CHAPTER 1: INTRODUCTION

1. BACKGROUND

The Department of Economic Development, Tourism and Environmental Affairs (DETEA) in the Free State Province funded the development of Integrated Waste Management Plan (IWMP) for Xhariep District Municipality (Table 1).

PEO Projects cc has been contracted to develop district IWMP in line with specified scope of work and terms of reference as articulated in the Contract. This document is a final report on the development of the IWMP for Xhariep District.

1.1 SCOPE OF WORK

The scope of work primarily required the development of a district waste management plan, by aligning all municipal plans and mapping of related priority data. The final plan would be characterized by the following:

- Alignment of municipal waste management plans;
- Identification of strategic and critical situational features through site visits, interviews and research;
- Consolidation of the municipal waste management plans into a district IWMP;
- A district integrated waste management plan with recommendations and implementation strategy and/or project proposals on problem areas identified in the exercise;
- Development of priority based implementation plans using a phased approach;
- The consolidation of sector (sector that generates, manages and/or handle waste) departmental strategies into a district plan.

This IWMP is developed as follows:

1.1.1 A description of the population and development profiles of the area to which the plan relates, the following to be discussed:

- Population generation, growth rates and distribution;
- Income categories;
- Education and age.

1.1.2 An assessment of the quantities and types of waste generated in the area; the following to be discussed:

- Waste generation;
- Waste types and characterization;
- Waste collection services and transport;
- Waste recycling;
- Waste disposal; and
- Waste transfer stations and disposal facility.

1.1.3 Current waste management practices, in particular, the description of waste services provided, or that are available for the collection, recycling, recovery, treatment and disposal of waste;

- Areas that are not currently receiving waste collection services and the number of people affected;
- Description of legal framework that supports waste management in all spheres of government; therefore the following will be discussed:
  - Current policies supporting waste management;
  - Effects of poor waste management practices, illegal dumping and the environment;
  - Waste and service delivery; and
  - Tariff structures, willingness to pay, indigent households qualifying and registered for municipal support, and cost recovery.

1.1.4 A comprehensive assessment of the capacity of the municipality to deliver waste services.

This assessment includes looking at the following: collection equipment, waste collection contracts awarded, provision of technical assistance, transfer stations, waste recycling facilities, waste disposal activities (permitted) and dumpsites (illegal).

1.1.5 Looking at Organizational Structures, in particular, the local government authority responsible for providing waste service and the number of people assigned within the waste management units in local government.

1.1.6 Capacity building initiatives, including those that promote waste hierarchy principles;

1.1.7 Financial provision for waste services, including looking at other funding options; therefore the following will be discussed:

- Review of tariff structures to ensure self-sufficiency and also making the cost of using the systems as low as possible for the individual user;
- Funding assistance from developmental funding agencies, for example, the National Lottery Distribution Trust Fund (NLDTF), Municipal Infrastructure Grant, Development Bank of South Africa (DBSA), among others;
- Public Private Partnerships;
- Funding of capital projects;
- Tourism Development and cross subsidization; and
- Specific approach to low income areas, for example, implementing free basic waste services and other strategies.

1.1.8 Using data generated in the situational analysis, strategic objectives were developed, focusing on each stage in the waste management hierarchy, namely the following:

- Waste prevention, minimization and recycling;
- Collection and transportation;
- Waste treatment; and
- Waste disposal.

The process of developing the Integrated Waste Management Plan was a consultative and participatory one; stakeholder workshops were held in this regard.

1.2 PROJECT GOALS AND OBJECTIVES

The project goal is to assist the DETEA with the development of a comprehensive and Integrated Waste Management Plan for Xhariep District Municipality.

1.2.1 Objectives of an Integrated Waste Management Plan

The objective of IWMP is to direct the district and its constituent municipalities to synergistically develop appropriate waste management systems and build management capacity in order to maximize efficiency in waste management, minimize environmental impacts and associated financial costs within the district. The implementation of the plan should lead to healthier and cleaner environment that is able to sustain an improved quality of life for all.

1.2.2 Approach

The guidelines articulated in the Starter Document for Integrated Waste Management Planning in South Africa, Draft National Waste Management Strategy (DEA, 2010)will be used as a tool to implement the waste hierarchy objectives, namely, the following:

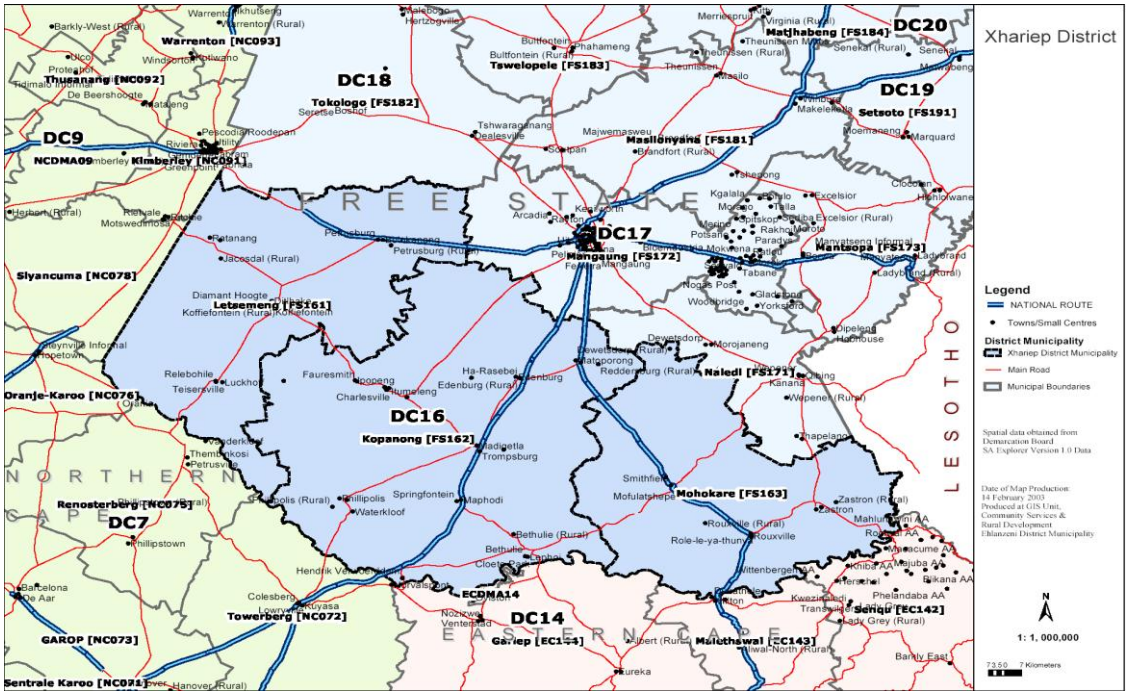
- To implement waste avoidance and prevention strategies;
- Recover waste of which generation cannot be avoided; and
- Practice safe disposal of waste that cannot be recovered.

The IWMP sets targets for waste minimization and milestones to be achieved. It also sets out the review and subsequent reporting processes as articulated in the NEM: Waste Act, 2008. The IWMP of Xhariep District Municipality will be submitted to the DETEA for approval and be incorporated into the district IDP as a sector plan.

Table 1.1 : Local Municipalities of Xhariep District

LOCAL MUNICIPALITY	ASSOCIATED TOWNS
Kopanong	Reddersburg, Trompsburg, Bethulie, Springfontein, Jagersfontein, Edenburg, Fauresmith and Philippolis and Gariep Dam
Mohokare	Smithfield, Zastron and Rouxville
Letsemeng	Petrusburg, Jacobsdal, Koffiefontein, Oppermansdorp and Luckhoff

The position and boundaries of Xhariep District are presented below in Map 1.1.



Map 1.1 : The boundaries of Xhariep District

1.3 PROJECT PHASES

The IWMP is structured into 5 phases which are intrinsically linked to each other. These phase are described below.

Phase 1: Inception Phase

Phase 2: Status quo Analysis

Phase 3: Gaps and Needs Analysis

Phase 4: Scenario Setting and Alternatives to Current Waste Management Practices

Phase 5: IWMP Framework for Implementation Strategy and Action Plan

1.3.1 PHASE 1: INCEPTION PHASE

This phase involved initial project planning activities and schedule of meetings. Project Implementation Report was submitted to DETEA as an output after discussions.

1.3.2 PHASE 2: STATUS QUO ANALYSIS

The status quo report provides a comprehensive situation assessment and analysis of waste management systems and implementation capacity in the district municipalities. This is the critical step for understanding the current status for waste management planning in the district. A full analysis of approaches and challenges currently utilized by individual local municipalities towards fulfilling their role in waste collection services is reported. The district municipality status quo analysis report is therefore a consolidation of the analysis of all status quo data sets from local municipalities with reference to their waste management plan.

For all the municipalities, data on the following was documented:

a. Description of the population and development profiles of the area to which the plan relates, i.e.
   - Population distribution;
   - Income categories;
   - Education and age.

b. The quantities and types of waste that are generated in the area. The following was discussed:
   - Waste generation rates;
   - Waste types and characterization;

c. Current waste management practices, in particular, the description of waste services that are provided, or that are available for the collection, recycling, recovery, treatment and disposal of waste;

d. Areas that are not currently receiving waste collection services and the number of people affected;

e. Description of the legal framework that supports waste management in all spheres of government.

f. A comprehensive assessment of the capacity of the districts to deliver waste services, including facilities, i.e. collection equipment, waste collection contracts awarded, provision of technical assistance, transfer stations, waste recycling facilities, waste disposal activities (permitted) and dumpsites (illegal).

g. Organizational structures, in particular, the number of people assigned within the waste management units in local and district municipalities and skills base to deliver waste services efficiently.

h. Capacity building initiatives, including those that promotes waste hierarchy principles.

i. Finances allocated for waste services, including various funding options. The following is discussed:

- Review of tariff structures to ensure self-sufficiency and also making the cost of using the systems as low as possible for the individual user;
- Funding assistance from developmental funding agencies, e.g. Development Bank of South Africa (DBSA), amongst others;
- Public Private Partnerships;
- Specific approach to low income areas, for example, implementing free basic waste services and other strategies.

Using data generated in the situational analysis, strategic objectives were developed, focusing on each stage in the waste management hierarchy, namely the following:

- *Waste prevention, minimisation and recycling*
- *Collection and transportation*
- *Waste treatment*
- *Waste disposal*

A workshop to discuss a draft Status Quo Report was held with stakeholders. This meeting validated all information that constitutes the waste status quo as this was the basis for decision-making for the next phases of the project.

1.4 ASSUMPTIONS AND LIMITATIONS

1.4.1 ASSUMPTIONS

1.4.1.1 Some of the information is assumed to be accurate, e.g. information from Statistics South Africa (Stats SA), on the strength and presumed credibility of the source.

1.4.1.2 The information documented in reports received from the officials of provincial, district and local governments, e.g. IDP documents, is assumed to be valid and authentic as presented in the report.

1.4.1.3 Any changes in statistical data are not materially different from what was last recorded by Stats SA.

1.4.1.4 The data of Stats SA is valid and is reliable for projecting developments, e.g. population numbers.

1.4.2 LIMITATIONS

1.4.2.1 Not all data received can be authenticated because of the logistical difficulties, e.g. population census which was conducted in 2001 and the Community Census that was conducted in 2007 has its own inherent limitations (Stats SA 2001, CS 2007).

1.4.2.2 Only data from official, legal and approved sources was used in the report.

1.4.2.3 No waste audit was conducted by any of the local municipalities during their IWMP development, therefore waste generation and recycling data cited by all municipalities within the district were estimates based on population income per capita. In the absence of accurate or verifiable data, e.g. waste tonnages sent to waste disposal sites, estimates were prudently calculated.

CHAPTER 2: LEGAL FRAMEWORK

2.1 Waste Management

Waste management responsibilities span all spheres of government; the national government departments, including sector departments like Health, Minerals Resources, Water Affairs, Agriculture and Fisheries, Energy, provincial departments, district and local municipality. There is no single law that governs waste management, but various policies, acts, regulations, by-laws, guidelines and strategy documents. Annexure 1 lists a summary of all legal instruments relevant to waste management.

The list shows the fragmented nature of waste management administration, including enforcement, compliance and monitoring. The advent of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008), consolidates all waste management objectives and coordinates administration throughout all spheres of government. It also gives effect to the obligations of industry towards waste through the development of industry waste management plans and extended producer responsibility.

The waste hierarchy model proposed in the National Waste Management Strategy (NWMS) forms the guiding principle to integrated waste management, hence it is used as a basis to develop the district Integrated Waste Management Plan (IWMP).

2.2 The Constitution of South Africa

The Constitution of the Republic of South Africa ensures the fundamental rights of the citizens of South Africa. A number of sections of the constitution have a direct bearing on the development of waste facilities and the protection of the environment, e.g.

Section 24: Environment

Section 24 of the Constitution caused a paradigm shift towards a new environmental policy for South Africa. An important element of the Constitution, namely to protect the human rights, is related to the need for a sustainable use of the country's scares natural resources, the promotion of conservation and the prevention of pollution and economic degradation.

- Section 24 (a) provides everyone the right to an environment that is not harmful to their health or wellbeing.

- Section 24 (b) provides everyone the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures.

Section 32: Access to information

Section 32 (a) of the Constitution entitles every person access to any information held by the State. Sub-section (b) also entitles every person to information that is held by another person and that is required for the exercise or protection of any rights.

Section 33: Just administration action

This right entails that:

- Everyone has the right to administrative action that is lawful, reasonable, and procedurally fair and

- Everyone whose rights have been adversely affected by administrative action has the right to be given reasons in writing.

Section 38: Right to Involvement

Right to involvement provides the "right to get involved" to any member of public. This means that a member of public has the right to take appropriate action to prevent environmental damage. This may include taking action against the responsible authority for failing to perform its duties in preventing environmental damage.

Section 41: Co-operative Governance and Intergovernmental Relations

These principles are repeated in two other acts, i.e. the National Environmental Management Act 1998 and the National Water Act 1998. These acts, particularly the NEMA, enshrine the same principles, i.e. the guarantee of a healthy environment, the right to information and seeking comments of the general public.

Hence, the principles behind the aforementioned sections of the Constitution must be acknowledged and complied with upon consideration of a waste site authorization.

2.3 WASTE POLICY

*2.3.1 Integrated Pollution and Waste Management (*IP&WM*)*

The White paper on Integrated Pollution and Waste Management outlines government new thinking in relation to pollution and waste management. The White Paper on Integrated Pollution and Waste Management for South Africa serves the following purposes:

2.3.1.1 To inform the public of government strategic goals and supporting objectives, and how the government intends to achieve them.

2.3.1.2 To inform government agencies and state organs of these strategic goals and supporting objectives and their roles in achieving them

2.3.2 7 strategic goals and objectives supporting the waste policy

2.3.2.1 Goal 1: Effective Institutional Framework and Legislation

"To create, develop, implement, maintain and continuously improve an effective, adequately resourced and harmonised institutional framework and integrated legislative system and to build institutional capacity."

Objectives

- To establish mechanisms to give effect of the institutional arrangements for all spheres of government;
- To conduct an audit and review of existing skills, capacities, functions and the deployment of resources in the national Departments of Environmental Affairs and Tourism and of the Water Affairs and Forestry, and realign them towards implementing IP&WM policy.

2.3.2.2 Goal 2: Pollution Prevention, Waste Minimisation, Impact Management and Remediation

"To promote holistic and integrated pollution and waste management through pollution prevention, minimisation at source, impact management and remediation."

Objectives

- To manage, prevent, reduce and control soil pollution problems arising from a range of other sources, e.g. waste treatment and disposal, and from the metal and mining industries

- Pollution and waste avoidance, prevention and minimisation to be achieved by:

    - Adhering to mechanisms that ensure appropriate design parameters, optimising operating procedures and good housekeeping for all waste generating processes.

    - Identifying mechanism such as risk assessment for forecasting potential situation in which accidents and spills can cause unscheduled waste emissions, whether be it at facility or during transportation.

- Resource recovery, recycling and reuse mechanisms, i.e.

    - Reduction in the waste stream by ensuring an economic environment which favours recycled materials

    - Extraction and utilisation of landfill gas.

- Waste collection, treatment and processing mechanisms

    - Ensuring that waste is appropriately treated and processed prior to disposal in accordance with the relevant regulations, standards, laws and guidelines.

    - Rendering harmless any pollutants which may be released during waste treatment processes.

    - Ensuring that all South Africans have adequate and sufficient waste and refuse collection services.

- Final waste disposal mechanisms

    - Timely identification, investigation and development of environmentally and socially acceptable waste disposal facilities, in a manner, which promotes the regionalisation or sharing of waste disposal sites to reduce their number and costs.

- Developing, operating and/or closing all other waste disposal facilities including tailings dams, metallurgical slag dumps, whether proposed, existing or closed, in terms of appropriate guidelines and pollution control legislation.

- Phasing out salvaging on landfills completely.

- Pollution remediation mechanisms

    - It will be required that where the environment has been impaired by accidental, insidious or intentional pollution or unacceptable waste management practices, it must be remediated by the accountable party and returned as close as possible to its original state.

2.3.2.3 Goal 3: Holistic and integrated planning

"To develop mechanisms to ensure that integrated pollution and waste management considerations are effectively integrated into the development of government policies, strategies and programmes, all spatial and economic development planning processes, and all economic activities."

Objectives

- To incorporate integrated environmental management principles and methodologies in spatial development planning, as it affects integrated pollution and waste management.

- To make timely and appropriate provision for adequate waste disposal facilities.

- To develop management instruments and mechanisms for integrating pollution and waste management concerns in development planning and land allocation.

To develop agreed and appropriate indicators to measure performance for inclusion in EIPs and EMPs as provided for in the NEMA.

2.3.2.4 Goal 4: Participation and partnerships in integrated pollution and waste management governance

"To establish mechanisms and processes to ensure effective public participation in integrated pollution and waste management governance."

Objectives

- To ensure that communication strategies in all spheres of government address public participation needs.

- To allocate government resources (financial and human) to build institutional capacity in national, provincial and local government spheres for effective management of public participation in integrated pollution and waste management governance.

- To encourage strategic alliance between government and interested and affected parties to ensure integrated pollution and waste management and achieve sustainable development.

2.3.2.5 Goal 5: Empowerment and education in integrated pollution and waste management

"To promote the education and empowerment of South Africa's people to increase their awareness of and concern for pollution and waste issues, and assist in developing the knowledge, skills, values and commitment necessary to achieve integrated pollution and waste management".

Objectives

- To integrate pollution and waste management education in all education programmes at all levels, in all curricula and disciplines of formal and non-formal education in the national qualification framework.

- To ensure that integrated pollution and waste management education programmes and projects foster a clear understanding of the interrelationships between pollution and waste, and of the economic, social, cultural, environmental and political issues in local, regional, national and global spheres.

- To develop a culture of discouraging pollution and waste generation among all South Africans.

- To assist Small, Micro and Medium-Enterprises (SMME) in developing appropriate integrated pollution and waste management procedures.

- To encourage and support the involvement of women, youth, workers, the unemployed, the disabled, traditional healers, the elderly and other special interest groups in the design,

planning, and implementation of integrated pollution and waste management education and capacity-building programmes and projects.

- To initiate awareness campaigns for integrated waste management planning, together with the provincial environmental departments. The campaigns will be implemented by local government for general waste, and the provincial environmental departments for hazardous and industrial waste.

2.3.2.6 Goal 6: Information Management

"To develop and maintain databases and information management systems to provide accessible information to interested and affected parties that will support effective integrated pollution and waste management."

Objectives

- To establish effective and efficient information system, including the development of appropriate pollution indicators to ensure informed decision-making, measure progress in policy implementation and enable public participation in the governance of integrated pollution and waste management.

- To strengthen and build capacity of government to collect, analyse, and use relevant information and knowledge for integrated pollution and waste management from all sources.

- To develop a register of pollution and waste releases and transfers from point of generation and diffuse sources.

- To develop a register for all waste handlers.

2.3.2.7 Goal 7: International Cooperation

"To develop mechanisms to deal effectively and in the national interest with international issues affecting pollution and waste."

Objectives

- To cooperate internationally on common pollution and waste management concerns, giving priority to the Southern African region.

A National Waste Management Strategy (NWMS), which forms the basis for translating the goals and objectives of the policy into practice, has been developed, together with short-term (five-year) priority Action Plans for the following key elements of the strategy:

- Integrated Waste Management Planning
- Waste information systems
- General waste collection
- Waste recycling and minimisation
- Waste treatment and disposal
- Capacity Building, Education, Awareness and Communication

While the Department of Environmental Affairs (DEA) is the lead agent for the environment, the Department of Water Affairs is the lead agent for water, responsible for managing water quality and quantity. The Department of Environmental Affairs provides leadership and guidance to enable other national departments, provincial environmental departments and municipalities to meet their executive obligation in respect of environment, including integrated pollution and waste management.

The responsibilities of the local government (Municipalities) are to provide waste management services and management of waste disposal facilities in line with the National Domestic Waste Collection Standards (2011).

Specific functions to be carried out by municipalities include:

- Compiling and implementing general waste management plans, with assistance from provincial government and other developmental agencies, where applicable;
- Implementing public awareness campaigns on the implementation of the IWMP;
- Collecting data for the Waste Information Systems;
- Providing general waste collection services and managing waste disposal facilities within their area of jurisdiction;

- Implementing and enforcing appropriate waste minimisation and recycling initiatives, such as promoting the development of voluntary partnership with industry;

- Education and awareness campaigns for communities on sorting waste at source, waste minimization (including the establishment of waste minimization clubs), recycling, and negative effects of illegal disposal of waste;

- Where possible, regional planning, establishment and management of landfill sites, especially for regionally based general waste landfills.

2.4 NATIONAL ACTS

2.4.1 National Environmental Management Act (NEMA), No. 107.1998

The National Environmental Management principles applicable to this study include the following:

2.4.1.1 Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.

2.4.1.2 Development must be socially, environmentally and economically sustainable.

2.4.1.3 Sustainable development requires the consideration of all relevant factors, including the following:

a. That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be altogether avoided, are minimised and remedied.

b. That pollution and degradation of the environment are avoided, or where they cannot be altogether avoided, are minimised and remedied.

c. That waste is avoided, or where it cannot be altogether avoided, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.

d. That the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied.

e. That the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resources.

f. That the development, use and exploitation of renewable resources and the ecosystems that they are part of do not exceed the level beyond which their integrity is jeopardised.

g. That a risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and

h. That negative impacts on the environment and the people's environmental rights are anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

2.4.1.4 Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental options.

2.4.1.5 Environmental justice must be pursued so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons.

2.4.1.6 Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being must be pursued and special measures may be taken to ensure access for categories of people who are disadvantaged by unfair discrimination.

2.4.1.7 Responsibility for the environmental health and safety consequences of a policy, programme, project, product, process, service or activity exists throughout its life cycle.

2.4.1.8 The participation of all interested and affected parties in environmental governance must be promoted and people must have the opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation. Participation by vulnerable and disadvantaged persons must be ensured.

2.4.1.9 Decisions must take into account the interest, needs and values of all interested and affected parties, and this includes recognizing all forms of knowledge, including traditional and ordinary knowledge.

2.4.1.10 Community well being and empowerment must be promoted through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and through other appropriate means.

2.4.1.11 The social, economic and environmental impacts of activities, including disadvantages and benefits must be considered, assessed and evaluated and decisions must be appropriate in the light of such consideration and assessments.

2.4.1.12 The right of workers to be informed of dangers and to refuse work that is harmful to human health or the environment must be respected and protected.

2.4.1.13 Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.

2.4.1.14 There must be inter-governmental co-ordination and harmonisation of policies, legislation and actions relating to environment.

2.4.1.15 Actual or potential conflicts of interest between organs of the state should be resolved through conflict resolution procedures.

2.4.1.16 Global and international responsibilities relating to the environment must be discharged in national interest.

2.4.1.17 The environment is held in public trust for the people. The beneficial use of environmental resources must serve the public interest and the environment must be protected as people's common heritage.

2.4.2 National Environmental Management: Protected Areas Act 57 of 2003 and Protected Areas Amendment Act 31 of 2004 regulations.

NEM: PAA stipulates the following requirements for the formulation of management plans and the management of protected areas:

2.4.2.1 Preparation of management plan

Section 39

1. The Minister or the MEC may make an assignment in terms of section 38(1) or (2) only with the concurrence of the prospective management authority.
2. The management authority assigned in terms of section 38(1) or (2) must, within 12 months of the assignment, submit a management plan for the protected area to the Minister or the MEC for approval.
3. When preparing a management plan for a protected area, the management authority concerned must consult municipalities, other organs of state, local communities and other affected parties which have an interest in the area.
4. A management plan must take into account any applicable aspects of the integrated development plan of the municipality in which the protected area is situated.

2.4.2.2 Management plan

Section 41

1. The object of a management plan is to ensure the protection, conservation and management of the protected area concerned in a manner which is consistent with the objectives of this Act and for the purpose it was declared.
2. A management plan must contain at least –
   a. the terms and conditions of any applicable biodiversity management plan;
   b. a co-ordinated policy framework;
   c. such planning measures, controls and performance criteria as may be prescribed;
   d. a programme for the implementation of the plan and its costing;
   e. procedures for public participation, including participation by the owner (if applicable), any local community or other interested party;
   f. where appropriate, the implementation of community-based natural resource management; and

g. a zoning of the area indicating what activities may take place in different sections of the area, and the conservation objectives of those sections.

3. A management plan may also contain-
   a. development of economic opportunities within and adjacent to the protected area in terms of the integrated development plan framework;
   b. development of local management capacity and knowledge exchange;
   c. financial and other support to ensure effective administration and implementation of the co-management agreement; and
   d. any other relevant matter.
4. Management plans may include subsidiary plans, and the Minister or MEC may approve the management plan or any subsidiary plan in whole or in part.

2.4.2.3 Co-management of protected area

Section 42

1. *(a)* The management authority may enter into an agreement with another organs of state, a local community, an individual or other party for-
   - the co-management of the area by the parties; or
   - the regulation of human activities that affect the environment in the area.

   *(b)*The co-management contemplated in paragraph *(a)* may not lead to fragmentation or duplication of management functions.

2. A co-management agreement may provide for-

   (a) the delegation of powers by the management authority to the other party to the agreement;

   (b) the apportionment of any income generated from the management of the protected area or any other form of benefit sharing between the parties;

   (c) the use of biological resources in the area;

   (d) access to the area;

   (e) occupation of the protected area or portions thereof;

   (f) development of economic opportunities within and adjacent to the protected area;

(g) development of local management capacity and knowledge exchange;

(h) financial and other support to ensure effective administration and implementation of the co- management agreement; and

(i) any other relevant matter.

3. A co-management agreement must-

(a) provide for the harmonisation and integration of the management of cultural heritage resources in the protected area by the management authority; and

(b) be consistent with the other provisions of this Act.

4. The Minister or the MEC, as the case may be, may cancel a co-management agreement after giving reasonable notice to the parties if the agreement is not effective or is inhibiting the attainment of any of the management objectives of the protected area.

5. Where the Minister or MEC in terms of subsection (4) cancels a co-management agreement forming a material term of an agreement contemplated in section 23(3) or 28(3), the withdrawal of the declaration of the protected area or exclusion contemplated in section 24(2) or 29, respectively, apply.

2.4.3 National Environmental Management: Biodiversity Act 10 of 2004 and regulations.

This Act has specific provisions relating to WHS and other protected areas and need to be adhered to. It provides for the development of Biodiversity Management Plans. Therefore, harmonization of management plans should be undertaken to align various planning instruments. For example, the Local Government develop IDP and SDF which should be aligned with the IMP and provision made for the protection of the area surrounding the WHS and the larger area of the impact structure should be zoned as a conservation area.

The plan should ensure that no activities such as mining, conventional residential development, industrial development and similar activities which can have a negative impact on the larger structure of the WHS should be allowed.

2.4.3.1 Biodiversity Management Plans

Section 43

1. Any person, organization or organ of state desiring to contribute to biodiversity management may submit to the Minister for his or her approval a draft management plan for-

   (a) an ecosystem-

      (i) listed in terms of section 52; or

      (ii) which is not listed in terms of section 52 but which does warrant special conservation attention

   (b) an indigenous species-

      (i) listed in terms of section 56 or 44 No. 26436 Government Gazette, 7 June 2004 Act No. 10, 2004 National Environmental Management: Biodiversity Act, 2004.

      (ii) which is not listed in terms of section 56 but which does warrant special attention

   (c) a migratory species to give effect to the Republic's obligations in terms of a conservation attention; or international agreement binding on the Republic.

2. Before approving a draft biodiversity management plan, the Minister must identify a suitable person, organization or organ of state which is willing to be responsible for the implementation of the plan.
3. The Minister must-

   (a) publish by notice in the Government Gazette a biodiversity management plan approved,

   (b) determine the manner of implementation of the plan; and

   (c) assign responsibility for the implementation of the plan to the person in terms of subsection (1); organisation or organ of state identified in terms of subsection (2).

2.4.4 National Water Act 1998, (Act 36 of 1998)

The National Water Act 1998 or NWA (Act No. 36 of 1998) was put in place to regulate the use of water resources. The NWA is a companion act to NEMA and dovetails with the principles contained within NEMA. As with NEMA, the NWA gives effect to Section 24 and 27 of the Constitution, which guarantees the right to all people of healthy and safe environment, but with particular emphasis on water usage and protection.

Furthermore, the NWA identifies 11 consumptive and non-consumptive water uses, which must be authorized under a tiered authorization system, which include Scheduled uses, General Authorization, or Licenses. Non-consumptive uses include waste disposal.

In particular, Section 21(g) of the Act requires licensing where waste is disposed "in a manner which may detrimentally impact on water resources". A disposal site requires permitting in terms of the NEM: Waste Act, administered by the Department of Environmental Affairs.

2.4.5 Development Facilitation Act, 1995

The Development Facilitation Act (DFA) was passed to achieve three key objectives:

1. To provide a coherent policy framework for land development, land registration and land planning in South Africa according to certain general principles;

2. To expedite and facilitate approval of land development applications; and

3. To overhaul the existing planning and land development framework in South Africa.

The DFA provides for the formulation of "land development objectives" for all local authority structures throughout South Africa with a view to integrated planning at local government level, setting goals and priorities in respect of service delivery and development projects, realigning resources (both human and financial) to adequately deal with such priorities and develop a spatial framework to illustrate the policies and project guidelines of the local authority for the future.

The DFA creates the framework within which a registered owner of land may approach the provincial authorities for permission to use land for a pre-identified development purpose, generally in line with the Land Development Objectives set for the relevant area. In general, the DFA provides that no authority may approve an application for land development that is deemed

to be inconsistent with the provisions of the statutory Land Development Objectives applicable to such area.

2.4.6 LOCAL GOVERNMENT LEGISLATION

2.4.6.1 The Municipal System Act, 2000 (Act 32 of 2000)

All municipalities must draft integrated development plans (IDP's) in terms of the Municipal System Act, 2000. An IDP is a comprehensive strategic plan for the development of the municipality and includes a strategic assessment of the environmental impact of the spatial development framework of the municipality. The resultant integrated environmental programme must be aligned and in accordance with provincial and national plans, policies and strategies.

The Waste Act articulates that the Integrated Waste Management Plans must be included in the IDP document.

2.4.7 NATIONAL REGULATIONS

2.4.7.1 The EIA Regulations

One of the objectives of the ECA is to control activities that are likely to have a detrimental effect on the environment. In order to provide for thorough and uniform control of the environmental impacts of development projects, legislation for compulsory Environmental Impact Assessment (EIA) was published in terms of section 21, 22, and 26 of the Environment Conservation Act (the EIA Regulation).

The EIA regulations have, *inter alia*, the following objectives:

- To ensure that the environmental effects of activities are taken into consideration before decisions in this regard are taken.
- To promote sustainable development, thereby achieving and maintaining an environment that is not harmful to people's health or well-being.
- To ensure that social and economic interests are taken into account before an activity is authorised.

- To regulate the process and reports required to enable the Minister or the designated competent authority to make informed decision on the activities.

Any waste disposal site to be permitted under the NEM: Waste Act as requiring an environmental impact assessment. The responsibility for administration of requirements for EIA is delegated to provincial departments.

2.4.8 NATIONAL GUIDELINES

2.4.8.1 GUIDELINES FOR INTEGRATED WASTE MANAGEMENT PLANS

Integrated Waste Management Planning is a basic requirement for all waste management activities in terms of the National Waste Management Strategy (NWMS). Recently it has been obligated by the NEM: Waste Act (2008) and is the cornerstone of all waste management activities.

a. **Objectives**

These guidelines are aimed at assisting waste management officials in all spheres of government to perform their planning duties and to compile comprehensive Integrated Waste Management Plans (IWMP). Following the promulgation of the Municipal Systems Act, No 32 of 2000, all municipal officials are obliged to participate in performance assessment; and the compilation of well defined and comprehensive IWMPs will provide a sound base for the assessment of the performance of the waste section.

The guidelines have been written to follow the waste handling process in accordance with the waste hierarchy. Manipulation of the waste hierarchy to incorporate specific South African conditions is addressed. This implies that waste management officials should include all aspects of the waste hierarchy in their planning efforts. These guidelines provide a background for the compilation of IWMP.

b. Minimum Requirements for Waste Disposal by Landfill – DWAF: Second Edition 1998

The *Minimum Requirements for Waste Disposal by Landfill* forms part of the Department of Water Affairs and Forestry's Waste Management Series. This series establishes a reference framework of standards for waste management in South Africa.

The objective of setting Minimum Requirements is to take pro-active steps to prevent the degradation of water quality and environment, and to improve the standard of waste disposal in South Africa. To ensure practical and affordable environmental protection, graded requirements are applied to different classes of landfill. The landfill class is determined from the waste type, size of operation, and potential for leachate generation.

There is an important relationship between all aspects of the landfill development process. Good landfill site selection provides for simple cost-effective design, which, provided the site preparation is correctly carried out, provides for good landfill operation. This in turn ensures the environmental acceptability of the landfill. Environmental acceptability, in its turn, often relates directly to public acceptability. Minimum requirements are therefore set for all technical aspects of landfill development, operations and closure. They are also set for involving Interested and Affected Parties (IAPs) in determining site feasibility and end user requirements.

The Permit Holder is primarily and ultimately accountable for the landfill and any effects it may have on the receiving environment. However, the Permit Holder may appoint a Responsible Person, for example, a consultant or operator, to ensure that the appropriate Minimum Requirements are applied throughout the development, operation and closure of the landfill.

2.4.9 OTHER GUIDELINES

2.4.9.1 The White Paper on Municipal Services Partnerships (MSPs)

According to the Constitution, the executive and legislative authority of a municipality is vested in its municipal council. The Constitution gives municipal councils the obligation to ensure that municipal services are delivered to its municipality in a sustainable way. This is a daunting challenge, as the demand for basic services continues to outpace available government finances.

The White Paper on Local Government recommends that municipalities look for innovative ways of providing and accelerating the delivery of municipal services. The Municipal Services Partnership (MSP) Policy aims to provide clear framework within which to leverage and marshal the resources of public institutions, CBOs, NGOs and the private sector towards meeting the country's overall development objectives. The MSP Policy is derived from the principles of *Batho Pele* (People First). It actively promotes the ethos of participation by consumers and other stakeholders throughout the process of determining and implementing service delivery options. The MSP Policy also endorses universal access to basic services, the progressive

improvement in service standards, and openness and transparency in the processes used for selecting service providers.

2.4.9.2 Objectives of the MSP Policy

a. The objective of the MSP Policy is to ensure that MSPs are applied in a manner that supports the Constitutional obligation of the municipalities and the Constitutional rights of communities.

b. The MSP Policy creates a more conducive environment for MSPs arrangements by addressing the gaps and constrains that presently limit the use of MSPs. This will make MSPs viable and functional services delivery options and will thereby help municipalities to plan, finance and accelerate the delivery of municipal services.

c. Municipalities will also be assisted in establishing systems to monitor the performance of service providers to ensure that they perform according to expectations and report on this to their communities.

d. The MSP Policy supports and encourages better information flows, value for money, avenues for citizen's redress and, importantly, courtesy in service delivery.

2.4.9.3 Typical MSP arrangements

2.4.9.3.1 ***Service contract*****:** The service provider receives a fee from the council to manage a particular aspect of a municipal service. Service contracts are usually short-term (one to three years). Examples include repair and maintenance or billing and collection functions. Evidence suggests that this type of arrangement is a starting point for involving CBOs and NGOs in municipal services provision with the other arrangements being considered as capacity and experience are developed over time.

2.4.9.3.2 ***Management contract*****:** The service provider is responsible for the overall management of all aspects of a municipal service, but without the responsibility to finance the operating, maintenance, repair, or capital costs of the service. Management contracts are typically for three to five years. Management contracts typically specify the payment of a fixed fee plus a variable component which is payable when the contractor meets or exceeds specified performance targets. The service provider normally does not assume the risk for collecting tariffs from residents; however, high collection rates could be a trigger for incentive payments to the service provider.

2.4.9.3.3 ***Lease*****:** The service provider is responsible for the overall management of all aspects of a municipal service, and the council's operating assets are leased to the service provider. The service provider is responsible for operating, maintenance and repairing of those assets. In some cases, the service provider may be responsible for collecting tariffs from resident and assume the related collection risk. The service provider pays the council rent for the facilities, which may include a component that varies with revenues. Generally, the service provider is not responsible for new capital investments or for replacement of leased assets. Leases are typically eight to fifteen years.

2.4.9.3.4 ***Build/Operate/Transfer (BOT)*****:** The service provider undertakes to design, build, manage, operate, maintain and repair, at its own expense, a facility to be used for delivery of a municipal service. The council becomes the owner of the facility at the end of the contract. BOTs may be used to develop new facilities, or expand existing ones. A BOT typically requires the council to pay the service provider a fee (which may include performance incentive) for the services provided, leaving responsibility for tariff collection with the council.

2.4.9.3.5 ***Concession:*** The service provider undertakes the management, operating, repair, maintenance, replacement, design, construction, and financing of a municipal service facility or system. The service provider often assumes responsibility for managing, operating, repairing and maintenance of related existing facilities. The service provider collects and retains all service tariffs, assumes the collection risk, and pays the council a concession fee (sometimes includes a component that varies with revenue). The municipality still remains the owner of any existing facility operated by the concessionaire, and the ownership of any new facility constructed by the concessionaire is transferred to the municipality at the end of the concession period.

2.4.9.4 Objectives of the Municipal Service Partnerships

2.4.9.4.1 If they are well structured and properly implemented, MSP arrangements can lead to significant improvements in the efficiency of service delivery i.e. significantly more services can be delivered while still remaining within the council's overall budget limits.

2.4.9.4.2 MSPs permit municipal councils to reduce their expenses for equipment rentals, lease costs, initial purchase costs and technology licensing arrangements.

2.4.9.4.3 Over time, municipalities can save on the capital costs of infrastructure expansion and technology upgrades.

2.4.9.4.4 By linking the provision of municipal services to a definitive contractual arrangement, municipal councils are also able to know their cost in advance and therefore are in a better position to prepare their budgets and plans.

2.4.9.4.5 By requiring a number of potential service providers to bid for the provision of municipal services, municipal councils can gain from the benefits of competition.

CHAPTER 3

STATUS QUO ANALYSIS

1. INTRODUCTION

Xhariep District is the area covering three local municipality areas, namely, Kopanong, Mohokare and Letsemeng expanding over a total area of 34,131.55km^2. The head office of Xhariep District Municipality is situated in Trompsburg next to the N1. Amongst the Districts in the Free State it is the smallest in population numbers. The dwindling numbers could also be attributed to the movement of communities towards areas which promises job opportunities. This district is situated on the south end of the Free State province and its boundaries are Lejweleputswa District Municipality, Motheo District Municipality, Northern Cape, Eastern Cape and Lesotho.

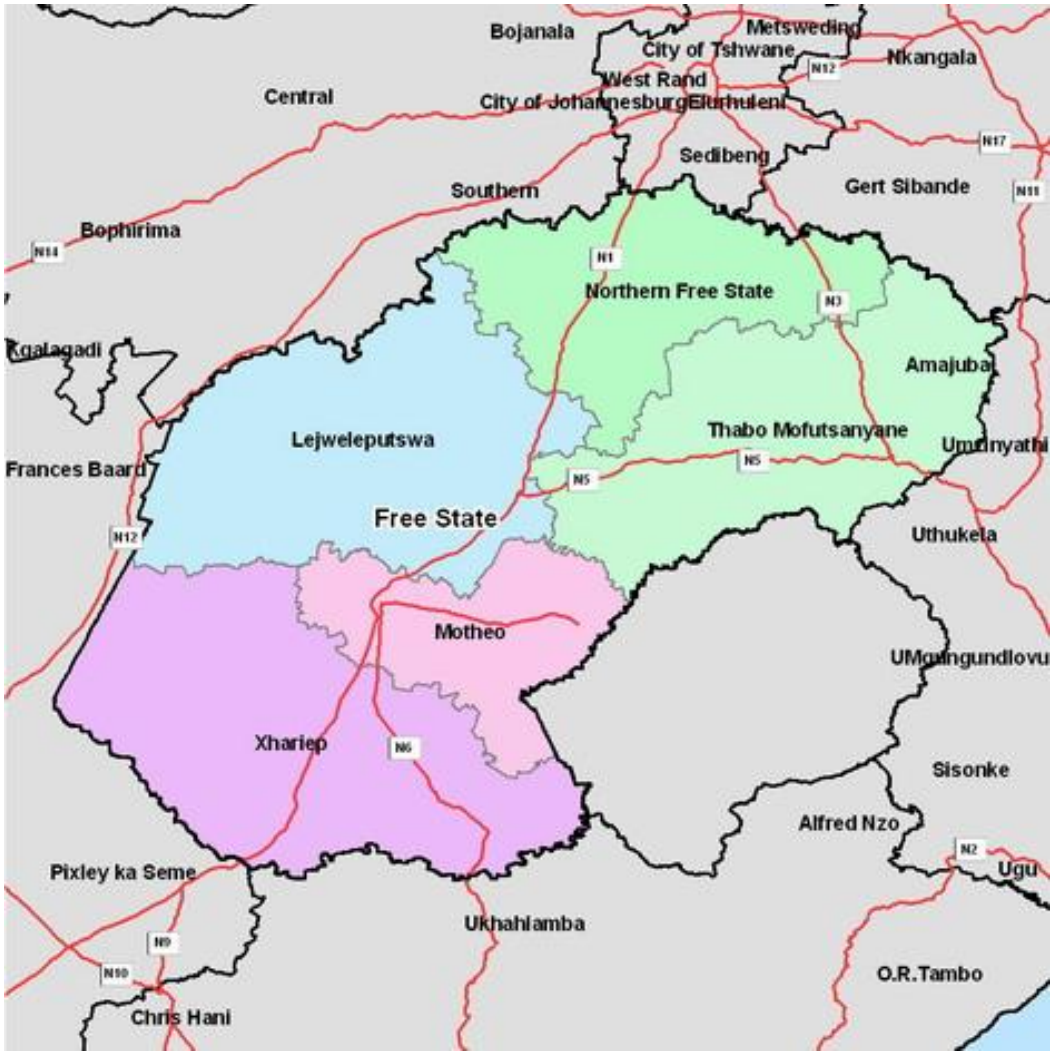


Fig 3.1: Map of Free State Province showing district boundaries

The economic driver of Xhariep District Municipality, as per the Gross Domestic Product released by Free State government, is Agriculture followed by government (see table 3.1). The community of Xhariep District Municipality ventures beyond the borders of the district for most of the commercial and economic issues.

Table 3.1: Sectoral Contribution to Gross Domestic Product in Xhariep District Municipality

GGP Sector	**Amount in Millions of Rands**
Agriculture	212 383.00
Mining and quarrying	37 572.25
Manufacturing	2 517.15
Electricity, gas and water supply	9 316.00
Construction	952.05
Wholesale and retail trade	74 369.45
Transport,	38 891.00
Financial services, insurance, real estate and business services	91 998.90
Community	6 433.55
General Government	95 597.35
Other industries	21 526.05

Source: www.fs.gov.za

The purpose of developing IWMP for Xhariep District Municipality is to establish coherent and integrated waste management strategies and implementation plans consistent with the needs and future developments in the area. This plan will assist the municipality in optimising on resources and establishing a sustainable, informative and efficiently managed operation in managing waste. The IWMP will direct the municipalities to develop appropriate waste management systems and build management capacity in order to maximize efficiency in waste management, minimize environmental impacts and associated financial costs. The implementation of the plan will lead to healthier and cleaner environment that is able to sustain an improved quality of life for all.

The local municipality IWMP will be used as a tool to implement the waste hierarchy objectives, namely, the following:

- To implement waste avoidance and prevention strategies;
- Recover waste of which generation cannot be avoided; and
- Practice safe disposal of waste that cannot be recovered.

The local municipalities that constitute Xhariep District are Kopanong, Mohokare and Letsemeng. These local municipalities and associated towns are listed below (Table 3.2). The IWMP sets targets for waste minimization and milestones to be achieved. It also sets out the review and subsequent reporting process as articulated in the NEM: Waste Act. The IWMP of Xhariep District Municipality will be submitted to the DETEA for approval and will be incorporated into the IDP of the district as a sector plan.

Table 3.2: Local Municipalities of Xhariep District

LOCAL MUNICIPALITY	ASSOCIATED TOWNS
Kopanong	Reddersburg, Trompsburg, Bethulie, Springfontein, Jagersfontein, Edenburg, Fauresmith and Philippolis and Gariep Dam
Mohokare	Smithfield, Zastron and Rouxville
Letsemeng	Petrusburg, Jacobsdal, Koffiefontein, Oppermansdorp and Luckhoff

3.1 Geographical Area

Xhariep District Municipality (DC 16) is positioned on the South end of the Free State Province. The total geographical area of DC 16 is 34131.55km^2 which is relatively rural with some mining activity. It shares borders with Motheo District Municipality, and the provinces of Northern Cape and Eastern Cape and Lesotho (Fig. 3.2). The border between Xhariep District and the provinces of Northern and Eastern Cape is a two thousand (2 000) km stretch of the Orange River. This section of the Orange River hosts South Africa's two hydro-electric power stations at the Gariep and Vanderkloof dams.

Fig. 3.2: Xhariep District map

Source: State of the Environment Report(2008)

3.2 Topography

Topography is intrinsically linked to all aspects of land use planning such as demarcations for residential use, industrial use, including location of landfill sites and establishment of collection routes. The study area includes all 3 local municipalities under Xhariep District Municipality and all associated towns and villages. Generally, each municipality comprises of several towns which straddle both urban and rural landscapes.

3.3 Socio-economic Environment

The management of general waste is the competency of the local municipality. This is one of the services that are not easy to charge for, and municipalities generally experience difficulties of cost recovery in executing this responsibility. The match between the financial strength of the municipality and the income levels of its communities is necessary to understand the feasibility of providing the service. This situation should be understood on the background that municipalities primarily rely on residential and commercial communities for cash generation.

It is generally accepted that, though not scientifically proven, the less commercialised municipalities will invariably be poorer and less resourced including inability to attract human capital. Notwithstanding, the government established a number of programmes and systems which the poorer municipalities can leverage for financial sustainability of developmental programmes in their areas.

3.4 Commercial Environment

The commercial activity in Xhariep District Municipality in the main is agriculture and mining.

a. ***Agriculture:*** This is the only district in the Free State whose export activity is dominated by the agricultural sector. The farm produce in this district include maize, potatoes, grapes and ground nuts. Live stock farming includes cattle, sheep and ostrich.

b. ***Mining:*** The diamond mining at Koffiefontein plays a major role in the economy of the area. Whilst the district has invested in various other commodities in manufacturing, products such beverages, apparel and glass dominate the export market. A variety of government schemes were used to develop industries such as pottery, arts and crafts. Industries such as spirulina production, leather tanning, essential oils production and cultivation of plants for medicinal use make significant contribution towards the economy.

3.4.1 Potential Economic Opportunities

The Xhariep district is classified as a 'low capacity area' in the National Development Spatial Programme. Hence this area should benefit from the National and Provincial economic development initiatives. Tremendous economic potential in tourism related activities is noted in the areas around the Gariep Dam. Evidently, the economic potential of the area is still to be realised with more strategic approaches towards development initiatives.

3.5 Social Environment

a. Residential

On average, fifty percent of the households in this district are fully paid off and this portion has shown a significant increase between the periods 2001 and 2007 (Table 3.3). This situation augurs well for high disposable income within the community which can boost the economy of this area. The houses rented also show some increase which could be attributed to inflow of people. The potential cause of this inflow is job opportunities.

The number of households, the layout of the residential area in terms of streets and access areas, directly impacts on the provision of various services to the residents. These numbers also impact on the levies or recoverable costs available to the municipality.

Table 3.3: Percentage distribution of households by tenure status and local municipality: Census 2001 and Census 2007

Municipality	Census 2001					Census 2007					
	Owned and fully paid off	Owned but not paid off yet	Rented	Occupied rent free	Total	Owned and fully paid off	Owned but not yet paid off	Rented	Owned rent free	Other	Total
FS 161 Letsemeng	33.6	15.1	13.1	38.1	100	52.2	12.7	13.5	21.3	0.3	100
FS 162 Kopanong	49.6	11.0	15.0	24.4	100	60.5	9.6	20.2	9.7	0.0	100
FS 163 Mohokare	44.7	8.8	13.2	33.8	100	47.3	2.4	18.4	31.6	0.0	100

Source: Community Survey, 2007 Basic Results: Municipalities

Housing is one of the basic human needs with a profound impact on the health, welfare, social attitudes and economic productivity of the individual. It is also one of the best indicators of a person's standard of living and of his or her place in society. This is a critical factor to be considered in formulating waste management strategies as this impact on the types and quantities of future waste.

The percentage of formal dwellings in Mohokare decreased significantly whilst there is a slight increase in both Kopanong and Letsemeng (Table 3.4). Also, the informal settlements in Mohokare increased tremendously whilst minor changes are noted in the other two municipalities. The increase in informal settlements in Mohokare could be related to the increase in population numbers, which could also mean increase in unemployment.

Table 3.4: Percentage of households living in formal and informal dwellings by municipality: Census 2001 and Census 2007

MUNICIPALITIES	Formal		Informal	
	Census 2001	Census 2007	Census 2001*	Census 2007
DC 16 : XHARIEP	**80,4**	**80,0**	**15,8**	**18,9**
FS161: Letsemeng Local Municipality	74,8	80,4	22,7	19,5
FS162: Kopanong Local Municipality	85,7	86,5	10,1	11,6
FS163: Mohokare Local Municipality	77,9	69,7	17,5	29,2

Source: Community Survey, 2007 Basic Results: Municipalities

a. Water and Sanitation

The total piped water for households has reduced slightly between year 2001 and 2007. During the same period the provision of piped water inside dwellings almost doubled through the district (Table

3.5). The difference could be indicative of the progress in providing water inside dwellings whilst there could be an increase in the number of new settlements which are not yet provided with water.

Table 3.5: Percentage of households having access to piped water by municipality: Census 2001 and Census 2007

Municipalities	Census 2001					Census 2007			
	Piped water inside dwelling	**Piped water inside yard**	**Piped (tap) water to community stand: distance < 200m from Dwelling**	**Piped (tap) water to community stand: distance > 200m from Dwelling**	**Total piped water**	**Piped water inside the dwelling**	**Piped water inside the yard**	**Piped water from access point outside the yard**	**Total piped water**
DC16:Xhariep	**24,3**	**56,4**	**9,0**	**7,1**	**96,7**	**48,5**	**35,3**	**8,6**	**92,5**
FS161:Letsemeng	30,9	44,9	11,6	7,4	94,7	52,2	24,7	12,1	89,0
FS162:Kopanong	23,9	60,7	6,6	6,3	97,5	64,6	21,2	8,5	94,3
FS163: Mohokare	16,5	63,0	10,3	8,2	97,9	20,0	68,8	4,7	93,5

Source: Community Survey, 2007 Basic Results: Municipalities

Consistent with the dynamics of the Free State province, a fairly high percentage of the community is still not provided with flushing toilets. Generally the number of households without toilets has reduced with a significant increase in bucket toilets (Table 3.6). This could be indicative of the economic profile of the district being dominated by lower side of the Living Standard Measures (LSM).

Table 3.6: Percentage of households using pit latrine, bucket and no toilet facility by municipality: Census 2001 and Census 2007

Municipalities	Pit Latrine		Bucket Toilet		No toilet	
	CS 2001	CS 2007	CS 2001	CS 2007	CS 2001	CS 2007
DC16: Xhariep	**10,6**	**11,3**	**7,6**	**10,6**	**16,0**	**6,9**
FS161: Letsemeng	11,3	25,3	6,1	1,5	20,5	4,1
FS162: Kopanong	8,7	5,0	6,5	9,4	12,0	5,8
FS163: Mohokare	13,0	4,9	11,6	22,5	17,8	11,7

Source: Community Survey, 2007 Basic Results: Municipalities

b. Health

Provision of health services is a basic human right entrenched within our constitution in South Africa. The provision of these services is the competency of both the province and the municipalities. The health care structures available in the Xhariep district are hospitals, clinics (including mobile units) and Primary Health Care centres (Table 3.7). The types and numbers of health care facilities directly influences the types and amounts of medical waste generated.

Table 3.7: Medical Facilities per Local Municipality

FS161 LETSEMENG LOCAL MUNICIPALITY	FS162 KOPANONG LOCAL MUNICIPALITY	FS163 MOHOKARE LOCAL MUNICIPALITY
Jacobsdal Clinic	Jagersfontein Clinic	Smithfield PHC Mobile
Petrusburg clinic	Verwoerddam PHC Mobile	Smithfield Clinic Riet
Petrusburg Clinic Bola	Trompsburg PHC Mobile	Smithfield Clinic Mofu
Koffiefontein opperman	Fauresmith Clinic	Rouxville Clinic Rolea
Koffiefontein Clinic D	Edenburg Clinic Ha-Ras	Smithfield Hospital
Koffiefontein Clinic	Edenburg Clinic	Zastron PHC Mobile
Jacobsdal Clinic Rata	Springfontein Clinic	Zastron Clinic
Jacobsdal PHC Mobile	Springfontein Clinic	Rouxville clinic
Koffiefontein PHC Mobile	Edenburg Clinic	Smithfield Clinic
Luckoff PHC Mobile	Reddersburg Clinic	Zastron Hospital
Petrusburg PHC Mobile	Fauresmith PHC Mobile	Zastron PHC Boesmanskop
Luckoff Clinic	Bethulie PHC Mobile	Zastron Hospital Matla
Jacobsdal Clinic	Springfontein PHC Mobile	
	Jagersfontein Clinic	
	Trompsburg Clinic	
	Edenburg PHC Mobile	
	Philippolis PHC Mobile	
	Philippolis Clinic	
	Bethulie Clinic Cloete	
	Jagersfontein Hospital	
	Bethulie Clinic	

Source: Statistics South Africa (2001)

3.6 Demographics

3.6.1 *Population and Growth Estimates*

The Census reports show a decline in the total population numbers of Xhariep District Municipality [Fig 3.3]. Mohokare local municipality is the only municipality with increasing population numbers.

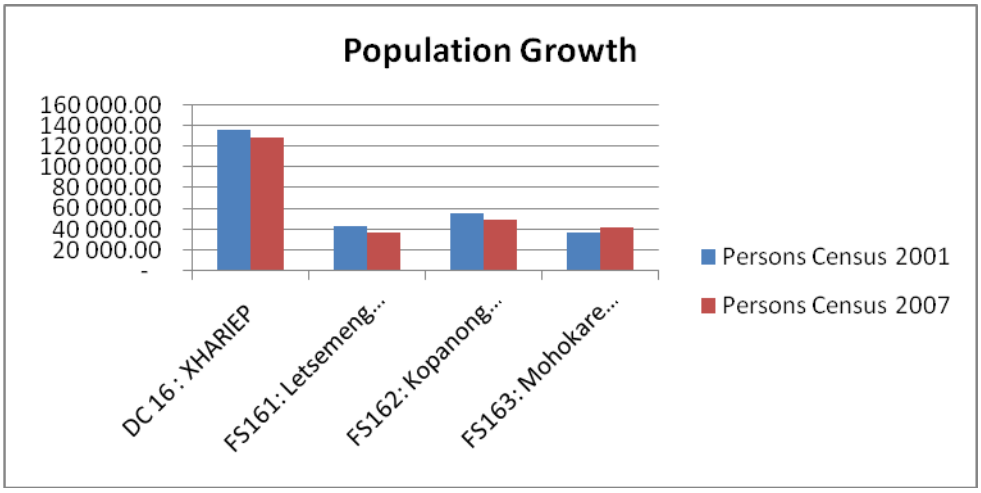


Fig 3.3: **Data Source**: Community Survey, 2007 Basic Results: Municipalities

The population growth trends are also consistent with growth in households [Fig 3.4]. The question is whether the Xhariep district economic developments as currently prevailing will effect a continued and sustained decline or an increase in population numbers? Considering the general international and South African trends of population increases, it is prudent to assume that the population of Xhariep District Municipality will increase. The assumed increase could be actualised by the increased national and provincial development initiatives which will increase retention and attraction of populations to areas such as Xhariep.

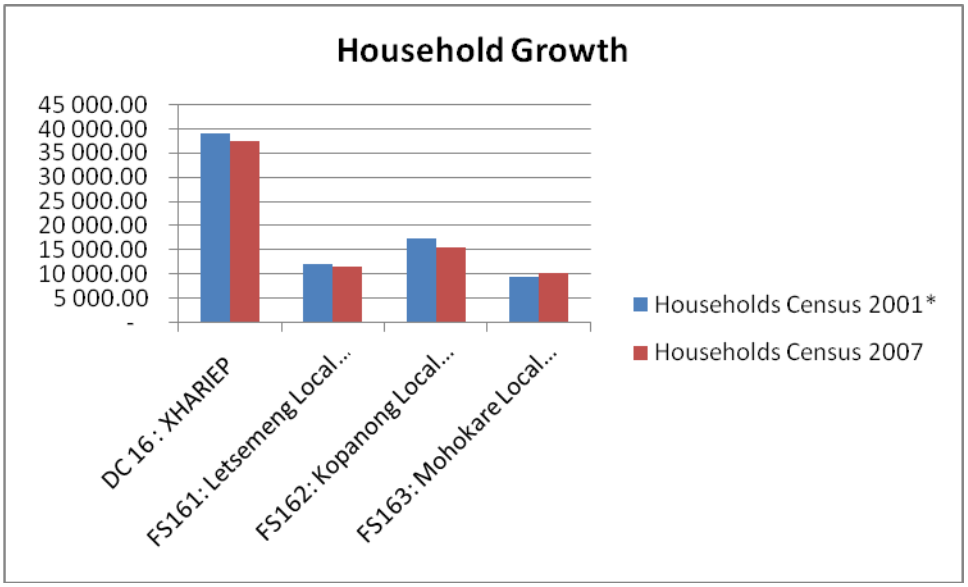


Fig 3.4 **Data Source**: Community Survey, 2007 Basic Results: Municipalities

3.6.2 *Socio-economic Factors, Income, Education and Age*

Xhariep district is relatively rural and non-industrialised. The economic opportunities are mainly within the tourism sector enhanced by the Xhariep Dam. The National Development Spatial Programme classified Xhariep district as a 'low capacity area', thus this area is well positioned to benefit from National and Provincial economic development initiatives.

The commercial activity of the area is intrinsically linked to the education level of the community. Industrialised economies generally boasts of the majority of highly skilled and/or educated workers, whilst economies such as agriculture and mining are generally dominated by low skills, illiterate to low level education.

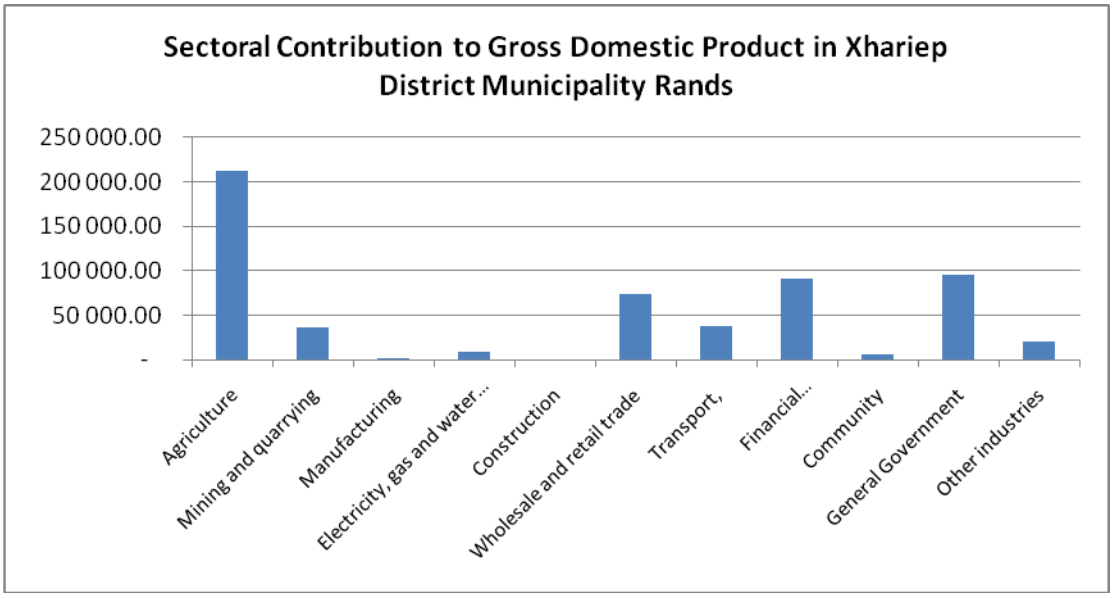


Fig 3.5: Data Source: www.fs.gov.za

The main economic driver in Xhariep District Municipality is the agricultural sector followed by government and the financial sector. The agricultural sector is traditionally a big employer offering relatively meagre salaries. This situation could explain the earning trends prevailing in the Xhariep district whereby the majority of the employed earns below R 9,600.00 per annum [Fig 3.6].

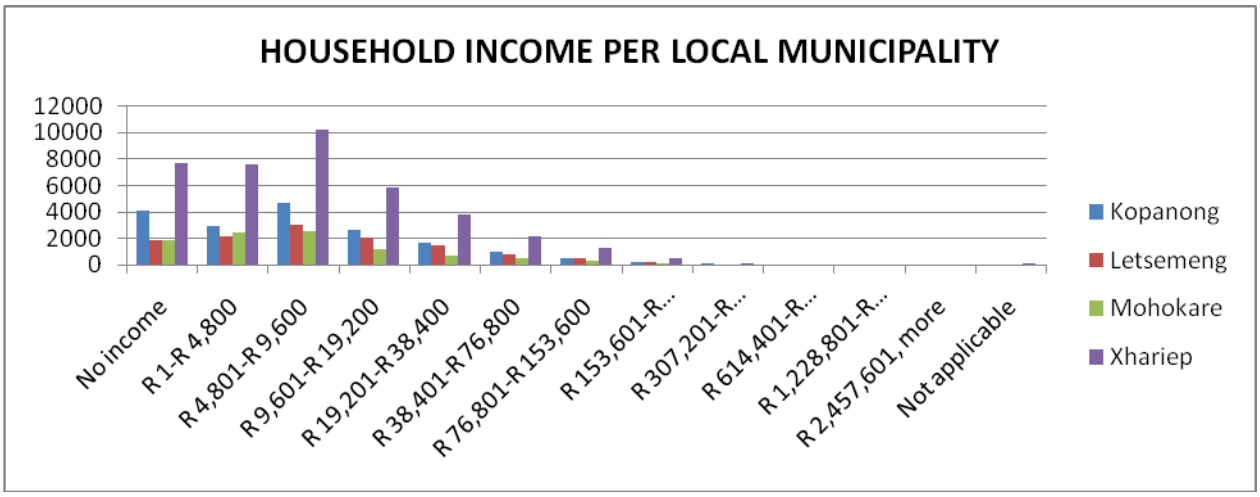


Fig 3.6: Data Source: StatsSA (2001)

The income profile of Xhariep District Municipality is dominated by people earning between R 4,801.00 and R 9,600.00 and below. The main contributor to this income is Kopanong Local Municipality. Generally, Kopanong Local Municipality contributes more of the income earners in all categories, followed by Letsemeng then Mohokare. The income of households is a critical factor in determining the lifestyles of the population, which will also determine the type and amount of waste generated by the population. The higher the income, the more formalised the dwellings will be, the more inorganic waste is expected.

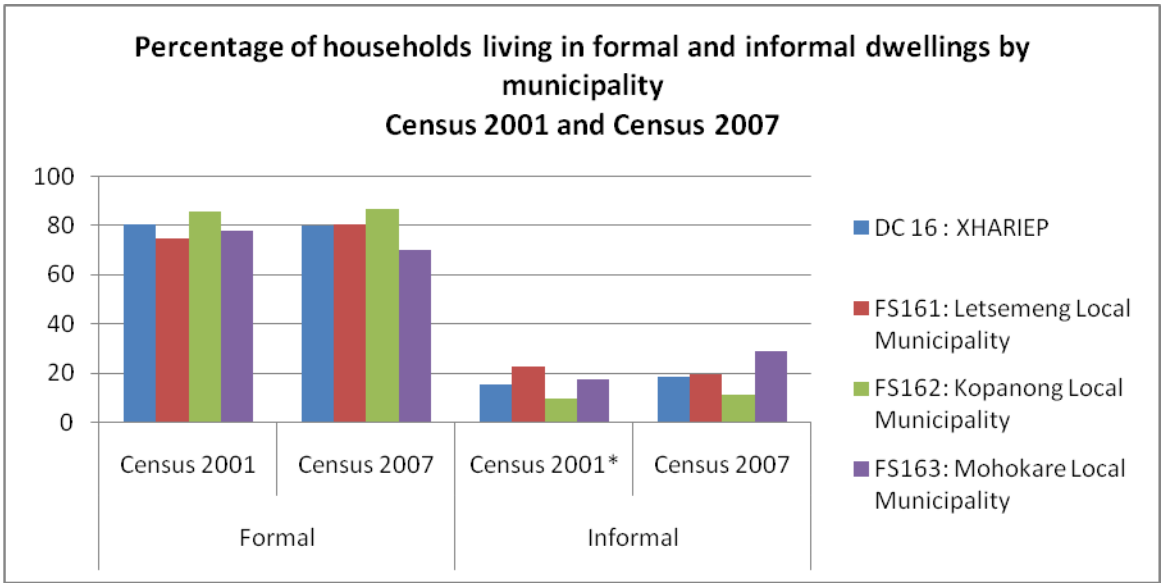


Fig 3.7 **Data Source**: Community Survey, 2007 Basic Results: Municipalities

Consistent with the income profiles of the local municipalities, Kopanong and Letsemeng local municipalities show slight increases in formal dwellings with slight decreases in informal dwellings. Mohokare local municipality show significant decreases in informal dwellings as well as significant increases in informal dwellings.

3.6.3 *Waste Management*

The data regarding the type of waste, its amounts and disposal methods, is not available in municipality documents. The officials confirmed that there is no system or process to capture the required data. This situation is mainly due to lack of efficient management of waste within the district. At the most, the municipalities have information about the facilities they avail for the communities in terms of collection and disposal. Most of the information provided is estimates and

assumptions some of which are agreeably inaccurate. To enable planning we therefore apply some of the scientific strategies to guide and make projections which will have to be reviewed consistently as validated data or information becomes available.

3.6.4 *Waste Generation*

The generation of waste is scientifically estimated to be between 0,2 and 0,7 kg per capita per day. The waste generation is generally lower within the indigent population and higher within an affluent population. The community of the district of Xhariep is more on the lower income scales hence their waste generation rate would presumably be on the lower side of the scale. An average of 0,5 kg per capita per day is used for the Xhariep District Municipality.

MUNICIPALITIES	Population numbers	Waste Generation Rate
	Census 2007	kg per capita per day
DC 16 : XHARIEP	127 627.00	63 813.50
FS161: Letsemeng Local Municipality	36 337.00	18 168.50
FS162: Kopanong Local Municipality	49 422.00	24 711.00
FS163: Mohokare Local Municipality	41 867.00	20 933.50

Fig 3.8 : **Source**: Community Survey, 2007 Basic Results: Municipalities

These estimates are to be used as reference for projections to years 2012 and 2015.

3.6.5 Waste Collection and Removal Strategies

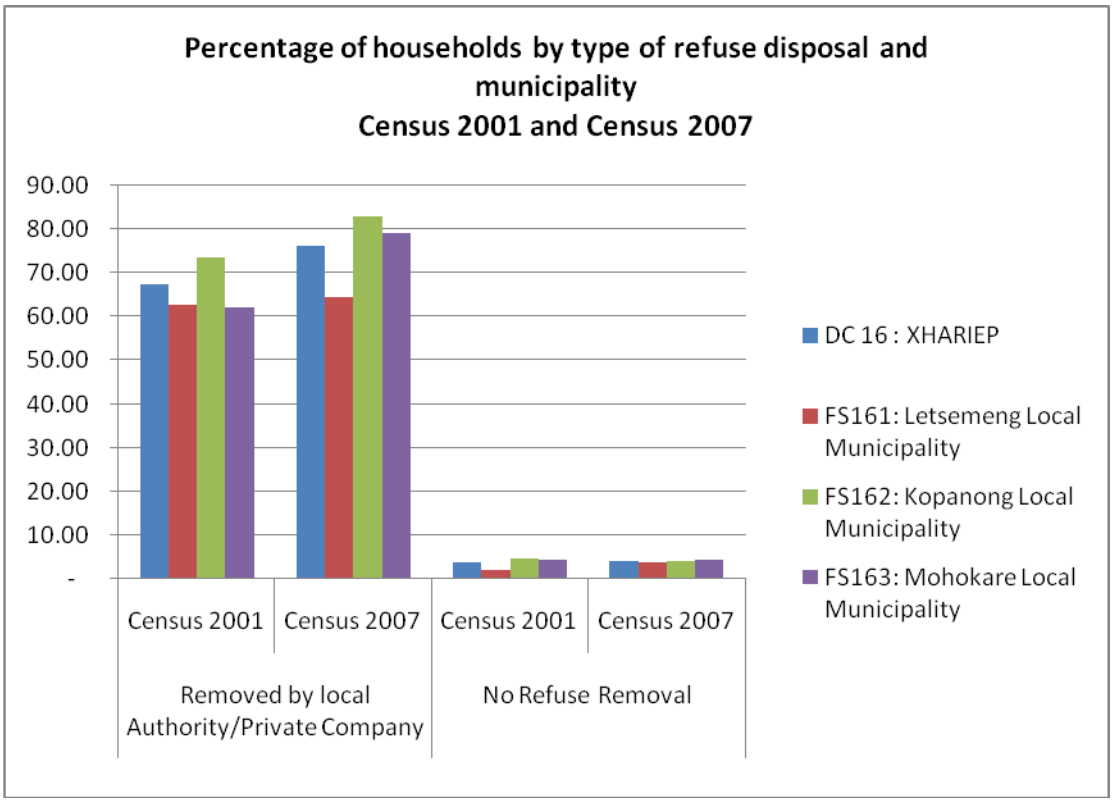


Fig 3.9: **Data Source**: Community Survey, 2007 Basic Results: Municipalities

The officials of all local municipalities assert that waste removal services are provided for all communities. To the contrary, according to Census 2007, whilst the removal of waste by either the local municipality or private company increased significantly since Census 2001, there are still communities not receiving waste removal services [Fig 3.9]. This discrepancy could be imputed to waste removal as per Community Survey meaning door-to-door services, whilst municipality officials refer to removal of waste from the areas where it could be found, and not necessarily provision of door-to-door services. In Letsemeng there is increase in the number of areas not receiving waste removal services since Census 2001.

3.6.6 Waste recycling strategies

Recycling of waste is not practised in the Xhariep district. In Letsemeng local municipality there are 2 private individuals involved in recycling activities. In Kopanong local municipality there is currently a group of community members interested in the recycling process, and efforts are explored to provide training.

3.6.7 Waste disposal strategies and facilities

The communities dispose waste in a variety of ways which the municipality may not necessarily have the intelligence to detect. A fair proportion of the community own dump sites. These dump sites are a major concern for the local municipalities. The municipality has no knowledge or information about the waste disposed in these dumping sites, and whether the disposal sites could be in areas whereby the ecosystem is not affected. However, it is commendable that a significant percentage of the community receives waste removal services at least once a week [Fig. 3.10].

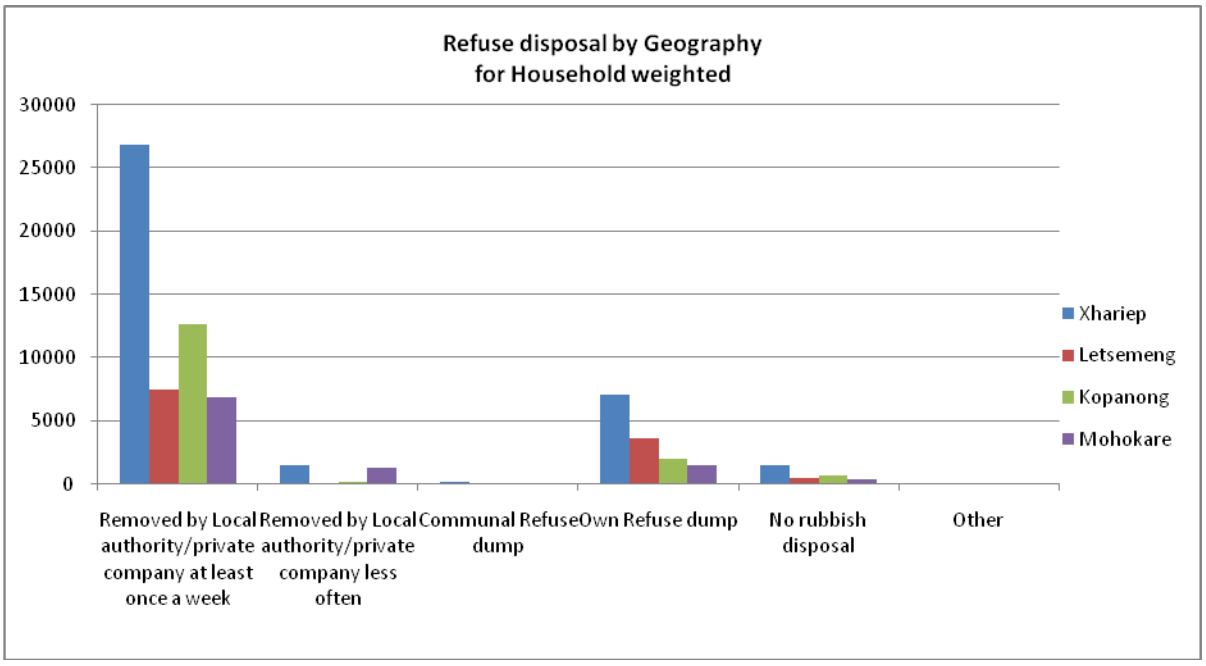


Fig. 3.10 : **Data Source**: Community Survey, 2007 Basic Results: Municipalities

3.6.8 Management of Hazardous Waste

Management of Hazardous waste is the competency of the province. The officials in Xhariep District Municipality have no information about how hazardous waste is managed within the district.

3.6.9 Healthcare Waste

The management of healthcare waste, particularly from the healthcare centres, is outsourced to EnviroServe. This company has disposal facilities located on a landfill site in Bloemfontein. The healthcare waste from other sources such private doctors and mortuaries cannot be accounted for.

3.6.10 Mining Waste

The De Beers mine in Letsemeng Local Municipality has its own landfill site. Apparently there is no information exchange between the mine and the local municipality regarding the overall management of the waste generated by the mine. The general assumption is that the mine adheres to the guidelines provided in its licence.

3.6.11 Agricultural Waste

No local municipality provides any special services to the farming areas. The farmers generally dispose of their waste on their own.

3.6.12 Household Hazardous Waste

The households put all waste together irrespective of its type. The fate of the waste is dependent on the disposal method available to the household. Despite some households not receiving collection of waste regularly, most of the waste is taken to the landfill sites.

3.6.13 Commercial and Industrial Waste

The general tendency is to mix all waste together. Some waste is collected by the waste collectors whilst some may be dropped off at the landfill site. Considering that the economic activity within Xhariep District Municipality is less industrialised, the amount of waste from this sector is very minimal.

3.7 Management, Operations and Systems for Waste Management

In general, the competencies of waste management in the municipalities are entrusted in either the community services or technical divisions of the institution. The provision of Waste Management Services is a cost that municipalities should budget for. The main cost is the capital expenditure then human capital.

3.7.1 Xhariep District Municipality

The Local Economic Development department of the district recently appointed an official to focus amongst other responsibilities on Waste Management. This official is well qualified to deal with waste related issues and should do well with more experience over the period. Whilst there are other officials dealing with waste related issues, e.g. Environmental Health Officers, the relationships and accountability seem not clear. During the year 2010 the healthcare officers within the local municipalities were transferred to Xhariep District Municipality. This action created a further gap within the already weak waste management teams of local municipalities. Within the local municipalities it is not clear as to which employees are responsible for the management and administration of waste related issues. It is also not clear as to who the ultimate responsible person is and what knowledge is available to assist in designing plans moving forward.

3.7.2 Infrastructure for Disposal of Waste

In South Africa it is common for waste generation, i.e. type and quantities, not to be reported. In terms of the Waste Act (2008) it is a legal requirement to report on the waste generated in terms of quantities, transportation from source, recycling, treatment and disposal at landfill sites. This legal requirement has necessitated the registration of landfill sites with the Waste Information System (WIS) of the Department of Environmental Affairs.

The generation of waste and the type seem directly linked to economic activity and lifestyles of the population. There are indications, though not scientifically tested, that as income increases there is an increase in waste generated, and it is mainly the ‘non-degradable’ type. Also, production of industrial waste will also increase with increase in economic development in the area.

The importance of proper management of landfill sites is evident in the light of the benefits inherent in the system. The more commercialised areas tend to produce more waste than the less commercialised, and hazardous waste would increase in industrialised communities. Waste is generated from households, institutions, industries and commercial businesses on a regular basis. A registered landfill site should meet certain minimum requirements, e.g. weigh bridge, signage, access control, site management, to be functional as an efficient site.

Table 3.8 : Mohokare Local Municipality : Equipment and Landfill Management

Town	Population	Equipment	Landfills	Incinerators	Landfill Access	Management
Smithfield	5478	1x Bell Tractor 1x Tipper Trailer	Not Permitted	0	- Partly fenced - Has Access gate - Roads usable - No signage	- No Administration - End tipping disposal - No waste cover - No Recycling
Zastron	12442	1x Compactor 1x Tractor 1x Tipper Trailer	Not Permitted	0	- Not fenced - Roads usable - No signage	- No Administration - Bulldozer used at least twice a week - End tipping disposal - No waste cover - No Recycling
Rouxville	6495	1x Bell Tractor 1x Tipper Trailer	Not Permitted	0	- Partly fenced - Has Access gate - Roads usable - No signage	- No Administration - End tipping disposal - Waste partly covered - No Recycling

Table 3.9 : Kopanong Local Municipality : Equipment and Landfill Management

Town	Population	Equipment	Landfill	Incinerators	Landfill Access	Management
Reddersburg	7000	2x Tractors 2x Trailers 1x Truck	Not Permitted	0	- No fence - No Access gate - Roads usable - No signage	- No Administration - No waste cover - No Recycling
Springfontein	5000	2x Tractors 2x Trailers 1x Truck	Not Permitted	1 Not Functional	- No fence - No Access gate - Roads usable - No signage	- No Administration - No waste cover - No Recycling
Trompsburg	10000	1x Tractor 1x Trailer 1x Truck	Not Permitted	1 Not Functional	- No fence - No Access gate - Roads usable - No signage	- No Administration - No waste cover - No Recycling
Bethulie	20000	1x Tractor	Not Permitted	1 Not Functional	- Partly fenced - No Access gate - Roads usable - No signage	- No Administration - End tipping disposal - No waste cover - Limited Recycling
Philippolis	6470	3x Tractors	Not Permitted	0	- Partly fenced	- No Administration

		3x Trailers 1x Truck			- Has Access gate - Roads usable - Limited signage	- End tipping disposal - No waste cover - No Recycling
Fauresmith	7000	2x Tractors 2x Trailers 1x Truck	Not Permitted	0	- No Fence - Roads usable - No signage	- No Administration - End tipping disposal - No waste cover - No Recycling
Jaggersfontein	8000	1x Tractor 1x Trailer 1x Truck	Permitted	0	- Partly fenced - Difficult Access - Roads usable - No signage	- No Administration - End tipping disposal - No waste cover - No Recycling
Edenburg	10000	1x Tractor 1x Truck	Permitted	0	- No fence - No Access gate - Roads usable - No signage	- No Administration - End tipping disposal - No waste cover - No Recycling
Gariep Dam	1200	1x Tractor 1x Trailer 1x Truck 1x Incinerator	Not Permitted	0	- No fence - No Access gate - Roads usable - No signage	- No Administration - End tipping disposal - No waste cover - Limited Recycling

Table 3.10 : Letsemeng Local Municipality : Equipment and Landfill Management

Town	Population	Equipment	Landfill	Incinerators	Landfill Access	Management
Petrusburg	6938	2x Compactors 4x Tipper Trucks 1x Tractor 1x Trailer	Not Permitted	0	- No fence - No Access gate - Roads usable - No signage	- No Administration - No waste cover - No Recycling
Jacobsdal	1200	1x Tractor 1x Trailer 1x Incinerator	Not Permitted	0	- No fence - No Access gate - Roads usable - No signage	- No Administration - No waste cover - No Recycling
Koffiefontein	11384	1x Tractor 1x Trailer	Not Permitted	0	- No fence - No Access gate - Roads usable - No signage	- No Administration - No waste cover - No Recycling
Luckoff	3059		Not Permitted	0	- Partly fenced - No Access gate - Roads usable - No signage	- No Administration - No waste cover - No Recycling

3.7.3 Current disposal practices

Disposal practices are determined by the type of waste, proximity or access to a legal or illegal disposal site, as well as the means of transportation. There is need for clarity between the different sectors regarding acceptable or legal disposal practices. For example, agriculturists would either bury or incinerate a carcass, and environmentalists would be concerned about possible contamination of the underground water or have issue with the gases emitted during incineration.

3.7.3.1 Disposal of General waste

Landfill sites in Xhariep district are not regulated and lack the administrative fundamentals pertinent for waste disposal. All waste is mixed together from source to disposal site without being sorted. The local municipalities and communities in Xhariep district apply all known methods of disposing waste. In Xhariep district general waste is either burned or buried in pits on the site of the waste generator.

At the landfill sites it is important to compact and bury the waste to avoid secondary pollution of the environment. The landfill sites in Xhariep district are not completely fenced, and little to no compacting of waste is done. As a result, the waste generation in the district is exacerbated by the secondary pollution of the environment through wind blowing on open landfills.

3.7.3.2 Disposal of Hazardous Waste

The disposal of hazardous waste is to a large extent a specialised process which would invariably be contracted out to private companies. Incinerators are used for disposal of some types of hazardous waste . It is also important to ensure that the waste is well sorted to avoid burning of waste that should not be burnt, e.g. aerosol sprays. The incinerators on the landfill sites in Xhariep District are either broken or not being used. To this extent, you find the mixing of all types of waste, thus resulting in the waste being managed as though it is all general waste. Currently the Xhariep District does not have industries which could potentially be creating concern about hazardous waste.

3.7.3.3 Disposal of Health care waste

Health care waste is generated mainly by hospitals, health care centres and clinics. Amongst the waste you also find sharp objects such as needles and razors. Companies such as SteinMed and EnviroServe are well resourced and licensed to manage health care waste.

3.8 Record-keeping of waste information

In recent years waste management, gas emissions and pollution of the environment have become very topical in Green Politics. Legislations and guidelines, namely

- National Water Act (Act 36 of 1998)
- The National Environmental Management Act (Act 107 of 1998)
- Municipal Structures Act (Act 117 of 1998)
- Municipal Systems Act (Act 32 of 2000)
- Mineral and Petroleum Resources Development Act (Act 28 of 2002)
- Air Quality Act (Act 39 of 2004)
- National Environmental Management: Waste Act, 2008 (Act 59 of 2008)

were developed by various governments and sectors to provide guidance in the overall management of waste. It has also become necessary for data especially on hazardous waste to be collected.

The local municipalities in Xhariep District do not have any form of data generation or record keeping for waste generated. The officials make estimates of what could be generated.

3.9 Institutional capacity for waste disposal

The capacity of an institution to manage waste is influenced by a number of factors including finance and access to skills. Amongst the critical weaknesses of Xhariep District Municipality are the lack of sustainable financial resources and the unattractiveness of this fairly rural area for highly skilled people. The legislations on waste management require institutions to comply with a number of aspects in the waste management chain. This includes attitudes in dealing with waste as well as generation of data. This situation demands of the municipalities to employ people with capacity and technical knowledge in waste management. The local municipalities, as well as the district, are taking cognisance of the legislative requirements and efforts are made to develop capacity. The municipalities currently have other officials involved in waste management and there are no employees at the landfill sites except for the operators of equipment such as tractors, bulldozers, etc. It is imperative for the municipalities to employ more personnel in the light of the gaps in the overall management, especially data capturing and monitoring of compliance by all stakeholders.

3.10 Emerging Waste Issues

Following the World Summit on Sustainable Development in Johannesburg in 2002, South Africa initiated energy saving programs to conserve non-renewable resources such as coal from which electricity is generated. One of the programs involves the use of energy saving fluorescent bulbs which use less energy. However, these bulbs contain mercury, a heavy metal which needs special attention especially as it will present itself in waste. These programs have not, however, included waste management options for such products that contain heavy metals. A lot of education and awareness has been raised about using fluorescent bulbs which reduce energy consumption. The Department of Energy and Eskom have even provided free bulbs to households.

While this is seen as a strategy for reducing energy consumption and saving non-renewable coal supplies, fluorescent bulbs will increase mercury-containing waste hazardous streams within general wastes collected from households. Municipality and the Department of Energy will have to jointly encourage waste separation of this hazardous waste stream before waste collection. The impacts of this waste stream in landfill waste are huge, both for humans and the environment, especially contamination of groundwater. Furthermore, as part of extended producer responsibility (section 18 of NEM: Waste Act, 2008), manufacturers and retailers can be partners in take-back programs of such products.

Another waste stream that is a concern is electronic/electrical waste. This includes mobile phones, computers, fridges, hairdryers etc. While it is unclear as to what proportion of commercial waste consists of electronic waste (e-waste), this type of waste is disposed of at landfill sites or communal dumpsites. The amount of e-waste collected and recycled within the municipalities of Xhariep district is unknown.

CHAPTER 4

ESTABLISHING STRATEGIC GOALS AND OBJECTIVES

The identification, rating, categorisation and analysis of the strategic goals and objectives is primarily informed by the following guidelines:

1. The legislated requirement to adhere to the waste management hierarchy
2. The National Environmental Management: Waste Act (2008)
3. The district IWMP should be implemented in 2015
4. The Constitution of South Africa

The officials were requested to rate issues pertinent to the management of waste as per the following categorisation.

KEY TO THE TABLE 4.1

Level of Priority

Very High[VH], High[H], Medium[M], Low[L] or Very low[VL]

Feasibility

Considering the available resources and local priorities, can this need be addressed

Very High[VH], High[H], Medium[M], Low[L] or Very low[VL]

Implementation Period Target **– How soon can the Need be implemented**

Short-Term	:	Within the next 2 years [S]
Medium-Term	:	Within 3 to 6 years [M]
Long-Term	:	After 6 years [L]

Comments

What are the thoughts of officials about this Need

What hurdles, minimum requirements, protocols, etc. should be managed to ensure implementation of the Need, e.g. finance, budget, IDP, etc.

What needs to be done to enable the implementation of the required action

Table 4.1 : Rating of issues pertinent to waste management

GOAL	CRITICAL	Level of Priority	Implementation [Target Period]	FEASIBILITY	COMMENTS
1.Authentic Data	Y	L	M	M	Need Action
2.Facilities for disposal of hazardous waste	Y	M	L	L	Provincial Competency - Could Delay
3.Education of the community	Y	H	S	Immediate	Need Action
4. Occupation and Health Safety Act. Considerations	Na	VH	S	S	Need Action
5.Management of abattoir waste	Na	H	M	S	Need Action
6.Monitoring of Landfill sites	Y	VH	S	M	Need Action
7.Compliance and enforcement (also Training of officials)	Y	M	S	S	Need Action
8.Finances	Y	VH	S	S	Need Action
9.Co-operative governance involving Green Scorpions	N	L	M	S	Need Action
10.Incinerate vs. landfill	N	L	M	M	Industrialisation due to job creation
11.Intergovernmental relations (IGR)	Y	VH	S	S	Need Action
12.Expansion of waste services and cost recovery	Y	VH	S	S	Need Action

GOAL	CRITICAL	Level of Priority	Implementation [Target Period]	FEASIBILITY	COMMENTS
13.Landfill licensing and compliance	Y	VH	S	S	Need Action
14.Promoting recycling initiatives	N	M	M	S	Need Action
15.Hazardous waste management	Na	H	M	M	Need Action
16.Strengthening organizational capacity	N	VH	S	M	Need Action
17.By-law development and enforcement capacity	N	H	S	M	Need Action
18.Education and awareness	Y		S	S	Need Action
19.Regionalization of disposal facilities	N	M	M	L	Need Action
20.Risk assessment, monitoring and remediation	N	M	S	S	Need Action
21.Waste salvagers	N	L	L	S	Need Action
22.Transfer Stations	N	VL	M	M	Need Action
23.Funding and Equipment Acquisition	N	L	M	M	Need Action
24.Composting site	N	VL	L	M	Need Action

Table 4.2 : Recommendations

GOAL	SUGGESTED ACTION
1.Authentic Data	The statistical data used for planning should be standardised through use of the same source by all managers and implementers.
2.Facilities for disposal of hazardous waste	The province should be approached regarding the hazardous waste management in the district since this is the competency of the province.
3.Education of the community	The community should be made aware of all the changes to be implemented regarding the overall management of waste in their areas. The need for change in behaviour as well as the decision to implement all applicable by-laws.
4.Occupation and Health Safety Act.	Everybody dealing with waste should be made aware of all the regulations regarding health and safety. The information should also emphasise the need to supply and use safety ware at all times.
5.Management of abattoir waste	The abattoir waste should not be allowed on the landfill site. An alternative should be sought with the owners in considering the appropriate alternative mechanisms.
6.Monitoring of Landfill sites	A management team should be stationed at the landfill site to ensure that only waste destined for the site is allowed, and all appropriate data is captured, e.g. weight.
7.Compliance and enforcement (also Training of officials)	All stakeholders must be engaged in the new mindset of waste management, and all regulations, Waste Management Act 2008, by-laws, should be enforced.
8.Finances	The strategies implemented for waste management should be cost-effective and sustainable. Funding institutions, e.g. DBSA should be approached
9.Co-operative governance involving Green Scorpions	Green Scorpions should be involved in the overall management to ensure that the overall process has intelligence enough to accomplish the mission.
10.Incinerate vs. landfill	The feasibility of incinerators on landfill sites should be done. Alternatives such as autoclaving should be considered.
11. Intergovernmental Relations(IGR)	All stakeholders, particularly government departments, should understand and synergise their efforts in the management of waste to ensure optimum results are obtained with the resources available.
12.Expansion of waste services and cost recovery	A levy should be charged for these services whilst making provision for indigents and the unemployed.

GOAL	SUGGESTED ACTION
13.Landfill licensing and compliance	Landfills should be licensed. This action will assist in ensuring that appropriate sites are used for landfills.
14.Promoting recycling initiatives	Communities should be trained on the processes and benefits of recycling. It is noted that the community of Trompsburg has shown interest in this industry.
15.Hazardous waste management	The provincial government should be alerted of the need to establish this facility.
16.Strengthening organizational capacity	Additional personnel are required to implement the strategies and activities required for improving the management of waste in the district. This action will require training of personnel.
17.By-law development and enforcement capacity	The by-laws should be developed, communicated to communities and enforced.
18.Education and awareness	The communities should be educated on all legislative requirements for waste management to ensure cooperation and compliance.
19.Regionalization of disposal facilities	The district should rationalize its resources to ensure optimum output.
20.Risk assessment, monitoring and remediation	Continuous monitoring of all processes implemented in improving the management of waste in the district should be effected. This is critical in the light of efforts to improve the economy of the district as the more waste, especially industrial, may be generated.
21.Waste salvagers	With recycling opportunities eminent, the increase in waste salvagers is expected, and efforts should be made to ensure the landfills are not invaded.
22.Transfer Stations	Transfer stations should be established to ensure that whatever is taken to the landfill site is only waste that should be buried.
23.Funding and Equipment Acquisition	Additional equipment is required for the overall management of the waste. Development agencies such as DBSA have schemes that could be leveraged.
24.Composting site	From the transfer station organic material for composting could be separated and channelled to a place where composting is initiated. The compost could be commercialised, or availed to the local municipalities for their parks.

CHAPTER 5

ALTERNATIVES TO CURRENT WASTE MANAGEMENT PRACTICES

The waste management practices in Xhariep District are categorised and assessed with respect to the following:

1. Technical feasibility
2. Socio-economical implications
3. Environmental implications; and
4. Financial implications and viability

which are essential variables for providing sustainable waste management services for the community. Also, in line with Polokwane Declaration of no waste to landfill by year 2020, the ability to implement the recommended strategy, i.e. Waste Hierarchy(see below), is being assessed.

Steps in Waste Hierarchy

(Source: DEA, 2010)

Figure 4: Steps in the Waste Hierarchy

The baseline scenario and alternative scenario are elaborated hereunder.

Baseline Scenario: The status quo, referred herein as Baseline Scenario, reflects the current quality of service. This is the reference point to identify what, if necessary, needs to be done in order that the service provided is in line with the constitution as well as the legislated requirements for service provision and protection of the environment.

Alternative Scenario: This scenario is conceptualised with reference to the baseline scenario. It ensures adaptation to legislative requirements as well as improving service delivery to the communities.

5.1 **The Baseline Scenario**

The Baseline Scenario is the prevailing waste management scenario in the Xhariep District Municipality, and this scenario is the reference point for the actions to be implemented for compliance with integrated waste management principles and the waste hierarchy concept. This scenario will be juxtaposed with the alternative scenario to identify gaps, and feasibility of adapting towards requirements of IWMP. This scenario is characterised as follows:

5.1.1 Technical feasibility

a. Equipment

- Available waste collection equipment includes tractors, trailers and compactors. Only Letsemeng Local Municipality has 2 compactors allocated to 2 landfill sites. An official from Letsemeng Local Municipality reported that they have 4 compactors, and 2 compactors have not been allocated a landfill site yet.
- At least a tractor and trailer is allocated for every landfill site.
- Only the landfill sites in Rouxville and Zastron have access to a bulldozer for burial of waste.
- None of the landfill sites has weigh bridges.

b. Waste Management

- On average, 4% of the population of Xhariep District Municipality is either under-serviced or not receiving waste management services at all.
- The legal framework for enforcing co-operation from the community is not in place.
- Minimum collection of recyclables is prevalent. The opportunity for job creation in this sector has been identified specifically in Kopanong.
- Data capturing is not put into practice at any of the landfills throughout the district.
- Waste generated is neither characterised nor differentiated.
- The incinerators at landfill sites are not operational.
- Medical waste is transported by EnviroServe to Bloemfontein where it will be incinerated at the landfill site.

5.1.2 Socio-economic status

a. Infrastructure

- The landfill sites are either partially fenced or not fenced at all. Generally there are no gates and weigh bridges.
- The roads are generally usable though problems may ensue during raining days.

b. Community Participation

- In Koffiefontein some community members are involved in small scale recycling.
- Community is not paying for the waste collection services.
- The majority of the population are on the lower end of the Living Standard Measure.

5.1.3 Environmental status

- Landfill sites are left open with no burying of waste.
- Waste is blown back into community.
- There is no information regarding the Environmental Impact Assessments.

5.1.4 The Waste Hierarchy

Most of the recommended steps in the waste hierarchy are not put into practice.

- The waste generated is characterised by various waste streams, including recyclables, organic and inorganic material. This resulting in large volumes of material being transported

to landfills. The district and local municipalities have no programmes of educating the communities on their roles in the overall management of waste.

- The amount of waste generated or taken to the landfill is not known. This situation posses challenges in establishing waste reduction goals to evaluate the impact of any efforts to reduce waste.

- The collection of waste is erratic resulting in other waste generators resorting to burning or burial at their places of residence or work.

- The transportation of waste hampered by poor road conditions especially after rainy days. Other than in Letsemeng Local Municipality, most areas rely on open trailers pulled by tractors for collection.

- Authorised landfills are not adhering to their permit conditions. There are no weigh bridges, and all waste types including health care waste reaches the site. Waste salvagers are operational at most landfills, and burning of waste happens.

- Contrary to permit conditions of landfills, retrieval of recyclables is done at landfill sites. The district has no formal recycling facilities hence recycling activity is scanty and erratic. The community still mix waste and all reaches the landfill.

  This is very much end-of-pipe solution which is neither efficient nor encouraged by the new strategies and legislation on waste management.

5.2 Alternative SCENARIO

This scenario introduces the life cycle approach to waste management. It is guided by National Waste Management Strategy as well as the Waste Hierarchy concept. This intends to establish waste minimisation and sorting programmes to reduce waste that ultimately reaches an authorised landfill. This scenario is characterised as follows:

5.2.1 Waste Avoidance and Reduction

Waste generated should be sorted at point of generation. An effort should be made to effect paradigm shift within the communities. Waste generators should be duly informed of the strategies and by-laws governing waste management. This

step should be supported with provision of waste receptacles such as bins, plastic bags and skips as determined by the needs of each waste generator. By-laws should also be implemented to penalise those who detract from newly established norms. A tariff structure should be developed for all services rendered along the value chain to ensure that the strategies are financially sustainable.

The district should develop a Waste Collection Plan in line with set National Domestic Waste Collection Standards (2011). This step will ensure that the district is able to provide set standards of service to the communities. Evidently, financial resources are required as the plan dictates additional human and technical resources. Accurate data on types and amounts of waste collected should be reported to the Waste Information System. This data is critical for planning and allocation of resources to ensure sustainable waste collection services.

5.2.2 Recovery, Reuse and Recycling

Recyclable materials should be handled at dedicated sites, such as buy back centres or Material Recovery Facilities (MRF), where they are processed according to prescribed protocols set by markets, baled and stored temporarily before transportation to markets. This step will discourage waste salvagers from going to landfills as almost nothing of value to them will enter the landfill. This will make the restriction of entry to the landfill easy to implement.

5.2.3 Treatment

Organic waste, e.g. trees, vegetables, fruits, peels, etc. should be channelled towards composting facilities. Communities may also be trained to retain organic material and produce compost for their gardens. The recyclables and reusables should be separated from the waste that is to be sent to the landfill. The landfill site should clearly indicate what type of waste is permitted on the site, and personnel on site should monitor adherence to restrictions.

5.2.4 Organizational and Institutional Issues

All local municipalities in the Xhariep district are evidently under staffed. The officials cited this weakness as a barrier to efficient administration of waste services. Human resources are the backbone of service delivery. Without adequate and appropriately trained human resources the service does not meet the stringent standards and requirements set nationally and provincially. Within the framework of existing skills development legislation every municipality should have a skills development plan. To ensure the completeness of the IWMP, a skills development plan of the district and local municipalities should include the training and development of all employees in the waste services. The plan must indicate the type of training planned, when the training would take place, and who would be trained through the Workplace Skills Plan (WSP). Provision should also be made for training officials for the implementation of the IWMP at district and municipality levels. While each municipality has its own unique IWMP, the district office should drive the process in order to have a coordinated and integrated process that feeds to the district plan.

The implementation of an IWMP requires proper institutional arrangements with trained knowledgeable personnel. The waste management section will have its own team for waste management to effectively executive implementation of the IWMP.

5.2.5 Financial Issues

The annual budget of all municipalities will allocate funds for waste management and other environmental health issues. The inherent benefits of efficient waste management, namely, prevention of air, land and water pollution, potential improvement of tourism due to the increased aesthetic value, etc., including the legislative requirements, requires that the waste management should be amongst the priorities in budget allocation.

The implementation of the IWMP is inherently resourceful in terms of finance. The establishment of a landfill site requires enormous capitalisation and maintenance costs. However, with systems such as weigh bridges in place, by-laws implemented, the ‘pay as you throw’ concept and polluter pays principles will be easy to implement. In addition, funds for developing infrastructure to support

implementation of waste management goals will be sourced from the Municipal Infrastructure Grant, (MIG), and the Development Bank of South Africa (DBSA), and the Treasury.

5.3 COMPARISON OF SCENARIOS

The implementation of IWMP demands high investments particularly in Landfill construction and maintenance, roads construction and maintenance, as well as transportation. Notwithstanding, many government institutions and programmes are available to facilitate financing, and implementation of this plan can be done over a period of years.

Table 5.1 : Comparison of Baseline Scenario with Recommended Scenario

CORE ELEMENTS OF WASTE MANAGEMENT SYSTEM				**IWM STRATEGY ELEMENTS**	
	Collection	**Transport**	**Disposal**	**Recycling**	**Treatment**
Baseline Scenario	Inadequate and erratic coverage of services to households; Number of households serviced unknown; Few collection points; Waste generation data not collected	Collection by trucks, trailers, REL compactor truck (in some municipalities) in formal settlements, donkey carts in rural areas; Poor road infrastructure; Amount of waste transported unknown	Illegal dumping; Burning of waste in backyard pits Few permitted landfill sites; Permitted sites not properly managed, No hazardous waste disposal site; Amount of waste disposed at landfill unknown	No sorting of waste at source; Few and unsustainable recycling initiatives; Recycling at landfill sites; No markets for recyclables; Amount of waste recycled unknown	No composting of organic wastes Ineffective health care waste incineration; Operating placenta pits; Waste data not collected
Alternative Scenario	Waste collection plan developed and implemented Expanded services provided to each household; Increased number of collection points; Waste data collected Efficient and financially sustained waste collection service; Periodic collection of household hazardous waste; WIS is operational	Collection by trucks, trailers, REL compaction vehicles in formal settlements, donkey carts and hand-pulled carts in rural areas; Waste data collected Efficient collection by trucks and compactors, long-haul vehicles; donkey carts and hand-pulled carts for rural areas; WIS is operational	Some illegal dumpsites closed and rehabilitated; More transfer stations and landfills established; Increased number of permitted landfill sites; Composting sites established; Waste data collected Less waste disposed; Permitted transfer stations and landfills; Regional sites Hazardous waste site established; WIS is operational	Sorting recyclables at source; More recycling initiatives supported; Waste exchange programs initiated; Increased markets for recyclables ; Waste data collected More material recovery and increased incentives; Waste exchange system operational; More recycling initiatives supported. WIS is operational	Increased composting of organic wastes; Efficient health care waste management systems established; Waste data collected Composting, and biological treatment; Efficient incinerator operations; Hazardous waste treatment initiated; WIS is operational

5.4 Benefits of the Alternative Scenario

Primarily, the rationale for the Waste Act 2008, supersedes all issues related to waste management. It is important to realise this is an ACT of parliament and it is criminal to breach. Also, it should be realised that South Africa participates in the global efforts to minimise waste and environmental pollutions, hence treaties and agreements reached at International level will impact on the overall management of waste in the district and country as a whole.

5.4.1 Socio-economic benefits

- Waste collection services are the constitutional rights of the communities, hence it is important for Xhariep District Municipality to ensure that these services are availed to the communities. The lack of the service risks dumping in the open areas, including along the water streams, creating hazard for the eco-system. The landfill sites will be on appropriate sites, properly structured and managed to facilitate proper burying. This will also assist in ensuring the landfill life span is maximised, and pollution is avoided.
- It is imperative that economic activity increase for improvement of the lives of the communities in Xhariep District. Concomitant with improvement in economic activity is the increase in generation of various types of waste which may require various forms of disposal mechanisms. It is thus crucial to establish appropriate systems to manage waste to ensure that waste generated by the various forms of economic activity will be efficiently managed.
- The waste management strategy as articulated in the Waste Hierarchy provides a range of opportunities for creation of employment or simply generation of income. Activities such as sorting of waste, composting and recycling are immediate benefits which the district can benefit from.

5.4.2 Capital injection

- The upgrading of the waste management service in Xhariep District requires acquisition of equipment, e.g. compactors, scales, etc., as well as improvement of roads and landfill sites. On a short and medium term, these activities will create a number of job opportunities for both skilled and unskilled people. This achievement will create opportunities for accessing finance from government incentive schemes.

5.5 Sources of Finance

Financial resources for implementing the alternative scenario can be sourced from the following:

5.5.1 Municipal Budgeting System

Annual budget planning processes at municipality allocates funds for waste collection and other environmental health issues. In the past, the provision of waste services was not a priority; however, in recent times it is recognized that improved waste management prevents air, land and water pollution, reduces the risk of exposure to pollution, improves the health status of communities and increases the aesthetic value of towns making them attractive as business and holiday destinations.

5.5.2 Cost Recovery from Collection of Rates

As more households are provided with waste collection services, municipalities can recoup costs by charging tariffs for these services. The challenge is the willingness of communities to pay for the services, high unemployment rate which renders some households indigent and thus not worth considering for charging levy. Municipalities have limited resources for implementing even basic services leading to under-servicing and abandonment of activities and projects if they are not supplemented.

5.5.3 Municipal Infrastructure Grant (MIG)

Funds for developing infrastructure to support implementation of waste management goals can be sourced from the Municipal Infrastructure Grant. A waste collection plan should identify collection routes and road networks necessary for efficient and cost-effective waste collection services, and apply for funding through the MIG. Where nearest access roads are not navigable, alternatives have to be sought and new road infrastructure may be required and funded.

5.5.4 Disposal Site Management and “Pay as You Throw”

Landfill design and construction requires huge capital investments and annual maintenance fees. However, the landfills operated currently do not have the capacity to charge disposal fees and recoup development costs. Lack of the necessary infrastructure such as weighbridges makes it

impossible to estimate waste received by landfills, hence the application of “pay as you throw’ concept and polluter pays principle is not feasible. Higher disposal fees may be charged for hazardous wastes. Municipalities must therefore ensure that newly established facilities have all the necessary infrastructure, equipment and skilled personnel to manage and operate landfill sites.

5.5.5 Intergovernmental Cooperation and Support

Judging from the status quo report and the current report, it is very clear that municipalities need to cooperate with other spheres of government to meet integrated waste management goals. Through the facilitation of the provincial department (LEDET) and municipal clusters, hazardous waste such as health care waste, mining waste, agricultural and veterinary waste, can be managed in a sustainable manner, with all sector departments focusing on the solutions to pollution posed by these various waste.

5.5.6 Bilateral Agreements

Bilateral agreements between South Africa and developed countries like Denmark (through DANIDA), United States of America (through USAID), European Commission and others, have funding for building capacity for specific environmental management projects. Municipalities and the province may source funding directly or through DEAT, Department of Foreign Affairs or other relevant sector departments. Other bilateral agreements are signed directly with provinces or individual municipalities and should be leveraged.

5.5.7 Development Bank of South Africa

The Development Bank of South Africa (DBSA) has funds dedicated to address the developmental affairs of each province. Provincial departments are assisted on a needs basis, based on the type of project and whether it meets the requirement of their funding criteria. Funding of municipality projects from the DBSA is sometimes direct funding.

5.5.8 Buyisa e-Bag for Recycling Projects

This organization was established in support of the plastic bag regulation as a section 21 company. Its purpose is to fund plastic recycling projects. Pilot projects at municipal and provincial level may be funded based on the project proposal if it meets the requirements of the funders.

5.8.9 Alternative Technologies

Composting is seen as a labour-intensive process that has huge land requirements. However, composting of waste organic products, garden cuttings produces a saleable product which can be used by city parks, golf courses and organic farmers. Therefore a refuse transfer station is recommended and can be self-sustaining. Also, landfills release methane (landfill gas) which can be tapped and electricity can be generated and sold to the national grid at Eskom or used to run municipal facilities. This can be linked to the Clean Development Mechanism (CDM) and carbon credits, which are projects facilitated by the department of Minerals and Energy (DME).

CHAPTER 6

FRAMEWORK FOR IWMP IMPLEMENTATION

INTRODUCTION

Critical to the accomplishment of IWMP is the partnership between government, the various industries and the community. Therefore, all these stakeholders should be informed of the process to be implemented as well as what their roles will be.

The following framework is informed by the goals developed to address the gaps and needs identified in the earlier phases. The framework therefore lists actions and strategies suggested for the district in adapting its waste management operations in line with the IWMP as articulated within the South African context.

It should be noted that the facilities for disposal of waste, e.g. landfill sites, are the competency of the local municipalities. The role of the district could be the overseering and facilitation of appropriate and recommended strategies for the IWMP.

Goal A: EXPANDING WASTE SERVICE DELIVERY AND COST RECOVERY

Action : Waste collection services should be provided to all communities.

a. The district must establish a database of generators of waste, as well as developing the intelligence of waste generated. This database will assist in developing ideas about routes, equipment and frequency of collection.
b. The affordability profiles of the community should be assessed to assist in determining cost recovery strategies. Whilst indigents may not be charged any levies, it is still necessary to educate about the need to pay for the services. Considering the type of waste from indigents is mainly organic, the drive for composting will reduce amount of waste to be collected from their areas.
c. Development of roads will be necessary to reach most of the un-serviced areas especially within the informal settlement. To expedite servicing of most of the communities, transfer stations should be established nearby roads or routes that are navigable.
d. The industries could be assisted with collection, or allowed to deliver to selected sites, e.g. transfer stations, whereby levies could be charged in relation to the overall cost of the disposal. Considering that industries in Xhariep District are in the main agriculture and mining, it is prudent to allow own deliveries.

e. The Department of Transport and the Department of Public Works must be engaged to assist with the construction of roads, with priority given to strategic routes as identified for the improvement of waste collection.

Goal B : Licensing of Landfills

Action: All sites to be used as landfills should comply with all legislations whilst also incorporating provisions of the Waste Management Act (2008) as regards measures for reducing waste going to landfills, therefore assisting all role players to meet national targets of zero waste to landfill by 2020.

a. The officials within the Xhariep District assert that all landfills within the district are not licensed. Presently, the district has more landfills than is necessary, hence some have to be closed. An Environmental Impact Assessment should be instituted for all sites currently used as landfills in order to establish which sites will be allowed as landfills.
b. The necessary infrastructure for a legally permissible landfill, e.g. weigh bridges, gates, and fencing, should be budgeted for whilst investigating which sites will be used landfills in the future. Amongst those sites found legally appropriate for licensing, assessment and identification of strategically efficient sites will be done.
c. Personnel should be trained for management of landfill sites.

Goal C : Promotion of Recycling

Action : Feasibility of establishing recycling industries is critical in determining whether recycling is an option for the district.

a. Presently, on a very small scale, some entrepreneurs collect recyclables for delivery to neighbouring districts. It is possible for recycling companies to establish recycling collection points or plants in the vicinity of waste collection sites. The district must actively pursue these companies with the view to encourage them to do feasibility studies for such industries.

b. Communities should be encouraged to separate waste at generation points. The individuals collecting waste should actually refuse to collect waste that is not appropriately separated. Incentives should be considered for co-operating communities.

Goal D : Facilities for Hazardous Waste Disposal

Action : The provincial government should be lobbied to establish disposal sites for hazardous waste because the disposal of hazardous waste is the competency of the province.

a. A database of hazardous waste produced within the district should be created. This database should specify the generators, the type and rates. This information should then be used to lobby the province to take action.

b. The current practices of disposal should be recorded to keep track of practices within the district. This will assist in determining the protecting the ecosystem through prohibition of methods which threaten the ecosystem.

c. The local development initiatives should be assessed to understand the potential waste streams and practices in the future.

Goal E : Organisational Capacity Building

Action : The improvement of service for the community will necessitate acquisition of appropriate skills as well as additional manpower to ensure adherence to standards recommended by both national and provincial departments. The recommendations below assume an individual employee equivalent to 8 man hours per day.

a. *Administration*: 1 Manager based at the district office, and 3 Health Care Officers for each local municipality. The Health Care Officers should visit sites and stakeholders regularly to ensure that all legislative requirements are adhered to.

b. *Landfill* : Each site should have at least 3 people

- Data Capturer : to capture data on weight, type, etc.
- Supervision of points of dropping waste
- The operator of the burying equipment, etc.

c. *Collection* : The individuals responsible should be well informed in terms of the overall strategy, and should understand how to handle different types of waste.

Goal F : Development and Enforcement of By-Laws

Action: NEM: Waste Act, 2008 (Act 59 of 2008) is an act of parliament and all sectors of government should abide by it. To ensure that this act is complied with, the Xhariep District Municipality should

a. Develop Waste Management By-Laws in line with the NEM: Waste Act, 2008 (Act 59 of 2008);

b. Implement waste management strategies at district level in line with the National Waste Management Strategy (NWMS);

c. Implement Intergovernmental Relations to improve Intergovernmental Relations and Cooperation to support IWMP implementation;
d. Develop a Waste Management Disaster Management Plan and supportive contingencies; and
e. Strengthen cooperation with enforcement agencies such as the South African Police Service (SAPS) and Environmental Management Inspectorate (EMI or Green Scorpions), Environmental Health Inspectors etc.

Goal G: Education and Awareness

Action: The new requirements for IWMP demands a paradigm shift amongst all stakeholders. The government officials and the community of waste generators should understand the new requirements nationally and globally, and also understand the responsibility each stakeholder has.

a. Raising awareness on the waste hierarchy principles and the need to minimize waste.
b. Promoting sorting of waste at source for recycling and recovery purposes.
c. Highlighting negative impacts associated with backyard pit burning and finding sustainable alternatives to this practice.
d. Encouraging collective responsibility for waste collection and cost recovery.
e. Make stakeholders aware of the laws governing the management of waste as well as penalties to be imposed.

Goal H: Regionalization and Optimization of Waste Management

Action: Establish common goals and objectives amongst all the local municipalities with the main focus of leveraging the available resources.

a. Letsemeng Local Municipality has 4 compactors. Each compactor must work 1 day a week per associated town within the district. This allocation will be feasible with the establishment of cooperation amongst the local municipalities.
b. Based on the Environmental Impact Assessment, landfill sites found to be appropriate should also be assessed on their position for efficient use of resources such as compactors.

Goal I: Risk Assessment and Monitoring

Action: As per the NEM: Waste Management Bill (2008), it is important to capture data on waste generators, transporters and disposers to enable accurate planning and implementation of waste management. The district should thus:

a. Create datasets of generators, transporters and disposers of waste within the district.

b. Update and audit these datasets on an annual basis.

Figure 6.1: Monitoring, Evaluation and Continual improvement of IWMP components

Goal J : Co-operation with Waste salvagers

Action : Waste salvagers play an important role in recovering usable material from the landfill destined waste. However, waste salvagers should not be allowed onto the landfill site. The district should

a. Enforce no entry at landfill sites except for government officials and people delivering waste.

b. Establish transfer stations to minimise attraction of waste salvagers to the landfill site.

c. Develop strategies to restrict access of landfill sites by waste salvagers.

Goal K : Funding and Equipment Acquisition

Action : The district should ensure that the waste taken to the landfill site is compacted, and is buried. The district should acquire

a. Radio-activity detectors, weigh bridges, bulldozers, etc. for each landfill and transfer station

b. The money generated through payment for the services should be allocated solely to waste management services

c. Institutions such as the Development Bank of South Africa have special funds for assisting municipalities with development of infrastructure. The Xhariep District municipality should leverage these services in developing capacity to implement IWMP.

Goal L : Composting Facility

Action: Composting is a potential industry considering the farming area within the district. The district should

a. Encourage communities to produce compost from their organic waste, and use it for their own gardens or commercialise
b. Organic material retrieved at transfer stations should be channelled to a place where it will be used for production of compost at commercial scales
c. The sludge from the sewerage should also be availed for production of compost

Goal M: Acquisition and Licensing of Incinerators

Action: Incinerators are necessary for disposal of both healthcare and hazardous waste. Generally, additional fees are charged for the use of the incinerator. This is an additional source of income which should be leveraged to generate additional income which could be invested in waste management services. The district should

a. Repair and/or replace the available incinerators at landfill sites

b. Encourage health and hazardous waste generators to bring waste to the local landfill sites

CONCLUSION

Whilst the implementation of the IWMP is supported by an Act of Parliament as well as the Constitution of South Africa, the success is directly linked to the priorities of the government. For this reason, the strategy to implement IWMP should take cognisance of these priorities, and identify leverage points within the system.

The implementation IWMP requires significant financial resources which the district cannot readily provide. It is noted that service delivery has become a point of contention amongst the political leaders, and waste related services are not much of a priority. Notwithstanding, pertinent issues such as job creation, roads, economic development and health can be leveraged to access funds. This strategy requires intergovernmental relations within the district to be strengthened.

The state of waste management services within the Xhariep District Municipality can be summarised as follows:

1. The infrastructure is not appropriately managed to ensure efficiency and compliance with all regulatory requirements.
2. Administration and Management personnel allocated to waste management services are not enough to implement all required strategies.
3. Generally the district does not comply with all regulations and lacks the competency to ensure legislations including by-laws.

To ensure that the district is able to comply with regulations and implement the IWMP successfully, the following action plan is recommended:

1. **Immediate Actions**

1.1 Licensing of Landfills

Environmental Impact Assessment should be commissioned for all landfill sites currently in use. This process is important for identification of landfill sites to be used in implementing the IWMP.

1.2 Characterisation of Waste generated

The district should station officials at landfill sites, as well as visit waste generators, to record information on the types of waste generated in the district, quantities, disposal methods and future trends. This action is particularly important for understanding future waste trends in the district.

1.3 Education

The stakeholders should be informed of the implementation of the IWMP, and informed of the role and contribution expected from them. In view of the need for a paradigm shift in terms of many issues related to waste management, continuous engagement will be key for success. It is critical to enlighten the community about the Waste Hierarchy principles, and also monitor performance against such.

1.4 Funds

The implementation of the IWMP requires substantial investments in infrastructure and processes, e.g. EIA, required to ensure compliance with Acts of parliament. Institutions such as the Development Bank of South Africa have programmes intended to assist poorer municipalities to deliver on basic services for the community. The district should intensely engage these institutions for financial support. Indirect sourcing of funds can be achieved by lobbying various government departments to deliver on mandates directly related to their departments. For example, Department of Roads must be approached for development of roads, with priority given to waste collection routes as the district will have determined.

2 Medium Term

At this stage it is expected that the district will have identified landfills that can be licensed, and funds are available to implement improvement of the infrastructure.

2.1 Landfills

The landfills to be used will be identified amongst those that would qualify as per the EIA. A concept of 1 landfill site per local municipality should be piloted. The selected landfills will then be reconstructed and upgraded in line with licensing stipulations, then licensing will be sought.

2.2 Waste Hierarchy

Considering that the community has been well informed of the overall strategy and objectives of the IWMP, the waste hierarchy principles should be enforced. Waste generated per source/generator should be closely monitored. Whilst encouraging waste reduction, investigations should be done in situations where reduction is not effected.

2.3 The by-laws

The by-laws on waste management should be developed and enforced. All role players in the enforcement of the law, including Green Scorpions, should be engaged in this process.

3. Long-term

It is important to bear in mind the long-term goal of No Waste to landfills by year 2020. The ground work is done earlier through provision of facilities such as transfer stations and implementation of the Waste Hierarchy. The successful implementation of these strategies will definitely reduce amount of material that may have to be disposed.

The landfill sites produce Methane gas which can be used for electricity production. The feasibility of this potential should be explored at this stage.

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