

# Swaziland Environmental Authority

Siphofaneni Pilot Project

Main Report

Development of Collection System in Siphofaneni Rural Area

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# 1. BACKGROUND

The Government of Swaziland is currently finalising the formulation a National Solid Waste Management Strategy (NSWMS). A draft was prepared in September 2001. The Strategy is being developed by the Swaziland Environment Authority (SEA), and is supported by the Danish Co-operation for Environment and Development (DANCED), represented by the Danish consultant RAMBØLL.

The project is designed to cover two components; i.e. the development of the National Solid Waste Management Strategy and a capacity development plan. The main objective is to reduce the adverse effects of all forms of solid waste, so that the social and economic development of Swaziland, the health of its people and the quality of its environment benefits.

A number of pilot projects have been initiated as part of the development of the NSWMS. Their main objective is to test the recommendations of the draft NSWMS and develop suitable solid waste management systems for the different waste streams, including general household waste, commercial waste, industrial and health care risk waste. In order to help address the short- and long-term problems of household and commercial wastes, pilot project areas were selected in Kwaluseni peri-urban area and in Siphofaneni rural area.

The aim of the Siphofaneni pilot project is to develop solid waste management systems in crossroads and commercial nodes in rural areas that are taking the characteristics of towns and are now being regarded as peri-urban areas that are located in rural areas. The main problems in these areas include the lack of solid waste related legislation including clarification of authority and responsibility for the management of solid waste in these areas, lack of guidelines for the management of solid waste and no institutional arrangement and funding for the management of solid waste.

The current legislation, Waste Regulations 2000, make provision that such areas may in future be declared as "Waste Control Areas". When this happens, the area must prepare a Waste Management Plan and establish a Waste Management System. The pilot project will assist the SEA in developing approaches for the installation of waste management systems in areas that are not currently serviced. The purpose of the pilot project is to:

- Clarify institutional issues and arrangements for waste management in rural areas related to innovative community based capacity development approaches.
- Evaluate different institutional cooperation agreements between the communities based in these areas and the adjacent formal structures where these are appropriate.

- Test different technical and organisational aspects.
- Reduce illegal dumping and litter in the peri-urban areas and improve the quality of the environment in these areas.
- Facilitate cooperation between the various ministries and, where appropriate, local authorities in bringing services to these areas.

## 2. INTRODUCTION

The research undertaken for the preparation of the Draft National Solid Waste Management Strategy indicated a strong need for the development of practical institutional and technical arrangements for waste management systems in peri-urban and rural areas. Rural areas which fall within the Swazi Nation Land are generally located away from cities and towns. These areas typically fall under the jurisdiction of Chiefs and does not constitute a local authority.

Rural areas are characterised by permanent housing inhabited by low income groups and there is an increasing trend towards establishing more commercial enterprises, shops and businesses in these areas. Residents and shop owners in rural areas have been encouraged by the Rural Health Motivators to solve their waste management problems individually by burning their domestic waste in pits. However, as commercial ventures within the rural areas densifies this strategy becomes increasingly less sustainable as the area available for burning pits decreases. The result is the development of a series of open dumps and a severe problem with litter. No clear responsibility has been allocated for the provision of waste management services in these areas and financial budgets are not provided for Chiefs (land managers), Regional Administrators in the Deputy Prime Minister's Office and adjacent urban authorities to provide waste management services in rural areas.

The designation of any area as a Waste Control Area obliges the residents, traders, businesses, schools and the public, in general, to cooperate in formalising waste management services in the Waste Control Area so as to develop long-term waste management plans and implement the National Solid Waste Management Strategy. This includes the implementation of the "user pays" principle so that cost recovery can be effected for the waste management services provided.

There is a need to develop and test effective and affordable approaches for the implementation of a waste management system. The development of a pilot project in Siphofaneni community will be used to examine the ways in which waste management services might be introduced to commercial areas in rural areas.

### 3. APPROACH AND METHODOLOGY

The development and implementation of the Siphofaneni Waste Management System was initiated in April 2002. The development of the system took place mainly between April and October 2002. An approach and methodology were devised in order to achieve the main objectives for the consultancy. The Terms of Reference were used to draw up a work plan for the consultation process. The Workplan was discussed and agreed upon between the consultant and the Chief Technical Advisor (see Annexure 2 for the proposed work plan). The work plan was not rigid, but for practical purposes, it was reviewed as and when necessary. The relevant findings and recommendations of the Community Consultation Process for Siphofaneni and Siphofaneni Pilot Project Report of April 2002 formed the basis for the formulation of the Siphofaneni Solid Waste Management System. In particular, the report findings on the current practice for solid waste management in the area were very useful for the exercise.

A community liaison structure that would be instrumental in providing access to the target community members by the consultant and also disseminate all necessary information between the major stakeholders and the consultant was first established. Key institutional structures that were identified as very important for the process were the Deputy Prime Minister's Office, Siphofaneni Inkhundla, the Siteki Regional Administration Office and the Madlenya Umphakatsi, under whose jurisdiction the project area lies.

Community consultations were made before the adoption of any decisions pertaining to the design and implementation of the waste management system. A number of community meetings were held in Siphofaneni to discuss a suitable waste management system and its implementation. Education and awareness needs were identified to guide the implementation of education and awareness campaigns. Two workshops were held to sensitise the people within the project area about the proposed waste management system, requirements for solid waste management and raising of awareness about the relevant waste regulations for Swaziland, in particular the Waste Regulations of 2000. Regular meetings were also held with the Chief Technical Advisor for the NSWMS Project for progress reporting and technical advice on the design for the waste management system. Other meetings would be held with other focus groups, as and when necessary.

A waste survey was undertaken over a period of two weeks. The main objective was to determine the waste volumes, types, frequency of generation and the composition of the waste that is generated by the different businesses in the project area. Results of the survey guided the recommendations of the proposed waste management system, e.g. deciding on the number of bins to be placed in the different locations, frequency of waste collection, recycling opportunities, etc.

## 4. THE STATUS QUO OF WASTE MANAGEMENT IN SIPHOFANENI

### 4.1 THE SIPHOFANENI COMMUNITY STRUCTURE

Siphofaneni is located in the Lubombo region, about 50 km from Manzini, on the Big Bend direction. Siphofaneni is on Swazi Nation Land (SNL), and therefore necessarily not an urban area. On SNL there are 55 administrative centres called Tinkhundla, which are under the leadership of about 200 chiefs. Each Inkhundla consists of a number of chiefdoms. Siphofaneni is one of these administrative centres and consists of 11 chiefdoms.

Customary law still applies in these areas. Such structures include the Community Development Officers reporting through the Inkhundla to the hierarchy of the Deputy Prime Minister's Office, the Rural Health Motivators who are volunteers reporting to the Ministry of Health and Social Welfare, and the Community Police. All of these also have links with the Inner Council of the Chiefdom which is presided over by the local Chief and his advisers. In most of the Chiefdoms the advisers include at least one Indvuna. The Chiefs representing the Chiefdoms in any particular Inkhundla make up the basis of that Inkhundla together with the Inkhundla Clerk who reports to the District Secretary. The District Secretaries report to the Regional Secretaries, who, in turn, report to the Deputy Prime Minister's Office.

The area that is covered by the Siphofaneni pilot project is situated in the central area of Siphofaneni, which is largely dominated by the presence of small and larger businesses (both formal and informal), whose numbers are fast growing. They include supermarkets, small shops, restaurants, bottle stores, butcheries, fruits and vegetable street vendors, carpentry, mechanics, filling station, etc. The Siphofaneni Inkhundla is also situated in this project area. There is no bank in Siphofaneni but the Post Office that is available does provide some banking facilities. The area is gradually assuming the characteristics of a town and has become a major transit point. Currently, there are about 41 formal commercial establishments within the project area, operating within premises that are owned by 13 individuals. Other important establishments include a clinic, primary school, soil-testing laboratory, a post office and three other offices. The latter include the Inkhudla office, the Lower Usuthu Irrigation Project (LUSIP) office and another one which is operated by a private individual.

According to 1997 estimates, the population of Siphofaneni business area is 1487 people. This figure excludes the 1162 people who are found in the periphery of the business centre (CSO, 2002).

Siphofaneni business area draws people from surrounding chiefdoms, either for permanent residence or for carrying out daily business transactions. Both the permanent and temporary population of the area is increasing, and the situation may be expected to worsen with the implementation of other developments such as the LUSIP project that has been initiated.

## 4.2 WASTE MANAGEMENT IN SIPHOFANENI

When the status quo was assessed in this community no formal waste management system of any description existed. However, the traditional way of waste disposal has mostly been followed by commercial enterprises and markets. This entails digging of a pit, dumping the waste in the pit and burning it. In many instances waste was even dumped in open areas without digging any pits.

The establishment of an increasing number of businesses and commercial ventures throughout Siphofaneni resulted in a dense settlement of businesses and informal market places which makes it difficult to dispose waste in the traditional way. The situation is exacerbated by the temporary influx of people in buses and taxis travelling through Siphofaneni so that the traditional waste disposal practices are no longer sustainable and contribute to environmental health problems.

The lack of space has contributed to a severe litter problem in Siphofaneni as many shop owners dump domestic refuse in open places adjacent to the shops. Attempts are made to burn these heaps of refuse and they smoulder for days at a time thereafter. It is necessary to develop a strategy for managing solid waste in Siphofaneni, as there are no formal waste managers in the area. The following were the main findings of the Community Consultation Process for Siphofaneni and Siphofaneni Report of 2002, on the current waste management situation in Siphofaneni:

### 4.2.1 Waste Types and Main Generators

The main waste generators in Siphofaneni are the business owners from their operations as well as the customers. The main types of waste include plastic and paper materials as well as metal cans and glass bottles. The formal business owners mainly use bins/drums for storing their waste. Other small businesses, including the street vendors, store the waste directly into shallow pits next to their areas of operation. The community of the 'emadladleni' (informal kitchens) is mainly involved in making home-brew and selling different types of consumables. Waste that is generated mainly includes biodegradable materials, plastic, paper, bottles and cans.



#### 4.2.2 Waste Disposal and Treatment

Most of the informal businesses dispose of and burn their waste in backyard pits. At the eastern informal kitchens, for example, waste is either disposed of indiscriminately around the business area or thrown into a nearby seasonal stream. When the rains come, it washes away some of the waste. Other waste generators dispose of their solid waste into the Usuthu River. Sometimes plastic and paper is burnt in backyard pits.

Most of the formal business owners use their own transport for taking waste to far away disposal areas. There is no designated area for waste disposal in Siphofaneni.

#### 4.2.3 Capacity and Knowledge

Before the project started, the people had already realised that solid waste management was a problem in the area, mainly due to the lack of adequate facilities for handling and disposing of the waste. There was no institutional arrangement that was dealing specifically with the management of waste, except for Health Inspectors who usually encourage the different business operators to keep their surroundings clean. Knowledge about environmental legislation, in particular the Waste Regulations 2000 and the related guidelines, was lacking at all levels of the community structure.

Since all the individuals who are included in the project area are involved in some form of income generating activities they may be expected to be able to pay for waste management.

#### 4.2.4 Major Problems and Constraints

The main constraint was the lack of both technical and financial capacity to manage waste. Cooperation between the different business groups is not very good and it is difficult for them to organise themselves in order to discuss issues of mutual concern. The community survey that was carried out earlier in the year indicated that willingness to pay for waste management was relatively poor, while the willingness to have an organised waste management system was good. Facilities for waste handling, transportation and disposal are generally lacking.

Currently, Siphofaneni faces a problem of scavenger pigs, goats and other livestock that salvage some of the solid waste from the storage areas even before it can be burnt or transported away, thus re-spreading the waste into surrounding areas.

### 4.3 THE REGULATORY SYSTEM RELATED TO SIPHOFANENI

A traditional system of government exists on Swazi Nation Land where the traditional structures managed through Chiefdoms are equally important and these

structures must also be consulted when projects are being planned. Apart from Customary Laws (the traditional system of governance alluded to above), the legislative framework governing waste management in Swaziland consists of the following elements:-

#### 4.3.1 The Waste Regulations 2000

These regulations have existed since 21 April 2000 and specify the roles and responsibilities of waste generators, waste collectors, waste disposers as well as the roles of the SEA and the different local authorities. The regulations empower the Minister of the Environment to declare a peri-urban or rural area a "Waste Control Area" which should facilitate the control of litter and the introduction of a formal waste management system to the designated area.

The Draft NSWMS proposes that the Office of the Deputy Prime Minister will be responsible for waste management in peri-urban and rural areas once declared a Waste Control Area. This would in practice mean that the inkhundla for a specific area will be the responsible authority for waste management for that particular area. They will be assisted strategically by the SEA and technically by the Ministry of Housing and Urban Development.

#### 4.3.2 The Environmental Management Bill of 1999

This Bill will, when enacted, provide an enabling legislation for the Waste Regulations 2000. The Siphofaneni Waste Management pilot project is designed to inform the development process related to the provision of appropriate and environmentally acceptable waste management systems that are affordable to the communities that live in areas that have previously never benefited from waste management services.

#### 4.3.3 The Environmental Authority Act of 1992

This is the Act that establishes the SEA.

#### 4.3.4 The Urban Government Act No. 8/69

This Act is presently undergoing revision.

#### 4.3.5 The Public Health Act No. 5/69

This Act is also under revision and it legislates for the employment of Health Officers by the Ministry of Health and Social Welfare. These health officers educate Rural Health Motivators in order to promote good waste management in rural areas. The Rural Health Motivators are voluntary workers who are elected by the community. Together with the Home Economic Extension Workers from the Min-

istry of Agriculture and Cooperatives, these people promote clean-up campaigns, the use of pit latrines and improved waste management.

The Office of the Deputy Prime Minister is responsible for monitoring and controlling waste management in rural areas (Swazi Nation Land) which includes areas, such as Siphofaneni, and serves as the communications channel between Government and the community through the local Tinkhundla Centre and the Chiefdoms. However, the Community Development Section in this office, which assists with the training of the community in pit latrine use and improved waste management (burning of wastes and on-site burial of the residue), does not have a legal mandate in any of its enabling legislation to support its activities with respect to environmental health management.

The waste control area regulations can be used to enforce the preparation of waste management plans and enable the installation of a formal waste management system involving waste storage, collection, transport and disposal.

## 5. THE PILOT PROJECT PROPOSAL

The pilot project is aimed at addressing the increasing littering and uncontrolled disposal of waste in Siphofaneni. It is anticipated that the introduction of the pilot project would further create job opportunities in the area of waste management and give an opportunity for the community and its leadership to be involved in the management of waste. As mentioned earlier, when Siphofaneni is declared a "Waste Control Area", the area must prepare a Waste Management Plan and establish a Waste Management System. A copy of the pilot project proposal can be found as Annexure 1

### 5.1 PILOT PROJECT OBJECTIVE(S)

The main objective of the Siphofaneni pilot project is to plan, develop and implement a technical and financial feasible Waste Management System in the area that will address its waste management needs and comply with the Waste Regulations 2000 and the National Solid Waste Management Strategy.

### 5.2 PILOT PROJECT OUTPUTS

The expected outputs of the Siphofaneni pilot project are as follows:

- Development of a waste management plan (for at least the next two years) for the Siphofaneni rural area.
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- Implementation of a waste management system to manage waste collection, disposal and recycling services in the Siphofaneni rural area.
- A capacitated and trained community to implement the waste management system.
- A project related awareness campaign on solid waste management

## 6. IMPLEMENTATION PROCESS FOR THE WASTE MANAGEMENT SYSTEM

The waste management planning appropriate to non-serviced areas had to be approached using business planning disciplines. The planning process was divided into two stages: -

STAGE 1: Collection of data and information for the design of waste management system

This included:-

- Information about the community;
- Information about the waste being produced in the community;
- Community management, awareness and buy-in.

STAGE 2: Waste collection system design and waste management planning

Using the Kwaluseni system as a mirror image, the system design for Siphofaneni was made such that it included consideration of the following:-

- How waste would be stored for collection
- How waste would be collected and transported
- How management costs would be recovered
- Who would manage the system, and how?

It was also important for the Siphofaneni Solid Waste Society to understand that the system had to be made compulsory rather than discretionary because there were always difficulties associated with fee collection. It was also observed that contracts had to be honoured by the Siphofaneni Solid Waste Society. It was noted that a compulsory system would be facilitated by the declaration of the area to be serviced as a "Waste Control Area".

### 6.1 DATA AND INFORMATION COLLECTION

A community survey was carried out and finalised in April 2002. Following that was a waste data survey that was undertaken for two weeks.

### 6.1.1 Community Survey

The survey report can be found as an Annexure 4 to the report. A summary of the findings of this community survey can be found in this report. The survey involved an analysis of the status quo for waste management in the area, which has been discussed in paragraphs 4.1 and 4.2 above.

In order to facilitate the identification of a suitable waste management system, sufficient information about the community and the study area was gathered. The survey also involved consideration of the existing infrastructure in the study area. The survey also gathered information on the number of formal and informal businesses in the area, the number and distribution of residential establishments, schools, clinics, etc. This information helped in the identification of the suitable size for the pilot project; that is the number of establishments that could initially be included in the waste management system.

The general perception was that the existing waste management situation in the area was not conducive to a better standard of living, hence there was a need to devise a strategy for managing waste in a more efficient way. There was, however, the fear among some community members that if they agreed to participate in the pilot project, they may be subjected to the system that currently exists in urban areas, where residents pay rates towards the services that are being provided to them by the municipalities. This group of residents feared that the payment system may be beyond their affordability levels, and therefore not sustainable. This kind of perception helped the consultant in developing a Waste Management System that would be affordable, as much as possible.

### 6.1.2 Waste Data Survey

A waste survey was required within the selected area to identify the different waste types produced by the different sectors as well as the volumes produced. The method used for the waste survey was agreed in consultation with the community. A waste data survey was undertaken between 9 June and 3 July 2002. A sample of 17 businesses was chosen for the survey. The cluster community of the eastern informal kitchens was included in the survey. Due to the large number of individual kitchens in this cluster, four (4) informal kitchens were included in the study. Waste data was collected by distributing a number of waste bags to each of the businesses in the sample. All waste generated by the businesses would be collected into the waste bags. Each set of bags would be collected after a period of two (2) days. The waste would then be taken into a designated area where each bag would be weighed and the percentage composition of waste in each bag determined. The number of waste bags that were filled within the two day period was also recorded. Annexure 5 shows the results of the waste data survey.

The results of the waste survey gave an indication of the frequency of waste generation in Siphofaneni, the types of waste produced and the volumes produced per time period. The results of the survey were used to make an estimate of the numbers of waste bins that were eventually placed and their locations. The data also guided the number and distribution of bunkers (temporary waste holding areas) that were eventually built within the project area.

In addition to the results of the waste survey shown in Annexure 5, the survey also assisted in the calculation of the estimated cost for the system, which is discussed in detail in paragraph 7.5 below.

The nature of the waste is varied and as a result different types of waste sometimes need to be handled in different ways. The majority of the waste produced in Siphofaneni is household (domestic) and commercial. However, the composition of this waste (i.e. volumes of "wet" and "dry" waste) is unknown. The composition of the waste produced has implications for the way in which the waste is managed. The effect of the inclusion of waste from schools, commercial and industrial enterprises on the overall composition of the waste needs to be considered. The possibility of income generation from recycling requires investigation

The survey indicated that the types of waste generated in within the pilot project area were typical of a domestic waste stream and the average composition of the waste stream was as follows:

Organic waste	30%
Plastic and paper	50%
Cans and bottles	20%

It should be noted that the cans and bottles category would sometimes also include ash.

## 6.2 COMMUNITY MANAGEMENT, AWARENESS AND BUY-IN

The community's involvement assessing the waste situation, prioritising the need for action to be taken and designing the waste collection system for implementation is important. The value of community involvement, awareness and education in the success of the pilot project was identified early in the planning phase. The support of the community must be obtained before a waste management system can be established. A number of activities were executed for the establishment of the Siphofaneni Waste Management System.

### 6.2.1 Community Consultation

There is a need to agree with the community on the waste collection service to be provided. Several community meetings to discuss the nature and amount of waste to be collected, how waste will be collected (e.g. refuse bags and bin/drum sys-

tem), who will collect it and on the location of the collection points have taken place.

The community consultation process for Siphofaneni that was finalised in April 2002 initiated a number of structures and procedures for the implementation of the waste management system for the area. These included the zonation of the pilot project area, election of a Waste Management Committee and a drafting of a Waste Management System document. The second phase of the pilot project reviewed and formalized the establishment of the structures and procedures, where necessary. The establishment of these structures and procedures was mainly facilitated through community meetings and the establishment of a close working relationship with the Siphofaneni Inkhundla, Siphofaneni Health Inspectors and the DPM's Office.

### 6.2.2 Community liaison structures

Decisions and the adoption of proposed procedures were done in meetings. There were two types of main meetings, i.e. a) community meetings, where all the affected and interested parties would attend the meetings, and b) working group meetings which were mainly organised to discuss procedures to be followed, actions to be taken, and other logistics for the successful implementation of the proposed waste management system. Progress reporting meetings were also scheduled every Monday between the Consultant and the Chief Technical Advisor and sometimes also the SEA Senior Environmental Officer responsible for the pilot project.

Ad hoc meetings would also be held with the Inkhundla office, community focus groups and the Working Group. A total of three community meetings were held on 28 April 2002, 28 July 2002 and on 31 July 2002, respectively (see Annexure 12 for minutes of main meetings held during the study).

In the first meeting, the updated and revised versions of the proposed waste management system and a draft constitution were discussed with the community. The need for the nomination of individuals who would implement the proposed system was also discussed in this meeting. The main outcome of the first community meeting was the election of the Waste Management Working Committee which comprised of the following members:

1. Mr Mbhekeni Gamedze
2. Mrs Mameni Shongwe
3. Mr Mbuzulwane Shongwe

The meeting felt that it was still too early to nominate the Executive of the Waste Management Committee that would implement the system.

Other members that were to be included in the working committee included those that were elected from the market and the informal kitchens during the community consultation survey that was finalised in April 2002. Several meetings were held with this committee during the study period, and the outcomes include securing of written approval by the Inkhundla of the proposed zonation for the study area, allocation of an area for the construction of a dumpsite by the traditional authorities of the Madlenya chiefdom. The written approval for the zonation and the dumpsite was submitted to the Chief Technical Advisor (see Annexure 7 for the proposed zonation and the number of businesses in each zone). The Swaziland Environment Authority made a site inspection of the proposed dumpsite and cleared it on environmental grounds. A draft constitution was developed in consultation with the target community members and is included as Annexure 3.

### 6.2.3 Establishment of zones

The zonation that was proposed in earlier studies for Siphofaneni was reviewed and finally adopted by the target community. Five zones were established as forming the area to be covered by the pilot project (see Annexure 7 for the names and owners of businesses in each of the zones). The Siphofaneni Inkhundla authorized the establishment of the zones in a letter signed on 13 May 2002.

### 6.2.4 Establishment of waste management society and waste management system

A Waste Management Society for Siphofaneni was established through the development of a Constitution. Using the Kwaluseni Constitution as a basis, the consultant developed a Constitution for Siphofaneni. A detailed description of the Waste Management Guidelines and System is attached as Annexure 6. The final version of the Constitution was a result of a number of meetings, consultations and discussions with the affected community, the Siphofaneni Inkhundla, the Chief Technical Advisor for the NSWMS Project and the SEA Senior Environmental Officer responsible for the pilot project.

The main objective of the Waste Management Society, as stated in the constitution, is to “start and manage a solid waste management system in the Siphofaneni Inkhundla...” and “to encourage the populace of Siphofaneni to keep their premises clean and healthy in accordance with the accepted environmental standards.” Another important aspect of the constitution is the provision for formation of the WMC that will implement the waste management system on a cost recovery basis, and in an environmentally and socially beneficial manner. For the first phase of the pilot project, the following members were elected into the Executive Committee in a community meeting that was held on 31 July 2002:



<b>ZONE NUMBER / COMMUNITY</b>	<b>NOMINEE</b>	<b>DESIGNATION</b>
Zone 1	Mr Jabulani Manana	Member
Zone 2	Mr Enock Mahlangu	Vice chairperson
Zone 3	Ms Malta Gamedze	Member
Zone 4	Mr Mbukeni Dlamini	Member
Zone 5	Mr Mbongeni Hlanze	Member
Emadladleni East	Ms Dudu Dlamini	Member
Emadladleni West	-	
Sukumani Bomake Association (market)	-	
Inkhundla	Mr Toddy Gamedze	Secretary
Community Member <sup>1</sup>	Mr Mbhekeni Gamedze	Chairperson
Community Member <sup>2</sup>	Ms Mameni Shongwe	Treasurer
Ministry of Health	Christopher Mabeleza	Vice Secretary

The Constitution was developed in such a way that it is in line with the provisions of the Waste Regulations 2000 and the accompanying Guidelines which were developed by the SEA and the Attorney General's Office. The main components of the Guidelines include the establishment of the necessary structures and institutional framework for the implementation of a solid waste management system in a Waste Control Area. These Guidelines set the scene for the implementation of the waste management system by identifying the exact participants for the system i.e. the business owners within the five (5) zones and their roles, identifying the institutions that should monitor the implementation of the system and the roles for each institution, and giving an overview of how the system should work.

#### 6.2.5 The Role of the Inkhundla

The waste management system must be linked to the Inkhundla at its inception. The Inkhundla is the respected authority in the community and must play a key role in the community consultation process. The consultation process involves:-

- Creation of awareness of the initiative among the community;
- Providing all stakeholders with the opportunity to participate;
- Inclusion of elected councillors and/or opinion makers in the consultation process;
- A consultation structure that is designed to allow for both formal and informal consultations;
- Consultation on proposals/options made for a collection and payment system

The functional roles of the Health Inspectors and Community Development Officers need to be established in order to involve these officials in the process at the

beginning of the project so that they can assist in the educational and awareness process. This was discussed with MHSW and the Deputy Prime Minister's Office as well as the Siphofaneni Solid Waste Society.

#### 6.2.6 Community Awareness and Education

It is also important to obtain support for the introduction of waste management systems in peri-urban and rural areas. Programmes of this nature must be carefully planned in consultation with the community and the objectives should include the following:-

- Generate interest and awareness on the current waste situation;
- Information about possible ways of improving the waste situation, and support the waste system that is eventually agreed upon; and
- Respect literacy levels, be accessible and flexible and they should promote a dialogue.

Health Inspectors and Community Development officers should be involved in the design and facilitation of awareness programmes in Siphofaneni, mainly because they are the ones who have always been involved in community outreach, related to development issues, including cleanliness and proper management of waste. Awareness raising activities should be run throughout the planning and implementation period. This has been facilitated through the regular meetings that have been held between the SEA, the consultants and the Siphofaneni Solid Waste Society.

## 7. SERVICE PROVIDED BY SIPHOFANENI SOLID WASTE SOCIETY

### 7.1 AREA TO BE SERVICED

The Pilot Project has been restricted to the commercial area in Siphofaneni.

Once the Pilot Project has proven itself, the system may be systematically expanded to cover the entire Siphofaneni Inkhundla.

### 7.2 SIPHOFANENI SOLID WASTE SOCIETY

The members of the Siphofane Solid Waste Society will apply for registration as a Cooperative Society under the Ministry of Agriculture and Cooperatives. The Constitution will have to be ratified by the Ministry of Agriculture and Cooperatives and the organisation is henceforth registered as a Cooperative Society and will operate as the Siphofaneni Solid Waste Society.

## 7.3 LEGISLATION

The Waste Regulations 2000 will become effective immediately once Siphofaneni is designated a Waste Control Area. These regulations are administered by the SEA and require the Siphofaneni Solid Waste Society to comply with the following: -

### 7.3.1 Waste Management Licence

The Siphofaneni Solid Waste Society will have to apply on the prescribed forms to the SEA for a Waste Management Licence.

### 7.3.2 Waste Management Plans

A long-term plan for the management of waste that conforms to the requirements of the Swaziland Environmental Authority will have to be prepared within a period of one (1) year of the area being designated a Waste Control Area.

### 7.3.3 Recovery of Waste

This will take place later after the evaluation of the Pilot Project period and will proceed relative to the implementation of the National Solid Waste Management Strategy. When application is made for the Waste Management Licence by the Siphofaneni Solid Waste Society allowance must be made for future recycling activities.

### 7.3.4 Littering and Abandoned Vehicles

It will be the responsibility of the Siphofaneni Solid Waste Society to control littering through the provision of adequate refuse bins in public places and prevent the dumping of abandoned vehicles in the area.

## 7.4 WASTE MANAGEMENT SYSTEM

### 7.4.1 Description of the System

The waste management system that was proposed by the community consultation report was improved upon, in consultation with the Siphofaneni community and the Chief Technical Advisor. The final version of the proposed system is included in Annexure 6. The main aspects of the system include the design specifications for the facilities and equipment, waste collection and storage, waste transportation and final disposal. As well as in the constitution, the waste management system

also provides for the monitoring and auditing of the implementation of the system, record keeping, reporting and financial auditing.

#### 7.4.2 Design specification for facilities

The designs for the waste bins and the bunkers were a result of the technical input for the Kwaluseni pilot project, taking into account the local situation for Siphofaneni. The problems of waste management that were identified during the community consultation process were used to guide the technical design for the Siphofaneni waste management system. The report of the Community Consultation Process for Kwaluseni and Siphofaneni indicated that some of the waste management problems that Siphofaneni was facing was the presence of stray pigs and cattle that are always scavenging and spilling the waste from any of their collection points, thus making it difficult to keep the area clean. The proposed waste management system tried to overcome this problem by designing the waste bins such that they stand above ground, thus minimising the risk of spillages by the animals.

Each bin has drainage holes punched in the base to facilitate drainage so that rain-water does not accumulate in the bins. The bins have been painted red and the logo for the Siphofaneni Solid Waste Society has been stuck onto the bins to identify the bins as belonging to the Society. Each bin has been mounted on red painted steel poles in such a way that the bin may be rotated to facilitate the removal of the refuse on collection days. The support poles have been concreted into the ground at each refuse bin location.

A design for a community landfill site was also developed which is discussed in more detail under 7.4.8.

#### 7.4.3 Provision of refuse bins

Data from the waste survey on quantities of waste produced by the different establishments in Siphofaneni became useful in deciding on the number and distribution of bins within each zone. A total of fifty (50) bins have initially been installed. The number is likely to increase, subject to demand as the system is being implemented. The allocation of bins to each zone is shown in table 1 below. Annexure 7 shows the distribution of the bins within each zone.

**Table 1: Allocation of Bins within each Zone**

<b>ZONE</b>	<b>NUMBER OF BINS</b>
1	13
2	6
3	9
4	14
5	8
<b>TOTAL</b>	<b>50</b>

#### 7.4.4 Provision of refuse bags

Standard refuse bags will be used to collect the waste from the shopping and informal market areas. According to the waste data collected, an average of 0.65 bags of waste per shop per day will be generated, each bag weighing an average of about 5.51Kg.

#### 7.4.5 Method of primary collection

Primary Collection Contractors will be appointed in consultation with the Rural Health Motivators Two waste collectors have been hired for emptying waste from the bins at least twice a week into trolleys that would be used to transport the waste to the temporary holding areas. Each contractor will be issued with a specially designed, purpose-built, refuse collection handcart. The Primary Collection Contractors' will be required to empty the refuse bins at each plot, including shopping areas, twice a week. The refuse bin contents will be placed in the refuse collection handcart. When the contractor estimates that the handcart is full it will be hauled to the Temporary Waste Storage Area or Refuse Bunker.

#### 7.4.6 Waste Storage Areas

The design for the bunkers is similar to that for Kwaluseni. However, minor adjustments were made to the doors, such that half their length is opaque to avoid people and animals from seeing or even removing the waste inside the bunkers. This design also helps prevent animals from accessing the waste and spilling it in non-designated areas. The bunkers also have water outlet points at the back, so that rainwater and any wastewater may be able to drain out. This would help keep the bunkers dry.

The refuse bunkers were constructed as follows: -

- 100 mm thick concrete slab of 6 m in length and 4 m in width;
- 
- Concrete block walls to a height of 1.5 m above normal ground level;
- 
- Corrugated sheet iron roof at 2.25 m above normal ground level, welded to a steel frame supported by steel poles embedded in the concrete floor and concrete block walls;
- 
- Expanded steel mesh, or palisade-type, lockable gate will be provided to control access the interior of the Refuse Bunker and,
- 
- The gap between the corrugated iron roof and the concrete block wall will be protected with a welded burglar guard to prevent unauthorised entry.

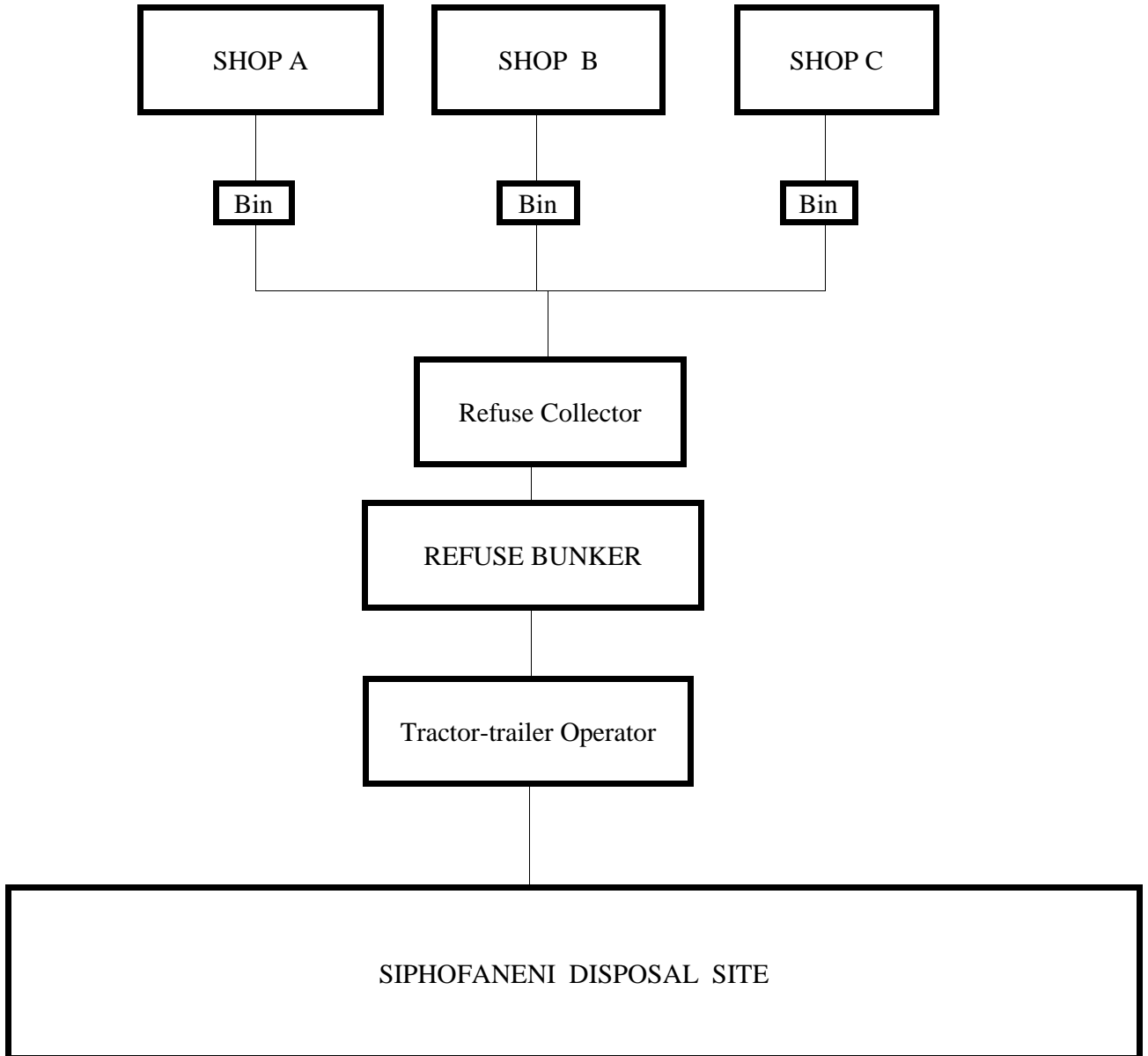
A total of three (3) refuse bunkers have been constructed within the project area; one in each of zones 2, 3 and 4. The owners of the premises on which the bunkers have been constructed agreed to their location and the Siphofaneni Inkhundla approved the locations.

#### 7.4.7 Final collection and transport to the disposal site

A contractor has been hired to transport the waste from the bunkers for a maximum of twice a week to the dumpsite that is being constructed about five (5) kilometers from the pilot project area.

Diagram 1 below illustrates the waste management system that has been proposed for implementation in Siphofaneni.

# DIAGRAM 1: THE SIPHOFANENI WASTE COLLECTION SERVICE



#### 7.4.8 Waste Disposal

A newly designed disposal site will be established in collaboration with the Ministry of Agriculture. A site approximately 5 Km to the west of Siphofaneni was selected in collaboration with the SEA. A description of the design is attached as Annexure 11. The site will be operated as a trench system. The dumpsite would be fenced off and entry controlled, for safety purposes. Scavenging will be prohibited. The Contractor will haul the waste transferred from the refuse bunkers to this disposal site for ultimate disposal. Waste will be dumped in trenches of three meter wide and 20 metres long. The waste will then be burnt and covered with soil. The waste transporter will be assisted by the collectors with the disposal process. Only one trench will be excavated and operated at a time. A second trench will be excavated after the first one has been filled completely. It is estimated, based on the waste survey, that one trench would accommodate waste of approximately one year.

#### 7.4.9 Waste Minimization and Recycling

The Waste Regulations 2000 provide for the declaration of Waste Control Areas (WCA) for places in the country that have solid waste management difficulties such as Siphofaneni. Since Siphofaneni was selected for the pilot project mainly to facilitate its declaration as a WCA and prepare it for compliance with the Regulations, the application of recycling and the minimisation of waste production are therefore an obligation for the area. As such, a recycling strategy would be developed once the system is fully operational. At this stage, the WMC, with assistance from the SEA, is looking at avenues for waste recycling in the nearest urban areas.

#### 7.4.10 Budget

The results of the waste survey were also used to guide the calculation of the cost for implementing the system, see Table 1 below.

It was realised that the charging per bin may be beyond the affordability of the people, even after trying keep the inherent cost for replacement and depreciation below the minimum allowed. The WMC then decided that the management costs should not be charged per bin, but rather per business. Each business would therefore pay a monthly subscription of twenty five Emalangeni (E25) and each person from the cluster communities of the market and the informal kitchens five Emalangeni (E5). However, this decision may have long-term implications in that it was not based on a full cost recovery scenario. This may in the long term influence the Society's ability to maintain and replace the equipment as it becomes necessary.

***Determination of the cost of the proposed service:*** Annexure 8 reports on the development of the financial model that was used to inform the Summarised Income Statement reported below



**TABLE 2: SIPHOFANENI WASTE MANAGEMENT SERVICES**

<b>CAPITAL COSTS</b>	<b>E.</b>
Carts	3000
Bins	3600
Bunkers	33000
Disposal site	7500
<b>Total</b>	<b>47100</b>
<b>OPERATIONAL COSTS</b>	
Administration costs	60
Collection cost	300
Disposal cost	500
Replacement and depreciation cost	500
<b>Total</b>	<b>1360</b>
<b>No of bins</b>	<b>50</b>
<b>Cost per bin/per month</b>	<b>E 27</b>

## 7.5 SAFETY AND HEALTH REQUIREMENTS

Although authoritative figures are not available on accident rates for solid waste workers in Swaziland, such data as are available in developed countries suggests that the expectation of the waste worker for a serious or even fatal accident is much higher than the average for industry in general.

Instruction and training is needed and is of crucial importance to safety but there is a tendency to regard such by many waste management organisations as being simply a matter of common sense. Important factors such as good communication, protective clothing, first aid kits and the training required to apply first aid are often overlooked.

## 7.6 Summary of Hazards

**Lifting Injuries & Falls** - The World Health Organisation has estimated that 80% of all industrial accidents have simple causes, such as tripping or dropping objects. The waste management worker usually works in far from ideal circumstances compared to a typical factory worker. For instance, he may have to lift heavy weights, carry them over uneven and/or steeply sloping surfaces and step into the roads before placing his load.

***Lacerations & Injection Wounds*** - Lacerations especially from contaminated jagged edges) besides causing pain and disability can give rise to infections which might have implications more severe than the original injury, and yet it is not easy to prevent such injuries to the refuse collector. Being employed in the open air, there is a tendency for workers to discard safety equipment. The problem associated with handling refuse bags on collection rounds is particularly severe because of the nature of the materials that are placed in the bags, e.g. broken bottles, shards of glass from windows, mirrors etc., needles (including hypodermic needles) and all of these may be contaminated with food wastes and other putrescible wastes.

***Mechanical Hazards*** - In addition to the self-evident risk of being struck by moving vehicles, the untidy state of some operations, tends to increase the risk of simple accidents, especially involving vehicles reversing under conditions of poor visibility.

***Inhalation*** - Due to uncertainties over the precise nature of many of the wastes being handled this represents a high potential for concern. In the case of inhalation of dust, fumes or gases sufficient exposure may occur to exceed short term exposure levels during tipping or disturbance of wastes (e.g. asbestos) despite the operation taking place in the open air. Less obvious sources of toxic emissions are the wetting of reactive wastes and the mixing of incompatible wastes (e.g. Hypochlorites). Such materials are not limited to chemical factories but can even be encountered in cleaning aids. Toxic gases such as carbon monoxide, hydrogen chloride and hydrogen cyanide can also be produced by fires on waste disposal sites. Fires are not uncommon on poorly managed waste disposal sites.

***Absorption*** - Some toxic substances can affect operators through absorption through the intact skin where exposure may arise through manual operations. A dermatitis hazard might be associated with prolonged or intermittent exposure to a wide range of material commonly found in household cleaning aids.

***Ingestion*** - Significant intake of toxic materials through the digestive system should not be a concern because eating and drinking on the job should be avoided when handling wastes and should only take place after the hands have been carefully washed.

***Infectious Agents*** - The potential presence of infectious material containing bacteria and viruses must be taken into account when assessing the risk that workers will contact disease during any operation.

***Gas Emissions*** - Landfill gas is starting to receive attention in Southern Africa as it is potentially explosive and inflammable. Thus collectors must be prohibited from smoking when delivering and tipping waste at the landfill site. The alterations which can occur in the quality of the air in a refuse bunker can be significant within a few hours of the waste being deposited in the relatively confined space of the bunker.

## 7.6.1 Safety Rules in Domestic and Commercial Wastes Collection

### *Always:*

- Provide comprehensive training to waste collection staff with special emphasis on the dangers associated with the collection of waste;
- Ensure that protective clothing is worn and this should include high visibility overalls, gloves as well as safety boots;
- Be alert for oncoming traffic;
- Take particular care with waste that might contain broken glass;
- Lift plastic refuse bags by the neck with, if necessary, a gloved hand underneath to support the bottom if the refuse bag seems unduly heavier than normal;
- Hold the bag away from the body and legs;
- Get advice before moving refuse which arouse suspicion, i.e. gives off fumes, has an unusual smell, etc.;
- Carry out regular checks to ensure that the collection cart has no prominent sharp edges which could snag clothing or inflict injuries to hands, limbs, etc.;
- Record and report accidents;
- Wash your hands before eating food or drinking beverages and,
- Do not consume alcoholic beverages whilst collecting wastes.

### *Never :*

- Try to lift a load that feels too heavy for you - get help;
- Carry a dustbin or a refuse bag in such a way that your vision is impaired;
- Attempt to pick through the contents of a refuse bag in order to salvage material;

## 7.7 INSTITUTIONAL FRAMEWORK

An institutional framework for the implementation of the waste management system was put in place. Discussions through meetings and workshops were held with the Deputy Prime Minister's (DPM's) Office concerning the appropriate institutions that would be responsible for the waste management system. The DPM's office, through the Lubombo Regional Administration office and the Siphofaneni Inkhundla, would be responsible for the supervision of the implementation of the system to enforce compliance to the Waste Regulations 2000. The SEA would monitor the enforcement of the Regulations by the DPM's office and provide any necessary training and capacity building for the implementation of the system.

The Health Inspectors, whose offices are within the Siphofaneni Inkhundla, would provide technical support to the Inkhundla on issues of environment and health, and make sure that solid waste in all the zones is managed as provided for in the system. In addition to the different meetings where the proposed waste management system, the constitution, Waste Regulations 2000 and the guidelines were described and discussed

in detail, copies of these documents were supplied to the Inkhundla Secretary, who is also a member of the Waste Management Committee (WMC), the Health Inspectors and all other WMC members. This was done for ease of reference by the important role players.

At a meeting held on 31 July 2002, a WMC was elected, comprising of 9 members. Detailed discussions of that meeting are in Annexure 12. The functions of the WMC are to implement the waste management system in accordance with its description and the

**Guidelines.** Diagram 2 illustrates the way in which the Siphofaneni Waste Management system will be managed. This system was endorsed following a workshop that was held on 22 August 2002 at the Esibayeni Lodge where the roles and responsibilities of each of the roleplayers were discussed and agreed to.

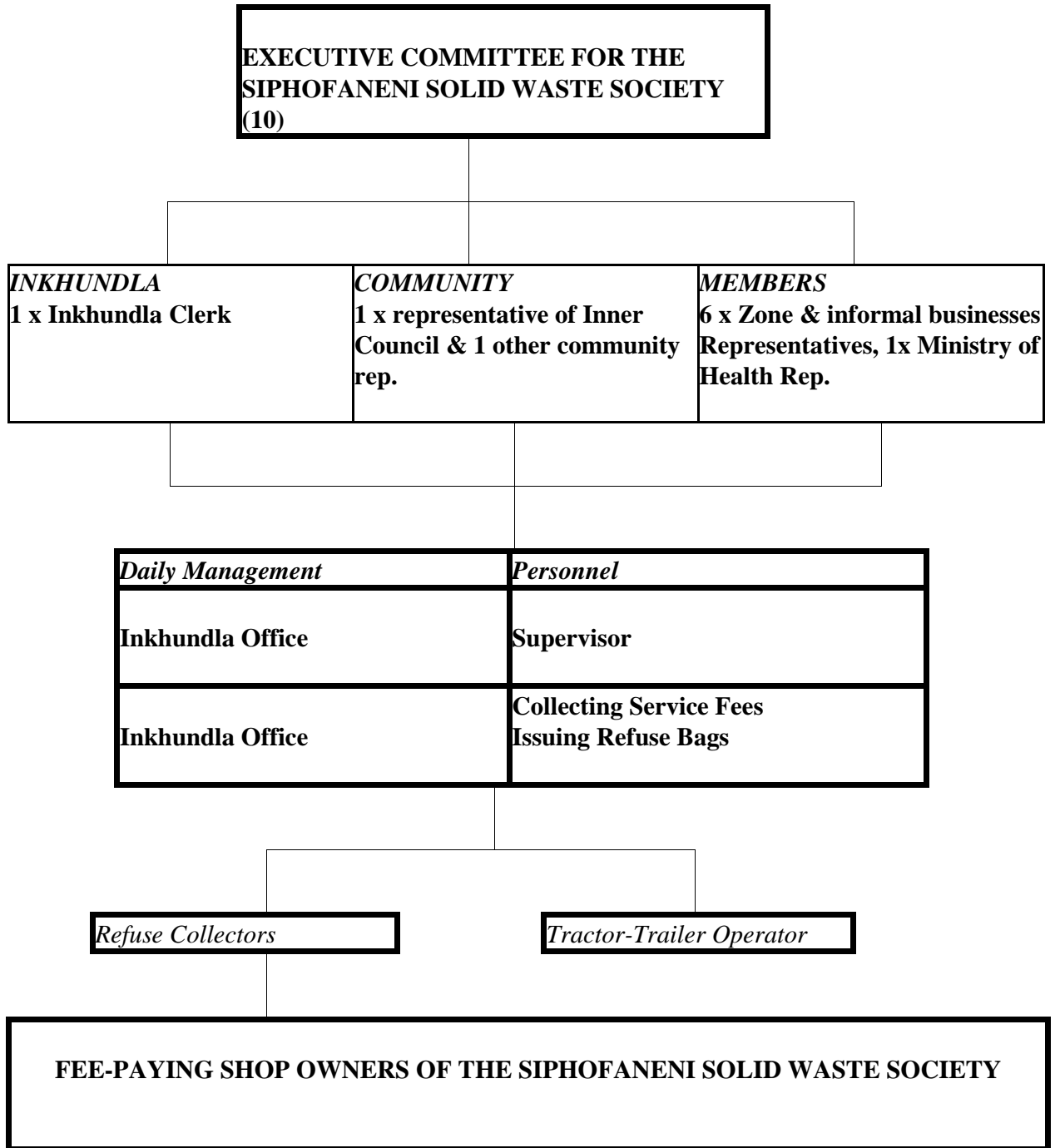
#### 7.7.1 Waste Control Area

The Siphofaneni Area must still be declared a "Waste Control Area" by the Minister responsible for the Environment including any amendments published under the directions of the same minister. Relative to the Ministerial Declaration of the Siphofaneni Waste Control Area, the Siphofaneni Solid Waste Society will comply with the Waste Regulations 2000 in every respect.

#### 7.7.2 Siphofaneni Waste Management Guidelines

A set of Guidelines governing the operation of the Waste Management System have been drafted by the Swaziland Environmental Authority. These Guidelines are additional to the Waste Regulations 2000 and shall apply to the Siphofaneni Waste Control Area. The Siphofaneni Waste Management Guidelines are appended to this document as Annexure 6 for reference.

## DIAGRAM 2: THE SIPHOFANENI SOLID WASTE SOCIETY MANAGEMENT STRUCTURE



### 7.7.3 The Role of the Deputy Prime Minister's Office

The Community Development Officers from the Inkhundla shall be responsible for the inspection of the zones and ensure that the waste is managed in accordance with the Waste Regulations 2000 and the Guidelines. The implementation of The Siphofaneni Waste Management Guidelines shall be supervised by the Deputy Prime Minister's Office through the Regional Administration and the Siphofaneni Inkhundla.

The DPM's office will play a regulatory role as follows:

**System:** Assist the SEA and participate actively in the development and implementation of all aspects of the system.

**Boundaries:**

- Assist SEA and the community in defining the boundary for the pilot project area.
- Assist the relevant community in zoning the area and dissemination of relevant information timeously
- In consultation with the community, identify suitable location for construction of holding areas in each zone as well as the waste disposal sites
- Obtain in writing, the necessary approval from the relevant authorities for the use of the holding areas in each zone
- Implement disciplinary measures for non compliance

**Registration:**

- All persons employed in the WMS should be registered with the Inkhundla
- Register people undertaking waste recycling

**Recycling:**

- Encourage the use of appropriate refuse bags
- Encourage waste recovery and separation

**Other Responsibilities:**

- Ensure that the Waste Regulations 2000 are applied uniformly and ensure continuity in cases where the WMC disbands or becomes ineffective.
- Provide office space for WMC and provide venue for monthly meetings
- Approve and assist in preparation of Contract documents
- Review tenders, where tendering becomes necessary
- Enforce compliance to regulations through the Health Inspectors Monitor the implementation of the system on a regular basis and take the

necessary steps to ensure an effective implementation of the system where necessary

#### 7.7.4 The role of the Ministry of Health and Social Welfare

The Health Officers working through the Rural Health Motivators will provide the motivation and awareness required to facilitate the commitment of the residents to the system.

##### The role of the Ministry of Health and Social Welfare

The Ministry of Agriculture and Cooperatives provides a business auditing and advisory service at no charge to the Siphofaneni Solid Waste Society, which will facilitate the auditing function required of the Deputy Prime Minister's Office.

#### 7.7.5 The role of the Ministry of Housing and Urban Development

The Health Inspectors and the Ministry of Housing and Urban Development shall provide the Inkhundla with technical support. The location of the waste bins shall be decided in collaboration with these Health Inspectors.

#### 7.7.6 The role of the Swaziland Environment Authority

The Swaziland Environmental Authority shall ensure that the Deputy Prime Minister's Office is enforcing the Waste Regulations 2000 in the Waste Control Area. The design of the refuse bunkers shall be decided in collaboration with the SEA. The SEA shall provide on request the necessary training in waste management to all stakeholders.

The SEA shall provide overall administration of the system in Siphofaneni as follows:

##### **Administration , Training and Awareness Creation Campaigns**

- Agree with the DPMO on peri-urban and rural areas to be targeted.
- Process the declaration of waste control areas.
- Facilitate the application for a license.
- Identify and liaise with relevant individuals and training institutions and government institutions such Ministry of Health and Social Welfare, etc, for the provision of training needs.
- Identify special training needs for the different community members or groups and channel training according to these special needs
- Disseminate relevant information about Waste Regulations, 2000 and the process of declaration of Waste Control Areas.

## **Equipment Procurement**

- Arrange for purchase of suitable equipment for the Waste Management System
- Arrange for delivery of equipment at the Inkhundla for safe keeping and distribution

## **Implementation and Monitoring (in close collaboration with the Inkhundla)**

- Agree with the community and other relevant authorities on the boundary for the pilot project
- Facilitate the establishment of a Waste Committee (Society)
- Facilitate the development of a Waste Management System for the area in collaboration with the DPMO (Inkhundla) and discuss it with the affected community, including traditional authorities
- Develop waste management guidelines and disseminate information on the implications of such procedures
- Facilitate the collection, recording and analysis of waste types, volumes, and other important statistics for the relevant communities.
- Agree with the community and other relevant authorities on the location and numbers of temporary holding areas
- Facilitate the construction of holding areas and a dumpsite
- Facilitate the erection of bins, drums or other relevant equipment as had been agreed upon at selected places within each zone
- Agree with the community and other relevant authorities and approve locality of the waste disposal site.
- Facilitate and assist with the implementation of the agreed system.
- Monitor overall implementation of all the different aspects of the proposed Waste Management System and ensure that the system is in line with the provisions of the Waste Regulations 2000.
- Provide technical inputs as and when necessary, e.g. in selection of dumpsite, treatment of the different kinds of waste, appropriate waste recycling and reclamation, etc.
- Facilitate the relevant training activities e.g. workshops, posters, etc.

## **Costs**

- Assist with the cost accounting of the system.
- Facilitate the dissemination of information about system cost to the affected communities
- Encourage Inkhundla and other stakeholders to set monthly subscriptions that would reflect the cost for the system



### 7.7.7 The Responsibilities of the Participants

Although posters and information leaflets have been produced and distributed there is a serious lack of awareness amongst the general public. The users of the system will need back-up inputs on a regular basis to reinforce their participation and amend current behaviour patterns. As the Guidelines clearly state "all participants shall without fail have the responsibility to participate in the Waste Management System of the Waste Control Area. Every participant shall keep the waste in waste bags within his/her premises, and place the full bags in the waste bins that have been provided at the boundary of the plot for collection by the waste collectors. All participants shall without fail pay for the waste management services through the Siphofaneni Solid Waste Society." However, there is no enforcing legislation in place until Siphofaneni has been declared a "Waste Control Area". Thus the system will in the interim rely on the powers vested in the Inkhundla for enforcement and the encouragement of the Rural Health Motivators for awareness re-enforcement.

### 7.7.8 The Responsibilities of the Siphofaneni Solid Waste Society

The Siphofaneni Solid Waste Society shall:

- ensure that refuse bunkers are maintained in good condition in all the designated areas.
- provide adequate refuse bins in all public places, strategically placed to cater for customers and passers-by.
- ensure that adequate refuse bins are provided for every zone.
- that adequate hand pulled carts are available for the appointed Primary Collection Contractors to transport waste from the refuse bins to the refuse bunkers.
- ensure that a Contractor is appointed to transport the waste from the refuse bunkers to the community disposal site.
- shall be responsible for the management of the funds and shall practice proper bookkeeping.

An office shall be established from which the Siphofaneni Solid Waste Society shall manage the Waste Management System. Funds paid by the participants, or solicited anywhere under the auspices of waste management, shall be strictly used to further the cause of waste management in The Siphofaneni Waste Control Area. The Siphofaneni Solid Waste Society shall independently decide how the funds are spent on The Waste Management System.

### 7.7.9 The Waste Management Committee (WMC) and their Role

The WMC will consist of representatives from within the Waste Control Area and should ideally consist of the following members:

1. Chairperson

2. Vice Chairperson
3. Secretary
4. Vice secretary
5. Treasurer
6. Two additional members

The Inkhundla should be represented on the committee.

### **WMC Responsibilities**

- 
- Implement the agreed system in the community.
- Disseminate information from the Inkhundla to the community
- Distribute bins to designated areas and within the WCA or project area
- Do onsite monitoring
- Disseminate information about, Waste Management Regulations, 2000 and its implications for Siphofaneni WCA
- In collaboration with Inkhundla, develop contract documents and review tenders
- In collaboration with the community, determine the payment structure for waste collectors
- Coordinate participation in training workshops
- Participate in awareness raising campaigns, putting up warnings, posters and bill boards
- Waste collectors will be employed by the WMC to service the different zone
- Take responsibility for maintenance and/or replacement of holding areas and bins
- Determine cost recovery charges for use of the bins and other facilities
- Develop Contract documents and review tenders
- Employ waste collectors, engage contractors and other service providers. Each zone should have one waste collector to be hired and paid for from the monthly subscription fees
- In collaboration with the community, set the payment structure for the community collectors and of service providers
- After receiving training, participate in Public Awareness Campaigns; putting up posters, coordinate participation in workshops, etc
- In consultation with the communities that they represent, SEA and DPM's Office, determine the fees to be paid towards operation of the of the system
- Determine payment dates at the Inkhundla/DPM's Office
- Prepare a constitution and a business plan
- Open and operate a business account with a bank
- Encourage waste collectors to record information on local waste types, volumes, etc.
- Develop a system for keeping information on local waste types, volumes, etc.

### **Duties of the Waste Collectors**

- Ensure that waste is kept in bins and refuse bags
- Report any irregularities to the WMC
- Empty bins on a regular basis as determined by the WMC.as into temporary holding areas (bunkers)
- Ensure that only waste in refuse bags may be deposited into holding areas

### **Duties of Waste transporter**

- Collecting the waste from the holding areas (bunkers) to the waste disposal site is
- to be contracted out to a suitable contractor with the necessary equipment eg.
- Tractor and trailer or truck.
- The Waste transporter will collect the waste from the holding areas at regular
- intervals and at times agreed with the WMC and transport the waste to the
- dumpsite.
- The transporter will dispose of the waste in the designated dumpsite in a way
- as
- prescribed by the WMC.

## 7.8 MANAGING THE SYSTEM

It was agreed by the Siphofaneni Solid Waste Society that a Waste Management Committee would manage the system. The Waste Management Committee would be representative of the formally constituted authorities, the traditional structures and the residents. This structure is illustrated in Diagram 2 above.

It was also decided that the day to day management of the system would be effected by the Chairperson of the executive committee. He would make sure that the waste collectors and transporters carry out their duties effectively, and report to the WMC any implementation problems that would require their attention and possibly, their action. The job descriptions of the waste collectors and transporters are appended as Annexure 9. All employees, including the WMC, would operate from the Inkhundla offices in Siphofaneni.

Fees would still be collected and refuse bags issued at the Siphofaneni Inkhundla. Participants in the waste management system would be encouraged to also buy the refuse bags from any other sources, besides the Inkhundla.

## 7.9 MONITORING AND AUDITING THE SYSTEM

Monitoring of the pilot project must serve two purposes:

- Monitoring linked to the objective, Outputs and Activities agreed for the Pilot Project;
- Monitoring linked to the purpose of extracting learning lessons and experience of relevance for the further refinement of the National Solid Waste Management Strategy.

The monitoring parameters may be different to serve the two purposes.

The first focuses on monitoring progress at the day to day operational level to reaffirm that the project is on track and this monitoring is mainly for use locally as well as nationally with SEA. A proposed monitoring frame for that purpose has been outlined below.

The second focuses on all the matters and issues arising before a way forward is found on a particular issue. This monitoring framework is predominantly for use by the SEA (the Liaison Committee) and it serves the purpose of refining the National Solid Waste Management Strategy.

## 7.10 PROPOSED REPORTING SYSTEM

The Siphofaneni Solid Waste Society will not be expected to produce comprehensive reports. Thus, a simple financial reporting system will be developed and linked mainly to the operational and implementation side of the project. However, for the purpose of refining the Draft National Solid Waste Management Strategy, SEA needs to capture more detailed and more qualitative than quantitative data on the project. The following operational reporting system is proposed:

- Monthly reports by the Siphofaneni Solid Waste Project to SEA. These reports will cover the following:
  - Progress with implementation (on each aspect of the implementation plan)
  - Problems encountered
  - Recommendations on proposed amendments

A format for this report will be prepared by the SEA.

- Notes must be taken from any ad hoc meetings and attached to the monthly report back to the SEA Liaison Committee.

## 7.11 MEANS OF VERIFICATION

The following means of verification will be used to monitor progress on the pilot project:

- Reports and studies undertaken on the Siphofaneni Solid Waste Project;
- Monthly reports by the Siphofaneni Solid Waste Society
- Reports from the Project Management Group to the Project Steering Committee
- Inspection visits to Siphofaneni to monitor visible improvements and awareness among community residents.

## 8. CAPACITY DEVELOPMENT

### 8.1 INTRODUCTION

The various meetings that were held with stakeholders involved education and awareness creation, especially about acceptable conduct for waste management as well as the existence of the SEA as a governing body for environmental issues in the country. The people were made aware of the existence and the provisions of the Waste Regulations 2000.

Training and awareness workshops were held between 7-8 August 2002 (see Annexure 12) for the reports on the proceedings of the workshops). The workshops not only targeted the business owners that were identified as falling within the pilot project area, but also targeted employees and any other persons who were potential waste generators and handlers.

The main focus for the workshop was to raise awareness among all concerned about the implementation of, and progress on the design and implementation of the Siphofaneni Waste Management System. The workshops also involved education on appropriate waste management procedures, the Waste Regulations 2000 and the processes that lead to the declaration of WCAs. The proposed system and constitution were also discussed in detail during the workshops. Comments and amendments to both documents were made. Both English and siSwati versions of the constitution and the proposed system were distributed to participants. The workshops also stressed the reality of having to pay for the costs of waste management, if it is to remain sustainable. The obligation for all participants in the system to pay for it was discussed in great detail. Awareness creation was also in the form of printed messages on T-shirts, pamphlets and posters. A logo was designed for the waste management system and was on all the printed messages. The launch for the system by the Minister for Tourism, Environment and Communications, which was held on the 26 September 2002, was the greatest form of awareness creation. In preparation for the launch, the pamphlets and posters were placed in a number of strategic places including shops, bus stops, in buses and any other buildings. The media was invited to cover the launching of the system. Drama and dancing carrying waste management messages were part of the launching for the system. On the day of the launching, a waste pick up campaign was carried out with assistance from school pupils from the Siphofaneni primary school. A separate needs assessment and capacity gap analysis was not done for Siphofaneni as the system and structures of the Siphofaneni system is very similar to the

Kwaluseni system. The needs assessment and gap analysis for Kwaluseni will therefore be used for capacity development purposes for Siphofaneni as well. A follow up workshop on the CD report for Kwaluseni was held with both communities where all the aspects were discussed and agreed upon.

The detailed capacity development report is attached as Annexure 10. The overall capacity development approach incorporated issues like planning and design, community mobilisation, analysis, systems design, financial planning. Most of these has been undertaken in terms of consulting services provided through the joint SEA/Danced sponsored National Solid Waste Management Strategy Project (NSWMS).

The capacity gap analysis has been based on a waste collection system which has not yet proven its suitability. Amendments to the collection system should therefore result in amendments to the capacity development plan.

The lack of a legal framework has made it difficult to undertake a needs assessment based on the requirements placed by such. Moreover, while the waste collection system established in Siphofaneni is considered a pilot project from the perspective of the NSWMS Strategy project, this is not so from the perspective of the Siphofaneni community. Here a sustainable waste collection system is sought for. Hence an attempt has been made to design a capacity development plan that supports the intention of the Siphofaneni Community to establish a sustainable waste collection system. The first step of capacity development planning is always to assess the capacity requirements that the programme must respond to. These requirements were found to be diverse. Some related to community awareness and community education; other related to the financial situation of the community whereas yet other related to the management and operation of the waste collection system.

## 8.2 CAPACITY GAP ANALYSIS

The “performance” of an organisation or a system (for example the waste collection system at Siphofaneni) can be said to be the same as the “capacity” of the organisation. Capacity in Siphofaneni was assessed under six main headings, which for the purpose of Siphofaneni can be defined as follows:

### **Strategic Issues (1)**

Could be said to summarise the five issues (2-6) in order to pursue sustainable waste collection in Siphofaneni. This could include:

- Does the Siphofaneni Solid Waste Society (SSWS) have clearly formulated approaches to achieve its objectives for waste collection?

- Does the SSWS have a structure and ownership that supports the sustainability of the proposed waste collection system?
- Proposed allocation of duties
- Does the SSWS feel that the allocated duties and responsibilities have been adequately defined and described?
- Does it appear realistic, that the proposed financing model, will be sufficient to financially sustain waste collection services as planned?
- Does the SSWS have an approved and widely accepted “Constitution” to guide its work?
- Is the organisational status of the SSWS appropriate (e.g. to register as a Society)?

### **Structure Issues (2)**

Structure indicates the division and organisation of work amongst the staff and lines of command and communication within the SSWS, between the WMC and the SSWS and between the WMC and its Contractors. The capacity assessment should hence look into the following:

- Is the proposed structure and organisation of WMC appropriate to deal with both current and expected future duties and responsibilities?
- Have the necessary linkages to local, regional and national structures been described and formalised?
- Is the WMC in a position to recruit, employ and retain the required staff?
- Is the WMC in a position to enter into agreements with other service providers?

### **System Tool Issues (3)**

System Tools refer to the tools of the SSWS including *hardware* (equipment and machines) as well as *software* (work systems and procedures) to undertake its waste collection responsibilities. Such may include:

- Ensuring that the required legislation (e.g. declaration of a Waste Control Area) is in place to support the operation of Waste Management System.
- Ensuring that there is a management system in place to capture data and to report back on the performance of waste collection (local, regional and national reporting) .
- Ensuring that the required equipment for waste collection is installed, available and/or ordered in time, and that it is appropriate.
- Ensuring that the required administrative systems and procedures are in place.
- Ensuring that the required financial systems and procedures are in place.
- Ensuring that maintenance procedures are in place.
- Ensuring that waste collection schedules are clearly defined.
- Ensuring that monitoring and supervision procedures for the waste collectors and contractors are in place.

#### **Skills, Knowledge and Awareness Issues (4)**

The issues relate to the ability of the SSWS, including WMC members, Waste Collectors and Haulers and other Contractors to perform their assigned duties and responsibilities. These issues also relate to improved knowledge and awareness by the above-mentioned groups, as well as public transport operators, customers and other people in transit about what is expected of them with respect to “good practice” solid waste management in Siphofaneni. Effectively:

- all of the above mentioned groups should have sufficient *knowledge* about waste management and the Siphofaneni Waste Management System, about hygiene and occupational health and safety, communication and community education and mobilisation, the existence of the WMC and its functions, etc
- The SSWS, including the WMC should have knowledge about General and Contract Management and Administration, Financial Management, Accounting, the concept of Cost Recovery, etc.
- all of the above should have the required *skills* to perform their assigned duties and/or responsibilities in relation to the installation and operation of the introduced Waste Management System.
- As much as possible, it must be ensured all those who would participate at the different levels of the implementation of the Waste Management System cooperate, and that bad/adverse attitude and behaviour by any of the SSWS members, the WMC members, waste collectors and transporters, customers, bus operators and their customers, etc is kept at a minimum. Disciplinary measures should be put in place.
- Acquired knowledge and skills should be put to fruitful use.
- The SSWS, if necessary, should have access to complementary and specialised expertise to undertake its allocated responsibilities. This could be provided through the SEA; MHUD; MHSW and DPM’s Office.

#### **Inter-relations (5)**

Inter-relations issues deal with the way all the different stakeholders of the SSWS and the waste collection system relate to each other. This could include:

- Relationships and hierarchies between different staff members of the SSWS
- Relationships between landlords and tenants
- Relationships between landlords and the WMC
- Relationships between tenants and the SSWS
- Relationships between all others and the Inkhundla
- Relationships between SEA, MHUD; MHSW and DPM’s Office and the SSWS
- Relationship to participating and non-participating zones



- Credibility of the WMC to the SSWS, the Traditional Authorities, the Inkhundla, general public and the private and commercial sectors
- Community support can be developed to support the SSWS to develop and operate the waste collection system.

### **Positive and Negative Incentives (6)**

A conducive environment constitutes a range of factors that will affect the performance of both the organisation and individuals within the SSWS. Such issues may include:

- Payment of staff and contractors in time
- National and local priorities and encouragement given to solid waste management.
- Sound financial management

It should be evident from the above that the capacity needs assessment takes a broader perspective than a training needs assessment. As such, training would most likely only be a partial response to the identified needs.

What is mentioned in this report should however be considered as an outline of pointer to where performance gaps should be expected and where further needs analyses need to be undertaken. At best the capacity assessment finds its justification at the organisational and occupational level.

## 8.3 CAPACITY DEVELOPMENT

The capacity development programme is restricted to cater for the management, financial, technical and administrative aspects of the waste collection system at Siphofaneni. The full programme is described in Annexure 10. Capacity gaps associated with community awareness and mobilisation are anticipated to have been addressed by the ongoing awareness raising program.

### 8.3.1 Proposed Capacity Development Programme

It is recommended that capacity development activities be also undertaken for key stakeholders at regional and national level. Such a programme will assist in building an understanding of the efforts required to establish sustainable waste management services in non-declared areas of Swaziland and also in discussing and agreeing on roles and responsibilities associated with taking legislation into such areas and on how to monitor.

Participants to the capacity development programme should include:

### Community Level

- Siphofaneni WMC members (Project Manager
- Community Waste Collectors (2)
- Waste Hauler Contractor (1) and his/her employees (1-2)
- Receiver of waste collection charges (e.g. the WMC and the Inkhundla)

### Regional and National level

A programme may also be run for representatives from regional and national level, in which case the following representatives may have to attend:

- Representative from the Regional Secretary's Office
- Representative from the DPM's Office (Mbabane)
- Representative from the SEA
- Representative from MHUD
- Representative from MHSW
- Ministry of Agriculture and Cooperatives
- Representative from the Tibiyo (optional)

#### 8.3.2 Employment creation

In order to improve the capacity for locals to implement the system and maintain the structures, employment of locals for the construction of bunkers and the installation of the bins was contracted out to them. The construction of the bins was not contracted out to the Siphofaneni community mainly because capacity and time availability were a constraint.

#### 8.4 AUDITING OF THE SYSTEM

It will become necessary to monitor and audit the implementation of the system, so that lessons can be learnt for its improvement and its implementation in other similar places elsewhere in the country. This process would also help identify issues that need to be considered for the revision of the NSWMS. The WMC need to be given training in record keeping and financial management so that they are able to implement and improve on the system.

### 9. REVISION OF THE STRATEGY

The outcomes of the Siphofaneni Pilot Project should be monitored and compared with the desired results of the strategy. Difficulties to achieve the desired performance of the waste management system will be examined and the pilot project adjusted until optimum performance of the system is achieved. The lessons learnt from this process

will be used to inform and modify the National Solid Waste Management Strategy with respect to waste management service provision in peri-urban areas.