impact of an unaided theory will be difficult to evaluate. The

revised programme theory requires detailed guidelines and processes for both learners and educators.

Due to the limited requirements for activity implementation, records reflect that all activities have been implemented. This, in conjunction with the studies above, it can be assumed that if all “intended” activities are implemented as planned, the WWP can achieve its outcome of reducing waste going to landfill. However, to prove causality between school’s waste education and a reduction of waste going to landfill, an impact evaluation examining the cause and effect is advised.

The goals and objectives of the programme are to increase waste knowledge at school level by providing waste education to develop a sustainable school recycling facility that will allow schools to be independently sustainable.

Within many Sub-Saharan cities, Din and Cohen (2013) shows that waste generation ranges between 0,3 and 0,8 kilograms per capita per day in comparison to the Organisation for Economic Co-ordination and Development (OEDC) countries that producers and average of 1,39 kilograms of waste per day per capita. This per capita difference is indicative of the difference between countries’ waste cultures, where waste education may have been influential. Public participation, support and education are important factors for waste reduction at household levels (Daskalopoulos, Badr, and Probert, 1997). However, various residential and consumer education campaigns are slowly emerging that there is a possible affect waste disposal and management. Gandy identified three factors that may influence public participation and education. The three factors are: 1) the psychological aspects of participation; 2) participation based on socio-economic characteristics and 3) the level of environmental concern in societies (as cited in Daskalopoulos et al.).

According to programme records, as well as programme staff interviewed, monthly payments of invoices submitted by the service provider have been paid. This is an indication that programme staff has approved and accepted the invoice and the monthly report as evidence of work completed. However, on interaction with all programme documentation to the evaluator’s exposure, no participation logs and no participant reports were available to support the invoices. On engagement with the

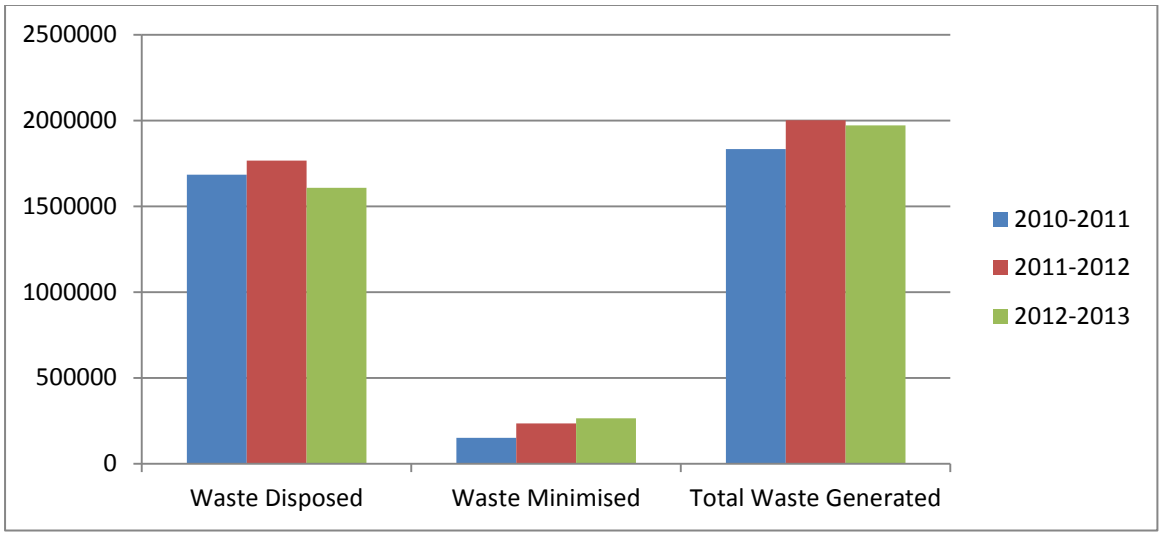
programme staff it was stated that these documents are available, but to date the evaluator have not received any copies of these documentations. As previously suggested, payment to service providers are prepared based on an invoice and a report. In order to ensure that goals and objectives of the programme are reached, additional documentation should be requested to ensure that fidelity of the programme is maintained. Before payment is due, a stricter control over documentation and monies are not paid out on invoice and report only. Additional documentation is needed to too ensure that proper implementation was done.

Programme records submitted by the service provider face a reliability and validity challenge as well as threatened validity of the programme. This is because no documentation is checked for fidelity of programme implementation and the evaluator only evaluated limited documentation. On submission of documentation, records are checked only for what is completed and not if activities have been implementated.

Collective waste statistics collected from City landfills, estimates that from January 2013 until June 2013 an estimated 1 003 830 tons of waste have been disposed of at the City's three landfill sites (A. Davison, personal communication, 15 July 2013). This leads to additional internal validity threats as the equipment used in the past has been seen as problematic. Prior to July 2010, all waste going to landfill was measured in cubic meters and subsequently converted into tonnages. This made data collection prior to July 2010 less reliable due to the increased error probability. Subsequent to 2010, measuring tools utilised to measure waste and the capturing of data was updated to increase the validity and reliability of all data collected (A. Davison, personal communication, 15 July 2013).

The histogram below contains totals of waste collected, waste diverted and total waste landfilled for the past three financial year ends, from July 2010 – June 2013 in tonnages.

Figure 5 – Waste disposal table



(Information supplied by A. Davison, personal communication, 15 July 2013)

Figure 5: documents the three aspects of waste disposed, waste removed from the waste stream and the difference between the two

The above Figure 5 reflects three aspects of waste management initiates within the City of Cape Town. The tonnages supplied runs over three financial year ends, with financial year end ending in June of a particular year. The three aspects are; waste being disposed, the fraction of waste in Cape Town being removed from the waste stream to be either recycled or reused and the difference between waste being disposed and waste being removed (Appendix G). This amount provides an actual estimation of tonnage of waste being disposed of at City's landfills. According to the tonnage data supplied during 2010-2011 approximately 9 percent was diverted, during 2011-2012 approximately 13, 5 percent were diverted and during the last financial year 2012-2013 approximately 16 percent were diverted from landfill. The histogram shows a slight positive increase in the percentage of waste being removed before waste is landfilled. However, due to the lack of programme evaluation, no correlation between public awareness and the decrease in waste disposal can be demonstrated.

The information supplied reflects City of Cape Town's collection programmes/ initiatives, e.g. City Drop off facilities, City composting facilities and the Think Twice

project, only and excludes collection from external role-players, e.g. Collect-a-Can, MPact, etc. (A. Davison, personal communication, 16 July 2013).

Missing and/or incomplete data may affect accuracy of information (Hatry, 1994) as well as the outcome of an evaluation. In this evaluation, obvious omissions were observed. This included lack of certain documentation such as participation logs of activities completed, lack of evaluation surveys of participants and lack of information on possible attrition from schools. Attrition has a huge effect on the evaluation as it does not stipulate how many schools did not complete the programme and why. Additionally, equipment used prior to a certain date was problematic which affects the tonnages supplied.

Subsequently, the above has implications for the sustainability of the programme as staff may not have recorded all activities, correspondence or challengers faced, which may have arisen during the programme cycle. Sustainability of the programme is dependent on efficient and effective documentation and administrative archiving.

According to programme records, programme methods have been altered with each participant. This allowed the service provider to work with school activities and to advise and support what is currently in place at schools. This method, according to the programme sponsor assisted in achieving the outcome.

Programme service utilisation plan

A service utilisation flowchart was not developed and the evaluator developed a service utilisation plan for easy reference. After careful analysis of all programme and service provider's documentation, the evaluator completed a programme-target transaction (Rossi et al., 2004). Due to the lack of activity planning in the content document, the following service utilisation chart is a combination of the content document and the service provider's intended activities which have been extrapolated in order to showcase the best service utilisation chart. The flowchart is a step-by-step guide to be followed, commencing from when a school request for assistance with a recycling project is received. Thus, the service utilisation is aimed at schools that utilise the WWP education programme. Figure 6 reflects the service

utilisation flowchart of the school education programme.

The service utilisation flowchart is inclusive but also distinguishes between both activities and possible outputs on both school and service provider levels. It starts when a school approaches the City of Cape Town for assistance and ends when the programme is fully operational with additional follow-ups to ensure sustainability. From literature analysed it is evident that a guide for implementation will assists with positive outcomes. A suitable educational programme supplies guidelines on format, timeframes, and targets. This allows for activities to be properly implemented, have a proper format and to be in a chronological order.

Figure 6. Revised service utilisation flowchart

Figure 6: The revised service utilisation flowchart is a sequenced step by step plan. The revised

flowchart when action is required from the programme staff and terms this an “activity”.

A primary target of the school’s recycling model is to achieve 600 schools within a three year period. On analysis of the documentation received from the service provider, only 237 schools were reached (Appendix H). A shortfall of 363 schools was omitted. On investigation of the shortfall, it was stated by the service provider that the holiday programme at community institutions, such as the local libraries and community centres, made up the shortfall. A request was put forward for a more detailed list of the schools, including those that attended the holiday programmes. To date, the evaluator is still awaiting the updated list.

Cape Town has a broad schools constituency. The WCED were contacted for a disaggregated list of schools that lies only within the boundaries of Cape Town. To date, the department has not replied to the evaluator’s request nor has any information been received. This is problematic as a comparative analysis cannot be completed. Due to the absence of a school’s recycling database, it is problematic to monitor the achievements reached by the City and compare it to the eighty percent goal set out by the National Waste Management Strategy. Additional problematic areas are the lack of information supplied about what programmes constitute a recycling programme, what constitute an education programme and what sustainability should look like. Thus, benchmarking the City’s school recycling achievements is challenging due to the lack of information supplied.

Programme organisational plan

Programme organisation plan will be discussed on two levels; that of the programme sponsor and the service provider

a) Programme sponsor

   The overall programme manager is the evaluation funder. She is located within the SWMD department and ensures that direction and guidance are given on all strategic and operational aspects of the programme. The SWMD’s staff has been divided to assist with various aspects of the programme. Two project staff have

been allocated to project manage the school's programme by ensuring that goals and objectives of the programme are achieved.

b) Service Provider

The service provider has recruited community facilitators to ensure that the operational leg of the programme is implemented. They have two levels of staff, strategic staff and operational staff (Appendix I).

The WWP evaluation highlighted a few unintended outcomes which did not form part of the initial rationale nor of any of the assumptions of the programme (Rossi et al. 2004; Bickman, 1987).

Uncovering unintended effects

The evaluation has identified three possible positive unintended outcomes which have been highlighted by the revised programme theory (Rossi et al. 2004). The three unintended outcomes are: intergenerational learning's, cost to benefit analysis and peer education which is discussed in detail below. Although the evidence at this stage is purely anecdotal, a future evaluation may want to examine these possible benefits as well.

Intergenerational learning (Armstrong, 2004)

The Waste Wise Programme has been utilising a mascot named Zibi to promote the waste reduction message to learners. Zibi was similarly utilised during the late 1990's to promote waste minimisation and was known as a waste warrior for the programme. It has subsequently emerged that parents are reliving their experiences of Zibi and this has assisted the programme with promoting the waste reduction message to both young and older generations (L Van Oordt, personal communication, 27 June 2013). Additionally, children may be acting as catalysts to influence their parent's waste wise behaviour.

The evaluation has brought this intergenerational learning to the fore. The initial programme theory does not allude to this learning and the evaluation ensured that this unintended outcome is augmented. It further suggested use of this as a tool to promote intergenerational conversations on waste reduction.

Cost to benefit analysis (Rossi, Lipsey and Freeman, 2004).

The Waste Wise education programme theory has a distal outcome of reducing waste being landfilled. Thus far, the conversation around waste education and reduction with the programme sponsor has been savings around financial budgets and budgetary constraints.

The evaluation highlighted that the amount of money spent on the programme only speaks to the amount of money spent on education completed and does not speak to unintended outcomes. Data received from the City of Cape Town's Waste minimisation unit reflects that there is a landfill saving year on year starting from financial year end 2010-2011 (A Davison, personal communication, 15 July 2013). This cost to benefit analysis has a direct link to the distal outcome of the programme.

Peer education

The programme requires schools to have or to initiate an eco-club that will ensure that the programme is driven by a coordinator at the school who is; either a teacher, learner or caretaker and it is advised that these members are learners from the higher grades. However, what emerged is that the majority of eco-club members are learners with an educator being the coordinator. The initial programme theory does not make provision for peer education, only for education from educator to learner or from external facilitator to both learner and educator.

The new revised programme theory reflected that in addition to the education being offered above, two additional levels of education are occurring. The initial phase of education is described above; the second phase occurs when eco-club members teach the learners at school general waste minimisation and how to partake in waste minimisation programmes. The final phase of the education occurs as a hand over process where the current eco-club members from a higher grade educate learners from a lower grade to take over the programme in order to sustain the programme

once the higher grade learners have left the school.

Conclusion

A programme theory that has a weak and faulty conceptualisation process has a highly unsuccessful rate (Rossi et al., 2004). Once the programme theory reflects inconsistencies, it may lead to inappropriate activities being implemented. Within this chapter, the evaluator compared the programme against other programmes to ascertain the durability of the programme theory. The process that the evaluator attempted to follow was taking the existing theory and developing a new revised theory through the literature review, the interview process as well as the observational procedure.

The ADEC WWP is an indication that the programme's plausibility is viable if implementation is done in a structured manner and not on a broad, general level. Results have shown that the programme could furthermore benefit from a revised programme theory. In addition to the development of a revised programme theory, a service utilisation plan was developed to assist programme staff to implement activities in a structured manner and to assist beneficiaries to receive activities which have a logical flow. Thus, the plausibility of the programme was enhanced and both programme staff and beneficiaries have a clearer guide on what is achievable.

Depending on the viewpoint, be it from the child who has the right to live in a pollution free and safe environment, from an adult who has the right to a healthy environment, or people's social responsibility that dictates peoples responsibility towards earth, or whether you are socialist who promotes people's rights over a capitalist who will promote entrepreneurial rights, everybody has a place in the waste realm. Everybody is entitled to benefit through waste education.

CHAPTER THREE – PROCESS EVALUATION

Introduction to process evaluation

Process evaluation, otherwise known as implementation evaluation, determines whether a programme is delivered as intended to the target beneficiaries (Rossi et al. (2004), 2004).

Defining process evaluation

According to Rossi, et al. (2004), process evaluation analysis ensures that a programme has been implemented well and executed according to their intended design and to the intended recipients. Various factors may contribute to why implementation failure is/is not occurring and how well a programme's fidelity has occurred. Thus ultimately refers to assessing a programme's operations and activities to its intended audience and will assess programme functions such as:

- If programme goals have been delivered
- Whether services are delivered to intended recipients
- How well activities have been arranged
- The effectiveness of the programme management and
- The use of programme resources (Rossi et al., 2004).

Process is the more common used of all evaluations as it can be used as a self-supporting evaluation or in conjunction with other types of evaluations, such as theory evaluation and outcome evaluation (Rossi et al., 2004). It has two outcomes (Rossi et al., 2004); that theory failure occurred or that implementation fidelity was achieved.

Method

Data sources

The following data sources were utilised during the process evaluation of the WWP:

- Interviews of participating selected schools
- Observations attached to an observational criteria

School selection

Based on the City of Cape Town's municipal boundaries, schools that were selected to participate were those that fell within the municipal boundaries. The preliminary research design suggested three cohorts which consisted of ten schools for each financial year end; 2010-2011, 2011-2012 and 2012-2013. The rationale was to ensure that each year is represented equally and that the year 2010-2011 would be a good representative of having a sustainable programme in place.

The list supplied to the evaluator consisted of 237 schools instead of 600 schools and it also did not reflect the year in which the school received an activity. On engagement with the programme manager, the information was requested from the service provider. On closer examination it was stated that a few schools were clustered into the "holiday programme" offered at the local library or community centre and that the educational programme did not specify that education should occur at schools only.

Selection was then proposed on a geographical radius. Schools were selected if they fell within a geographical radius of 30km of the City of Cape Town's offices in Cape Town. This decision was based on time and cost resource. However, this was a further challenge to the evaluator, as school and contact person information supplied were either erroneously captured or omitted.

Initial communication

The evaluator utilised various means of contacting the schools to participate in the evaluation. The initial contact was made via email. Approximately 230 emails were distributed to schools to participate in the evaluation. Approximately four percent of emails were returned undelivered; a percentage of emails were not received by the recipient. This may imply that the email addresses does not exist, may be inactive or were documented incorrectly. Approximately 80 percent of the emails distributed were not replied to and of the 10 percent that replied, approximately five percent cancelled the initial interview.

Due to the limited responses received, a second phase of contact was completed by the evaluator. Additional follow-up of schools were done telephonically to arrange an appointment. The evaluator contacted each school on the list via telephone and a similar challenge arose similar where contact information supplied of the school or the contact person were either erroneously captured or omitted. This is problematic for the programme if its records are so out of date.

Additionally, if educators were the contact person, they were restricted to receive telephone calls and visitors during school hours from the Western Cape Education Department. This led to a further challenge as educators were unable to be interviewed during school hours and interviews were generally five minutes longer than most first breaks at schools. Voicemail messages were left on educator's cell phones and a percentage of teachers were non responsiveness to the request to be interviewed. A further percentage was not interested as the programme was no longer active at their schools. Only 20 environmental teachers from the list of schools were interested in being interviewed, thus, reducing the sample size from the initial thirty participants to twenty participants due to the various challengers experienced by the evaluator. 100 percent of the schools who participated in this evaluation had educators who were the coordinator of the environmental club. This, as the results will reflect, showcased its own challengers.

An approximate 2 000km was driven by the evaluator in order to gather the required data for this evaluation.

Data collection

Data collection was done in two parts, interviews and observations.

Interview guides

An interview guide (Appendix J) was developed by the evaluator. This served as a guide for the interview process and the evaluator could allow participants to expand where needed. The guide was divided into two sections. The initial section of the questionnaire guide dealt with the programme's service utilisation which refers to target transaction as previously discussed. The second section deals with the organisational plan which articulates the perspective of programme management (Rossi et al., 2004).

Interview procedure

Interviews for the process evaluation were initiated after contact was made and permission was granted. Appointments were then confirmed with educators for a set time and date. Before commencement of each interview, participants were requested to sign a permission to participate letter (ptp) which is kept on record in a secured drawer (Appendix K). Once this ptp was signed, the interview commenced.

All interviews were completed within twenty minutes as agreed upon between the evaluator and the interviewee. The data collection process commenced during July 2013 until September 2013. However, the evaluator could only commence with interviews during the latter part of July due to school holidays. Each interview was completed at the interviewee's school and a venue as stipulated by them. The time limit for the interviews was based on the schools daily break time for learners not to interfere with educators teaching times. Interviews were recorded on paper and subsequently transcribed in order to extract information relevant to the evaluation questions.

Pre administration

Before interviews with the participants commenced, the participants were requested permission to participate in the interview. The evaluator explained the purpose of the evaluation, the non-disclosure clause and requested the participant to give signed permission. This permission was granted on a consent form which is held on record.

Observations

An observational guide was developed by the evaluator (Appendix L). This guide speaks to the infrastructure of the programme and was developed to ascertain if schools are in possession of any infrastructure.

Once the interview was complete, the evaluator requested verbal permission to walk the premises of the school where an active recycling facility was in place. This was a technique to confirm what was said in the interview session.

Sample size

An evaluation outcome is as strong as its sample size. An initial sample size of 30 was selected to represent 3 cohorts; 10 samples for each year of the programme. However, due to various challengers faced by the evaluator, the sample size had to be reduced to 20. The selected sample size for this research was based on various factors, including beneficiary participation, financial constraints, external role-players such as the WCED's rules and time constraints (Field, 2013; Raudys & Jain, 1991; Springate, 2012.; Taylor, 1999.; Marshall, 1996).

Data analysis

The Statistical Package for the Social Sciences (SPSS) has been extensively used to analyse social research data (Field, 2013). For this dissertation, data were cleaned and exported into the SPSS Version 21 for analysis purposes. Additional data analysis followed a thematical analysis process.

Results and discussion

The questionnaire guide was divided into two sections; the service utilisation and the organisational support. This was followed by an observational guide to investigate infrastructural placements at schools.

Service utilisation

Numerous methods were used to informed participants about the programme. 2 participants found an advert in the local newspaper or the educator's circular and responded accordingly. This advert was not specifically aimed at educators, but anybody who is affiliated to a school structure; this includes educators, caretakers, learners and referrals through partnership programme. 16 participants were approached by the service provider's programme staff and requested to partake in the programme. Recruitment of schools to participate in the WWP were done on two levels:

Broader awareness: the programme was broadly advertised or schools were approached to participate.

Green Zones: the GZ fell within three areas and schools were selected if they fell within the geographical area as demarcated in this project. Additionally, 10 participants' mentioned that the schools database from the Western Cape Education Department were utilised to select schools. Schools that participated in previous WWP were also considered (Waste Wise content document, 2011).

However, programme records do not contain the adverts specified above. According to the programme manager, additional documentation was offered to the programme manager but she had to decline due to limited archiving space at her office (L Van Oordt, personal communication, 17 July 2013).

The initial meeting between the service provider and the school received positive feedback from all participants. Participants agreed that programme

objectives were clearly outlined, thus giving them a full scope of what the WWP entails. This outline included the Eco School concept and criteria that the WWP service provider has opted to base the school education and recycling programme on.

As previously stated, programme activities are not stipulated in the WWP proposal document. This allowed the service provider to develop the programme's own set of activities that was presented at school level. Each school received an initial meeting to initiate the programme and this was followed-up by an action plan developed by the school. The following activity that was completed more often than the others was a presentation on how to do a clean-up in the area. This lead to schools performing clean-ups as an additional activity. Even though two activities, namely watching of a video and arts & crafts making was mentioned in the records, no participants received these activities. However, there are two high scores, namely hosting an initial (1st) meeting and having at least one follow-up meeting with participants, which can be considered as outliers as they are much higher than the rest of the activities and will affect the average (Field, 2013). A minimum of an hour was set aside for the education programme but depending on interactions, it would be extended. Even though the programme ran for three years, an hour session was allocated for any activity to be rolled out.

10 participants felt that the education programme consisted of awareness and education activities which should be aligned to a specific waste programme. This should be further maintained by additional support e.g. setting up recycling and food gardens, doing compost heaps, etc.

Table 6 is a list of all activities as identified by participants. However, 16 participants felt that the WWP facilitators did not bring anything new to their process as they have, due to various partnerships, already been exposed to most of the activities offered. There is no sequence nor is one activity considered a priority over the other (Programme beneficiaries, personal communication, July 2013).

Table 6. Programme activities

Activities identified by participants during interviews

Activity Description	Aggregate of schools who received activity (n = 20)
Zibi Drama Performance	6
Presentation on recycling	6
Watching of a video	0
Waste Audit	4
Presentation on sorting of waste stream items	5
Presentation on how to do a clean-up	9
Presentation on composting	5
Tour of the Athlone Resource & Transfer Station (ARTS)	4
Arts & crafts making	0
Workshop on how to formalise an enviroclub/ecoclub	3
Initial (1st) meeting	20
At least one follow-up meetings	20

Table 6: These are the activities identified by the participants and which were performed by the service provider at the relevant school. It was documented that each activity can be presented unaided.

As per the programme manager, partnership development is important within this model as it assists with infrastructural placements (L Van Oordt, personal communication, 17 July 2013). At least 2 participating schools found that the Eco-schools programme assisted them in the WWP as it guided them to implement a waste programme.

16 participants reflected that follow-up to the initial meeting was done in the form of emails, telephone conversation or personal visitations to the schools to provide feedback and updates. This support assisted participants to set up a recycling programme or initiate and establish a waste committee to

take responsibility for driving the programme.

Any school who partook in the programme, any member affiliated to the school or any programme affiliated to the school could be the intended recipient of the programme. Of the 600 schools, 50 were recruited to partake in the Eco-school's programme and 37 fully complied with the Eco-school criteria. This implies that 37 schools had a functional recycling facility on their premises. It reports that this functional facility is a facility that is either collection or accepting waste recyclable materials. 4 Participants suggested that follow-up was not regular enough to support educators.

Participants of the educational programme suggest that activities were not specified to them, but instead they were given an outline of what could work. Participants felt that a more concrete action plan would equip them to concretise their programmes better. Activities differ from each programme and on analyses it appears that activities are implemented depending on the facilitator's understanding of the programme. This made evaluating fidelity of the programme difficult as there are no activities that are seen as mandatory nor are there any primary activities which should be implemented (WWP service provider's proposal, 2011; Waste Wise content document, 2011; Programme beneficiaries 1, 2,3,5,9,10,11,12,13, personal communication, July 2013) .

Organisational support

Organisational support was evaluated from the programme funder's office. This was done as the three year cycle of the programme came to an end at the end of June 2013. Any additional meetings scheduled with the service providers would then be at an additional cost. A sample size of two participated in this questionnaire guide.

Training of staff was administered as follows:

Community facilitators: Community facilitators received two sets of training. One set of workshops were on the Participatory Rural Appraisal (PRA) and

how this should be utilised in partnership with communities, including schools. They additionally received training on various waste topics.

Project staff: Project staff received various training, not necessarily specific to this project but skills that can be applied in projects such as the WWP.

The above speaks to the human resource requirement of the organisational support of the programme. The training was offered to staff to implement the activities and programme services that are specific to the programme. These activities and programme services was indicated in the service provider's proposal (Rossi et al. (2004), 2004; WWP service provider's proposal, 2011).

Recruitment of the facilitators was done in partnership with the local sub council office. 10 participants spoke about the partnerships with the local sub council office, where selection was done from a database of unemployed persons in the area which is hosted by the sub council (M Julie, personal communication, 30 July 2013). All 20 participants said that previous waste experience; facilitators being apolitical and strong community participation were strong requirements for possible selection.

The service provider's project managers ensured that the organisational plan encompassed the relevant persons and that all applicants were suitable for the position that they are being employed for. This was a mechanism to ensure that the organisational plan relates to the service utilisation plan. However, programme staff suggested that the organisation structure of the service provider was insufficient and that additional staff should have been employed to ensure better implementation and follow-up support (WWP service provider's proposal, 2011).

Monthly project meetings assisted with coherence between staff. These meetings were used as a technique to mitigate any conflict between service provider and programme sponsor. It was also used as a discussion forum to ensure that all strategies and activities were aligned with relevant various legislation, including and specifically NEMWA was utilised to support this programme (WWP service provider's proposal, 2011; Waste Wise content

document, 2011).

Participants for this evaluation came from the programme staff and difference in opinions existed about the amount of facilitators that were recruited for school purposes. This does seem to have affected the programme facilitator's roles included "nannying" schools to implement their intended programme.

Participants differed in their satisfaction levels. Approximately 8 participants felt that better support could have been given to them in the form of more meetings, more guidance supplied and just better tracking of their projects. However, 12 participants felt that the facilitators gave sterling support and that the rest was up to the school.

Observations

Once the evaluator interviewed the participants, the evaluator completed an observational tour on the school premises. This observation was done to assess if any infrastructure are present on the property and if it was acquired through this programme. Table 7 showcases the infrastructure currently being utilised by schools. 5 Schools interviewed had some kind of infrastructure in place to facilitate recycling on the school premises. This does not imply that the infrastructure is used for its intended purpose.

Table 7: Recycling infrastructure

Type of infrastructure:	Types of infrastructure found at schools **(n = 20)**
Bins	0
Bags	1
Boxes	13
Igloos	1
Other	0

Table 7: One type of the above infrastructure is sufficient on school premises

Whilst interviewing and subsequently observing school's intended programme, it is concluded that infrastructural partnerships should be set up in order for schools to implement their programme(s). On interviewing programme beneficiaries, partnership has not occurred very often and schools are experiencing various challenges with infrastructure; from placement of structures to maintenance to collection of the stored materials in the structures. In instances where a partnership occurred, the relationship of the partnership did not last due to requirements from the infrastructure partners. It was suggested that recycling stakeholders have Terms and Conditions in place for placing infrastructure on school premises and schools may not be able to adhere to certain requirements. An example of the Terms and Conditions suggests that a school should provide evidence that they are able to supply 1 000kg of recyclable material every two weeks before infrastructural partners collect and empty recycling infrastructure (Collect-a-Can, Consol, The Glass Recycling Company, personal communication, March 2013). Schools suggested that infrastructural partners could streamline problematic issues such as the collection of recycling material.

Conclusion

The chapter outlined what process evaluation is, the method that was followed to collect data by discussing how schools were selected for the evaluation, how the data was collected from beneficiaries of the programme and the conclusion that was drawn from the data collection. The chapter further discusses the service utilisation and the organisational plan of the WWP.

The chapter showcased that a lack of clear, guided activities in a specific area can lead to a dysfunctional programme. The service utilisation plan was very specific on its target audience and in the school's recycling model, it was shown that the intended target audience was reached. However, a clear guide on activities focusses the programme and gives direction to achieving the outcome of the programme

The following step is to ensure that all recommendations are aligned to the research and that the limitation of the study was kept to a minimal. The evaluator found it

difficult to complete the process evaluation due to the absence of activities, guidelines and other processors.

Lastly, on finalisation of the evaluation, the evaluator finally received documentation from the programme manager that gives an analysis of the 600 schools that were reached.

CHAPTER FOUR – Recommendations, limitations and conclusion

Both theory and process evaluation has highlighted numerous recommendations and limitations of the WWP. This chapter will discuss recommendations and limitations as a means to assist in improving the programme theory, outputs and programme activities.

Recommendations

The recommendations have been divided into those related to theory and those related to process for easy reference.

Theory Evaluation

Plausibility analysis

The plausibility analysis revealed that the School recycling model could possibly benefit from a more structured approach. The Australian WWP (Goldfields, undated) showcased that the programme can be enhanced by following a holistic approach. This holistic approach implies that the programme should consist of three distinct segments, namely; 1) an educational segment for the learners, 2) a support structure for the educators and 3) a programme which is affiliated to the curriculum. The latter allows the educator to combine waste activities with subject learning activities. These activities should include tasks and practical guidelines for implementation of a waste programme. It should provide learners a step by step guide to implement a waste programme.

The support section should assist the educator with module development and link these activities to the educator's curriculum. They should also be assisted in identifying and eliminating barriers relevant to the waste programme. Various examples exist within literature of linking a waste activity to the curriculum. Appendix M refers to the Eco school's booklet on how waste education can be aligned to the

curriculum. It is an activity booklet which lays out detailed activity plans for learners (http://www.eco-schools.org/menu/about/eco-schools-2).

Currently, the programme theory, as previously stated, may be altered every three years. This theory change can influence the outcome of an evaluation as it would be difficult to assess if the programme has any impact, thus making the undertaking of an impact evaluation difficult. Therefore, the programme manager should consider conserving the current programme theory and amend only the implementation methodology.

The literature review highlighted the dearth of waste education topics within the South African context. This has an effect on how the South African curriculum is aligned to waste topics. Even though SWMD is considered the subject matter experts, they are not involved in development of waste modules. This could be achieved by developing a closer relationship with the WCED and tertiary education institutions, such as universities. Furthermore, curriculum development may have financial implications for both the WCED and the SWMD as new modules, amended class plans and new teacher guides needs to be developed.

Record management

On examination, various documentation was omitted and could not be included to form part of the evaluation. The programme would greatly benefit from a good administrative system that allows for documentation to be archived. Documentation that requires filing should include; requests for participation in the programme; participation logs for workshops, meetings and other gatherings; and evaluation forms completed by participants after they have completed a programme. This will ensure that a paper trail of evidence exists. A paper trail is an important record mechanism for audit purposes as it serves as evidence that a programme was implemented and completed as stipulated. Additionally, it ensures that participation occurred and should a programme evaluation be requested, that beneficiaries of the programme are contactable.

Data management

In recent times, Geographical Information Systems (GIS) have been utilised to map schools that have participated in the programme. This should be augmented as GIS has a Management Information System (MIS) which can be utilised as an archiving facility to store documentation electronically. This may require additional physical resources that could be allocated in the organisational plan.

Programme sustainability

Programme sustainability refers to two tiers:

- the continuation of the programme after the three year cycle has been completed and prior to commencement of the following programme cycle, and
- long-term support to schools who have implemented a waste programme.

Participants suggested that the programme develop an exit strategy which would include a referral section. This exit strategy should be in place during the final year of the programme in order for schools to know who to contact, and where to go for additional resources within the SWMD should they require assistance. This will ensure that the sustainability of the programme does not get compromised due to lack of support.

Process evaluation

The process evaluation investigated the WWP's programme fidelity.

Programme implementation

Activities

Activities consisted of a diverse array of events as previously documented. The target audience is diverse and differs in demographics, geographical areas and socio-economical characteristics. Due to the above differences, the programme manager suggested that one type of activity should not be used for all beneficiaries.

It was suggested that each beneficiary have its own unique set of activities. A recommendation is that each programme type should consist of certain guidelines and minimum standards that are able to guide each programme type. These guidelines should be based on the requirements of the programme as well as give direction to schools on how to implement a programme. The guidelines should be easily understandable and clearly articulated in various languages to ensure uniformity of the programme implementation. These guidelines should consist of timeframes as well as suggest frequency of activities. This will allow for analysis of programme fidelity.

Organisational plan

The current organogram of the programme could benefit from employing additional staff, such as interns, to assist with various aspects of programme management. The interns could be from various faculties, including public administration and project management and their role would be defined based on their academic expertise.

Future evaluation possibilities

The evaluation raised a few opportunities for future evaluations to be completed to improve and enhance the current programme theory:

An initial evaluation should analyse the effect programme guidelines will have on the programme theory. This will see how the programme could benefit from having a more structured approach to its implementation plan.

Secondly, an evaluation could possibly investigate the impact a sustainability programme will have. This analysis should investigate the effect of such a programme. The sustainability programme should commence during the final year of the service provider's cycle and continue until the next service provider has been contracted. This evaluation should possibly include what sustainability is within a waste environment, what aspects it should cover and how it will impact the programme once the service provider has completed their cycle.

Thirdly, an evaluation that identifies guidelines on how to become a WWP school should be investigated. Currently, the programme follows the Eco schools guidelines and once schools have implemented all the requested steps, schools then become a Waste Wise school. The WWP should investigate its own step approach as a guide to schools on how to become Waste Wise.

The programme does not consist of any monitoring and evaluation indicators, measures or targets for the programme. In order to ensure programme fidelity, the programme should implement various indicators.

Finally, the final three opportunities include; development an exit strategy during the final year of the programme, improving partnerships with the WCED to ensure curriculum alignment and inclusion of an incentive scheme for schools. Incentive programmes are reward programmes which could be implemented on either a financial scale for the school or a point system for the learners. An example of an incentive programme for schools who are participating in a recycling programme could be that schools pay less to the local municipality when utilising fewer bins on their grounds. An example of an incentive programme for learners could be that learners could possibly receive a credit towards their year mark if they bring a certain amount of paper or cans to the school. Both incentive programmes should have criteria to ensure that each learner is assigned the same mark for bringing the same type of waste material and for bringing the same amount of materials to the school.

Limitations of the programme

This evaluator faced some challengers when examining the WWP and limitations will be discussed on two levels: what the participants experienced during the programme, and what the evaluator experienced during the evaluation.

Participants' limitations during evaluation

During the evaluation, participants identified challengers they experienced during the programme. 4 educators who participated felt that more time should have been allocated for educators to be interviewed. They suggested that the timeframe given to those who participated in the interview were to short and they felt rushed to

complete the interview. Educators suggested that WCED permission should be requested to ensure that longer time is allocated to the interviews.

Educators suggested that not only one person should be interviewed. They suggested that if there were more than one educator involved in the programme, that all should participate in the interview. This will ensure that information given during the interview is covers all aspects.

An additional 4 participants felt that if the programme was aligned with the WCED's curriculum and/or have permission from WCED to perform these activities, educators would be able to respond better with curriculum alignment.

Evaluator's limitations

The evaluator experienced two limitations during the evaluation. The first limitation experienced was the limited documentation that the evaluator had to their disposal. This limited the evaluator's search of programme documentation. The second limitation was the educator's times. The evaluator had to make appointments, postpone appointments and in some cases, cancel appointments as educators was bound by school hours.

Conclusion

Gough (2004) suggests that even though there is a demand for environmental education, specifically waste education, primary school educators seldom have the confidence or the competence to teach it. This suggest two challengers; 1) that educators may not be properly trained in waste management or be in possession of information which allows them to disseminate accurate information, and, 2) this could be contributing to why programme staff are receiving some resistance from the WCED to implement various curriculum aligned programmes.

This chapter has identified various recommendations, limitations and future evaluation opportunities for the WWP. In South Africa, the programme has been implemented for just over a decade and an impact evaluation should be the next

step for the programme. An impact evaluation can influence how the programme will be improve and may determine a causal link between the education programme and improved waste behaviour. This could affect implementation.

A formative evaluation could be considered before the next cycle is written and implemented. This will ensure that the next programme theory will be more focussed, better structure and well managed.

An aspect of communication which should be seen as a useful tool to communicate Waste Wise information is social media. Social media does not have a specific audience and it speaks to various age audiences. Social media has been under utilised and should be seen as a mechanism to drive this programme on waste behaviour further.

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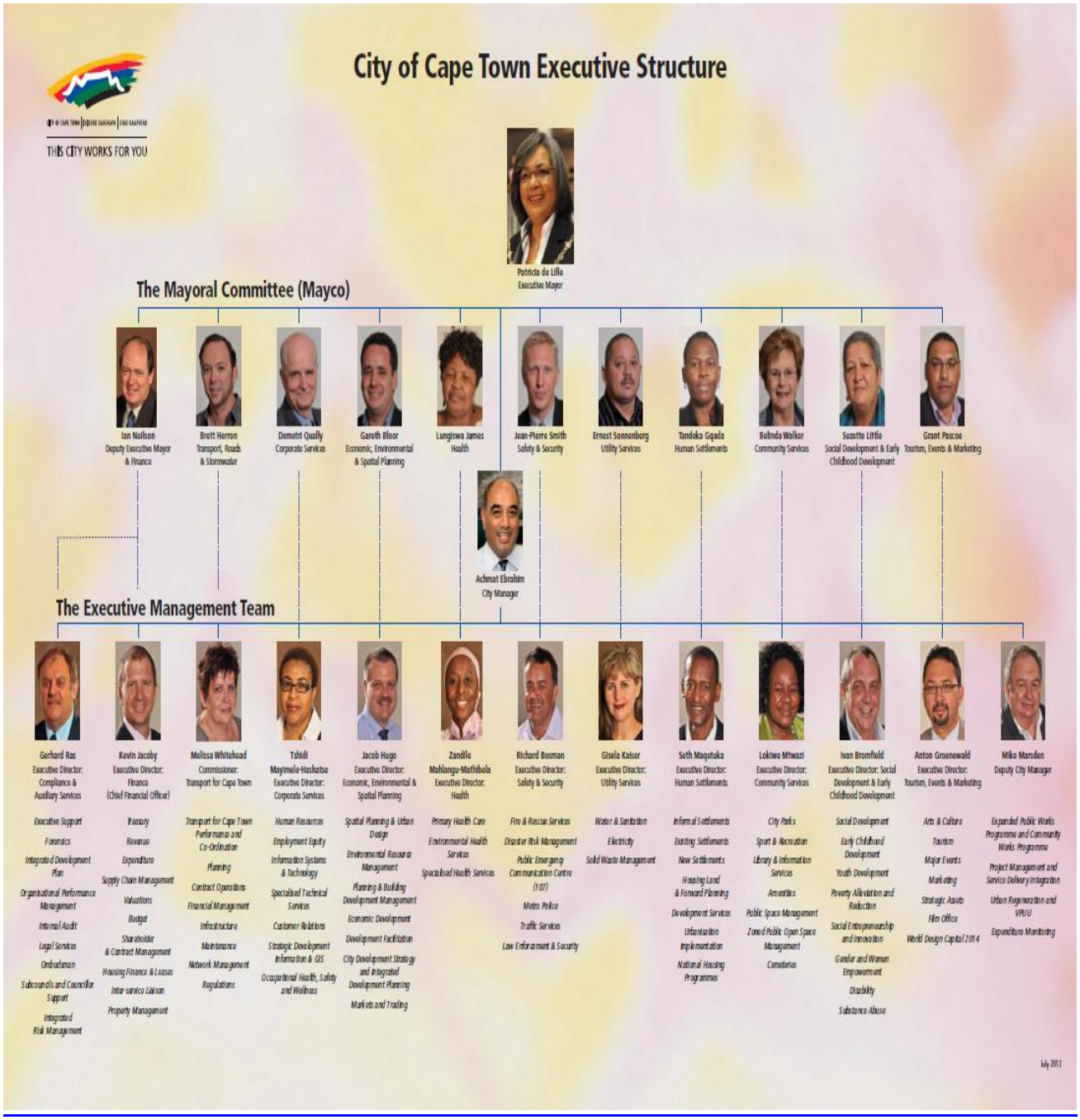
APPENDIX A – THE CITY OF CAPE TOWN'S EXECUTIVE STRUCTURE



APPENDIX B – CITY OF CAPE TOWN'S THINK TWICE © OPERATIONAL AREAS

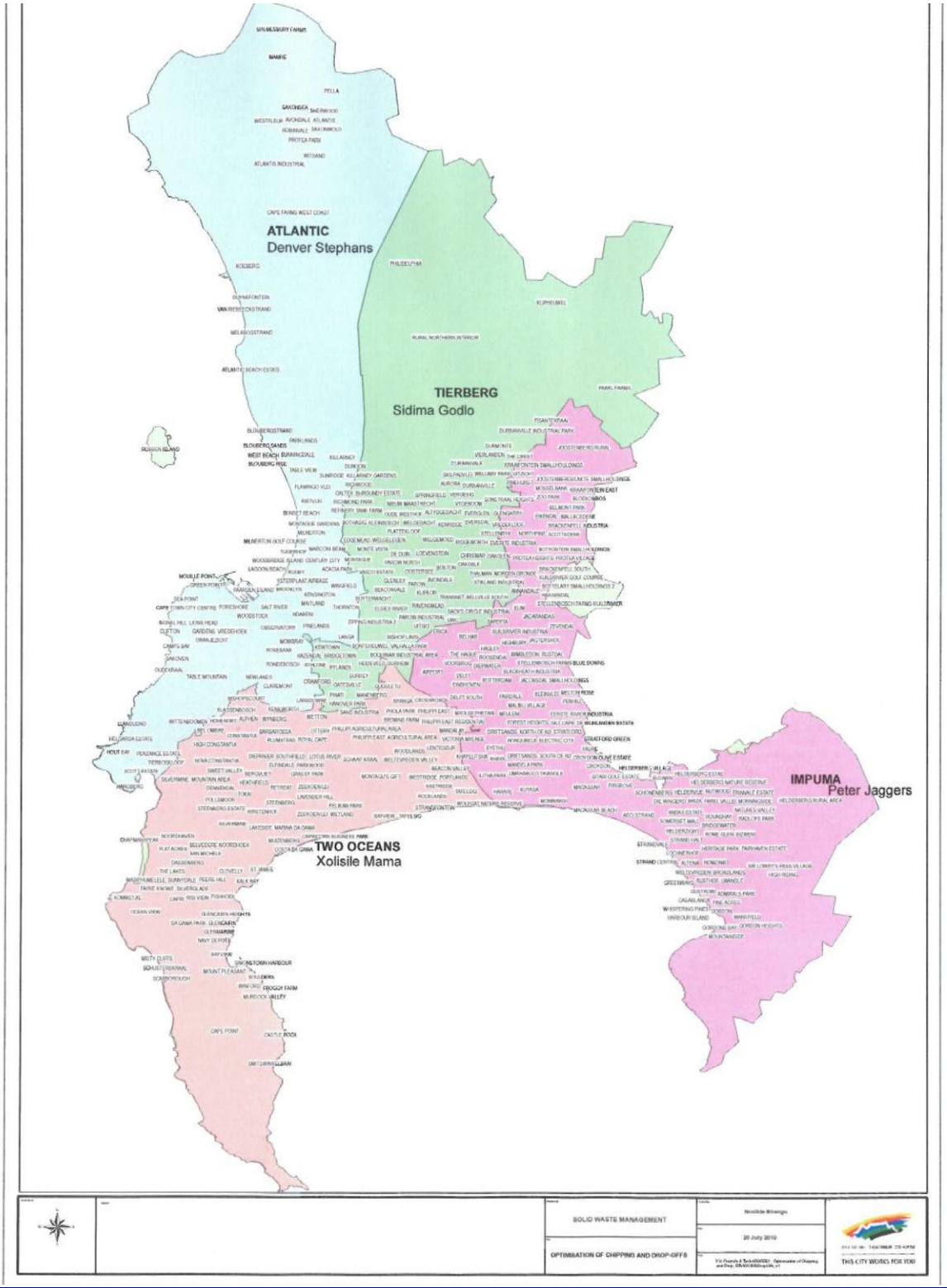
Updated – Feb 2012

City of Cape Town: Extension of "Think Twice" Door to Door Recycling Services

Since 2007 the City of Cape Town has initiated six contracts, collectively known as the "Think Twice" contracts whereby contractors collect mixed recyclables in clear bags from households. Currently these

Area	Contractor and Contact Number
• Atlantic Think Twice Contract Pinelands, Blouberg, Melkbos and part of Parklands (Falls within Atlantic Refuse Collection Area)	**Main Contractor: Waste Mart** **Sub-Contractor: Waste Plan** Web: www.wasteplan.co.za Email: info@wasteplan.co.za Tel: **086 111 6699**
• Camps Bay/ Hout Bay Think Twice Contract Hout Bay, Camps Bay, Clifton, Bantry Bay, Bakoven (Falls within Atlantic Refuse Collection Area)	**Main Contractor: Waste Control** **Sub-Contractor: Waste Control** Web: www.wastecontrol.co.za Email: info@wastecontrol.co.za Tel: **021 590 3900**
• Helderberg Think Twice Contract Helderberg Area, including Gordon's Bay, Somerset West, Strand and part of Macassar (Falls within Impuma Refuse Collection Area)	**Main Contractor: Waste Mart** **Sub-Contractor: Waste-Plan** Web: www.wasteplan.co.za Email: info@wasteplan.co.za Tel: **086 111 6699**
• Deep South Think Twice Contract South Peninsula, including Fish Hoek, Simonstown, Kommetjie, Scarborough and Noordhoek (Falls within Two Oceans Refuse Collection Area)	**Main Contractor: Waste Mart** **Sub-Contractor: Waste-Plan** Web: www.wasteplan.co.za Email: info@wasteplan.co.za Tel: **086 111 6699**
• Sea point Think Twice Contract 1. Area 1: Sea Point (Businesses with CoCT refuse collection contracts, flats and sectional titles only due to vagrants)	**1. Area 1 – Main Contractor: Mandla Recycling** Web: www.thinktwice.co.za Email: info@thinktwice.co.za Tel: **021 933 3087**
• Sea point Think Twice Contract Area 2: Green Point, Mouille Point and Three Anchor Bay (Businesses with CoCT refuse contracts, flats and sectional titles only due to vagrants) (Both areas fall within Atlantic Refuse Collection Area)	**2. Area 2: Main Contractor: Waste Plan** Web: www.wasteplan.co.za Email: info@wasteplan.co.za Tel: **086 111 6699**
• Kraaifontein Think Twice Contract Durbanville Area and Surrounds, East of Welgedacht and North of the N1. Phase 2 (South of N1 – not yet on map) includes suburbs East of R300,North of Old Paarl Road and West of Maroela Rd (Falls within Tierberg and Impuma Refuse Collection Areas)	**Main Contractor: Waste Plan** Web: www.wasteplan.co.za Email: info@wasteplan.co.za Tel: **086 111 6699**

APPENDIX C – THE CITY OF CAPE TOWN MUNICIPALITY'S FOUR SERVICE AREAS



APPENDIX D – THE PROGRAMME MANAGER'S PERMISSION LETTER

UNIVERSITY OF CAPE TOWN

School of Management Studies
University of Cape Town. Private Bag.
Rondebosch 7701
Telephone: +27 21 650-5218
Fax: +27 21 689-7570
4 February 2013

TO WHOM IT MAY CONCERN

Thank you very much for your willingness to enable one of our Master's students to work with a programme from your organisation. I appreciate your contribution to the education of our students.

Please note that our students are required to work within the ethical framework of the Faculty of Commerce when collecting information from programme documents or programme recipients. This framework deals with confidentiality, sensitivity when requesting information from people and responsible reporting of results.

We also undertake and ensure you that the student will display professional behaviour at all times while working in your organisation or on your programme. At the end of the process, you will receive a useful report which will enable you to make informed decisions regarding your programme.

In order to comply with the rules of the Faculty of Commerce, we request you to sign below to indicate that the student will have access to programme records and where applicable, to programme recipients.

Thank you very much.

Yours sincerely

PROF J LOUW-POTGIETER
CONVENER: MPHIL PROGRAMME EVALUATION

AGREEMENT TO ACCESS PROGRAMME RECORDS AND/OR RECIPIENTS:
(L. van Oordt) for Public Awareness and Education records Head

AUTHORISED PERSON City of Capetown Public Awareness **ORGANISATION** **DATE** 01 March 2013

APPENDIX E – PERMISSION LETTER FROM UCT'S ETHICS COMMITTEE

On your cover letter to your questionnaire have you included the following?	
1. The following UCT Logo 	☒
2. A sentence explaining the aim of the research	☒
3. Sentences of a similar nature to below must be included in the cover letter or consent form:	
This research has been approved by the Commerce Faculty Ethics in Research Committee.	☒
Your participation in this research is voluntary. You can choose to withdraw from the research at any time.	☒
The questionnaire will take approximately X minutes to complete	
You will not be requested to supply any identifiable information, ensuring anonymity of your responses.	☒
Due to the nature of the study you will need to provide the researchers with some form of identifiable information however, all responses will be confidential and used for the purposes of this research only.	☒
	OR
Should you have any questions regarding the research please feel free to contact the researcher (insert contact details).	☒
4. Have you scanned in your signature for the last section of the form?	☒

FOR ETHICS COMMITTEE REPRESENTATIVE ONLY

Recommendation(s): **Recommended for approval**

Signature: Signed by candidate

Date: **14 June 2013**

FOR ETHICS COMMITTEE CHAIRPERSON ONLY

Recommendation:

Signature:

Date:

APPENDIX F – QUESTIONAIRE GUIDE FOR THE THEORY EVALUATION

Name of interviewee……

Position within programme…..……

Date of interview……..

2. Organisational Support

2.1 What training did staff receive to administer their functions, including trainings?

Community facilitators: ……

……

……

Project Staff:……..……...

……

……

2.2 What criteria were used to recruit the programme's community facilitators?

……

……

……

2.3 How did project managers ensure that programme staff was qualified to administer the training?

……

……

……

2.4 Community facilitators: how many were recruited and were they sufficient to administer all the activities? Why/why not?

……

……

……

2.5 How much time was allocated to roll-out the education programme?

……

……

……

2.6 Was there coherence between the service provider and the programme staff?

……

……

……

2.7 How were schools contacted to participate in the programme?

……

……

……

2.8 Did the same programme personnel contact the school and administer the training?

……

……

……

2.9 How was resources effectively and efficiently used?

……

……

……

2.10 Is the programme compliant with national and local legislative frameworks?

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……

……

2.11 Are participants satisfied with interactions with programme staff and why?

……

……

……

2.12 Do participants and programme staff engage in any follow-up actions?

……

……

……

2.13 What according to you, is the education programme being offered to schools?

……

……

……

2.14 What activities forms part of the education programme?

……

……

……

2.15 What type of project constitutes a recycling programme?

……

……

……

2.16 Since the initial meeting, has the programme been implemented?

……

……

……

2.17 Were the participants receiving the programme, the intended recipients of the programme?

……

……

……

2.18 What proportion of schools received the programme?

……

……

……

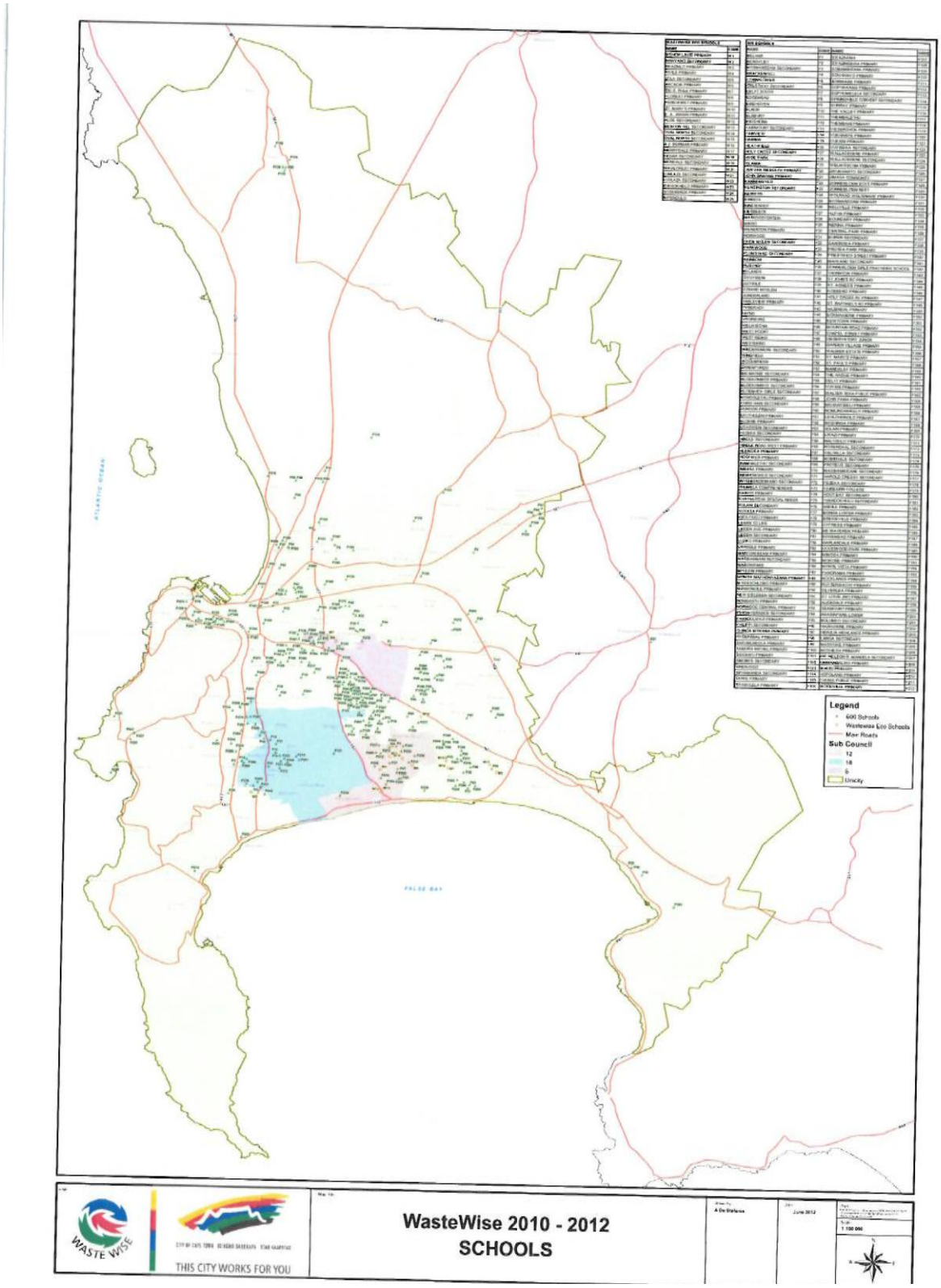
APPENDIX G – WASTE TONNAGES AS SUPPLIED BY A. DAVISON – FINANCIAL YEARS 2010 - 2013

2010-2011	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	TOTAL
GENERAL WASTE	99488	104644	104644	101273	119032	128962	96325	99742	104251	97694	106818	106818	1269691
HAZARDOUS WASTE	4221	4848	4858	3975	5135	6455	4825	3559	4659	3446	3671	3419	53071
BUILDERS RUBBLE	16940	19706	19706	15959	31997	23190	16427	29832	25856	31880	26103	26155	283751
GARDEN GREENS	15714	15442	15442	2225	3804	3805	4936	1668	1118	4057	3814	5283	77308
TOT WASTE DISPOSED	136363	144649	144649	123431	159968	162412	122512	134801	135884	137077	140406	141674	1683826
WASTE MINIMISED	13928	10683	10683	12191	10872	11954	14406	14213	12567	11730	12515	14433	150175
TOT WASTE GENERATED	150291	155332	155332	135622	170840	174365	136918	149014	148451	148806	152920	156107	1833998

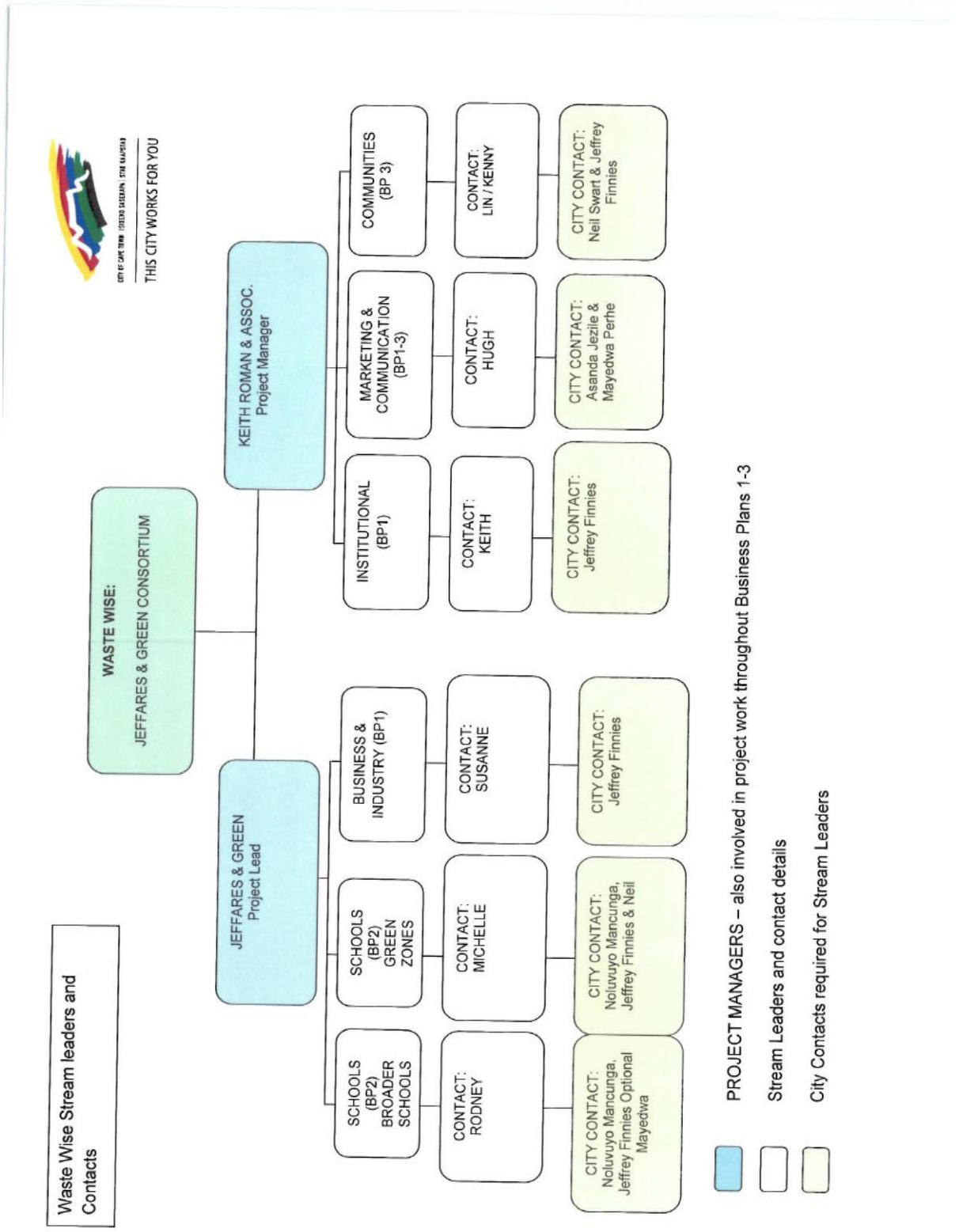
2011-2012	July	August	Sept	Oct	Nov	Dec	January	February	March	April	May	June	TOTAL
GENERAL WASTE	102889	110946	114245	113581	111568	110700	110561	110900	105247	98547	111842	101048	1302074
HAZARDOUS WASTE	2598	2469	3197	3021	3298	3237	2335	2519	2813	2499	8633	5008	41627
BUILDERS RUBBLE	20196	22043	29655	32463	31681	24933	15216	25182	29380	25304	31914	48399	336366
GARDEN GREENS	3484	2782	6723	8832	9871	8258	8089	7453	5024	7797	8632	8398	85343
TOT WASTE DISPOSED	129166	138238	153819	157896	156417	147127	136201	146054	142464	134147	161021	162853	1765403
WASTE MINIMISED	16466	18556	15886	17629	18935	18346	16571	17434	23347	24303	27280	20693	235446
TOT WASTE GENERATED	145632	156794	169704	175524	175352	165473	152772	163488	165811	158480	188301	183546	2000877

2012-2013	July	August	Sept	Oct	Nov	Dec	January	February	March	April	May	June	TOTAL
GENERAL WASTE	100886	112001	98009	101058	102929	97815	108404	99239	102760	121604	127047	110906	1282658
HAZARDOUS WASTE	3645	2749	5568	2676	2943	1614	2086	1349	2651	1676	3895	1475	32327
BUILDERS RUBBLE	32869	26508	17485	21552	20117	16402	22296	27509	24620	34510	44249	26281	314398
GARDEN GREENS	6729	7587	7277	7803	7894	7895	7972	7414	8546	8536	0	0	77653
TOT WASTE DISPOSED	144129	148845	128339	133089	133882	123726	140758	135511	38577	166326	175191	138662	1607035
WASTE MINIMISED	21943	29448	19759	29945	29889	25122	31430	22145	19626	18835	16770	0	264912
OT WASTE GENERATED	166071	178293	148098	163034	163771	148848	172188	157656	158203	185160	191961	138662	1971945

APPENDIX H – WASTE WISE LIST OF SCHOOLS



APPENDIX I – WASTE WISE PROGRAMME'S ORGANOGRAM



APPENDIX J – INTERVIEW GUIDE FOR THE PROCESS EVALUATION

Name of school……

Name of interviewee……

Position held at school……

Date of interview……...

1. Service utilisation

1.1 How did you find out about the programme being offered?

……

……

……

1.2 Was the programme outline discussed with you prior to implementation?

……

……

……

1.3 What activities were and how many of each was done during the educational programme?

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……..

1.4 What type of project did you select to participate in the programme?

……

……

……

1.5 Which activities were offered in order for your intended programme to achieve its gaol?

……

……

……

1.6 What partnership programmes assisted you during this programme?

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……

……

1.7 Which education services were used to achieve implementation of your programme: school presentations, workshops, discussion meetings?

……

……

……

1.7.1 Was follow-up done and if yes, what type of follow-up was done?

……

……

……

1.7.2 When did follow-up occur?

……

……

……

1.7.3. If no, what type of follow-up would you like to have occurred?

……

……

……

1.8 What are your perceptions of the services offered by the programme?

……

……

……

1.9 What challenges have you experienced during the programme

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……

……

1.10 How did the programme assist you with overcoming these challenges?

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1.11 Additional comments

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APPENDIX K – PERMISSION LETTER PROVIDED TO PARTICIPANTS

Dear Participant

The aim of the interview is to find out how the City of Cape Town's Waste Wise Programme on the Education and School Recycling Model was implemented. This interview is part of my Master's dissertation in Programme Evaluation at the University of Cape Town. I am supervised by Professor Johan Louw.

Your participation is valuable and I would appreciate your opinion of the programme implementation. Please note that participation in this interview is voluntary and you can choose to withdraw at any time. The interview should not continue for more than 20 minutes and there will be no repercussions should you choose to withdraw. Due to the nature of the study you will need to provide the researcher with some form of identifiable information, such as name of school and position currently holding at school. All responses will be reflected as anonymous and used for the purposes of this research only. All records will be kept in a safe place and only the researcher will have access to any identifying information.

This research has been approved by the Commerce Faculty Ethics in Research Committee.

Should you have any questions regarding the research please feel free to contact Jameyah Armien-Ally on sjally@mweb.co.za

By ticking the box below, you consent to complete this interview:

I agree to participate in this interview ☐

APPENDIX L – OBSERVATION GUIDE UTILISED FOR DATA COLLECTION

Name of school……

Date of observation……...

OBSERVATIONAL GUIDE FOR SCHOOLS

Does the school have containers for storage and collection of recyclable items in place?	*Yes*	*No*
Which of the following containers are used for collection and storage?		
Bins:		
Bags:		
Boxes:		
Igloos:		
Other:		
How many containers are there for each of the following?		
Bins:		
Bags:		
Boxes:		
Igloos:		
Other:		
Does the school have scales for weighing of recyclable items readily available?		
Is the recycling facility a covered area for storage and sorting?		
Is the recycling facility within a fenced area?		
Is the recycling facility easily accessible for dropping of recyclables?		

APPENDIX M – ECO SCHOOL ACTIVITY BOOKLET COVER PAGE

- Making compost (recycling nutrients)
- Combating soil erosion
- What to do about waste – re-fuse, re-duce, re-use, re-cycle
- Renewable energy production
- Energy use and generation in relation to sustainable development
- Consumerism – Lifestyles which use up more and more resources and produce a bigger and bigger footprint on the earth.

Some Calendar Links

World Wetlands Day (Feb 2) – Use a visit to a local wetland or a demonstration of how a 'wetland in a bottle' filters water and regulates flow, to discuss how wetlands as a water resource. Can we do something to protect one of our remaining wetlands?

National Water Week (March 20-26) – South Africa is running out of water; how can our school set an example? Get a poster or speaker (e.g. from DWAE) and start a project.

World Environment Day (5 June) and **National Environment Week (5-9 June)** - What is this year's theme? How does it relate to Resource Use? Use the Week to showcase projects which helped to reduce resource use at the school.

World Population Day (July 11) – More people use more of the earth's resources. Some countries use more resources than anyone else, even though they have smaller populations. The earth cannot sustain the high levels of use. What should be done? Hold a debate on this topic at your school.

National Cleanup Week (Sept 11-16) – Use a clean-up or visit to a rubbish dump to start a discussion about waste: Why is a lot of waste a problem? Where do these bits of waste come from? What happens to waste which doesn't get into a bin? What happens at landfills? What can we do to reduce the amount of waste around us?

Buy Nothing Day (Nov 25) – Showcase 'make your own' or 'refuse, reduce, repair, re-use' projects which aims at reducing consumerism and waste among your learners.

Some Curriculum Possibilities

		Resource Use: Foundation Phase – Waste Management
		Life Skills
Grade R	Beginning Knowledge & Personal & Social Well-being	**Term 1:** Use recycled materials to make different sounds **Term 2:** Print making with found objects **Term 3:** Water (2 hrs) **Term 3:** Healthy Environment recycling (2 hrs), clay modelling **Term 4:** Print-making, could be inspired animals covered in nature & bio also T4
Grade 1		**Term 1:** Shapes - use recycled materials to explore and create different shapes. **Term 2:** Materials that homes are made of - look at traditional homes, modelling out of 'waste' **Term 3:** Keeping my community clean (action projects) and lesson on recycling **Term 4:** Water (4 hr)
Grade 2		**Term 3:** Soil (4 hrs) **Term 3:** Making useful items from paper mache or recycled items - look at our school waste management system, "how can we make it better?"
Grade 3		**Term 2:** Recycling (6 hrs) - survey what types of waste the school is producing. Sort waste into organic/inorganic Make something useful with a waste item so it doesn't end up in the landfill. Visit the local landfill. Grey water recycling week, bring 2 l bottles in for watering the garden. **Term 4:** Products and Processes - plants & the earth (6hrs) link with fun action projects e.g. making fire bricks with recycled paper. Clay making bricks etc Cream making butter.