

CHAPTER ONE

1.1 Introduction

There is an international recognition of the importance of affordable modern energy sources as reflected in the Millennium Development Goals (MDGs) (Najam, 2003). In South Africa, there is an energy crisis affecting everyone related to the reliable supply of electricity. The energy policy responds to the crisis by supporting the provision of electricity (DME, 1998). In essence, the electricity provision programme was designed to widen access to adequate and affordable electricity to all poor households. However, the supply of electricity as a strategy in a context of poor electricity supply is still problematic. This research specifically looks at low-income communities in Diepkloof, Soweto to understand the usefulness of the assumption that poor households will switch to electricity if it is available.

The poor supply of electricity leads to a variety of energy choices people make. Bank (1999) argues that these energy choices, which arise from the poor supply of electricity in South Africa, create uncertainties among poor people. As a result, complete dependence on electricity leaves households vulnerable to unreliable electricity services. However, given the nature of the crisis, many people in the townships rely on multiple fuel use as coping strategies. In this context, coping strategies are the ways that households manage their needs. This strategy may prevent permanent transition to modern energy sources. The diverse ways in which urban households utilise the energy available can make fuel transition from coal and wood to electricity very difficult to achieve.

One of the driving forces behind the policy objective of moving towards modern fuel usage in poor communities is that the effects of the accumulated pollutants resulting from the household biomass burning are very serious for health (Ramphela and McDowell, 1991). Current air pollution levels resulting from low-income household emissions remains a major global, regional and national concern, which impacts negatively on human health and on the environment. However, access to modern energy services such

as electricity in these poor households will help towards curbing current high mortality, low life expectancy, high illiteracy and fertility rates in South Africa.

What is missing from analyses into current energy consumption patterns is an understanding of the range of energy resources used and the factors affecting fuel choices in poor urban communities. The complexity surrounding the assumption that poor households will switch to electricity if it is available, needs to be interpreted in many different ways. Of course, new ideas with regard to energy consumption in a household requires data pertaining to socio-economic analysis, factors affecting fuel choice and household fuel switching. In order for the government to address these energy challenges in a way that will lead to sustainable household consumption, there is a need to investigate why fuel switching is not occurring in poor urban townships. This study uses Soweto township, Diepkloof as a case study to investigate household energy consumption patterns and the energy-related characteristics of households.

1.2 Background to the case study of Diepkloof Township

Diepkloof township is situated on the western side of Johannesburg. It covers an area of about 50 hectares within the valley between the Witwatersrand mine dumps and the hills seen along the Old Potchefstroom Road (Figure 1.1). The population of Diepkloof township in 2001 was estimated to be 405, 522 (Khunou, 2001). Diepkloof township is divided into nine sections called zones. The economic activities of people living in Diepkloof vary depending on the zone. According to Khunou (2001), most people living in both Zones Two and Three are low-income earners and pensioners. The houses are largely the old municipal four-roomed units, known as “matchbox” houses. People living in Diepkloof Extension in Zone Five are middle-income earners and have a higher education level than people living in the rest of Diepkloof.

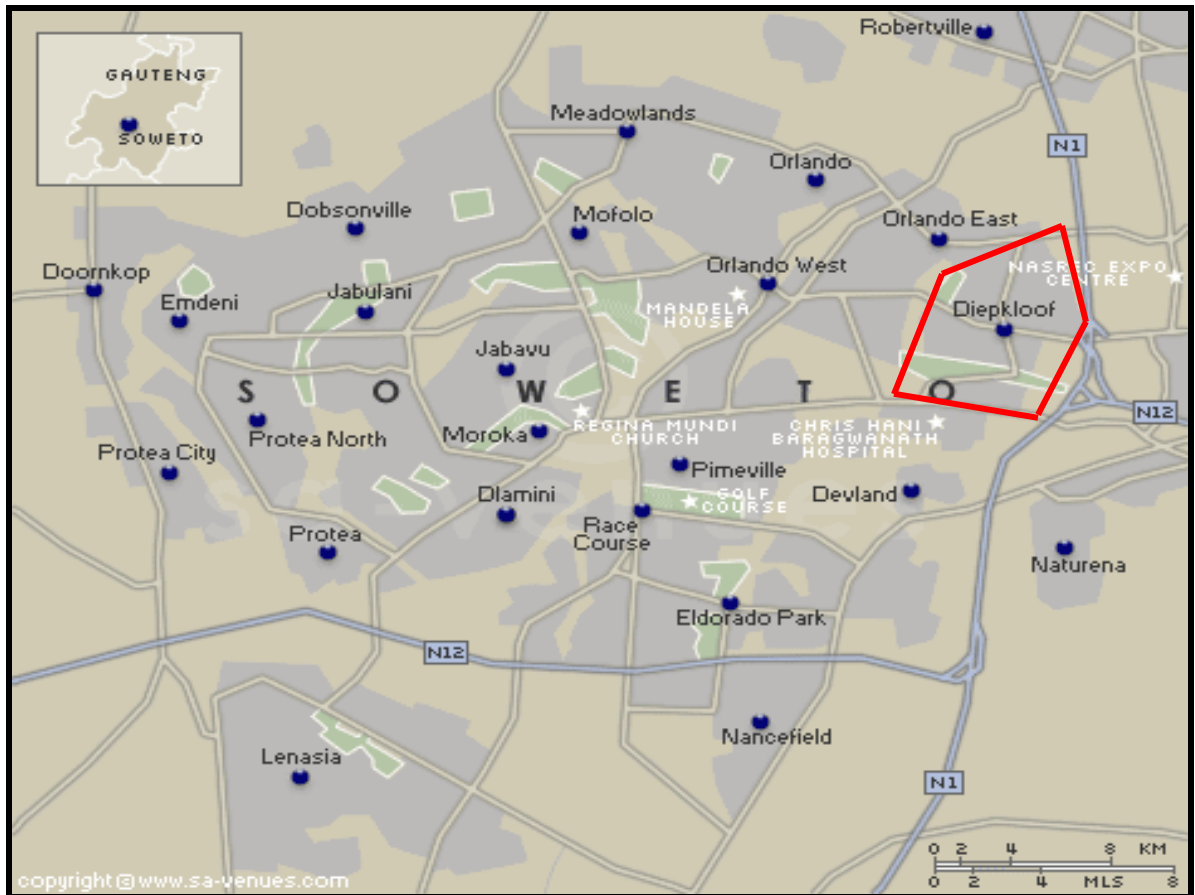


Figure 1.1: Map of Soweto. The pentagon shape in the North Eastern sector of the map shows that study area (www.sa-venues.com, 2005)

Air pollution was a serious environmental problem in Diepkloof before the installation of electricity in the 1980s (Ramphela and McDowell, 1991). Households in Diepkloof relied heavily on the use of coal, firewood and paraffin burners for heating and cooking (Ramphela and McDowell, 1991). The use of these fossil fuels seriously affects air quality in the township. The installation of electricity in 1988 did not make any significant change in energy consumption patterns and air pollution levels have not decreased further. Most formal houses in Diepkloof (83,000 out of a total of 88,856 houses) use coal for domestic purposes (Ramphela and McDowell, 1991). This represents some 94 percent of the total households because coal is cheap and affordable for most poor people and is the most accessible source of energy (Karekezi *et al.*, 2004).

In post-apartheid South Africa, electricity has been an issue of great conflict in Diepkloof (Khunou, 2001). At the centre of this conflict has been the government policy of cost recovery. According to previous research done by the Municipal Service Project, cost recovery measures led to electricity cut-offs in up to 20,000 households per month during 2001 (Fiil-Flynn, 2001). These cut-offs precipitated considerable community action. The most notable resistance has come from the Soweto Electricity Crisis Committee (SECC). The SECC responded to cut-offs by launching Operation *Khanyisa* (light up) in certain parts of Soweto. Under this campaign, SECC activists illegally reconnected households that had been cut-off by Eskom, the service provider in the area. Nearly every part of Soweto including Diepkloof has been affected by cut-offs, arrears, and illegal reconnection as a result of cost-recovery measures for electricity (Khunou, 2001)

1.3 Rationale for the study

Information is available on the global and national impact of multiple fuel consumption, emission levels and in certain cases on the resultant pollution. Despite these studies, information gaps still remain as to the reasons why clean energy sources are not being used by the poor in urban townships. Even though the government strategies for enhancing affordable access to modern energy sources, including electrification and solar energy programme has been integrated into the energy policy reforms, the supply of electricity remains a problem. Thus, household energy consumption survey was undertaken in order to assess factors that affect energy dynamics and choices of poor urban households. This research recognised the importance of household energy transition in areas where electricity is provided. However, the question is: can the current energy policy offer a viable alternative solution to key issues such addressing basic energy needs, fuel switching and multiple fuel use?

Research on household energy use and its role in the eradication of poverty is not yet fully explored and developed. The early scholarly work on energy consumption patterns was written in the context of the energy ladder model. In South Africa a significant body of literature focuses of the relations between household energy use and policy

implementation. In Diepkloof particularly Zone Two and Three the consumption patterns can be changed from the heavy reliance on dirty energy sources to the consumption of modern energy sources through government intervention. This research looks at low-income households in Diepkloof to assess the usefulness of the assumption that poor households will switch to electricity if it is available.

1.4 Aims of the study

The study aims to conduct a baseline consumption survey in order to determine the energy consumption and energy choices of Diepkloof residents. The focus will fall on the following objectives:

- To assess the range of energy resources used in the households in Diepkloof.
- To determine factors affecting fuel choice(s) in Diepkloof.
- To assess the attitudes of households in Diepkloof towards alternative energy sources.
- To assess the effectiveness of policies supporting the supply of electricity to Diepkloof.

1.5 Thesis outline

This study consists of seven chapters. Chapter one offers a summary of energy consumption in the urban areas of developing countries in Africa. The economic and household characteristics shaping energy demand in most developing countries are also outlined in this chapter. Chapter one also provides a background to the study, rationale for the study, and its aims and objectives.

Chapter two develops a literature review for the analysis of urban household energy consumption in developing countries. It first gives a brief introduction of the outline of the whole chapter and different types of energy sources used at household level and their impacts. In the second part of this section it traces the debates on sustainable development and household energy consumption at global, regional and local levels. In the third section, the chapter outlines debates on household energy trends in developing countries with special reference to multiple fuel use and the energy ladder model.

Chapter three explains the methodology used to collect the data and outlines methods of data analysis. Chapter four and five present the empirical findings in terms of household energy patterns and actual consumption patterns in Diepkloof. These two chapters present analysis of stakeholder interviews with respect to energy consumption in Diepkloof. Chapter six outlines the discussion of results of the empirical findings in terms of the attitudes of people in Diepkloof, Eskom, and SECC towards the household energy (particularly electricity) crisis. Chapter seven concludes the report with a discussion and summary of the main findings and identification of major lesson learnt and possible future research that needs to be undertaken.