CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1 Introduction

The objective of a development policy is to improve the living conditions of the people**.** In the process people's quality of life improves. One question that arises when one thinks about improving quality of life is, can quality of life be measured? This question needs an objective answer if comparison in people's quality of life is to be made. Some indicators of quality of life which are currently in use vary from micro-level indicators like household income to aggregated measures like the gross domestic product (GDP) and Gross national product (GNP) (Todaro, 2000). Quality of life however, is not just about money as expressed in terms of per capita income and other aggregated economic measures. Quality of life is a complex and multidimensional phenomenon which needs to be viewed holistically.

Other measures of quality of life have taken into consideration the basic human needs - a socio-economic status approach. One such measure is the living standards measure (LSM) which was developed by the South African advertising research foundation (SAARF). While the measure is at the micro - level (the unit of measurement being individuals or households), the measure uses data that are nominal in nature. This excludes the use of data that are ordinal in nature - take for instance, distance from a water source or the type of toilet facility used by a household. The quality of life enjoyed by households varies considerably in terms of the degree to which households access most basic needs. The aim of this study is to develop a measure of quality of life where data pertaining to socio-economic aspects are at the ordinal level of measurement.

1.2 The background

The inequalities in socio-economic conditions experienced in South Africa can be traced mainly in the previous apartheid policies. This is evident in the settlement pattern of the African people which differs considerably from those of the other racial groups in the country. According to Gelderblom and Kok (1994:67) Africans did not share the experience of widespread urbanisation undergone by the other inhabitants of South Africa to the same extent as the latter, mainly because of the influx control measures.

These measures ensured that Africans lived in predominantly rural areas that were designated to them, the intention having been, to regulate and monitor the rural-urban influx to the so-called white areas. Influx control measures had the following implications:

- Control was exercised over the mobility of Africans. In this way, Africans required, in general, permission to leave the reserves and the white farms in order to reside in the urban areas.
- Africans could stay in towns only if they satisfied various conditions. The basic principle was that Africans should be allowed in municipal areas only for as long as their presence was needed by the white population. The following two quotations are extracted from the Stallard Report (Transvaal 1922) by Gelderblom and Kok (1994:84): "The native should only be allowed to enter urban areas, which are essentially the creation of the whites, to provide in the needs of whites and should leave when he is no longer subservient", and "the masterless, idling-about native is in urban areas a source of danger and a cause of degeneration of both whites and blacks".

It needs to be mentioned however that, the Stallard doctrine was not always implemented to the word in government policies to the same degree. According to Gelderblom and Kok (1994), the amendment to the Native (Urban Areas) Act that was effected in 1937, recognised that Africans who were born in an urban area could not be removed from it if they became unemployed. This right to permanent urban settlement for some categories of African people was also included in the Bantu (Urban Areas) Consolidation Act of 1945 and, for a number of reasons, never really tampered with even during the most extreme periods of Apartheid rule.

- Africans required permission to be employed. According to Gelderblom and Kok (1994), the Black Labour Act of 1964 and the Black Labour Regulations of 1965, decreed in terms of this act, made provision for labour bureaux that controlled the employment of Africans.
- A document (the so-called reference book or “Dompas”), which had to be carried by Africans, was introduced and used to monitor their compliance with the various measures. The “Dompas”, in addition to the fact that it replaced the many documents African men used to carry before the Abolition of Pass laws, had a far wider scope for, African women also had to carry it (Gelderblom & Kok, 1994:83 – 85).

The reasons for influx control were intended to serve political and economic purposes but, the social and economic consequences were far reaching. On the economic side, many employers in South Africa (especially those in mining and agriculture) saw influx control as an aversion to the workings of the African labour market and the usual forces of supply and demand, because they felt that competing for African labourers would cause a rise in wages. This was undesirable. On the political side, there was a fear that if Africans were allowed to reside permanently in towns, they would insist on demanding political rights. Granting political rights would inevitably lead to a demand for economic rights–the rights to employment, access to municipal services and even a right to property.

With time, particularly in the early sixties, it became evident that the influx control measures were not effective, partly because restricting black urbanisation went on in spite of the influx control measures and, restricting blacks to townships resulted in overcrowding and terrible living conditions. Of course the ineffectiveness of the influx control measures never came with no cause. During the Second World War the ANC, founded in 1912, together with its allies organised protests against the pass laws. This to a fair extent, coupled with the failure of the labour bureaux to control the employment of the Africans in urban areas, saw African/Black urbanisation rise substantially. By 1960 31% of the total African population was urbanized (see Gelderblom & Kok, 1994).

To stem rural – urban – migration of Africans, the Apartheid government created homeland states, hoping that with the decentralisation of industries into the homelands, migration streams will be channeled into the homelands. It was hoped that this move will, with time, attract Blacks from the white towns. This move did not work as expected, to the extent that Blacks, who did not move voluntarily, had to be forcefully removed from white cities and towns. The movements (voluntary and otherwise) into the homelands happened without the national government making sufficient effort to ensure that the homeland administration had the capacity to provide adequate living conditions for the people, talk less of employment provision. All this changed in 1994 with the coming of the new democratically elected government.

After the 1994 national government elections, an initiative was undertaken to review development considerations. A national development programme characterised by targeted social spending on sectors such as health, education and infrastructure capacity building came into being (Erasmus, 1994:9). Economic restructuring and development required the design of a strategic framework for economic restructuring; the facilitation of public debate at national, regional and local level to achieve its translation into practical strategies on national, regional and local level, and the design of institutional systems to manage the support programmes and projects at all levels – reconstruction and development (Erasmus, 1994:10 – 11). It is against this backdrop that the current study is undertaken as a way to establish the achievements made by the new government in respect of improving people's quality of life.

1.3 The problem statement

The concept "quality of life" (QOL) is not entirely new. Equally so is the measurement of QOL as a way of assessing development. As indicated earlier on, the objective of having a development policy in place is to ensure that development takes place. Development in its broad sense is about improving people's quality of life be it at work, at home, in transit from one place to another, even in the process of healing when one is sick. Available literature indicates that several measures of development are available, some of which are at the meso- or macro- level (see Human development report, 2001; Erasmus, 1995). Most of these measures are economic in nature, like the GDP, GNP, and per capita income. These measures do not highlight the disparities within a population as far as access to resources is concerned. A rise in GDP does not necessarily imply an increase in income and improvement in people's living conditions (Todaro, 1997:148; Todaro, 2000:163). Access to resources plays a great role in determining people's living conditions. This in turn reflects the quality of life that people enjoy.

Attempts to measure quality of life in South Africa have been made at both the subjective and objective levels. At the subjective level, a study of people's perception of well-being and life satisfaction has been conducted by Moller *et al*.(1987). The main aim was to provide a basis for observation of future trends in the improvement of living standards and people's

assessment of their life circumstances. A research instrument was developed for this purpose, which could be used to monitor changes in people's quality of life based on their own assessment of the life circumstances they happen to find themselves in. This study analysed the relationship between overall quality of life (dependent variable) and various quality of life indicators. After employing a series of multivariate inferential techniques, results revealed a great deal of consistency with regard to what impacts most on overall quality of life within the population categories of the surveyed people.

Results indicated that irrespective of population group the most salient and "reliable" domain issues (or indicators in the case of the current study) of quality of life are the following:

- Ability to provide for family
- Health
- Quality and quantity of food
- Wages and incomes
- Personal possessions
- Financial security in old age
- Dwelling adequacy
- Education
- Job opportunity

(See Moller *et al*., 1987:7).

Results emanating from multivariate inferential analysis indicate a relatively low explanatory power of the components of quality of life as far as quality of life is concerned. The ten most salient components listed above for the entire sample indicate that 43% of the variation in life satisfaction is accounted for by the variation in the ten components. This seems to reinforce the complex nature of quality of life and how a multidimensional approach to analysing quality of life aspects at the ordinal level could possibly improve the explanatory power.

A more relatively recent study, also qualitative in nature, was conducted by Moller (1996). This study analysed household satisfaction by comparing past household satisfaction (in terms of financial achievement), current satisfaction, and expectations of satisfaction in future

(Moller, 1996:239). One of the questions the study addressed focused on the relationship between level of satisfaction and a household's level of income and expenditure. A related question was whether lower income levels are associated with basic needs to a greater degree than higher incomes. The findings of this study indicate a positive relationship between level of satisfaction as a variable, and household income and expenditure. This finding calls for further investigation as far as this relationship is concerned. Given the existence of this relationship, what proportion of households in South Africa fall within the confines of this established relationship currently?

A quantitative measure of quality of life at the household level was formulated by the South African advertising research foundation (SAARF). The living standards measure (LSM) is a scale used to indicate the socio-economic status of an individual or group of individuals. The LSM has undergone changes in the process of fine tuning it, to the current SAARF universal LSM (see SAARF Universal LSM, 2002). The target population of the LSM are marketers. The contribution of the SAARF Universal LSM towards measuring QOL and development as such is enormous. One shortcoming identified with this measure lies in the nature of the data used in its construction. The variables are at the nominal level of measurement. It is a fact that data pertaining to many socio-economic aspects impacting on QOL are ordinal in nature if not at higher levels of measurement.

Bearing in mind that ordinal level variables and variables at higher level of measurement can be collapsed and analysed at nominal level, the act of collapsing variables involves a trade - off of vital information in the process. The aim of this study is to develop a measure of QOL in which socio-economic aspects impacting on quality of life are measured at the ordinal level. In this way a household's level of development will be measured in respect of the socio-economic aspects (or indicators for that matter which a household accesses) impacting on the household.

1.4 Aims of the study and research questions

The aim of this study is to measure quality of life and, to analyse the changes in household quality of life between 1996 and 1999.

The analysis will focus on changes in household access to selected indicators of quality of life. The indicators will fall in the following broad categories:

- Indicators relating to durable items including household appliances like refrigeration, television, etc.;
- Indicators relating to household access to services, like water, sanitation, and electricity;
- Indicators relating to infrastructure facilities, like type of dwelling, toilet, etc. and;
- Subjective indicators pertaining to household life satisfaction.

The analysis will be guided by the following major questions which have already been raised by among others; HSRC, Stats SA, SAARF, parliamentary politicians, the media, and the public domain.

- Can quality of life be objectively measured?
- What has been happening to QOL in South Africa?
- What are the prevailing gender differentials in household QOL in South Africa?
- What is the situation regarding child - headed households and, what are the likely implications?
- What do previous research findings reflect?
- What is the international situation in terms of household QOL?
- Is household life satisfaction related to the conditions of QOL a household finds itself in? Put differently, do material conditions influence household life satisfaction?
- Has quality of life in South Africa actually improved?

Answers to these questions will enable the researcher to get a better understanding of the concept "quality of life". The researcher will then be able to measure QOL, analyse the changes that have taken place during the period 1996–1999, and answer the most pertinent question that this study seeks to answer – whether quality of life in South Africa has improved.

1.5 Operationalisation, assumptions and delimitations

The term "operationalism" refers to operations carried out in the measurement of a concept. Researchers who emphasise operationalism generally seek quantitative measures of their concepts.

Today it is customary to solve problems of representation by means of the development of operational specifications of theoretical, abstract terms. According to Kibuuka (1998:36), the function of operational specification is to transform the theoretical term to a measurable variable. To a strict operationalist, measurement error is not a major problem, simply because the concept is defined to be that which is measured.

For the purpose of this study, the construct *quality of life* needs to be defined and this is not an easy task given its complexity and the subjective value attached to its rationalization. Furthermore the definition and/or determination of *quality of life* has to be approached from a perspective of a particular discipline. According to Diener and Suh (1997:189), there are three major philosophical approaches to determining the quality of life. The first approach describes the characteristics of the good quality of life that are dictated by normative ideals based on a religious, philosophical, or other systems. An example of this approach is given where we might believe that the good life must include helping others because this is dictated by our religious principles.

Another approach to defining the good life is based on satisfaction of preferences. Within the constraints of the resources they possess, the assumption here is that people will select those things that will most enhance their quality of life. In this tradition, the definition of the quality of life of a society is based on whether the citizens can obtain the things they desire. People select the best quality of life for themselves that is commensurate with their resources and individual desires. This approach to utility or the good life based on people's choices under girds much of modern economic thinking. In a way, it is in line with the approach of the South African government to population and development. The programme of action, within the context of the current population and development paradigm, endorses a development strategy that emphasises the reciprocal relationships between population, development and environment. It focuses on meeting the needs of the people rather than on achieving demographic targets. One of the objectives is the need to fully integrate population concerns into all development strategies, planning, decision making and resource allocation, with the goal of meeting the needs and improving the quality of life of present and future generations. "Sustainable human development" sees development as a process of enlarging people's choices.

The role of government in development is the creation of an enabling environment for people to enjoy long, healthy and creative lives. The challenge is to meet the needs of the present generation and to improve their quality of life without destroying the environment or depleting non-renewable natural resources, which would compromise the ability of future generations to meet their own needs (South African population policy, 1998:4-7).

The third definition of quality of life is in terms of the experience of individuals. If a person experiences her life as good and desirable, it is assumed to be so. In this approach, factors such as feelings of joy, pleasure, contentment, and life satisfaction are paramount. This approach to defining the quality of life is most associated with the subjective well–being tradition in the behavioral sciences. This study will operationalise quality of life by considering the second and third approaches.

Bearing the two approaches above in mind, an operational definition that could possibly be close to that of *quality of life* is the one of *Level of living* used by Erikson. Erikson (1993, 72) defined *Level of living* as "*The individual's command over resources* in the form of money, possessions, knowledge, mental and physical energy, social relations, security and so on, *through which the individual can control and consciously direct his living conditions*". The central element in his definition is the individual's "command over resources". In Erikson's view, it is difficult, if not impossible to judge the level of living of an individual or a group, without knowing their resources and conditions in several respects, which are not transferable between each other. To have knowledge about, for example, economic conditions is just not enough; we also have to know about health, knowledge and skills, social relations, conditions of work, etc., in order to determine the level of living. There is no common yardstick through which the different dimensions could be compared or put on a par. No objective or impartial way exists by which it would be possible to decide which of two men is better off if one of them has, for example, worse health but better economic conditions than the other. Welfare or level of living seems, at least in the European tradition, to be based either on people's needs or on their resources. If needs are made central, then the concern is with the "degree of need–satisfaction'. If resources are made central then the concern is rather with man's capacity to satisfy those needs or, more generally, to "control and consciously direct his living conditions";

the individual's level of living thus being an expression of his "scope of action" (Erikson, 1993:72).

In view of the various approaches to quality of life mentioned above, the current study will have *quality of life* defined from a needs–satisfaction perspective. This study perceives a household's *quality of life* to be *conditioned* by the degree to which the household is able to meet its needs. The *conditioning* emanates from the fact that different households experience different QOL conditions not only in terms of what proportion of the whole range of household needs are satisfied, but also in terms of the quality of the needs which are satisfied. The whole range of household needs can certainly not be established, nor can the entire spectrum of what each household considers to be the best, in quality terms, for each need. This said however, there is a wide variety of basic human needs recognized internationally, which every human being should not miss out upon; housing, water, education, health, employment for the economically active, transport, security of life and property, to mention but a few. These are basic needs – referred to as indicators of quality of life in this study - which every household needs to access but, the degree of access differs from household to household due to a number of factors. For instance, a household in a rural area is unlikely to access tertiary education with the same ease or cost as a household in the city because tertiary institutions are usually located in urban areas. The same applies to other needs like clean water, transport, electricity, telephones, health services, etc. Households in rural areas experience relatively poorer living conditions or, call it poorer quality of life because of the differences in infrastructure - a meso-level factor. Households in the same locality also do experience different quality of life (QOL hereafter) because of the differences in ability to access what is needed and/or what is available. For instance in a rural setting, a better off household in terms of income will dig its own bore hole in the compound, and even install a water pump, which a poor household cannot do. Even if piped water were availed in the locality, installing piped water in the dwelling will be done by the household with the necessary financial capability; the poorer household will not be able to have water in the dwelling. The two households experience similar meso-level conditions but they will experience different living conditions because of the situations they experience as individual households.

Looking at household needs in a broad framework will be elusive if the contextual conditions in which such needs are satisfied are ignored. Take safety as an example. Household safety has two interconnected components, both of which, from a need perspective, are subjective. One component of household safety deals with safety within the household. This component could be judged and expressed from the point of view of how household members feel in respect of how difficult it is for an intruder to gain entry without permission. While this [safety] depends a great deal on the physical structure of the premises and other early warning systems, which in themselves are a function of income in particular, such safety is also influenced by safety in the neighbourhood or community- community safety being the other safety component. The two components may be considered by the household in assessing the overall safety situation of the household. They may be interconnected but implementing them is quite different. Community safety is implemented by security services like the police, and other local initiatives like neighbourhood watch, and private security organisations.

Most of these security services can be found in urban areas, not in rural areas. The current study will assert that while safety is a basic human need, satisfying it depends on where a household happens to be located because location determines the type of service(s) - at community level - that are available. Thus a household's perception of its safety will be contextually conditioned by the extent to which its safety as a need is satisfied. Essentially a household's quality of life is shaped or determined by what needs (or indicators in this study) it can satisfy under certain conditions. The conditions play a critical role in influencing the extent to which needs or indicators can be satisfied or accessed.

Several other terms also need to be defined. These are terms which were used in the October household surveys of Stats SA and they are as follows:

- A *household* consists of a single person or a group of people who live together for at least four nights a week, who eat together and who share resources.
- A *hostel* is a communal living quarter for workers, provided by a public organisation such as a local authority, or a private organisation such as a mining company. These were residential dormitories established for migrant workers during the apartheid era, and they continue to house people working in certain industries, such as the mining industry.

- The *employed* are those who performed work for pay, profit or family gain in the seven days prior to the household survey interview, or who were absent from work during these seven days, but did have some for of paid work that they would return to.
- The *formal sector* includes all businesses which are registered for tax purposes, and which have a VAT number.
- The informal sector consists of those businesses that are unregistered and do not have a VAT number. They are generally small in nature, and are seldom run from business premises. Instead, they are run from homes, street pavements or other informal arrangements.
- An *urban area* is one that was legally proclaimed as being urban under previous legislation. These include towns, cities and metropolitan areas.
- A *semi - urban area* is not part of a previously legally proclaimed urban area, but adjoins it. Informal settlements are examples of these types of areas. According to Statistics South Africa (2001:11), *semi- urban* areas have been included with non-urban areas.
- *Non-urban* areas include all other areas, including commercial farms, small settlements, rural villages, and other areas, which are further away from towns and cities.
- *Traditional dwellings* include huts or other dwellings made of traditional materials such as dung and straw
- Informal dwellings comprise shacks or shanties in informal settlements or in back yards. (Statistics South Africa, 2001:9 - 11).

1.5.1 **Assumptions**

There are some assumptions made for the purpose of this study namely:

- The relationship between quality of life and the indicators of quality of life.

  This study assumes that there is a direct relationship between quality of life and access to the indicators of quality of life. In this way households accessing a few of the selected indicators of quality of life are expected to experience relatively poorer quality of life as compared to households accessing most and the better part of the selected indicators. For instance a household using bore hole water or relying on public transport water and, having no telephone in the dwelling will be badly off as compared to a household having piped water in the dwelling, with its own car, and a telephone in the dwelling.

- The second assumption relates to a household's level of development. This assumption is in a way, derived from the first one. That is access to the indicators of quality of life is directly related to the household's level of development. Put in another way the more a household accesses most indicators and the better part of the said indicators the better is its quality of life and, the more developed the said household is.

1.5.2 The delimitations

Two important delimitations need to be clearly spelt out. One deals with quality of life. Quality of life will be measured, analysed and interpreted strictly in terms of access to the selected indicators thereof. The second delimitation deals with the reference period in relation to findings of the study. The study findings will refer to the period 1996 - 1999 to which the OHS data apply

1.6 Contribution of the study

This study is a follow-up on the study completed in 1999 by Kironji, titled "The formulation of a household-based development index and assessing the efficacy thereof in a rural area". The previous study served to test the methodology - the formulated index. Following its results and, having looked at the results of other studies particularly the SAARF Universal LSM^{TM}, HSRC, and Stats SA (2001), there is a need for another measure of quality of life. This study will quantify quality of life and, in the process, contribute towards an understanding of the changes in household differential access to the aspects that impact on quality of life. Not only will changes in material conditions be highlighted (a crucial factor for policy implementation), also the interrelationships between these changes and the subjective changes of quality of life will be depicted. The former is crucial in as far as refocusing the development policy objectives is concerned. This is particularly important in view of the fact that development is a collaborative process involving the various government departments.

1.7 The outline of the study

Following this introductory chapter, chapter two will focus on reviewing the literature related to the research on quality of life and related areas like living conditions, welfare, and

development. Although study findings in respect of the above research areas will be noted, particular attention will be paid to the methodology used in attaining the results. Focusing on the methodology will sharpen the understanding of the analytical methods, the technical problems associated with such methods, and how some problems have been dealt with in previous research. Of particular interest is the universal Living Standards Measure (LSM^{TM}) study by the South African advertising research foundation (SAARF). SAARF(2002) developed a measure of living standards, which constitutes an index that reflects the living standards of households or individuals on the basis of a wide range of consumer goods possessed.

Chapter three will focus on conceptualising quality of life in light of the operational definition of the concept *quality of life*, which has been dealt with at length in this chapter. A conceptual model will be developed to provide guidelines in understanding the aspects which impact on household quality of life, what makes households to experience different quality of life, and what aspects play a critical role in differentiating household quality of life (QOL hereafter). Literature on the linkages between quality of life and some pertinent indicators will be applied to inform and guide the development of the conceptual model. Following this section in Chapter three will be a description of the research methodology wherein, details regarding the processes involved in quantifying quality of life will be provided.

Chapters four to seven will present the findings of the study in respect of the emerging quality of life clusters. The quality of life index is consists of the entire array of quality of life groups emanating from cluster analysis. In the various QOL groups or clusters, conditions experienced by households in terms of what households in each cluster have access to, are described. The linear discriminant function (LDF hereafter) emanating from discriminant function analysis, describes the relative contribution of the QOL indicators to quality of life. The changes in the number and composition of the QOL groups and the corresponding LDFs for the period 1996 – 1999 will be analysed in order to assess the improvement in QOL conditions over this period.

In Chapter eight a discussion of the findings will be provided, and the extent to which the study results fit the conceptual model. The discussion will be done in collaboration with the reviewed literature in order to assess the areas where the findings are in agreement or disagreement with the literature. This is crucial as disagreement calls for possible explanation(s); whether the differences are due to changes in QOL or, due to the methodologies applied. Either way, clarity needs to be sought to avoid drawing misleading conclusions and making wrongly informed recommendations.

This study concludes with chapter nine where recommendations from the analysis of research findings is presented. The study's limitations are highlighted and, certain conclusions are drawn as well as recommendations for further research.

1.8 Summary

In this chapter, the background of the study has been presented, followed by the problem statement. Thereafter the aims of the study have been spelt out and motivated.

The research questions have been raised. Quality of life has been operationalised, and other operational definitions used in the October household surveys have been indicated. The accompanying assumptions and the study's delimitations have been stated, followed by the contribution of the study in the light of other previous research. The chapter ends by giving an outline of the study.

CHAPTER TWO: REVIEW OF THE RELATED LITERATURE

2.1 Introduction

The purpose of this chapter is to review the literature related to quality of life, population and development in general. Literature review will not only sharpen and deepen the ability to conceptualize development interactions, it will also make it possible to identify the salient variables which will serve as development indicators. Literature review will focus on a number of aspects. Among these are aspects relating to economic activity, and access to basic household needs like housing, health services, electricity and, water and sanitation. Literature related to population-development-environment link and, education and sustainable development will be conducted, plus aspects relating to subjective well being.

2.2 Qualitative measures of quality of life: A composite index of subjective "global" measure of quality of life

Measuring quality of life is a relatively new phenomenon both locally, in South Africa and internationally. With regard to South Africa, Moller *et al*. (1987) conducted a nationwide study in South Africa with the aim of measuring QOL on a subjective basis. Their study made use of data collected in 1982/83. The survey comprised of 5000 South Africans from all population groups. The study investigated respondents' perceptions of well-being and basic needs. The aim of the study was two fold:

- To provide benchmark data for the observation of future trends in the improvement of living standards and people's assessment of their life circumstance and,
- To develop an appropriate instrument for the measurement of perceived well-being - the subjective quality of life of South Africans.

The study came up with a standard set of QOL indicators which covered a wide spectrum, ranging from perceptions regarding material possessions (like dwelling, health, and income), to subjective issues like self esteem, freedom of choice and expression and, overall quality of life. By combining "global" measures of QOL - (1) satisfaction with one's life; (2) how happy a person is in life; (3) how happy a person is with taking things together-with indicators of

specific domain items, a composite index reflecting subjectively experienced QOL was derived (Moller *et al*, 1987:146).

The study went ahead and ranked the components of QOL. At this stage the degree of a person's overall satisfaction- ranging from "very satisfied" to "Don't know"- was taken as the dependent variable while QOL indicators served as the predictors. Multiple regression analysis was undertaken to quantify the contribution of the indicators to overall well-being. All the indicator variables were recorded as dichotomous scales, except in the case of per capita income (Moller *et al.*, 1987:31).

From the point of view of the current study, the derived measure has made a substantial contribution to understanding QOL in South Africa, especially along race lines. However the index is not without weakness, just like many measures. For instance, recoding the independent variables as dichotomous scales reduces their power in explaining the differences in the dependent variables. This is likely to be problematic given the fact that affluence on its own does not necessarily imply life satisfaction and happiness (Diener & Suh, 1997:207). Secondly it is important to know people's perceptions regarding how satisfied they are with life but, much as material possession does not automatically translate into life satisfaction and happiness, lack of material basic needs can never reflect satisfactory QOL. Lastly, while perceptions can be real, perception alone will be insufficient in informing policy with regard to the extent to which people's QOL has improved.

2.3 Qualitative measures of quality of life: Components of life satisfaction within South Africa's population categories

As indicated in the previous section attempts have been made to measure quality of life and life satisfaction in South Africa. Moller *et al.* (1987) tried to establish what impacts on life satisfaction within the population categories of South Africa.

This study analysed the relationship between overall quality of life (dependent variable) and various quality of life indicators. After employing a series of multivariate inferential techniques, results revealed a great deal of consistency with regard to what impacts most on overall quality of life within the population categories of the surveyed people.

Results emanating from Moller's study indicate that irrespective of population group the most salient and "reliable" domain issues (or indicators in the case of the current study) of quality of life are the following:

- Ability to provide for family
- Health
- Quality and quantity of food
- Life comparison with other races
- Wages and incomes
- Personal possessions
- Financial security in old age
- Dwelling adequacy
- Education
- Job opportunity

(See Moller *et al*., 1987:7).

As far as the Black population is concerned Moller *et al.* (1987: 29) noted that perceived quality of life is most "problematic and negative" among Blacks. In this population group the following domain issues were found to be consistently salient among both rural and urban Blacks.

- Health
- Ability to provide for family
- Quality and quantity of food
- Life compared to other races
- Family happiness and peace
- Job opportunities
- Food prices
- Education
- Personal possessions

Perceived quality of life was assumed by this study to be less problematic among the whites. In this group the most salient domain issues about life satisfaction included the following:

- Health
- Adequacy of dwelling

- Financial security in old age
- Personal possessions
- Choice of where to live

(See Moller *et al.*, 1987:33 for a detailed list of the results in respect of ranking of the components of quality of life).

Results emanating from multivariate inferential analysis indicate a relatively low explanatory power of the components of quality of life as far as quality of life is concerned. The ten most salient components listed above for the entire sample indicate that 43% of the variation in life satisfaction (or quality of life) is accounted for by the variation in the ten components. This seems to reinforce the complex nature of quality of life and how a multidimensional approach to analysing quality of life aspects at the ordinal level could possibly improve the explanatory power.

2.4 Qualitative measures of quality of life: Household satisfaction - Past, present and future perspectives

Concern about happiness and quality of life is common to all societies on earth and can be traced back to the beginning of civilisation. According to Moller (1996), the scientific study of QOL is however, relatively new. One of the consistent research findings over the past three decades is that subjective well-being has three components; satisfaction with life as a whole and, positive and negative effect. High levels of subjective well-being occur when people are infrequently sad, frequently happy or joyful, and generally feel good about their lives. The three components are interrelated but do not overlap completely. Satisfaction with life is largely a cognitive summary evaluation of one's life situation, which leaves to individual judgment the importance of various aspects of life.

Moller (1996) analysed secondary data on QOL. The original data was part of the Project for Statistics on Living Standards and Development (PSLD) which was conducted by the South African Labour and Development Research Unit (SALDRU). Moller (1996) had, among others, the following questions that guided her analysis:

What is the relationship between perceived financial achievement ("past satisfaction"), current satisfaction, and expectations of satisfaction in future ("future satisfaction")?
Are high levels of satisfaction related to high levels of household income and expenditure? A related question is whether lower income levels are associated with basic needs to a greater degree than higher income levels.

According to Moller (1996: 241), recent cross-cultural studies shed more light on the significance of income and fulfillment of basic needs in relation to happiness. Numerous cross-national studies show that material wealth is a consistent and important predictor of QOL. Money has increasingly become a global value and universal goal. Income straddles the material and non-material divide in that it confers social standing and begets influence in most societies. It allows individuals to fulfill a wide range of personal goals including non-material ones. Regarding Moller's findings as far as the relationship between income and satisfaction is concerned, a consistent pattern emerged: income and expenditure levels co-varied with levels of satisfaction with living standards. This finding suggested that income levels might influence expressions of present satisfaction with QOL. However, future satisfaction was not income-linked.

Regarding the relation between "past satisfaction" and "future satisfaction", Moller (1996) finds future satisfaction indicators to have highlighted the raised expectations for a future beyond apartheid which was most pronounced among black South Africans. She indicates that when present and future satisfactions were combined the future winners (current dissatisfaction and optimist for the future) and lower income earners expressed the need for basics such as food, shelter, infrastructure and income - providing jobs. Current satisfaction and higher income regardless of future outlook were linked to needs for stability, peace and income maintenance.

Higher-and lower-income groups shared to a certain degree the need for peace, which may be viewed as a prerequisite for the provision of basic needs. These findings support the hypothesis that *satisfaction is not relative but linked to basic needs and income especially in the case of poorer populations*.

The effect of income on satisfaction was stronger in lower - income families at the bottom of the racial hierarchy (Blacks) but still had an effect when basic needs were met. This in way suggests that income continues to influence satisfaction beyond basic needs.

2.5 Quantitative measures of quality of life: The SAARF Universal Living Standards Measure

The South African Advertising Research Foundation (SAARF) developed a measure of living standards referred to as the SAARF AMPS™ Living Measure. This is a measure that was initiated in 1988/89 and has evolved to become a universal measure of living standards. The SAARF Universal LSM™ is a scale used to indicate the socio-economic status of an individual or group (SAARF, 2002:3). Households are grouped on the basis of access to specific household variables such that households accessing similar variables are grouped together forming one living standards measurement (LSM) group.

Towards the end of 2000, (SAARF) in conjunction with its contractors ACNielsen Media International realised the apparent need to introduce a universal living standards measure (LSM) which could be used consistently for all markets and across all its products. According to SAARF (2002: 2), SAARF's principal objectives are:

"To promote, sponsor, arrange, authorize, commission, manage, control or cause to be arranged, organised, conducted, authorised or commissioned, the obtaining of all kinds of advertising research, media audience research, surveys, investigations and reports. Likewise to do all things and carry on any activity related, connected or associated with any of the above objects and purposes by itself or through agents, employees, contractors and other interested parties and to employ companies, firms and persons for such purposes and generally to do all things necessary and incidental in order to give effect to any of the objects of the South Africa Advertising Foundation".

The need for a universal living standards measure stemmed from the conflict between the desire to sustain consistency for trending purposes and the need to reflect changes in the market. This called fore a measure that will not need year - on – year adjustments.

Within this context, the SAARF Universal LSM™ was formulated. SAARF LSM™ stands for "Living Standards Measure". It is a scale indicating the socio-economic status of an individual or group. The reasoning behind formulating the new SAARF Universal LSM™ was for the measure to be based on household variables. In this way the household would be the unit of analysis whereby households can be grouped on the basis of the variables they access (SAARF, 2002:60).

The new SAARF Universal LSM™ draws its success from SAARF's previous work on the living standards measure (LSM) which dates back in 1988/89. Developing such a measure had its origin in comments that while the community size measure, which splits the population into groups according to the size of the community in which they reside, was effective in reflecting people's lifestyles, persons who live in similar community sizes lead different and at times quite sophisticated lifestyles. In particular, it became apparent that all rural dwellers were no longer (if they had been) living a simple, unsophisticated lifestyle.

The search was then commenced for a measure which could be able to distinguish living standards better than any single demographic variable. The development of the new measure - the SAARF AMPS™ Living Standards Measure (LSM) which has evolved into the SAARF Universal LSM™ - involved a great deal of preliminary discussion and experimentation before reaching the present form (see SAARF, 2002 for details).

As a start, using the entire SAARF AMPS™ 87/88 data base, each respondent was assigned a score on a large number of variables which had been selected on judgment. The variables included the possession of a range of durable household articles, access to reticulated water and electricity supplies, use of the various media and a wide range of demographics including population group, income, education and others. Some twenty variables were coded into 71 classes (SAARF, 2002:56).

For each respondent a score on an index was calculated. Using the total population frequency distribution, the index was divided into a number of groups. Persons falling into the various groups were cross-tabulated against their consumption of goods, services and media to obtain

an idea of whether the groups were giving sufficient segmentation of the population. The results were promising (SAARF, 2002: 57)

A principal component analysis was used to examine the spread of the data points of variables, in order to determine the combination of variables along which the largest proportion of the spread occurred. The variables used were the 71 indicator variables defining the classes of the original 20 variables. After the axis of the first principal component has been defined, a number of further "directions" or axes are determined such that the second axis is the axis along which "most" of the rest of the variability in the data occurs, but with the second axis perpendicular to the first principal component and so on. The first principal component was found to cater for a large proportion of the variation in the data (just over one quarter), with the other principle components catering for smaller proportions. Stepwise regression analysis was then used to choose a sub set of the variables that would accurately predict the scores of the respondents on the first principle component. (SAARF 2002: 57)

The SAARF AMPS™ has evolved considerably since then, with some variables being dropped and new ones being incorporated. The new SAARF Universal LSM™ has been based entirely on household variables. The variables were agreed upon by the SAARF council in July 2001. In the process of developing the new SAARF Universal LSM™ it was agreed that the list of variables be expanded to 29 to give finer definition to the scale. The council also agreed to increase the number of LSM groups in the scale from seven to ten. Using the procedure described above, the 29 variables resulted into the weights indicated in Table 2.3 below, with the data base having been divided into ten LSM groups. The ten groups constitute the SAARF Universal LSM scale denoted as LSM 1 - LSM 10. A description of the most outstanding findings of some of the LSM groups is provided in sections 2.6.1-2.6.3. A full description of the findings with regard to the SAARF Universal LSM™ scale is available in SAARF (2002, 14 - 55).

Table 2.1: Variables used in the new SAARF universal LSM and results of stepwise regression analysis

Attribute	Squared multiple correlation	Weight
Built in kitchen	0.6463	0.165505
Microwave oven	0.7692	0.126829
Fridge/freezer(combination)	0.8287	0.152515
Vacuum cleaner/floor polisher	0.8617	0.135318
Flush toilet in/outside house	0.8887	0.142228
No cell phone in household	0.9085	-0.175184
0 or 1 radio set in household	0.9216	-0.158252
No domestic worker in household	0.9320	-0.222364
TV set	0.9418	0.133830
Traditional hut	0.9489	-0.201085
VCR	0.9555	0.134488
Washing machine	0.9606	0.138930
Electric stove	0.9650	0.163219
Motor vehicle in household	0.9689	0.155217
PC	0.9720	0.132148
Electricity	0.9748	0.128613
M-net/Dstv subscription	0.9768	0.126068
Hi-fi/music centre	0.9787	0.105378
Hot running water	0.9805	0.158200
Home telephone	0.9820	0.097140
Water	0.9835	0.127671
Tumble drier	0.9848	0.117338
Deep freezer	0.9857	0.093849
Rural rest(exc. W. Cape & Gauteng rural)	0.9865	-0.093228
Sewing machine	0.9872	0.090320
Home security service	0.9877	0.091632
Dishwasher	0.9881	0.119925
Western Cape (this can not be a variable)	0.98840	0.079999
Gauteng (this can not be a variable)	0.9888	0.056788

Source: SAARF Universal LSM, 2002:62

It should be pointed out that since 2004, SAARF has dropped four attributes from the list above. These include traditional hut, electricity, Gauteng, and Western Cape. These have been replaced by the attributes *House/cluster house/town house, Metropolitan dweller, DVD player,* and *1 cell phone in household* (SAARF, 2004). It is indicated that as South African society develops, the SAARF Universal LSM has the ability to be extended beyond group 10, and 11, 12, etc. will be added as time goes by.

2.5.1 Findings in respect of SAARF Universal LSM™ - 1

The SAARF Universal LSM™ - 1 happens to be the group at the lowest end as far as access to selected goods, services and facilities is concerned. The group accounts for 10.5% of the sampled adult population. With regard to demographics, virtually everyone in this group lives in a rural area (99%). Females constitute the majority (58.8%), of which 28.8% are above fifty years old. According to SAARF (2002:16) the proportion of women in this group with children and/babies is above average. Hardly anyone in this group has received more than some high school education; two thirds having even less, with 27% having no formal schooling at all - functionally illiterate. The average monthly income for this group is R 777 and, the group contains a large proportion of people who are not working (i.e. the unemployed and not seeking work). A significant portion of adults in this group (28%) regard themselves as active gardeners, an indication of active participation in agricultural activities at least for subsistence purposes. Most households in this group (74%) are concentrated in KwaZulu Natal and the Eastern Cape. In general terms the majority of people in these households are Zulu and Xhosa - speaking people (SAARF 2002:16).

As far as residence is concerned, three quarters of the people in LSM™ - 1 live in traditional huts with an earthen floor. Eleven percent are reported to have had access to mains electricity and, only 4% having a water supply on the property (SAARF 2002:16). With regard to household possessions or durables, LSM™ - 1 is reported to have been lacking on most of the items listed in Table 2. It is only the radio which was found to be possessed by most households (71%). TVs were reportedly possessed by 3% and hi-fi/music centres were found to be possessed by and 10%. About 4% of the households were reported to be cooking with electricity, while possession of refrigerators was reported at around 1% (SAARF, 2002:17).

When it comes to lifestyle, most of the activities dealt with by the survey are found to be either of little interest to LSM^{TM} – 1, or not within their orbit. In this group, 4% of the households buy take – away foods in a four – week period while 3% eat at a restaurant in the same period. A major exception to the norm is provided by lottery tickets bought by 15% and scratch cards by 3% during the year, and gardening activities in which 28% of the households indicate to be participating. One in ten households is reported to have gone on holiday, almost invariably to stay with relatives. This group LSM^{TM} – 1, is reported to be physically very stable, with a home- moving rate of 3 in a 100 which is a third of the average, and hardly any having changed jobs. (SAARF 2002: 18)

2.5.2 Findings in respect of SAARF Universal LSM^{TM} - 5

The SAARF Universal LSM^{TM} - 5 consists of households belonging to a group that is located around midway along the scale. This group accounted for 12.5% of the adult population which was sampled. From a demographic point of view, 10% of the adult population in this group are English speakers while 12% speak Afrikaans. The group is generally young, with 28% of adults falling in the 16 - 24 age groups, 29% falling in the 25 - 34 age group, and adults over 50, years accounting for around 17%. The proportion of rural households keeps on dwindling as one moves from SAARF Universal LSM^{TM} - 1 - where virtually everyone is a rural dweller - to the point that only 12% of the adult population in SAARF Universal LSM^{TM} - 5 is rural. Some 32% of the adult population in this group lives in Gauteng. The level of illiteracy shows a similar pattern, with illiteracy levels moving from 27% in SAARF Universal LSM^{TM} - 1 to around 3% - 4% in SAARF Universal LSM^{TM} - 5. Average monthly household income is R2205 which accrues to people working mainly in mining/production, service and clerical/sales sectors. Only 2% of the adults in this group are employed in the agricultural sector. Unemployment stands at 38%.

With regard to residence, 85% of the population in SAARF Universal LSM^{TM} - 5 live in a conventional dwelling (77% live in a house). Squatter camps house some 4%, while 3% of the population live in structures in backyards. Three percent of the population in this group live in hostels/compounds.

Seventy four percent of the households own the homes they live in. Ninety eight percent of the households have access to electricity and the same percentage holds true for access to water on site, 58% have taps inside the home. Everyone in SAARF Universal LSM™ - 5 has access to a toilet - 86% use flushing toilets. (SAARF 2002: 33).

When it comes to possessing durable items, adults in group 5 were found to engage extensively in electronic media. Some 90% live in homes with television and, 67% do have hi-fi's. Access to radio stands at 89% but access to a VCR drops to 18%. Only 1% have a PC in the home. Seventy one percent of the households cook on electric stoves while some 30% use electric hotplates. Microwave ovens start emerging in this group with some 9% having the same at home. Eighty six percent have access to refrigerators, and 11% are reported to having access to freezers. Some 16% are reported to have a cell phone, while vehicle ownership stands at 5%.(SAARF 2002: 34)

Findings in respect of lifestyle reveal some concerns for personal well - being beginning to appear at significant levels in LSM™ – 5. Taking exercise for health, building gradually through the previous group categories, is reported to reach 18% here(though only 2% go to gym) while 4% have attempted to lose weight during the previous 12 months. During the past 4 weeks, 3% will visit a casino, 11% buy scratch cards, while 58% will buy lottery tickets. Fourteen percent have decorated indoors, 6% have painted the outside of their home, and 7% have spent upwards of R1000 on improvements in the last 12 months. During an average month 18% will eat at a restaurant and 30% purchase take-away food. Going away on holiday is reported to remain an infrequent luxury though 10% will do so in a year. Eight percent are reported to have moved house in the past 12 months while 3% changed jobs and 4% undertook part-time study/education. As far as possessing hi-fi's is concerned, tapes and CD's are bought by 9% and 8% respectively. (SAARF 2002: 35)

2.5.3 Findings in respect of SAARF Universal LSM™ - 10

At the top most end of the scale is SAARF Universal LSM™ - 10 which accounted for 5.1% of the adult population. Herein, 55% of the population speaks English and 48% speaks Afrikaans.

It is generally a "mid- aged" group with 35% of the adults falling in the 35 - 49 age group, while people aged between 25 and 34 years make up 18%. Forty percent have gone on to post - matric studies - 15% at university. Seventeen percent of the adults in this group are engaged in "Professional/technical" and "administrative/managerial" work, with household income for this group averaging R13788 per month. According to SAARF (2002: 53), the group is very entrepreneurial (presumably not least because of its access to appropriate resources), with nearly a quarter (24%) classifying themselves as self - employed. Unemployment in this group was recorded at 4%. Four out of five people (83%) make use of a domestic worker (with 27% living in). Seventy two percent of the households in this group live metropolitan areas (42% living in Gauteng) (SAARF 2002: 53).

With regard to residence, most households in the SAARF Universal LSM^{TM} - 10 (88%) own the dwellings they occupy and these are houses being referred to here. Only 4% of the households in this group reside in flats (SAARF 2002: 53).

When it comes to possessing durable items, cost is a minor item in group ten. Seventy eight percent have a PC in the home and, 39% have a satellite dish. Virtually every household has a microwave oven in the kitchen (99%), while possession of freezers stands at 81%. Possession of a cell phone stands at 74% and, vehicle ownership is reported at 82%. Possession of these latter two items is in stark contrast to the situation in group one where virtually no household was reported to possess either a cell phone or a vehicle (SAARF, 2002:54).

When it comes to lifestyle**,** almost every activity that reflects wealth is reported to reach its highest incidence in group 10. Some of the notable peaks (compared to preceding groups – group 9) are: buying CD’s (60); buying jewellery over R500 (14%); spending R1000 + on home maintenance (38%); eating out in a restaurant monthly (74%); and paying for home security (41%). According to SAARF (2002, 55) lifestyle preferences are also apparent. Being a member of a gym is well above previous groups, at 13%, while taking exercise rises to 30% and “losing weight” to 17%. Gardening is reportedly an “active pursuit”, appealing to 36% - a higher proportion than in any other group – while accessing the internet leaps from 18% in group 9 to 38% in Group 10.

Eating in restaurants is as widespread in this group as buying take – away foods (both 74%). Casino attendance reaches the highest level here at 18%. Traveling by air is reportedly double the proportion reached in group 9 (inside South Africa: 23% versus 11%; outside South Africa: 25% versus 13%). Every year 61% goes on holiday in South Africa and 18% visited other countries in the past 3 years for pleasure only. (SAARF 2002: 55).

So the SAARF Universal LSM^{TM} scale shows systematically the lifestyle changes, and changes in living conditions experienced by South African households. The lifestyles portrayed by households in the different groups of the index are greatly influenced by the conditions experienced by those particular households and this, to a great extent, is a function of what households have access to. Table 2.4 has been incorporated into the literature to provide a snapshot of the findings of the SAARF Universal LSM^{TM} scale in respect of the sample distribution, household income, and gender profile.

Table 2.2: Summary findings in respect of population distribution, average household income and gender profile

		SAARF Universal LSM^{TM} groups									
		1	2	3	4	5	6	7	8	9	10
Proportion of sample (%)		10.5	14	14.3	13.8	12.5	12.6	6.0	5.8	5.4	5.1
Average household income (RAND)		77	885	1107	1523	2205	3557	5509	7428	9861	13788
Gender profile (%)	Male	41.2	46.4	49.5	48.8	51.0	49.4	49.7	50.2	51.0	49.9
	Female	58.8	53.6	50.5	51.2	49.0	50.6	50.3	49.8	49.0	50.1

Source: SAARF Universal LSM (2002:10 – 11)

2.6 Descriptions of inequality: The Swedish approach to welfare research

Erikson (1993) provided a critical analysis of the problems encountered in measuring and describing welfare, using data from Sweden. His analysis was based on findings from data originating from "The level of living surveys". These surveys had been commissioned by the Swedish government to describe the conditions and problems of low income earners, using data collected in 1968, 1974, and 1981. The task was approached in three steps: (1) a study of the distribution of factor income, (2) a study of the distribution of disposable income, and (3)

a study of the distribution of welfare in non-monetary terms (Erikson, 1993: 67). It is the third study that is of particular interest as far as QOL is concerned.

The study about the distribution of welfare in non-monetary terms investigated the respondents' living conditions in nine different areas or components of life. A large number of indicators were used for most of the components. The components, as referred to by Erikson (1993:75) are "conditions and problems which we all meet during our lives and which are of such importance that there are collectively organised attempts to cope with them in all societies". These components, together with some typical indicators are shown in Table 2.5. According to Erikson (1993: 69), the overriding aim of the three surveys, whose report was published in 1994 was to answer three questions:

(a) Had there been an average change in the level of living between 1968 and 1981?

(b) Were there any differences in level of living between different population groups, especially between men and women, social classes, age groups, or regions?

(c) Had there been any changes between 1968 and 1981 in differences in level of living between groups?

In attempting to answer the three questions above, questions were asked within the context of the components of life. For instance three questions were asked about physical mobility: whether the respondent could walk 100 metres briskly without problems, whether he or she could go up and down stairs without difficulty, and whether he or she could run 100 metres without difficulty.

Table 2.3: Components and some typical indicators in the Swedish level of living surveys

Components	Indicators
1. Health and access to health care	Ability to walk 100 metres, various symptoms of illness, contacts with doctors and nurses
2. Employment and working conditions	Unemployment experiences, physical demands of work, possibilities to leave the place of work during working hours
3. Economic resources	Income and wealth, property, ability to cover unforeseen expenses of up to $1,000 within a week
4. Education and skills	Years of education, level of education reached
5.Family and social integration	Marital status, contacts with friends and relatives
6. Housing	Number of persons per room, amenities
7. Security of life and property	Exposure to violence and thefts
8. Recreation and culture	Leisure-time pursuits, vacation trips
9. Political resources	Voting in elections, membership of unions and political parties, ability to file complaints

Source: Erikson (1993:68)

The study made use of both subjective and objective indicators. Findings in respect of disability indicate that there had been no overall change from 1968 to 1981 in the proportion of disabled people. However, the results highlighted the important finding that women tend to be disabled more often than men, when other factors are accounted for. The findings also revealed that older people are disabled more often than younger people but this difference had diminished between the period under consideration. As far as regional differences are concerned, no clear disability differences emanated between cities, towns, and the countryside.

Findings in respect of class revealed that members of the working class are disabled more often (having accounted for age, etc.) than members of the upper middle class, with the lower middle class falling in between.

Findings of one objective indicator sighted by Erikson (1993:70) relates to income inequality due to employment between different classes and occupational groups. This finding indicates that the overall income inequality decreased over the period 1967 – 1980. This decrease was partly the result of diminishing differences between occupational groups, but partly also of lessening inequality within classes. Wages in occupations mainly employing women increased considerably during the period.

2.7 Basic needs and the Physical Quality of Life Index (PQLI)

From an international point of view, there has been a growing awareness of the urgency to meet basic needs. The "Declaration of Principles and Programme of Action" adopted at the 1976 World Employment Conference stated that: Strategies and national development plans and policies should include explicitly as a priority objective the promotion of employment and the satisfaction of the basic needs of each country's population (Morris, 1979:20).

Basic needs as understood in this program of action, include two elements. First, they include certain minimum requirements of a family for private consumption: adequate food, shelter and clothing, as well as certain household equipment and furniture. Second, they include essential services provided by and for the community at large, such as safe drinking water, sanitation, public transport and health, educational and cultural facilities. A basic-needs-oriented policy implies the participation of the people in making the decisions which affect them through organizations of their own choice. It is important to recognize that the concept of basic needs is a country- specific and dynamic concept. This concept should be placed within a context of a nation's over- all economic and social development. In no circumstances should it be taken to mean merely the minimum necessary for subsistence; it should be placed within a context of national independence, the dignity of individuals and people and their freedom to chart their destiny without hindrance.

2.7.1 Criteria for a composite Indicator and its application

Bearing in mind the complexity *of basic needs* it becomes clear as to how difficult it is to come up with a single quantitative measure for this concept. In the formulation of a physical quality of life index, six criteria that a composite measure of international socio-economic

performance should meet were established at the outset. According to Morris (1979:21), these are as follows.

(a) It should not assume that there is only one pattern of development.
(b) It should avoid standards that reflect the values of specific societies.
(c) It should measure results, not inputs.
(d) It should be able to reflect the distribution of social results.
(e) It should be simple to construct and easy to comprehend.
(f) It should lend itself to international comparison

The three indicators that met the set out criteria are Infant mortality, life expectancy and, basic literacy. These are the components of a physical quality of life index.

Physical quality of life indices for various developed and developing countries of the world were compiled in a study by Morris. The importance of a PQLI is revealed by its application in conjunction with the Gross National (Product (GNP). In this study poor countries (those with low per capita GNPs) tended to have low PQLIs and, high income countries (i.e. the first world) tended to have high PQLI's. While this pattern may have been expected, correlations between GNP and PQLI were found not to be close at all. On one hand several oil producing countries of the Middle East (particularly Saudi Arabia, United Arab Emirates, Qatar and Libya) stood out with high per capita GNP and low PQLIs. On the other hand low GNP countries like Cuba, Republic of Korea, Sri Lanka and, (before their rapid rises in per capita GNP) Costa Rica, Hong Kong and Taiwan have different political systems but all registered high PQLIs in the mid- eighties at per capita GNP levels below US$700 (see Morris, 1979:61). This shows that money is not everything. A lot more than money is required to improve quality of life. Improving quality of life has a lot to do with the presence or absence of the social infrastructure that determines a society's PQLI (Morris, 1979: 57-66).

2.8 Measuring quality of life: Economic, Social, and Subjective indicators

In the endeavor to improve people's living conditions, measuring quality of life, and improvements made in this regard, has become essential the world over. While improving people's quality of life is a crucial development objective, the means to achieving this objective differ in conceptual terms.

According to Diener and Suh (1997:189) there are three major philosophical approaches to determining quality of life. The first approach describes characteristics of the good life that are dictated by normative ideals based on a religious, philosophical, or other systems. The second approach is rooted in the economic domain and defines good life on the basis of satisfaction of preferences. This economic approach assumes that people will, given their resource constraints, select those things that will most enhance their quality of life (i.e. utility maximisation). The third definition of quality of life is in terms of the experience of individuals. If a person experiences his or her life as good and desirable, it is assumed to be so. In this approach factors such as feelings of joy, pleasure, contentment, and life satisfaction are paramount. Each of the three approaches to defining quality of life has its merits and demerits but the latter two seem to out compete the first approach. In fact, emphasis in conceptualising quality of life is put on the latter two and, above all, policy formulation, monitoring and implementation are commonly based on the economic approach. For that matter this literature will highlight the merits and demerits of the objective or social indicators, as well as the indicators of subjective well-being (SWB).

2.8.1 Objective or Social indicators

Objective or social indicators are societal measures that reflect people's objective circumstances in a given culture or geographic unit. According to Diener and Suh (1997:192), the hallmark of social indicators is that they are based on objective, quantitative statistics rather than on individuals' subjective perceptions of their social environment. Under the conceptual umbrella of social indicators, variables representing a wide range of societal domains have been identified, and measured. In the health domain these include indices like infant mortality and life expectancy, doctors per capita, and bed occupancy ratio. Indicators related to crime, like police per capita, incidence of rape, suicide and homicide rates, have been established to assess crime–related quality of life. Other commonly used social indicators include literacy rates, unemployment rates and income per capita. Income and wealth in general, are found to significantly influence quality of life but it is not an accurate predictor of good or satisfactory quality of life. Diener and Suh (1997:193) highlight this issue in two instances. The first instance refers to a situation where Israel is twice as better off financially (in terms of per capita income) as Tunisia but the two enjoying the same quality of

life on the social indicator index. The second instance involves a situation where Mauritius and Spain are at par in terms of per capita income but Spain enjoying far better quality of life in terms of the social indicators.

Social indicators have their strong and weak points, some of which are highlighted hereafter. Among the strengths of social indicators is objectivity. Social indicators can be fairly precisely defined and quantified. This enables cross- section and time series comparison with regard to information pertaining to such indicators, be it locally or globally. For instance infant mortality is globally defined and measured in the same way. This enables policy makers to assess the improvements made with regard to reducing infant mortality. One needs to take note of the meaning of "objectivity". In the example above, objectivity refers to the degree of precision as far as measuring infant mortality is concerned. However, Diener and Suh (1997: 193) indicate that objectivity may also mean that there is widespread agreement about the value of what is being measured. In this context high infant mortality is rationalised as something bad while an improvement in life expectancy is rationalized as a good thing. Objectivity may also refer to the exclusion of the opinion of the observer (i.e. value–free).

Another strength of social indicators that relates to rationalisation is that social indicators often reflect normative ideals of a society. People are likely to value the absence of crime, clean air and a quiet environment. People are likely to value these things regardless of whether they influence happiness. Thus, social indicators can assess societal qualities that do not rest solely on their influence on subjective well-being, but which are based on widely shared values.

Social indicators, however, do have some pitfalls. One such pitfall is the inevitable subjectivity that creeps in as the researcher decides on what indicators to select and what value(s) should be assigned to such indicators (see Diener & Suh, 1997: 197 At times wisdom is questioned even in situations involving clearly defined indicators. Diener and Suh (1997: 196) give an example regarding the justification of increasing the longevity of people who are extremely senile or severely incapacitated.

They highlight that questions often arise about the optimum levels of indicators, and about trade offs between specific indicators and other values.

2.8.2 Subjective Well – Being (SWB) indicators

The preceding section has focused on objective or social indicators, highlighting some of their strengths and weaknesses. This section will look at subjective well-being (SWB) research, highlighting its strengths and weaknesses. At the end of the section, an attempt will be made to show how combining social indicators and subjective well-being indicators plays a complementary role, a combination that enhances the comprehension of aspects impacting on quality of life.

The basic premise of subjective well-being research is its importance in measuring directly, the individual's cognitive and affective reactions to the individual's whole life, as well as to specific domains of life, if we are to understand the individual's well-being. Subjective well-being consists of three interrelated components: life satisfaction, pleasant affect, and unpleasant affect. Affect refers to pleasant and unpleasant moods and emotions, whereas life satisfaction refers to a cognitive sense of satisfaction with life. Both affect and reported satisfaction judgments represent people's evaluations of their lives and circumstances. Since subjective well-being consists of life satisfaction, pleasant and unpleasant affect, high subjective well-being can include negative experiences as well as the presence of positive affect, and satisfaction with life and domains of life such as work and leisure. Since an individual or society that is high on one of the subjective well-being components can be low on the others, it is imperative that all three components should be assessed (Diener & Suh, 1997:200).

Subjective well-being is concerned with the respondents' own internal judgment of well-being. It is a concept that reflects on how people internally react to and experience the events and situations in their lives. Subjective well-being is a reflection of people's reactions to the conditions and experiences in life; how pleasant or unpleasant a job is, how satisfied or unsatisfied with the salary, working conditions, etc. The relationship between social indicators- reflecting objective conditions – and subjective well-being measures, is not always

a given. Diener and Suh (1997) found small correlations between subjective well-being and objective resources. In their analysis of the World Value Survey II (comprising of nationally representative samples of 43 nations and regions), Diener and Suh (1997) found subjective well-being correlating 0.13 with physical attractiveness, 0,10 with physician–related health, 0.12 with income, and 0.17 with intelligence. Several factors could arguably be responsible for such low correlations, one being adaptability. People tend to rapidly adapt to their levels of resources and experiences. As a result people who had reported to be unhappy at a certain level of material conditions could later report to be happy. Another reason for the low correlations could be the fact that well-being is influenced not only by external life conditions but also by stable dispositional characteristics. Different people may perceive the same life circumstances differently (Diener & Suh, 1997: 201).

People's psychological adjustment strategies to objective conditions appear to be remarkably flexible but the degree of flexibility seems to be limited by resource availability. People tend to aspire for, or set goals of achievements basing on the material resources at their disposal. People choose personal goals for which they have relevant resources, and the degree of congruence of individuals' goals with their resources predicts their subjective well-being (Diener & Suh, 1997: 202). It will be fair then to say that objective conditions greatly shape people's expression of what they report with regard to well-being, bearing in mind that people adapt psychologically to any level of material circumstances at a given time.

Just like objective indicators, subjective well-being measures also have strong points and weak points. One major advantage of subjective well-being (SWB) measures is that they capture experiences that are important to the individual. These may be experiences of events that are negative or positive. Because most objective social indicators are indirect measures of how people feel about their life conditions, SWB measures provide an important additional assessment that can be used to evaluate the evidence summarized by objective indicators. If objective and subjective indicators converge, the researcher can make more definitive conclusions about quality of life. Where objective and subjective measures diverge, a deeper analysis of the meaning of the indicators is required. Another strength of subjective well-being measures is that when proven inadequate, they are often easier to modify in subsequent

studies than objective indicators, which are usually compiled by sources (e.g. government departments) beyond the reach of most researchers (Diener & Suh, 1997: 205). This however, will not affect the choice of indicators in the current study as all data have been collected sequentially by the same organisation, covering the same scope, and applying the same instrument. Another strength of subjective well-being measures is that by measuring the experience of well-being on a common dimension such as degree of satisfaction, subjective well-being measures can more easily be compared across domains than can objective measures that usually involve different units of measurements. This enhances comparability across time and regions. This factor also will neither work in favor nor against measuring quality of life in the current study as all the indicators selected are being set at the same level of measurement (i.e. ordinal).

Subjective well-being measures do have some serious weaknesses. One such weakness is epistemic in nature. The fact that someone reports to be happy does not necessarily mean that that person is actually happy. This compromises validity. The compromise on validity is worsened by the fact that a person experiencing certain material conditions can report different levels of satisfaction or dissatisfaction at different times within a short space of time. This is a failure on reliability grounds. In a similar breath subjective well-being measures may not fully reflect the objective quality of community life in a locale because they may be more dependent on temperament and personal relationships than on actual societal factors. Also because people naturally adapt to situations, social expectations may influence individuals' subjective well-being. For instance, poor economic conditions may be perceived less negative if experts remind citizens about the nation's economic improvements from the past instead of focusing on the problems of the current economy (Diener & Suh, 1997:206).

Having looked at the merits and demerits of both the objective and subjective measures of quality of life, it is imperative to briefly indicate the importance of using both measures to get a better understanding of quality of life. For policy makers, an accurate assessment of quality of life is crucial if policies are to achieve their objectives. For this to be achieved, reliable and valid social indicators must be used for this purpose to assess the changes in quality of life.

Subjective well-being indicators are equally important for people to express their satisfaction or dissatisfaction with the actual conditions they happen to be in; this takes care of the context. This is not withstanding the fact that people's expression of life satisfaction or dissatisfaction is generally a transformation of objective conditions that they [people] experience, but it will be wrong to assume that this transformation is always automatic. From a methodological point of view, the parallel use of both measures is reinforcing in that the measurement weaknesses of the two types of indicators are not the same. As such it provides alternative views of assessing quality of life that are not likely to be affected by common errors of measurement (Diener & Sun, 1997: 207).

2.9 Quality of life indexes and national policy

Numerous attempts have been made by governments and public policy institutes to develop quality of indexes, with the intention of measuring quality of life. Hagerty *et al*.(2001) developed fourteen criteria for determining the validity and usefulness of twenty two commonly used QOL indexes. The QOL indexes reviewed address various domains of quality of life, at different levels of conceptualisation – micro, meso or macro levels (Hagerty *et al*., 2001:3). The fourteen criteria developed for reviewing the QOL indexes are briefly as follows:

(i) The index must have a clear practical purpose, i.e. a public policy purpose.

(ii) The index should help public policy makers develop and assess programs at all levels of aggregation.

(iii) The index should be based on time series to allow periodic monitoring and control.

(iv) The index should be grounded in well-established theory. "Theory" in this context means the "nomological net" of concepts and causal paths that specify how QOL is related to exogenous and endogenous variables. "Well-established" means that its parts have been subjected to empirical test (Hagerty *et al*., 2001: 6).

(v) The components of the index should be reliable, valid, and sensitive. By sensitive is meant the index's ability to show changes in response to public policy inputs.

(vi) The index should be reported as a single number, but can be broken down into components.

(vii) The domains in aggregate must encompass the totality of life experience.

(viii) Each domain must encompass a substantial but discrete portion of the QOL construct

(ix) Each domain must have the potential to be measured in both objective and subjective dimensions.

(x) Each domain within a generic QOL instrument must have relevance to most people

(xi) If a specific domain is proposed for a non-generic instrument, it must be demonstrated to contribute unique variance to the QOL construct beyond the generic domains for the target group.

(xii) Domains must be potentially neutral, positive, or negative in their contribution the QOL construct.

(xiii) Domains differ from the dimensions of personality, cognitive processes, and affect in that they cannot be measured objectively.

(xiv) The subjective dimension of each domain has both a cognitive and an affective component. They are measured by questions concerning "satisfaction" Hagerty *et al*. (2001: 2-11).

As indicated above, twenty two commonly used QOL indicators were reviewed. These include the U.N. Human Development index, consumer confidence index (CCI), Index of economic well-being (IEWB), World Health Organisation QOL, and Index of social health, among others (Hagerty *et al*., 2001: 11- 71). The QOL indexes reviewed by a nine–man committee, were selectively applicable to public policy. The QOL indexes were reviewed in accordance with the fourteen criteria while at the same time, identifying the QOL domains addressed by the indexes. As examples, four of the reviewed QOL indexes are dealt with hereafter namely the CCI, IEWB, Index of social health, and U.N. Human Development index.

2.9.1. The Consumer confidence index (CCI)

According to Hagerty *et al*. (2001: 20), consumer confidence indexes measure the "economic outlook" domain of quality of life in subjective terms.

The index is comprised of questions addressing issues at household and society levels. In addition, current conditions and those expected in the future are also included. Among the questions asked are the following:

a) We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?
b) Now looking ahead- do you think that a year from now you (and your family living there) will be better off financially, or worse off, or just the same as now?
c) Now turning to business conditions in the country as a whole- do you think that during the next 12 months we will have good times financially, or bad times or what?
d) Looking ahead, which would you say is more likely – that in the country as a whole we will have continuous good times during the next five years or so, or that we will have periods of widespread unemployment or depression or what?
(See Hagerty *et al*., 2001: 21 for a complete list of questions).

The Consumer confidence index is found to have a clear practical purpose for policy makers (criterion 1), through its ability to measure society's economic expectations and gauging societal hope. In this context the CCI is viewed as an indicator of subjective QOL, reflecting subjective opinions about material living conditions. The CCI however, is criticised for its inability to reflect on several other QOL domains which encompass the totality of life experience. Further more the CCI is found to fall short on the ninth criterion which requires that as an economically focused domain, it must be able to be measured in both objective and subjective dimensions (Hagerty *et al*., 2001: 20-22).

2.9.2. **The Index of economic well- being (IEWB)**

The IEWB is based on the view that the economic well-being of a society depends on the level of average consumption flows, aggregate accumulation of productive stocks, inequality in the distribution of individual incomes and insecurity in the anticipation of future incomes. Hagerty *et al*. (2001) say that the weights attached to each of these components of economic well-being will vary, depending on the values of different observers. The four components or dimensions of economic well-being on the index are:

- Effective per capita consumption;
- Net societal accumulation of stocks of productive resources;
- Poverty and inequality; and
- Economic security from job loss and unemployment, illness, family breakup, and poverty in old age (Hagerty *et al*., 2001: 24-25).

Evaluation of the IEWB shows that the index enables policy makers to ascertain trends in overall economic well-being as well as identifying where problems exist so that corrective actions can be taken. It is an index that is more applicable at the meso- and macro-levels as opposed to the micro-level. The IEWB is found to be well grounded in economic theory, with clearly defined and operationalised concepts like the gini coefficient. The weakness identified in using the IEWB as a QOL index lies in its lack of variables addressing the subjective perceptions of well-being. According to Hagerty *et al*. (2001: 8-10) quality of life is an end state of being. If this is the case, both subjective and objective indicators are needed to capture the totality of the means and ends of QOL. Bearing this in mind, the IEWB will need to incorporate variables which address the subjective dimension in order to reflect on QOL as an end state of being.

2.9.3. Miringoff's Index of social health

The index of social health is said to be one of the few that (1) evaluates several domains using reliable, objective measures, and (2) integrates the domains into a single measure. The domains which include sixteen measures as time series since 1970, composed of :

- Infant mortality;
- Child abuse;
- Children in poverty;
- Teenage suicide;
- Drug abuse;
- High school dropout rate;
- Teenage births;
- Unemployment;
- Average weekly earnings;
- Health insurance coverage;
- Poverty among those over 65 years
- Life expectancy at age 65
- Violent crime rate
- Alcohol-related traffic fatalities
- Housing affordability; and
- Gap between rich and poor (measured using gini coefficient)

(See Hagerty *et al*. (2001: 43-44).

The sixteen components are organised in age groupings, with the first three pertaining to children, the next four to youth, the next three to adults, the next two to the ageing, and the last five to all groups.

The committee's evaluation finds the index of social health to have a clear public policy purpose and uses time series data to allow monitoring and control. Most of the components are considered reliable as the measures were developed by federal government agencies using large samples of the U.S population. However, the index is criticised on issues of validity. It is not clear as to whether the 16 components correlate with people's experienced quality of life. Further more, no sufficient explanation is given regarding what informed the choice of the sixteen measures. As such it is inconclusive that the chosen measures are the best measures of people's QOL. (See Hagerty *et al*. (2001: 44-45 for details).

2.9.4. The Human Development Index (HDI)

Each year since 1990, the United Nations Development Program (UNDP) has published a human development index (HDI). According to United Nations Development Program (1996: 28), the Human Development Index is a composite index of achievements in basic human capabilities in three fundamental dimensions- a long and healthy life, knowledge and a decent standard of living. The variables chosen to represent the three dimensions are life expectancy, educational attainment and income (see also UNDP, 2006: 263). The HDI value for each country indicates how far it has to go to attain certain defined goals: an average life span of 85 years, access to education for all and a decent standard of living. According to United Nations Development Program (1996: 30) the HDI is constructed by measuring a country's relative achievement in each of the three basic variables and taking a simple average of the three indicators. United Nations Development Program (2006: 263) highlights that the HDI is not in any sense a comprehensive measure of human development. It does not, for example, include important indicators such as respect for human rights, democracy and inequality. What it provides is a broadened prism for viewing human progress and the complex relationship between income and well-being.

Much as each indicator can be used separately for comparison purposes, the three indicators are at national levels. This is to the disadvantage of areas that need a more focused approach if their specific needs are to be addressed. For instance, according to United Nations Development Program (1996: 32), when South Africa's HDI was desegregated for the nine provinces, the strong correlation between regional disadvantage and ethnic origin became obvious. The Limpopo province (formerly called Northern Transvaal, and later on the Northern province after 1994 elections) had a HDI value of 0.45. Herein, 90% of the population was black. Western Cape had the highest HDI value of 0.791. Herein, only 17 percent of the population was black. The difference in HDI values between the two provinces was due mostly to income disparity. Western Cape's per capita income of US $6000 in purchasing power parity rates (PPP) was five times as high as Northern province's US $1190. The income disparity could be traced mainly to the absence of economic opportunities for the blacks in northern province. This is inter-provincial comparison where disaggregation is revealing just part of the inequalities in access to basic human needs. Greater disparities are likely to be revealed within provinces especially with respect to access to facilities, services and economic opportunities in rural areas; a task the current study intends to address.

According to the United Nations Development Program (1996: 132), estimates of income in the HDI are also fraught with measurement difficulties. Economic data are initially reported in domestic currencies and then converted into say US dollars. Due to fluctuations in exchange rates, purchasing power parity rates in US dollars (PPP) have been used for conversion by the World Bank and International Monetary Fund (IMF). But even then the PPP - based estimates of GDP present problems of comparability because of differences in the international comparison programme (ICP) survey procedures and, in the methods used in producing the estimates.

As far as life expectancy as an indicator of long and healthy life is concerned, it has a number of weaknesses. It is not only based on population aggregates (life tables determined from census data which may at times be out dated), but demographic interest is also systematically shifting from knowing about how long people live, to how healthy they have been in their life

span. In fact focus is currently on reducing the time people spend as disabled before they die- compression of morbidity (Crimmins *et al.*, 1994; Hagerty *et al*., 2001: 39).

In summary Hagerty *et al*.(2001) find that many of the commonly used indexes can be put to successful use because they are reliable and have established time series measures which enhance comparison. Many such indexes can also be disaggregated to study subpopulations. However, many QOL indexes are found to fall short in four areas:

(i) Indexes vary greatly in their coverage and definitions of domains of QOL;

(ii) None of the indexes was found to distinguish among the concepts of input, throughput, and output;

(iii) Indexes fail to show how QOL outputs are sensitive to public policy inputs; and

(iv) None of the reviewed indexes examined convergent validity against each other.

All in all it is concluded that many of the commonly used indexes are potentially useful for public policy and, research aimed at their improvement is recommended (Hagerty *et al*., 2001: 86).

2.10 Housing, electricity supply, water and sanitation

Although the government has made major strides in providing water and electricity, far too many South Africans still live in shacks, without safe water, sanitation, or electricity. According to the Department of Welfare (1998:13), most people in non- urban areas rely on pit latrines, only 20% of which have been improved to an acceptable, hygienic standard. With regard to housing, about one quarter of South Africa's housing stock consists of traditional dwellings and shacks, nearly all of which are located in non-urban areas. The high proportion of shacks in urban and peri-urban areas is the result of limited housing and increased rural-urban migration since the 1980s. The Department of Welfare (1998) reports that some 36% of the very poor live in shacks or traditional dwellings. Very poor households are crowded, with an average of 2.3 persons per room. Africans and Coloureds have an average of 0.8 rooms per person while the average for whites is 1.9. Only 15% of the very poor households have electricity. As a result, most of the very poor households use wood for cooking, which must also be fetched over long distances.

Studies conducted recently paint a rather different picture. In 2001 Statistics South Africa published findings emanating from the analysis of the October Household Survey (OHS) data for the period 1995 - 1999. As far as housing is concerned results indicate an overall gradual increase in the proportion of households living in formal dwellings. Statistics show that the percentage of households in this category increased from 65.5% in 1995 to 69.9% in 1999. The percentage of households living in traditional dwellings declined steadily from 15.3% in 1995 to 10.9% in 1999. A rather surprising finding however relates to the proportion of households living in informal dwellings. The percentage of households in this type of dwellings showed an increasing trend, rising from 7.5% in 1995 to 12.3% in 1999. This increase is in fact higher than the increase realised among households living in formal dwellings (Stats SA, 2001:71-74).

Much as the findings do not offer any conclusive explanation (i.e. the actual percentages are subject to sampling and non-sampling errors and therefore not directly comparable) internal migration could be part of the answer. The reason here being that in addition to the trends shown in the formal and informal dwelling categories, the proportion of households living in traditional dwellings showed a declining trend. This could signal rural-urban migration whereby a significant proportion of people move to urban areas where the majority may end up in informal settlements. This is fairly supported by the statistics from the 1999 OHS relating to the urban versus non-urban household situation. While close to 75% of the urban households lived in formal dwellings, around 17% lived in informal dwellings. Of the households living in non-urban areas, 63.3% lived in formal dwellings while only 6% lived in informal dwellings.

As far as water is concerned, the water situation is reported in the population policy to have been particularly bad for poor rural households. While 57% of African households do not have access to piped water (i.e. internal households or yard taps), only 17% of the households in rural areas fetch water from less than one kilometer away. Only 19% have piped water, while only 11% have flash toilets or improved latrines.

The task of fetching water rests mainly on women's shoulders. African women living in households without their own water supply spend more than three hours a day fetching water. The Department of Welfare (1998:13) cited poor housing, poor hygienic water supplies and lack of sanitation as major underlying causes of the high mortality and morbidity rates, especially among children from poor families.

A major benefit from improved water supply will be a general improvement in health. Mothers and children will also be released from fetching water; a relief that could enable women to devote more time to their families, and perhaps earn income (Department of Welfare, 1998).

Findings from the 1995-1999 OHS indicate some improvement with regard to household access to clean water (piped water inside the dwelling or on site, communal tap or public tanker). Figures indicate an improvement in household access to clean water from 78.5% in 1995 to 83.4% in 1999. This having been the case with clean water, the proportion of households obtaining water from rivers, streams and dams, remained almost constant at around 11%. This indicates a possibility that improved access to clean water may not have significantly filtered through to the previously disadvantaged areas (Stats SA, 2001:75).

That paints the broader picture of the water situation. A deeper look at the situation involved fetching water from a source outside the dwelling unit. Findings from the 1999 OHS indicate that the problem of fetching water is experienced both in urban and non-urban areas. The problem is obviously more severe in non-urban areas where the majority are Africans. Statistics indicate that at least 52% of African women and 41% of African men had to fetch water from a source outside the dwelling unit. The problem is less with the other population groups, with coloureds following the Africans and whites having the least of this problem (Stats SA, 2001: 76).

A further look at the problem of fetching water involved an age and sex analysis. In both urban and non-urban areas, females were found to be more involved than males. The problem is worse in non-urban areas where most of the water fetching is done by males and females

between five and twenty four years. This is likely to have a negative impact on these youngsters as far as education is concerned.

2.11 Access to sanitation

The importance a clean environment and sanitation in general need not be emphasised as far as satisfactory quality of life is concerned. This said however, findings from the October household surveys for the years 1995-1999 send mixed signals with regard to household access to sanitation. According to Stats SA (2001: 88) there has been a possible slight decrease in the proportion of households with access to flush or chemical toilets. Figures show a decrease in the percentage of households with flush or chemical toilets from 56.9% in 1995 to 55.8% in 1999. During the same time period the percentage of households with informal facilities like going to the bush or stream, shows a possible slight increase from 8.3% to 10.6%. Findings from the 1999 OHS indicate that at least 46% of households living in traditional dwellings were using the bush or a river or a stream as toilets with majority of the remainder using pit latrines. Among households living in informal dwellings 10% were found to be using the bush or, a river or stream as toilets. Some 12.5% used the bucket system while 44% used pit latrines. Even among households living in formal dwellings at least 6% indicated that they were using the bush or, a river or stream as toilets. Some 2.5% used the bucket system while close to 60% used flush or chemical toilets.

The above findings paint a grim picture as far as quality of life is concerned. This is especially for households living in traditional and informal dwellings. With the majority of households in traditional dwellings being located in non-urban areas, sanitation becomes a real problem since these happen to the same areas experiencing problems when it comes to clean water. The risks of increased morbidity and mortality are worsened.

2.12 Health services

South Africa has relatively well financed health services. Unlike most Sub- Saharan African countries with small and declining health expenditure (see Brockerhoff, 1995), the health budget of South Africa accounts for 8.5% of the GDP (see the South African population policy, 1998).

State expenditure on health services in 1995/96 financial year accounted for 10% of the total state budget expenditure. Expenditure in the health sector however, is concentrated in tertiary institutions, which benefit 20% of the population, who are members of medical schemes. More than half of South Africa's doctors serve only 25% of the population. Primary health care, (a basic service for rural masses), accounts for only 12% of public spending on health and is not readily accessible to a major section of the population.

According to Cockerham (1995:55), to be poor is by definition to have less of things (including health care) produced by society. This situation is seen in the experience of the poor in obtaining health care in the United States. Medical systems in the United States have not been designed to meet needs of the poor. Large medical centres (mainly designed for training purposes) can be especially complex and confusing to people with low levels of education. The manner in which the poor live and conduct their daily lives is not always considered by health care providers. A review of relevant research discloses that a number of studies substantiate the relationship between poverty and lack of access to *quality* medical care in the United States. Despite evidence of more frequent visits to physicians made possible by greater insurance coverage through government-sponsored programs, the poor are still treated within the framework of welfare medicine and still live on a day-to-day basis within an environment of poverty. Obtaining equal access to care is a major step in improving the health of the general population. However, improved access to health services is only part of the solution for advancing health. The fact remains that people at the bottom of society have the worst health of all, regardless of what country they live in and which type of health insurance they have (Cockerham, 1995:56).

2.13 Human development and quality of life

Human development with the aim of improving the quality of life for all has been the objective of most governments**.** In her report on the human development of South Africa, Erasmus (1995) reported that the issues of poverty, development and reconstruction are currently at the centre of the stage with the implementation of the reconstruction and

development program (RDP). The Development Bank of Southern Africa is making a special effort to support this process, *inter alia* by focusing on the main issues of reconstruction and development policy and programming at national, provincial and local levels, within the framework of the human development approach. The human development approach attempts to widen the range of choices for all South Africans by expanding their capacities and their opportunities for using these productively. It provides an encompassing vision, over arching intermediate socio-economic objectives such as growth, income distribution and economic stability. Each of these objectives becomes a necessary, but not sufficient, condition for development. Thus, economic growth is necessary to enable the implementation of human development strategies, but it is only by empowering people through human development that sustained growth becomes an achievable objective (Erasmus, 1994: 22-45).

In analysing human capacities, and access to services in particular, Erasmus (1994:23) put it that, " ...services such as housing, water and sanitation, energy, transport and communication are vital to enabling people to fulfill their potential. The absence of these services limits people's environment, affects health, education, and the utilisation of time. Data on access to services are particularly poor…".

A similar view is provided by the United Nations Development Program (2002). According to this report, human development is much more than the rise or fall of national incomes. It is about creating an environment in which people can develop their full potential and lead productive, creative lives in accord with their needs and interests. In this context, people are perceived to be the real wealth of nations. Development is about expanding the choices people have, to lead lives that they value. As such, development is about much more than economic growth, which is only a means of enlarging people's choices (United Nations Development Program, 2002:9).

Fundamental to enlarging these choices is building human capabilities – the range of things that people can do or be in life. The most basic capabilities for human development are to lead long and healthy lives, to be knowledgeable, to have access to the resources needed for a decent standard of living and to be able to participate in the life of the community.

According to the Human Development Report (2002), a lot of progress has been made with respect to human development in the past three decades but, the challenges remain large in the new millennium. Of the 4.6 billion people living in developing countries, more than 850 million are reportedly illiterate, nearly a billion lack access to improved water sources, and 2.4 billion lack access to basic sanitation. Nearly 325 million boys and girls are reportedly out of school. And 11 million children under age five die each year from preventable causes – equivalent to more than 30, 000 a day. Around 1.2 billion people live on less than $1 a day (1993 PPP US$), and 2.8 billion on less than $2 a day. These drawbacks are not restricted to developing countries only. In the OECD countries, 130 million people are reportedly income poor, 34 million are unemployed, and adult functional illiteracy rates average 15%. Several developing countries have experienced a drop in human development as revealed by the human development index (HDI). The HDI is a composite index of achievements in basic human capabilities in three dimensions – life expectancy, literacy, and standard of living. Table 2.6 indicates countries that experienced setbacks in the HDI, as reported in 1999.

Table 2.4: Countries suffering setbacks in the human development index, 1999

HDI lower than in 1975	HDI lower than in 1980	HDI lower than in 1985	HDI lower than in 1990	HDI lower than in 1995
Zambia	Romania Russian Federation Zimbabwe	Botswana Balgaria Burundi Congo Latvia Lesotho	Belarus Cameroon Kenya Lithuania Moldova Republic of South Africa Swaziland Ukraine	Malawi Namibia

Source: Human development report, 2002: 10

From Table 2.6 countries, mainly in the developing country category experienced declines in human development at different times and of course, from different causes. Much as this could be so, most countries experienced declines in the last fifteen years or so, and facts indicate that HIV/AIDS has been rampant during this period (Human development report, 2002: 13). According to this report, 36 million people were living with HIV at the end of 2000 – 95% of them in developing countries and 70% in Sub-Saharan Africa. In Sub–Saharan Africa, mainly because of HIV/AIDS, more than 20 countries experienced drops in

life expectancy between 1985–1990 and 1995–2000. In six countries – Botswana, Burundi, Namibia, Rwanda, Zambia and Zimbabwe – life expectancy declined by more than seven years. This alone had a significant effect on the human development indices of the countries concerned. It is important to bear in mind that the spread of HIV has multiple consequences for development and quality of life. It robs countries of people in their prime, and leaves children uncared for. United Nations Development Program (2002) states that by the end of 1999, 13 million children were HIV orphans. The setbacks in the human development indices above portray a grim picture with regard to development for developing countries, including South Africa.

2.14 Household fertility and development

In recent years attention has been focused on the micro economic determinants of family fertility in an attempt to provide a better theoretical and empirical explanation for the falling birth rates associated with the third stage of the demographic transition. Economists have drawn on the traditional neo-classical theory of household and consumer behaviour for their basic analytical model. They have used the principles of economy and optimisation to explain family-size decisions (see Todaro, 1994). The conventional theory assumes that rational self-interested people will choose to consume goods that offer them the greatest utility. This is subject to income constraints and the subjective tastes or preferences.

The conventional theory is applied to fertility analysis and, considering children as a special kind of consumption good, fertility is considered a rational economic response to the consumer's (family) demand for children relative to other goods.

That is if other factors are held constant, the desired number of children can be expected to vary directly with household income, inversely with the price (cost) of children, and inversely with the strength of the tastes for other goods relative to children (Todaro, 1994:196-199).

According to Todaro (1994:199), there exists a strong intrinsic psychological and cultural determinant of family size in developing countries whereby the first two or three children should be viewed as "consumer goods" for which demand may not be very responsive to relative price changes.

Cost-benefit analysis in fertility consideration is assumed to begin there after. The theory of family fertility as applied to less developed countries (LDCs), concludes that when the price or cost of children rises as a result of say, increased educational and employment opportunities for women, or a rise in school fees or the establishment of minimum-age child labour laws or the provision of publicly financed old-age social security schemes, parents will demand fewer additional children, substituting, perhaps, quality for quantity or a mother's employment income for her child-rearing activities**.** It follows that one way to induce families to desire fewer children is to raise the price of child rearing by say, providing greater educational opportunities and a wider range of higher-paying jobs for young women (i.e. empowerment of women).

Empirical evidence exists in the statistical studies conducted in countries like Chile, Taiwan, Philippines and Thailand. For example it has been found that high female employment opportunities outside the home and greater female and male school attendance, especially at the primary and early secondary schooling, are associated with lower levels of fertility. As women become well educated, they tend to earn a larger share of household income and to produce fewer children. Moreover, the studies have confirmed the association between declines in mortality and the subsequent declines in fertility. Assuming that households desire a target number of surviving children, increased incomes and higher levels of living can decrease child mortality and therefore increase the likelihood that the first born will survive. As a result, fewer births may be necessary to attain the same number of surviving children. This fact alone underlines the importance of improved public health and child nutrition programs in ultimately reducing third world fertility (Todaro, 1994:200).

Finally, although increased income may enable the family to support more children, evidence seems to show that with higher incomes, parents will tend to substitute child quality for quantity by investing in fewer, better-educated children whose eventual earning capacity will be much higher. It is further argued that more income may also tend to lower fertility because the status effect of increased incomes raises the relative desire for material goods, especially among low-income groups whose budget constraints precluded the purchase of these goods.

In other words, additional children beyond a socially accepted minimum desired number may be “inferior goods” in low-income countries; above some threshold subsistence level, higher incomes may induce families to desire fewer children. (Todaro, 1994:200).

2.15 Household-based development index and Quality Of Life

Kironji (1999) conducted a pilot study to measure household Quality Of Life (QOL) at Goodwood, a rural area located in the North West province of South Africa. The study applied cluster analysis and discriminant analysis to formulate a household-based development index. The study findings show that distinct clusters of households existed which enjoyed different QOL depending on the type of indicators accessed. Findings in respect of cluster analysis show that households having access to land for commercial crop growing scored highest on the index, with a mean index of 4.9 above the standard mean of zero. Households in this cluster happen to be the ones in which a household member has a reasonably good job (usually skilled like teaching) and, other household members have access to training in preparation for formal employment. Within this cluster are the few business people like shop owners in Goodwood. Households in this cluster were found to be in a better position to meet most of the household needs. They are the ones which for instance, use gas and paraffin for cooking and, in most cases they possess refrigerators. They are likely to have the best QOL in Goodwood (see Kironji, 1999).

The second cluster scored a mean index of 1.25 above the standard mean of zero. This consists of households that rely mostly on pension money and remittances from working household members. The working people (usually males) in this cluster are mostly semi-skilled or unskilled migrant workers on mines. Households in this cluster usually have a piece of land for subsistence crop-growing plus access to communal grazing. These households commonly use paraffin and firewood for cooking while gas is mostly used on refrigerators where a household has one. Since remittances are usually made on month ends and pension money is insufficient to meet all the basic household needs, refrigerators in these households are not used all the time through the month. Households in this cluster enjoy moderate QOL (Kironji,1999).

The third cluster scored a mean index of 4.1 below the standardized distribution mean. This cluster consists of households with unstable income. The household members who happen to be working are usually seasonal workers on neighboring farms. Others work on grape farms at Upington which is some 450 kilometers away, while some rely on casual work like brick making, house construction and repairing farm fences around Goodwood. Some households receive donations from extended families. Households in this cluster have small plots of land which can only be used to construct a house. They are unable to participate in animal rearing even though communal grazing land is available. Households in this cluster have the poorest access to basic household needs when compared with those in the first two clusters (Kironji, 1999).

2.16 Aspects of the quality of life in black townships in a South African city: implications for human development

Beukes and Van der Colff (1997) conducted a study on aspects of quality of life in the black townships around Bloemfontein. Their study focussed on quality of life and human development. The study used social indicators to measure the contribution to general well-being of health, nutrition, housing, income - distribution, some economic indicators (e.g. transport and communications), and other aspects of social and cultural development. In essence the study tried to appraise what the people themselves felt about their living conditions. Ordinary people were given the opportunity of making and communicating their own judgements about their social, economic, and political conditions (Beukes & Van der Colff, 1997:229-250).

One important aspect of this type of study is that it attempts to record the subjective feelings and opinions about what people think and feel about their conditions. This is against the backdrop of the current development paradigm where development is people centered; human development is predicted on what the ordinary person in a situation of poverty or deprivation sees as his/her life-chances and what can be done by the individual to change this for the better. (Beukes & Van der Colff, 1997: 231).

Human development in this context is determined by a complex variety of functionings and capabilities of people in the every day course of their lives in which commodities and access to

these can play an enabling role but doe not in itself establish living standards and the quality of life. Implicitly then, if the interest is to assess progress in human development, it becomes crucial top establish what resources are available, how people evaluate the use they can make of the resources and, whether they are experiencing progress in improving their lives. (Beukes & Van der Colff, 1997 ; 232 – 233).

In applying the analysis of quality of life studies to estimating development potential, the study tried to ascertain whether gaps or "tension" existed between what people have at their disposal - as appraised by themselves - and how they experience the usefulness of these resources for improving their lives. These "tensions" were interpreted as possible "windows of opportunity" through which people have to improve matters for themselves. This could be taken as an indicator of the potential for human development (Beukes & Van der Colff, 1997: 233).

Several dimensions were investigated by the study to ascertain the subjective willingness to use opportunities to improve functioning. One particular dimension stands out clearly and links well with the conceptual model to be used in assessing quality of life at household level. This is the dimension investigating the relation between what people consider their objective resources to be and how they evaluate the sufficiency of these resources. Within this relation derives "tensions" regarding who people (households in the context of proposed study) think should carry the responsibility for their own development - a socio-psychological and/or financial matter (Beukes & Van der Colff, 1997: 234).

The findings of this study are numerous but one stands out clearly as far as this literature is concerned in relation to the proposed study. This finding is in respect of where the responsibility lay for improving people's overall quality of life. A majority of 51% of the sampled respondents indicated that they themselves are the main determinants of their future life quality, while 34% held government (at various levels) responsible, and 14% looked to their families for improving things. The fact that most people see it as their responsibility to improve their living conditions seems to suggest a shift towards creating a conducive environment to individual or household development rather than institutions trying to do the development for the people (Beukes & Van der Colff, 1997: 242).

In general the study indicates that quality of life studies can be used and their results interpreted in a way that provides grounds for assessing the potential for human development in a surveyed area. The analytic device used to come to the above finding, was that of identifying the elements in people's quality of life assessments which indicate positive and creative tensions between their current and their desired future condition. These could serve as priority areas in which policy interventions can be designed to enhance people's capacity to become more self - reliant and improve their own living standards (see Beukes & Van der Colff, 1997:247).

2.17 Summary

This chapter has reviewed the literature related to aspects pertaining to quality of life. Literature related to subjective and objective indicators of wellbeing has been reviewed. International views regarding quality of life at different levels of conceptualization have been consulted. Local measures related to quality of life, particularly the living standards measure have been widely reviewed. In the process of reviewing the related literature, strong points and weaknesses of various existing measures of wellbeing have been noted. Chapter three will deal with how the current study conceptualises quality of life and, the methodology to be applied.

CHAPTER THREE: THE DEVELOPMENT OF A HOUSEHOLD – BASED MEASURE OF QUALITY OF LIFE

3.1 Introduction

As indicated earlier on, the main objectives of this study are twofold. The first objective is to develop a measure of QOL. Developing a measure of QOL is not an end in itself but rather a means to the end; to enable the study to achieve its second objective. The second objective which in actual sense is the prime objective, is to analyse and describe the changes in QOL which have occurred during the period 1996 through 1999 in South Africa. For the study to achieve the two objectives, a good amount of work will have to be done, especially around the issues relating to conceptualising and quantifying QOL. This chapter will deal with these two issues. Sections 3.2 and 3.3 will deal with issues pertaining to the conceptualisation of quality of life. In this section a conceptual model will be developed, whose function among others, will be to indicate the processes through which household QOL conditions are differentiated. The model will also indicate the interactions between the model variables and quality of life. In the end the conceptual model, together with the results of the study, will provide a basis for making recommendations as to how to improve QOL further. Section 3.4 will address issues relating to the research methodology. Herein, a description of the sources and nature of data will be addressed, together with the stages involved in analysing the data.

3.2 Conceptualisation of quality of life

A conceptual model indicating the relationship between the indicators of quality of life and quality of life itself, together with the processes involved is developed in this study. This model will guide the research in the following ways:

- It [the model] provides theoretical guidance by indicating which variables impact on quality of life, the way variables interact and, the processes involved.
- The variables and processes in the model will be used in analysing the data to derive a quality of life index and to establish which variables contribute most to the differences in quality of life conditions reflected by the index.

- The conceptual model, in conjunction with the results of the study, will provide a basis for making recommendations as to which variables (or indicators) need to be targeted to improve on the quality of life conditions depicted by the quality of life index.

When trying to conceptualise the interactions between quality of life and its indicators, and how the interactions between the indicators would enhance or suppress quality of life, it is necessary to conceptualise such interactions on the basis of past research. Kibuuka (1998: 230) shows that variables influencing one another, can be linked in various ways in a model. Variables can be linked serially in the sense that one variable influences another; the influenced variable also influences another and so on. For instance, completed level of education influences the prospects of getting a good job; a good job leads to earning a decent salary (earning and of course spending power), which salary determines where one lives (location and type of dwelling), the transport one affords, which health facility to use when sick – all of which influence quality of life. This is a rather simplistic way of viewing the interactions between quality of life and the aspects impacting on it.

Variables in the model could also be linked parallel; in this way, two or more variables are jointly influencing another variable(s). For example location of a household (rural or urban), parents' level of education and income could jointly influence the type of dwelling occupied, the type of energy used for household purposes, transport and, children's education – all these impacting on household quality of life.

Another way of linking variables is what Todaro (1997: 19) describes as being holistic in nature. With this approach a large range of variables are at any time, in a very complex interaction with one another, enhancing or depressing an outcome variable (i.e. economic development). For instance education and government policies will influence entrepreurship, which in turn will influence government policies again. There is also a large number of social and political factors present influencing government policy, which in turn influences education leading again to education influencing entrepreneurship. This could be a more realistic approach to analysing the aspects impacting on quality of life, given their multitude and interactions.

3.2.1 The questions informing the conceptualisation of QOL

In trying to come to an understanding of the aspects impacting on quality of life, several questions need to be asked namely,

- What aspects impact on quality of life?
- Are these aspects operating on the household level or some other relatively higher level?
- Can these aspects (or variables) be operationalised and if so at what level does measurement take place?
- What type of modeling is applicable given the level at which the variables are measured?

In the case of this study the analytical models to be applied will involve a linear probabilistic approach (i.e. cluster analysis and discriminant analysis). The reason for choosing this approach has to do with the nature of the data and what the study has set out to achieve – assessing the quality of life at a particular point in time, as opposed to a time series analysis. The latter would call for dynamic modeling, an approach which is not compatible with the ordinal level data. The aim of this study is to describe the quality of life conditions experienced by households at particular times during the reference period (1996 – 1999), and the changes that have occurred during the reference period. This however, should not be taken to mean that QOL and the aspects impacting on QOL are linear in nature. According to Kibuuka (1998, 226), a researcher will be more likely to use linear probabilistic methods to analyse data if he/she views social phenomena as something which can accurately be described by research as it manifests at a specific time. Kibuuka goes on to say that the linear probabilistic view of society has dominated social research for many years mainly because the statistical methods used to analyse data like linear regression and analysis of variance (ANOVA) are both probabilistic models–models from which the physical and economic sciences are trying to shift, towards non-linear deterministic models. Whereas linear probabilistic models try to identify the probability of there being a relationship between variables, non-linear deterministic models focus on describing the dynamic interaction between variables. As indicated earlier on, the latter model would have offered a better description of the interactions if the data were at the interval or ratio level, which is not entirely the case for this study. The current study aims at developing a measure of QOL on a cross-section basis, using ordinal level data.

3.2.2 Conceptualising the model: The link between female education and quality of life

Attempting to have a clear view of the interactions between quality of life and the aspects impacting on QOL will require a conceptual framework. This will provide guidelines in addressing the questions raised above. Jumping to the conceptual framework without providing some underlying theory will be undermining what other studies have already found out as far as QOL and development in general are concerned. Sections 3.2.2 - 3.2.5 will provide a theoretical overview of the linkage between QOL and some of the key variables (indicators) considered in the model.

In recent years attention has been focused on the micro economic determinants of family fertility in an attempt to provide a better theoretical and empirical explanation for the falling birth rates associated with the third stage of the demographic transition. Economists have drawn on the traditional neo-classical theory of household and consumer behavior for their basic analytical model. They have used the principles of economy and optimisation to explain family-size decisions. The conventional theory assumes that rational self-interested people will choose to consume goods that offer them the greatest utility. This is subject to income constraints and the subjective tastes or preferences. Becker in Todaro (1994) applied this theory to fertility analysis. Considering children as a special kind of consumption goods, fertility was considered a rational economic response to the consumer's (family) demand for children relative to other goods. That is if other factors are held constant, the desired number of children can be expected to vary directly with household income, inversely with the price (cost) of children, and inversely with the strength of the tastes for other goods relative to children. (Todaro, 1994:196-199).

According to Todaro (1994:199), there exists a strong intrinsic psychological and cultural determinant of family size in developing countries whereby the first two or three children should be viewed as "consumer goods" for which demand may not be very responsive to relative price changes. Cost-benefit analysis in fertility consideration is assumed to begin there after. The theory of family fertility as applied to less developed countries (LDCs), concludes that when the price or cost of children rises as a result of say, increased educational and employment opportunities for women, or a rise in school fees or the establishment of

minimum-age child labour laws or the provision of publicly financed old-age social security schemes, parents will demand fewer additional children, substituting, perhaps, quality for quantity or a mother's employment income for her child-rearing activities**.** It follows that one way to induce families to desire fewer children is to raise the price of child rearing by say, providing greater educational opportunities and a wider range of higher-paying jobs for young women (i.e. empowerment of women).

Empirical evidence exists in statistical studies conducted in countries like Chile, Taiwan, Philippines and Thailand. For example it has been found that high female employment opportunities outside the home and greater female and male school attendance, especially at the primary and early secondary schooling, are associated with lower levels of fertility. As women become well educated, they tend to earn a larger share of household income and to produce fewer children. Moreover, studies have confirmed the association between declines in mortality and the subsequent declines in fertility. Assuming that households desire a target number of surviving children, increased incomes and higher levels of living (*better QOL*) can decrease child mortality and therefore increase the likelihood that the first born will survive. As a result, fewer births may be necessary to attain the same number of surviving children. This fact alone underlines the importance of improved public health and child nutrition programs in ultimately reducing third world fertility (Todaro, 1994: 200).

Finally, although increased income may enable the family to support more children, evidence seems to show that with higher incomes, parents will tend to substitute child quality for quantity by investing in fewer, better-educated children whose eventual earning capacity will be much higher. It is further argued that more income may also tend to lower fertility because the status effect of increased incomes raises the relative desire for material goods, especially among low-income groups whose budget constraints precluded the purchase of these goods. In other words, additional children beyond a socially accepted minimum desired number may be "inferior goods" in low-income countries; above some threshold subsistence level, higher incomes may induce families to desire fewer children (Todaro, 1994).

The above literature provides insight on the multiple role "female education" plays in changing the QOL scenario. By improving women's employment capabilities, education provides a multi-dimensional effect on QOL including reduced child and maternal mortality, reduced fertility, and raising household income. These have a direct bearing on the children's education–a feedback mechanism – which has a direct impact on their QOL when they grow up to form households of the next generation. (See Todaro, 1994:201).

3.2.3 Conceptualising the model: Social status and quality of life

According to Bird *et al*. (2000:48) social status has four main components: education, employment, work, and economic status. Education status includes years of schooling and academic qualifications. It indicates the knowledge, skills, values, and behaviours learned at school, as well as the credentials that structure job opportunities. Employment status differentiates categories of labour, distinguishing among being employed full time, employed part time, laid off or unemployed, unable to work because of a disability, in school full time, retired, or keeping house. The third component, work status, corresponds to various aspects of productive activity. It includes occupational prestige or rank and class for employed persons, and the conditions and qualities of activity for employed persons and others. The fourth component, economic status, includes aspects of economic well-being such as personal earnings, household income, and material or economic hardship. The work of Bird *et al*. (2000) focuses among others, on links between social status and health status, not on QOL per se. Their work never the less, links up with some aspects impacting on QOL either directly or otherwise. With this born in mind, Bird *et al*. (2000, 49) emphasise the need to view each element of social status as distinct rather than as interchangeable with others. They say that some researchers measure general social standing by averaging together rank on a number of dimensions such as education, occupational prestige, and household income. That practice obscures two things needed for understanding the relationship of social status to health. First, it obscures the causal relationships among the different aspects of social status. Education, employment, work status, and economic resources occupy ordered positions in a causal chain.

As far as education is concerned, it acts as the key to position in the stratification system. As the root component of social status, education shapes the likelihood of being employed, the

qualities of the job a person can get, and income. Education has a fundamental influence on adult health and well-being because it generates social inequalities in employment, job, and economic status. People with high levels of education experience better physical health than those with less education; they tend to report their health as being good; they tend to experience high levels of physical functioning and low levels of morbidity, mortality, and disability. In the context of the current study, people in this category are likely to form a cluster(s) with the best QOL conditions.

As far as employment is concerned, it improves the physical and psychological well – being. On the aggregate level, higher levels of unemployment coincide with higher rates of morbidity and mortality, including heart disease mortality, infant mortality, and admissions to mental hospitals, and suicide (Bird *et al*., 2000: 51). According to this literature, studies that follow individuals provide more direct tests of the effect of unemployment on health. Most find that people who are unemployed have worse physical and mental health than others of similar background who remain employed. Literature suggests that education increases the likelihood of employment. For instance Bird *et al*. (2000, 51) indicate that among American persons aged 25–34 in 1991, 87% of the college graduates were employed, compared to 77% of those with only high school degree, and 56% of those with eight years of education or less. The unemployment rate for college graduates stood at 3%, or one-fifth of the rate for persons with some high school, of whom 15% were unemployed. Lack of education limits employment opportunities. The poorly educated often work at low – status, poorly paid jobs and have the greatest risk of losing their jobs in an economic downturn. Among the employed, education increases the likelihood of full-time employment. Part-time work typically offers lower returns to experience and fewer benefits.

With regard to work conditions, there is a strong causal linkage between education, work conditions and health. These three status components possess a potential to impact directly or indirectly on QOL. Workers doing routine, simple jobs closely controlled by management report higher levels of psychological distress compared to workers doing other types of jobs. Workers who constantly face role overload or who persistently work overtime report significantly higher levels of psychological distress, and they have higher rates of morbidity

and mortality. Education gives people access to subjectively rewarding work. Well – educated people are more likely than the poorly educated to control their own work. They often have autonomy on the job and stimulating non-routine work, both of which increase psychological functioning, the sense of personal control, job satisfaction, and psychological well–being (Bird *et al*., 2000:51).

With regard to economic well–being, studies referred to by Bird *et al*. (2000, 52) find that low income, poverty, and economic hardship erode health and well-being, raising the risk of morbidity, impairment, and death. This however, does not automatically translate into a direct relationship between income and economic well-being, especially if one looks specifically at health. A number of observations suggest that the differences in health resulting from differences in income depend on circumstances. First, the desirable effect of additional income on health occurs only at the bottom of the income scale. In the US, differences in income predict larger differences in health the lower one gets on that scale. Below the 20th percentile, poor health, chronic disease, physical impairment, and the risk of death increase more and more sharply as one approaches the lowest levels of income. Above the 20th percentile higher income produces little or no effect on health. The diminishing incremental effects of income show up in international comparisons too. Increases in GNP per capita generally reduce infant mortality and increase life expectancy. Once countries get above the per capita GNP of, say, Greece, Portugal, Taiwan, and the Czech Republic, differences in GNP account for little of the differences in life expectancy and infant mortality. Second, the effect of income depends on education. This is so because education reduces the association between low income and economic hardship.

The effect of income on health, and well-being in general, needs further scrutiny given the fact the association is assessed at a macro-level and, above all, the LSM study-a micro-level study – found income not to be statistically significant in discriminating between LSM groups. The statistical insignificance of income however, could be attributed to a number of factors, including measurement problems. Though it is globally known to be a powerful indicator of well-being, poverty or QOL-whichever one wants to call it - income is very difficult to measure reliably and accurately.

Because it is derived from multiple sources, it can be defined in different ways. Non-money metric forms of income are extremely difficult to identify and measure, such as the value of public goods, public services, barter or in - kind income. This is especially problematic in rural areas or barter economies where large numbers of people may depend on these types of income. In the Afro barometer survey, Mattes *et al.* (2003:9) found that in Malawi, approximately two–thirds of the national sample was not receiving a cash income from a job nor looking for a job. Further more, the sensitivity of the subject can lead to inaccurate responses yet, even if respondents are willing to answer honestly, they may not accurately recall all sources of income. The effect of these irregularities is likely to be reflected not only in micro-level studies like the Living Standards Measurement survey, but it can be compounded and amplified in aggregated measures including GDP per capita. This in turn invalidates the effect of incremental changes arising from measures on say health, life expectancy, or well-being.

3.2.4 Conceptualising the model: lifestyles and quality of life

The above explanation has thrown light to the relationships between social status and QOL without mentioning what "status" itself means. According to Cockerham (1998, 86) status as a concept is subjective, consisting of the amount of esteem a person is accorded by other people. The basis for a person's status, which determines the amount of esteem, depends greatly on a person's occupation and level of education. Of course the two are greatly linked in that highly educated people usually occupy better paying jobs which carry a lot of ostentation. People in this category tend to share many things in common, including tastes, place of residence, the type of cars they drive, etc. These commonalities end up grouping them together in what is referred to as status groups. Cockerham (1998) defines a status group as referring to people who share similar material circumstances, prestige, education, and political influence; moreover, members of the same status group share a similar lifestyle-a very important part of QOL.

According to Bird *et al*. (2000:160) "lifestyle" is a key concept in explaining human social behaviour. Lifestyles are adopted by individuals and are utilitarian social practices and ways of living that reflect personal, group, and socio-economic identities. Put in another way, the

study of lifestyles helps make sense of what people do, why they do it, and what doing it means to them and others. Both Cockerham and Bird bring in Max Weber's theoretical perspective in trying to explain the concept of lifestyle, which has a lot to do with status groups. Cockerham (1998: 86) points out that a status group refers to people who share similar material circumstances, prestige, education, and political influence; moreover, members of the same status group share a similar lifestyle. In Cockerham's view, a particular lifestyle is what distinguishes one status group from another. People with high social economic status (SES) clearly lead a different style of life than those at the bottom of society and those somewhere in the middle. Weber (1978:932), as quoted by Bird *et al*. (200, 161) links lifestyle to status by pointing out that a distinguishing characteristic of status is 'status honor or prestige which is normally expressed by the fact that above all else a specific *style of life* is expected from all those who wish to belong to the circle'. It is pointed out by both Cockerham (1998) and Bird *et al.* (2000) that the lifestyles of status groups are based not so much on what they and the people within them produce but on what they consume. Hence Bird *et al.* (2000, 161) quotes Weber to have put it that, "One might thus say that classes are stratified according to their relations to the production and acquisition of goods: whereas status groups are stratified according to the principles of their *consumption* of goods as represented by special styles of life".

To link with the assertion that one's lifestyle is a reflection of the types and amounts of goods and services one uses or consumes, it is argued that the economic mode of production sets the basic parameters within which consumption takes place; it does not determine or even necessarily affect specific forms of it. This is because the consumption of goods and services conveys a social meaning that displays, at the time, the status and social identity of the consumer. Consumption can therefore be regarded as a set of social and cultural practices that establish differences between groups, not merely a means of expressing differences that are already in place because of economic factors. It is the use of particular goods and services through distinct lifestyles that ultimately distinguishes status groups from one another (Bird *et al.*, 2000: 161).

Without getting into the pure origins of Weber's explanation of "lifestyles", the three terms he used to express lifestyle are the following:

- Stylisation of life or put simply, lifestyle
- Life conduct
- Life chances.

Lifestyle refers to the choices that people have in their selection of lifestyles, while life chances refers to the probability of actually realizing those choices. It is important to note that much of Weber's work was completed on his behalf (i.e. after his death). Life chances are interpreted to mean the 'crystallized probability of finding satisfaction for interests, wants and needs, thus the probability of the occurrence of events which bring about satisfaction'. The probability of acquiring satisfaction is anchored in structural conditions that are largely socio-economic, but Dahrendorf (the interpreter of Weber's work) suggests the concept of life chances also involves rights, norms, and social relationships (the probability that others will respond in a certain manner). Weber does not consider life chances to be a matter of pure chance; rather, they are the chances people have in life because of the social situation. His overall thesis is that chance is socially determined, and social structure is an arrangement of chances. Hence, lifestyles are not random behaviours unrelated to structure but typically are deliberate choices influenced by life chances. (Bird *et al.*, 2000: 161 - 162)

The above explanation clarifies the relationship between lifestyle and SES on one hand, and quality of life on the other. That is household QOL is conditioned by what that household can access and, although this situation can be changed for the better, change is not entirely in the hands of the household, as some factors determining its capability are at the meso- or macro-levels. In fact the relationship brings to light the link between poverty and QOL which follows in the next section.

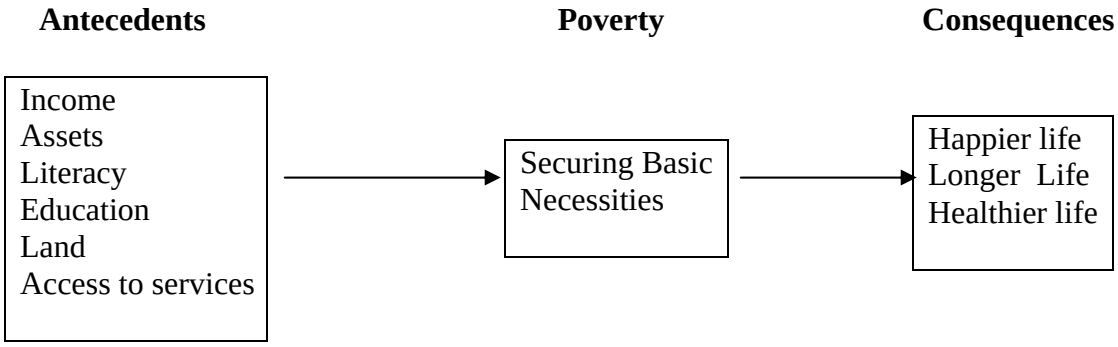
3.2.5 Conceptualising the model: poverty and quality of life

Mattes *et al*. (2003) developed a measure of lived poverty-the Lived Poverty Index (LPI). The study used data from seven 1999–2000 Afro barometer surveys in Southern Africa to develop measures of poverty and well being, as well as its possible consequences both in terms of day-

to-day survival, and political attitudes and behaviour. In capturing lived poverty, the LPI targeted among other indicators, basic needs including food, water, home security, medical treatment, and cash income. The study views well being as being severely impacted on by poverty in a multi-faceted way. Poverty is seen to have various manifestations, including lack of income and productive resources sufficient to ensure sustainable livelihoods.; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments and social discrimination and exclusion. Absolute poverty is described as a condition characterised by severe deprivation of basic needs, including food, safe drinking water, sanitation facilities, health, shelter, education, and information (Mattes *et al*., 2003: 2-4).

In conceptualising "lived poverty", Mattes *et al.* (2003: 8) came up with a set of items which they argued to be valid measures of poverty. These were used to in the following conceptual model.

Figure 3.1: Poverty, Its Antecedents and Consequences



Source; Mattes et al. (2003: 8).

The findings of the study on poverty, survival and democracy in Southern Africa are many but, there are two key findings which help in informing the conceptualisation of the current study. The first and less important finding relates to the location of a household in to access to basic services. Mattes *et al*. (2003, 22) report that there is a strong urban bias to poverty and development in Southern Africa.

People who live in urban areas are less likely to go without basic necessities, and more likely to have gone farther in the education system. Urban areas are also much more likely to have been the beneficiaries of state- and/or donor- financed projects to build development infrastructure (such as electricity, water, sewerage, and places to shop). Rural – urban location is also found to play a strong role in shaping poverty when placed into the analysis along with age and gender. But once variables such as education and employment status are introduced into the analysis, the impact of rural – urban location becomes extremely small.

The second and perhaps most important finding relates to the relationship between lived poverty (or QOL if one thinks in terms of the current study) on one hand, and the existence of development infrastructure in the immediate area around the respondent, and individual education attainment on the other. Mattes *et al*. (2003, 22) found that within each country and race group, within both rural or urban populations, and at equal levels of employment, the more governments have built electricity and water grids, sewerage systems, health clinics and paved streets in the immediate surrounding area, and the further you have advanced through the education system, the less likely you are to live in poverty. Not having a job, now or at any point in the past year, is also strongly associated with poverty. This is symptomatic of lack of state unemployment benefits across the region, except in South Africa, and the very limited impact of these benefits in keeping the unemployed out of poverty.

Another finding of interest but of lesser importance relates poverty to race. Mattes *et al*. (2003: 22) found that in all countries of the Southern African region, being white, coloured or Indian is associated with sharply reduced levels of poverty. This finding largely reflects the legacies of legally- enforced racial discrimination in South Africa, Namibia and Zimbabwe. The study used South Africa as a reference point and, in doing so, it was found that being a resident of Botswana and Malawi is associated with reduced poverty (after controlling for factors like education, employment or rural/urban status). However, being from Zambia, Zimbabwe and Lesotho is associated with an increase in poverty compared to South Africa. Mattes *et al*. (2003) do not maintain that there is something essential or genetic to race or to national culture that accounts for these results. Rather, they see race and country as summary, proxy measures of differing socialisation and historical experiences, as well as variations in

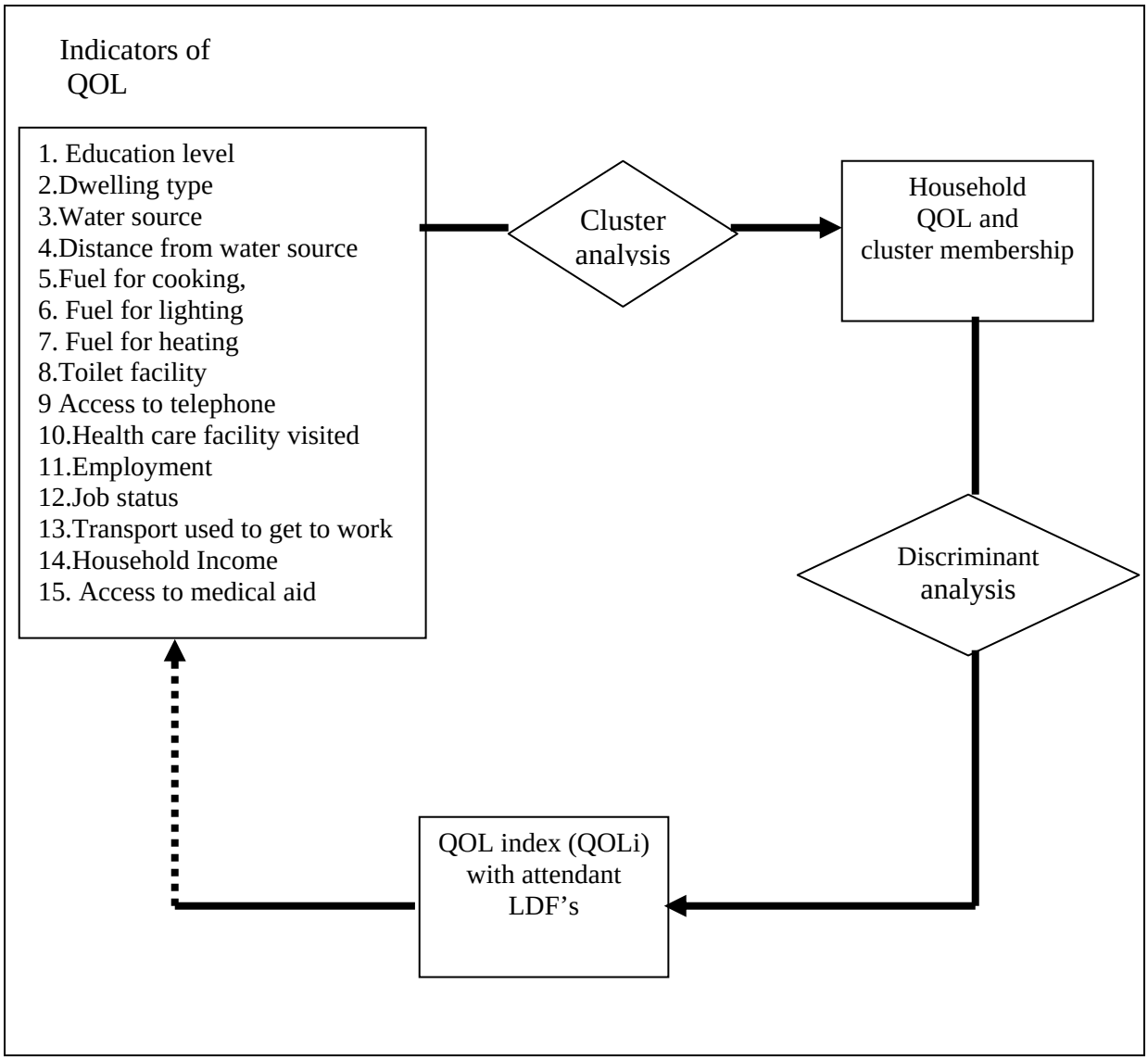
current perceptions about how the differing groups are affected by economic trends and government performance.

3.3 The conceptual model

In conceptualizing quality of life (QOL), indicators of quality of life need to be identified. These will have to be selected within a framework of human needs given that every household strives to satisfy its needs and preferences. Within the constraints of the resources they possess, households are assumed to select those things that will most enhance their quality of life. Along this line of thinking, QOL is conceptualised in terms of people's ability to access the things they desire. According to Diener and Suh (1997:190) people select the best quality of life for themselves that is commensurate with their resources and their individual desires.

The possible effects of the selected indicators on quality of life are perceived to be multidimensional with some indicators being more influential but on the whole, indicators are expected to interact with one another. A conceptual model has been developed in this regard to provide guidelines in the selection of the relevant indicators (see Figure 3.2). Within the context of the model a household serves as a nucleus for human life around which hopes are built and realized, and needs perceived and satisfied. From the household's point of view, each indicator satisfies a need and, satisfaction of that need is perceived to have a financial and/or social-psychological effect. The effect could be direct or indirect. For example education enhances the prospects of getting a good job in the formal sector. On one hand a job in the formal sector usually leads to improved material living conditions like decent accommodation and ability to afford a regular balanced diet, which reduces numerous risks to life. On the other hand education enlightens people, which leads to a change in behavior like sexual behavior and eating habits. According to Cockerham (1995) well-educated people are generally the best informed about the merits of a healthy lifestyle and the advantages of seeking preventive or medical treatment for health problems when they need it. This is of course made possible by the improved financial capability which is greatly enhanced by education and better employment prospects. These are direct effects, made possible by financial capability.

Figure 3.2: The conceptual model of the interactions between quality of life and the variables (indicators) impacting on quality if life (QOL)



On the social/ psychological side, education**,** through its improvements in employment and income prospects, enables an individual or household to lead an autonomous life. This improves decision-making. The individual or household for that matter, experiences a shift to a better social class and an improvement in status. With decision- making in the hands of the individual or household, several other socio-economic and demographic factors like fertility decision-making are influenced.

This leads not only to changes in household size and quality of life of the household in question, but through the process of learned behavior, other households in the locality are likely to emulate the prospering household (Turke, 1989:62-63).

In a broad context then, education plays a crucial role in differentiating QOL conditions for households because of the various ways it influences a household's ability to satisfy its needs. It is the differential ability to satisfy household needs that results into households to live under different conditions. In other words, QOL is conditioned by what a household is able to access. When looked at from this perspective, households accessing or satisfying similar needs, in essence live under similar conditions. Such households can be grouped together on the basis of what they access, and this will constitute a QOL group. It is this kind of thinking that is being portrayed in the conceptual model in Figure 3.2 below. The point is, households are classified or clustered into different groupings on the basis of the aspects (i.e. goods, services and amenities) they access. In the context of this study, the goods, services and amenities constitute the indicators of QOL. The indicators used to classify households are objective because they reflect measurable conditions. This differentiation reflects the objective or measurable QOL. In this study, it is asserted that the objective QOL conditions households experience shape the perceived QOL that the said households report (see Moller, 1996: 241). Households which can only satisfy a few of the household needs, access a few of the selected indicators because of resource constraints. Such households will belong to a group or cluster with poor QOL. Such households will be expected to be unsatisfied with life in general (i.e. perceived QOL). It suffices to point out however, that the list of selected indicators (see Figure 3.2) is not at all exhaustive. In any case it is doubtful if a comprehensive list of all human needs can be drawn and agreed upon, given the fact that human desires change relative to budget constraints and context. This borne in mind, the selection of indicators has been informed by the review of existing literature but, above all, indicator selection has been restricted by the fact the data to be used are secondary in nature.

When households are grouped into different QOL conditions, there is a need to identify what actually differentiates the apparent QOL conditions. In other words, there is a need to identify what indicator or indicators differentiate between the resultant groups of households.

This is important because not all indicators impact equally on QOL, as indicated by the role of education as an indicator. By applying discriminant function analysis it would be possible to identify the importance of the selected variables. Knowing the relative contribution of the indicators is the cornerstone for this study because it sets the platform for informing policy on what needs to be addressed in order to further improve quality of life. Details regarding cluster analysis and discriminant function analysis are provided in section 3.4, which deals with the research methodology. The selected indicators of quality of life, and their corresponding components are provided in appendix A. These indicators extracted from the questionnaire for OHS 1999, to show how components were weighted.

While education has been found empirically to have a significant positive effect on people's living conditions (Turke, 1989; United Nations, 1995:57; United Nations Development Program, 1996: 28), several people have missed out on attaining education. The reasons for not attaining education are numerous. It could be absence of schooling facilities in a community in which case, distance and related financial costs deter people from attaining education. It could be political insecurity and/or social unrest as was the case in apartheid South Africa. In some instances it could be the way society is set up, like in patriarchal societies where boys have preferential access to resources including education (Caldwell, 1987). Whatever the reason could be**,** lack of education and enlightenment in general, obstructs the perceived financial and/or social-psychological effects. This has a negative effect on quality of life. Section 3.4 will explain the methodology applied in this study together with a justification of the indicators selected for the study.

3.4. The research methodology

3.4.1 Introduction

Research may be characterised as methodical investigations into a subject problem. According to Malcom and May (1996:7), to "research" is to seek answers that involve understanding and explanation, whereas the credibility of its outcomes will rest heavily upon the conduct of the investigation. The research process consists of a series of steps and judgments that involve the application of techniques. This is where the design of the study becomes very crucial. Research design is described as the strategy, the plan and the structure of conducting a

research project, aiming at maximising the eventual validity of the research findings. It is a program to guide the researcher in collecting, analysing and interpreting observed facts (Mouton & Marais, 1990: 32; Bless & Higson-Smith, 1995:63).

This section will explain the research methodology used in this study. The data sources and nature of the data will be described in sections 3.4.2. A description of the sample sizes for the four data sets will be provided in section 3.4.3, followed by a comment on the research instruments used in section 3.4.4. Reference to the relevant indicators is made in section 3.4.5, alluding to the relevance of the selected indicators in quantifying QOL.

Sections 3.4.6-3.4.10 provide a detailed description of the different phases involved in data analysis and interpretation of the study's results. The section ends with a description of what constitutes the QOL index and an example of its interpretation.

3.4.2 Data sources

This study will use four secondary data sets. All of them are October Household Survey (OHS) data sets from 1996 through 1999. The data sets have been obtained from the South African Data Archive (SADA). They are nationally representative and were collected by Statistics South Africa (Stats SA). The data sets contain information on a series of subjects including household composition, education, health, fertility, employment, and income to mention but a few. It should be emphasised that although the study will focus on the above mentioned data sets, data right from 1994 are available. These data could be used to explore and describe the conditions prior to 1996. However, comparability will be hampered by the fact some indicators contained in the data sets for the period 1996 - 1999 are not included in the OHS data sets prior to this period. For this reason, the study will focus only on the period between 1996 and 1999.

3.4.3 Sample size

As indicated earlier on, the household will be the unit of analysis in this study. The OHS data sets for the four years under consideration, vary considerably in sample size as indicated in Table 3.1 below.

Despite this observation, no explanation has been sought by this study in connection with the variation in sample size. In any case, the methodology used in adhering to sample representativity is clearly articulated in the meta data files for each of the four data sets.

Table 3.1: Sample sizes and number of cases for OHS 1996-1999

Year	Number of households	Number of cases
1996	15 917	72 988
1997	29 811	140 151
1998	18 981	82 364
1999	26 134	106 650

3.4.4 The instrument and its design

The research instruments used in the OHS surveys for the four years are available and can be obtained from South African data archives (SADA) on request. They constitute part of the information package. Structured questionnaires were designed by Stats SA which were used to collect the data for the OHS data sets for 1996 through 1999. Since the data to be used in this study are secondary in nature, no research instrument needs to be designed.

3.4.5 The relevant indicators

In attempting to measure QOL, the household-based development approach will have limited objectives. Limitations are three fold. First, due to the complexity and multitude of the aspects that impact on QOL, the study will only focus on a limited number of indicators. This will enable the study to provide a comprehensible interpretation of the influence of the selected indicators. Second, since the data to be used are secondary in nature, the indicators to be used will to a great extent, be data – driven. Thirdly it is true that parsimony, that is, economy or simplicity of description will be born in mind. This however, will not be the major determinant of which indicators to be included in the study. According to Huberty (1994: 228) fewer outcome variables make explanations and interpretations substantively simpler. This may be a practical reason for deleting some variables in a MANOVA/DDA (multivariate analysis of variance and descriptive discriminant analysis respectively) context. All in all it is recognised that regardless of the care taken in the initial variable choice, some relatively worthless variables may be chosen for initial inclusion. In this way it is the data analysis

which determines whether it may be desirable to delete some variables. Thus the final list of indicators to be used in the analysis and interpretation of QOL will be determined by discriminant analysis as detailed in section 3.3.7.4. The indicators that are tentatively being considered are indicated in the conceptual model in section 3.2, and the details regarding the components of the indicators are provided in the appendix.

The indicators selected for this study meet most, if not all the criteria for a composite indicator as elaborated on by Morris (1979). For example:

- All of the selected indicators (with the possible exception of *dwelling type*) do not assume a particular pattern of development or depend in a way, on a particular organization of the economy. A system can be market-oriented or not, and households still have good access to the selected indicators of QOL. Regardless of the system in place, people would prefer to have the best of the selected indictors and not the worst.
- The selected indicators measure results, not inputs. These indicators focus on how many households access the selected indicators rather than the cost of providing the said indicators.
- The selected indicators fit the requirements of simplicity and comprehension. The data required to formulate the selected indicators are data commonly collected by most social research institutions and government departments. The data are unambiguous and the resulting index is likely to be easy to comprehend (Morris, 1979: 20-40).

Much as the indicators selected meet most, if not all the requirements above, one might wonder why objective and subjective indicators are being used in this study. Diener and Suh (1997:206) highlight the complementary role that the two sets of indicators play in understanding quality of life. While objective social indicators address fundamental policy questions regarding measuring improvements in quality of life, subjective well-being (SWB) measures assess people's actual reactions to the social conditions they experience. People transform the objective conditions- measured by objective indicators – they experience individually, taking culture into consideration, to express what they perceive as desirable or undesirable. The transformation process however, is not always explicit as one would imagine.

Diener and Suh (1997: 207) caution that scientific findings on well-being sometimes contradict lay beliefs that are prevalent in our culture. While wealth is often considered the most obvious indicator of happiness, Diener and Suh (1997:207) report of the finding that 37% of the wealthiest Americans were found to be less happy than the average Americans. People who aspire for material success and fame often suffer more from depression and anxiety than others.

This is one extreme that needs to be considered. On the other extreme, we find people in abject poverty who, for one reason or another, might seem contented with the rather harsh conditions by any standard. Measures that are based on objective standards are needed to judge the conditions of a society, because people can be tolerably happy even in many undesirable circumstances (see also Allardt, 1993:92). The point being made here is that both objective social indicators and SWB measures need to be employed in QOL studies if we are to have a more comprehensive picture.

A conceptual framework is crucial in selecting the indicators of quality of life. Diener (1995) is quoted in Diener and Suh (1997: 198) to have proposed a value based index of quality of life. In his proposal, Diener (1995) suggested that the variables selected for measuring quality of life are commonly reflective of the prominent values endorsed in the society. The value based index of quality of life proposed by Diener is grounded on the universal structure of values namely, hierarchy, mastery, affective autonomy, intellectual autonomy, and conservatism. Diener's QOL index – an aggregated national index–consisted of two separate indices namely, the Basic QOL Index and the Advanced QOL index. His argument is that previous measures of quality of life were often based on variables that discriminate the quality of life of nations at one level of development, but were less sensitive to the quality of life features of nations at a different level of development. Diener (1995) for instance, found that roughly 62% of the variance in the overall quality of life of nations was accounted for by income (GDP). Despite the high relation, however, a significant number of quality of life variables had a nonlinear relation with income. For example, quality of life variables such as literacy and percent attending tertiary schools, rose rapidly with income among low income nations but leveled off at high levels of income.

On the other hand, variables reflecting advanced scientific activity, such as Nobel prizes per capita, were found to accelerate rapidly at the upper levels of income. Overall, the findings indicated that advanced scientific achievements and technology tend to emerge after the basic physical needs of the citizens are fulfilled during a society's economic development process. As such the Basic QOL Index was found to be more sensitive in differentiating the quality of life in less wealthy nations, and the Advanced QOL Index better at discriminating wealthier societies. The point being emphasized here is that the context is crucial in selecting the relevant indicators of quality of life if a meaningful measure is to be achieved.

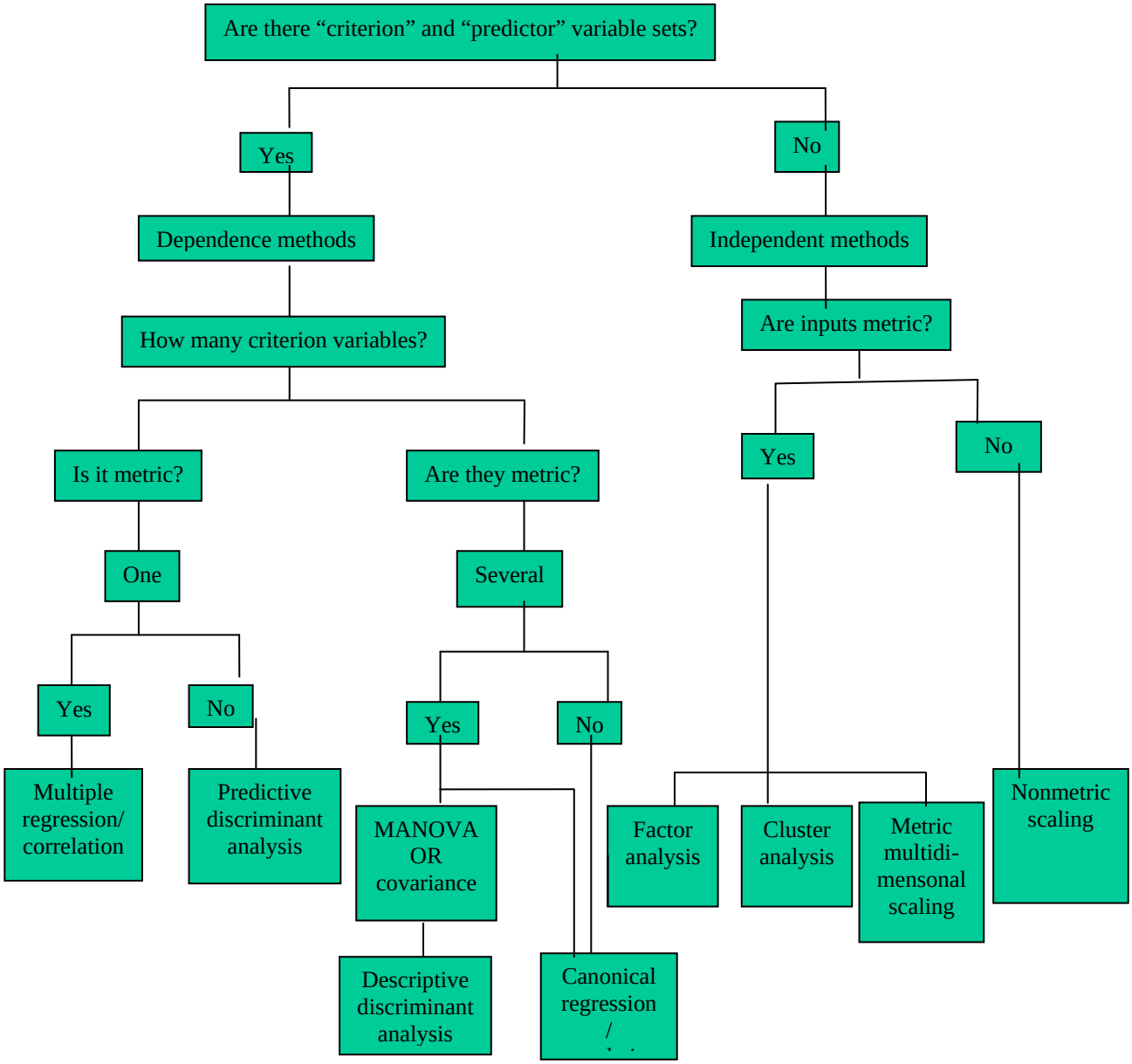
3.4.6 Overview of data analysis

In most social research situations it is rare for a researcher to be confronted with a situation whereby a social problem is impacted upon by one variable. A similar situation arises when one thinks of the aspects that impact on QOL. When we think of the indicators accessed by a household as predictors of household QOL we obtain a multiple correlation involving indicators f_1, f_2, …..,f_n on one hand and QOL on the other. This would clearly be a multivariate situation. Anlysing and interpreting the simultaneous effects of the various indicators on household QOL calls for multivariate statistical methods. In this case cluster and discriminant analysis are the statistical methods that will be applied. To get an idea of how the two methods systematically follow each other, consider figure 3.3. When one thinks of the selected indicators having an influence on QOL, one comes up with a possibility of an existing relationship between household QOL and the indicators in question. According to Huberty (1994: 28) the techniques of interest in such a situation involve multiple or canonical correlation. Such techniques are listed on the right in figure 3.3. They are employed in a situation where a single group of units (in this case households) is being studied to identify individual differences. Since households accessing similar indicators of QOL are likely to experience similar QOL conditions, such households are likely to form one stratum or cluster if stratification is based on indicators accessed. This is where cluster analysis will be applied.

After identifying household clusters, the objective of the study will be to describe the cluster or group differences on the basis of the fact that the selected indicators will have contributed to differentiating the household clusters.

In this situation discriminant analysis techniques will be appropriate. The following sections describe the phases through which data analysis will be conducted.

Figure 3.3. Classification of multivariate methods.



Source: Huberty C. J. (1994: 27)

3.4.7 Ordinal level data analysis

Analysing data at ordinal level will involve looking at variability within each of the selected indicators. Here, variability within the indicators will be analysed by considering the order of importance of the attributes constituting each indicator. Components are assigned values starting from one. The minimum value of one (1) is assigned to the attribute considered to be the poorest for the indicator, while the highest value depends on the number of attributes identified. The highest value will be assigned to the attribute considered to be the best as far as a particular indicator is concerned. For example, for the indicator *source of water*, a household with piped - hot and cold - water in the dwelling will take on the highest score, depending on the number of water sources identified in the survey. A household with the poorest water source, say water fetched from a dam, will take the value of "one". A score around the middle of the continuum would reflect a moderate quality of life as compared to the two extremes in respect of water. This could be water fetched from a bore hole from the neighbourhood. (See also Moller, 1997:53 - 59).

It should be noted that assigning values or weights to attributes within indicators introduces an element of subjectivity. If "type of dwelling" is taken as an example, a figure of "5" is assigned to a household occupying a traditional dwelling or a hut. A household living in a "Dwelling/house or brick structure on a separate stand/yard" is assigned a figure of "11" (see Appendix A). In numerical analytical terms, this could give the implication that the QOL of a household living in a traditional dwelling is almost half as good as the QOL experienced by a household in a brick house on a separate stand, in as far as this indicator is concerned. This is not entirely true because the subjective value (attached by households) to the type of dwelling they occupy, can only be known by them. Therefore assigning weights to QOL indicator attributes is not entirely value-free; it could have an impact on the study's results.

Hagerty *et al.* (2001: 83) indicate that some QOL indexes avoid the controversies around weighting by not weighting domains and, not providing explanations for adopting such an approach. They say that no weighting is still a form of weighting – equal weighting. However, Hagerty *et al.* (2001: 84) go ahead to caution that "no weighting" does not always result in equal weighting and can result in methodological flaws and misrepresentation of intended

objectives. The point being made here is that weighting of indicator attributes is inevitable albeit the subjectivity issue, and the apparent inadequacy of empirical background against which the weighting is enforced.

A list of the attributes and QOL indicators extracted from OHS 1999 is provided in the appendix A as an example. A comprehensive list for all indicators could not be compiled because of the way the questionnaires used in the surveys subsequent to OHS 1996, kept on being amended.

3.4.8 Cluster analysis

Households differ in respect of access to goods, services and facilities or amenities. This difference is crucial because it influences the quality of life conditions households experience. The quality of life a household enjoys is, to a great extent, determined by the goods and services (i.e. indicators of QOL) accessed by the household in question. A household which accesses most or all of the considered indicators, enjoys better QOL than a household which accesses a few. Ideally, households accessing the "best" attributes for all indicators under consideration enjoy the best QOL. Despite the differential access to goods, services and facilities, households accessing the same goods and services are likely to experience similar living conditions–this being referred to as QOL in this study. In other words households can be stratified according to the type and number of indicators they access. The resultant strata or groups can be analysed in order to establish the QOL experienced, on the basis of the number and type of indicators. This is where cluster analysis will play a role in this study.

According to Van Ryzin (1977: 18) clustering can be derived systematically from the data. There are three main types of data used in clustering; (1) multivariate data, (2) proximity data and, (3) clustering data. Multivariate data gives the values of several variables for several individuals. Proximity data consist of proximities among objects of the same kind: proximities among individuals, proximities among variables, proximities among stimuli and the like. Clustering data generally consist of the information derived from cluster analysis.

Of central importance in attempting to identify clusters of observations which may be present in data is knowledge of how "close" individual observations are to each other, or how far apart they are. Two observations are said to be "close" or similar when they have many characteristics that are common to both of them. Several measures exist for measuring proximity–a quantitative measure of closeness - depending on the level of measurement (Everitt *et al.,* 2001: 35). In some cases the purpose of undertaking cluster analysis is to identify and define groups of observations and how close the groups are – inter-group proximity. According to Everitt *et al.,* (2001: 46) there are two basic approaches to defining inter-group proximities. One approach is to define the proximity between the two groups by a suitable summary of the proximities between individuals from either group. Secondly, each group might be described by a representative observation by choosing a suitable summary statistic for each variable, and the inter-group proximity defined as the proximity between the representative observations. In the case of this study cluster analysis will be applied to classify households into groups on the basis of the QOL indicators accessed by households. From this point of view, interest is in identifying and defining groups rather than individual households. For that matter, the latter approach is more suitable. Further more, the number of clusters is not known *apriori*. As a result, cluster analysis will be used mainly for exploratory–vague-purposes, simply "to see what is there" (Van Ryzin, 1977: 22).

The K-means cluster technique will be applied in this instance to group households into QOL clusters on the basis of the indicators accessed by the households. This technique will also enable the study to establish household cluster membership. Because the indicators are measured on different scales (for example age is in completed years while income is in Rands and, grouped for that matter), the K-means cluster algorithm is suitable as it is not invariant under scaling. (Everitt *et al*., 2001: 106). According to Stockburger (1996) the K-means cluster analysis technique is appropriate in situations where the number of clusters is known before hand. In this case however, the number of clusters is not known and this is a problem. The K-means technique can still be used but it will require guessing the number of clusters and then adjust that number until an appropriate number is acquired in terms of the distance between the groups or clusters. The process involved in determining the ultimate number of clusters is explained in the following paragraphs.

According to Everitt *et al.* (2001: 35) two individuals are close when their dissimilarity or distance is small or their similarity large. In the K-means cluster technique dissimilarity or similarity between groups is measured and the distance is given depending on the number of clusters. Having too many clusters reduces the differences between the groups which reduces the distance between them. This undermines the identification of clear clusters as several individuals or items stand at or close to the cluster borders. Having too few clusters on the other hand like just two clusters, maximises the difference between clusters but this may obscure some characteristics that could be clearly identifiable if the number of groups were to be increased a bit. So the idea is to adjust the number of clusters to a point that maximises the group differences.

Deciding on the number of groups or clusters which optimises the criterion remains contentious but computer software has been developed at least, to reduce the burden of partitioning. According to Everitt *et al*. (2001: 99) the number of different partitions of *n* objects into *g* groups is given by the following formula.

$$N(n,g) = \frac{1}{g!}\sum_{m=1}^{g}(-1)^{g-m}\binom{g}{m}m^{n} \qquad (3.1)$$

Because of the numerous possible partitions, algorithms have been designed to search for the optimum value for a clustering criterion by rearranging existing partitions and keeping the new one only if it provides an improvement. The essential steps in the development of algorithms are as follows:

- Find some initial partition of the *n* objects into g groups.
- Calculate the change in clustering criterion produced by moving each object from its own to another group.
- Make the change which leads to the greatest improvement in the value of the clustering criterion.
- Repeat the previous two steps until no move of a single object causes the cluster to improve.

The details of the above procedure together with an example of how it works can be found in Everitt *et al. (2001: 100 – 102).*

The problem of determining the number of groups or clusters is not automatically solved by the steps mentioned above. The choice of the initial number of groups or clusters is random. The real task lies in determining the ultimate number of distinct clusters that maximises the differences between groups or clusters. This requires a need to establish how close groups are in terms of the summary measures (i.e. inter-group proximity). Everitt *et al.(2001)* proposes the use of Mahlanobis's distance given by the following formula:

$$D^2 = (\bar{X}_A - \bar{X}_B)' W^{-1} (\bar{X}_A - \bar{X}_B) \qquad 3.1$$

where W is the pooled within-group covariance matrix for the two groups. When correlations between variables within groups are slight, D^2 will be similar to the squared Euclidean distance calculated on variables standardised by dividing by their within-group standard deviation.
Thus, the Mahlanobis's distance increases with increasing distance between the group centres and with decreasing within-group variation (Everitt *et al., 2001:46).*

The concept of between-group distance relative to within-group variation is used in this study to decide on the optimum number of clusters. Assuming that a minimal number of clusters is started with, say two, increasing the number of clusters will increase the distance between the group centers since several households had initially been compacted into a few groups. Remember that households are being grouped on the basis of several QOL indicators accessed by households. The between-group distance will increase as households accessing the same indicators get stratified distinctively into particular groups. At the same time, within-group variation will be minimised as households with common characteristics (i.e. accessing similar QOL indicators) are grouped together. This process of increasing the number of clusters gradually, causes D^2 to increase as objects or households get slotted into clear distinct groups which reduces the within-group variation. The increase in D^2 however, reaches a maximum at a certain point where increasing the number of clusters causes an overlap of cases – reducing the distance between group centers – while the within-group variation is virtually non-existent.

Hereafter, D^2 begins to decrease and it marks a point where increasing the number of clusters is no longer justified. This will provide a basis for deciding on the number of clusters or QOL groups for this study.

Another alternative could be resorting to hierarchical clustering methods. These are two namely, divisive and agglomerative. They are applicable where no prior knowledge of the number of clusters is available. This method works well where clearly distinct clusters exist (See Everit *et al.*, 2001:55). In the context of this study, it is highly unlikely to get clearly distinct QOL clusters, particularly on the lower part of the continuum where households struggling to meet basic needs are located. Therefore the K-means cluster technique turns out to be most appropriate.

Going through the process described above, this study was able to establish the number of QOL clusters which enabled the study to describe the different QOL conditions in the various clusters. The study would then be able to analyse the changes in cluster composition for the period 1996 – 1999. This is where one would be able to ascertain the changes in access to the selected indicators in the various QOL clusters. A description of how subjective indicators of QOL relate with the objective indicators, is made possible and how this relationship may have changed during the period under review. The clusters obtained were used in discriminant function analysis to determine the indicators that discriminate between QOL groups (i.e. coefficients of the indicators of QOL). This is described in the following section and, it is the last phase of data analysis.

3.4.9 Discriminant function analysis

Households differ in living conditions mainly because they differ in ability to meet their needs. Ability to meet household needs depends on factors pertinent to a household like household income and employment status of household members. These factors are considered to be internal and hence could be regulated by the household in question. There are other factors like location (rural or urban) which are external to and outside the household's control, but they are influential to a household's ability to meet its needs. The external factors tend to play an indirect role in influencing household quality of life.

The two sets of factors – internal and external – are conceptualised in this study as QOL indicators and combine to influence household quality of life. In this context, household QOL is perceived to be a function of the indicators accessed by a household. It is important to stress that the indicators themselves are not static. Considering "source of water" as an example, it is clear that a household with piped water in the household will live better than a household with a tap in the compound. A household with a tap in the yard is better off in terms of access to water than a household relying on public tap water, because the latter has to travel some distance to fetch water. All this is clean water but there is a difference when it comes to accessibility. The difference in "accessibility" – a particular attribute - influences household QOL. Thus the indicators accessed by a household and their quality, differentiate between household quality of life and in the process, determine the cluster to which a household belongs (cluster membership).

From the example above, it can be seen that the contribution of the various indicators to QOL is not the same. This is likely to be the case because an indicator with many attributes will influence the classification of households just on the basis of its attributes as opposed to an indicator with a few attributes.

Contribution to QOL by the various indicators is in itself not known. What is established so far is the difference in QOL conditions depicted by the resultant clusters, on the basis of differential access to the selected QOL indicators. There is a need to establish the contribution of the various indicators to household quality of life. It is important to remember that households will belong to a particular cluster because they access certain indicators. A particular cluster of households will reflect a certain level of quality of life (QOL_i). Quality of life in a particular cluster will differ from quality of life in other clusters because of specific indicators and their relative importance. It is on this point of relative indicator importance that discriminant analysis will be applied.

According to Amemiya (1985: 291) discriminant analysis serves to measure the characteristics of an individual or an object and, on the basis of the measurements, the individual or object is classified into one or more groups.

Discriminant analysis techniques are appropriate in situations where groups of units are known and the purpose of the research is either to describe group differences or to predict group membership. The latter involves predictive discriminant analysis (PDA) in which group membership is predicted using a combination of variables. The variables determine group membership and, as such they serve as independent variables, while the groups form the dependent variables or grouping variable (Huberty, 1994:28; Tabachnick & Fidell, 2001:456). In the context of this study applying PDA enables the study to establish the percentage of cases – in this case, households – that are correctly placed on the basis of the selected indicators. This to a great extent verifies the extent to which results from cluster analysis are in agreement with the results emanating from discriminant function analysis, given that households are grouped using the same QOL indicators.

Descriptive discriminant analysis (DDA) strives to describe the effect the grouping variable(s) have on the multiple response variables. In other words the multiple response variables are viewed as the outcome variables and the grouping variable(s) as the explanatory variables. The primary goals of discriminant function analysis are to find the dimension or dimensions along which groups differ, and to find classifications to describe group membership. The degree to which these goals are met depends on the choice of variables. Choice is made either on the basis of theory about which variables should provide information about group membership, or on the basis of pragmatic considerations such as expense, convenience, or unobtrusiveness (Tabachnick & Fidell, 2001:458). The objective of this study is to establish whether quality of life in South Africa has improved. This will require a description of the changes in the prevailing conditions during the period under consideration. The choice of variables or indicators of quality of life is informed by theory (refer to Chapter two).

If one could recall the situation in multiple regression, there is a criterion or dependent variable (Y) and a set of predictor (independent) variables (X_i). A linear composite of predictors - call it X - is determined so that a simple correlation between the criterion variable and the predictors is determined. In this way a set of weights (w_i) for the predictor variables is determined so that the correlation (for the data being used) is higher than if any other set of w_i is used in determining Y.

This idea of determining w_i for some response variables in order to maximise correlation is also applied in DDA. In DDA the idea is to determine weights w_i for which the correlation between the group differences or group separation and the response variables is a maximum (Huberty, 1994: 207; Tabachnick & Fidell, 2001:464). The weights are part of the linear composite of the predictors x_i. The linear composite is of the form below.

$$Y = \sum_{i=1}^{n} w_i x_i \qquad (3.2)$$

Where:

Y = a linear composite of indicators of QOL,

w_i = the weight (canonical discriminant function coefficient) for a particular indicator,

x_i = a particular indicator accessible to households and,

n = the number of indicators or variables used in creating QOL groups

The linear composite in Equation 3.2 is referred to as a linear discriminant function (LDF). In discriminant function analysis, the coefficients (w_i) are chosen to maximise differences between groups relative to differences within groups. Just as in multiple regression, Equation 3.2 can be written either for raw scores or for standardized scores. A discriminant function score for a case (Y_i), then, can be produced by multiplying the raw score on each predictor by its associated unstandardised discriminant function coefficient, adding the products over all predictors, and adding a constant to adjust for the means.

Just as Y_i can be calculated for each case, a mean value of Y_i can be calculated for a group. The members of each group considered together have a mean score on a discriminant function that is the distance of the group, in standard deviation units, from the zero mean of the discriminant function. Group means on Y_i are typically called centroids in reduced space, the space having been reduced from that of the n predictors to a single dimension, or discriminant function (Tabachnick & Fidell, 2001:466).

In the context of this study QOL is not known but, households have been grouped into QOL groups or clusters in respect of the indicators of quality of life they access.

These should definitely be household clusters with different quality of life conditions much as quality of life itself may not be known. By taking the household quality of life groups or clusters on one side as a grouping variable and, the multiple response indicators on the other, the result will be a set of linear discriminant function(s) - depending on the number of groups or number of variables, whichever is smaller - in the form of equation 3.2 above. The discriminant function or functions will be used in the description and interpretation of the relative contribution of the quality of life indicators in differentiating between the QOL conditions existing in the QOL groups. In this way DDA will have played a role in determining the contribution of the various indicators to QOL (i.e. canonical discriminant function coefficients w_i, or LDF's as referred to by Huberty (1994: 208)), and to discriminate between household QOL clusters**.**

The study would then be able to identify household cluster membership, and what indicators are accessed by different household clusters- the latter reflecting the QOL conditions. The study will also be able to identify the most probable causes of the differences in household QOL conditions. The value of the coefficients (w_i) of the LDF, also known as the canonical discriminant function coefficients, will offer the basis for recommending as to which indicators should be targeted for purposes of further improving QOL – an issue for policy consideration. The following section will offer some insight regarding the interpretation of the results of discriminant function analysis.

3.4.10 Interpretation of study findings

The main objectives of this study are (1) to measure QOL at household level and (2) establish whether QOL has improved. An explanation of how the first objective will be achieved has been provided. To achieve the second objective, the task is to make sense of the resultant LDF's. This is more demanding than assessing the changes in cluster composition which forms part of the second objective. One of the questions that arises pertains to the meaning of the weights (w_i) of the LDF's.

According to Tabachnick and Fidell (2001: 457) discriminant function analysis has got two facets and one or both facets could be used in the interpretation of research findings.

One facet involves a situation where discriminant function analysis is used to classify cases and the researcher is interested in the classification rules pertaining to the classification process. In such a situation the researcher's interest is in establishing the existence of distinct classes or groupings of cases without trying to attempt to understand the meaning of the related combinations of predictors. The other facet involves a situation whereby interest is more in the meaning of the combinations of predictors in the various dimensions – discriminant functions – that separate the resultant groups from each other, than just establishing the existence of groupings of cases. The researcher is not merely interested in establishing whether distinct groups of cases exist or not. In the context of this study the latter facet is more relevant as the objective is not just to identify QOL groups but also to identify what discriminates between them.

To get an understanding of the whole process- description and interpretation- let us make use of the results in the example of Tabachnick and Fidell (2001: 464). In this example, learning – disabled children are grouped into three. The three groups are *memory* (children whose major difficulty seems to be with tasks related to memory), *perception* (children who show difficulty in visual perception), and *communication* (children with language difficulty). Children are classification into the three groups using predictors *performance IQ, age, information*, and *verbal expression*.

The hypothetical data are given in Table 11.1 in Tabachnick and Fidell (2001: 464). After performing a discriminant function analysis using SPSS, the following results in Table 3.2 are obtained as part of the SPSS output.

Table 3.2: Anatomy of discriminant function results

Part one: Summary of Canonical Discriminant Functions

Function	Eigenvalue	% of Variance	Cumulative %	Canonical correlation
1	13.486	70.7	70.7	0.965
2	5.589	29.3	100.0	0.921

a. First 2 canonical discriminant functions were used in the analysis

Part two: Wilks' Lambda

Test of functions	Wilks' Lambda	Chi square	df	Sig.
1 through 2	.010	20.514	8	.009
2	.152	8.484	3	.037

Part three: Standardised Canonical Discriminant Function coefficients

	Function	
	1	2
Performance IQ	-2.504	-1.474
Information	3.490	-.284
Verbal expression	-1.325	1.789
Age	.503	.236

Part four: Functions at group centroids

	Function	
Group	1	2
Memory	-4.102	.691
Perception	2.981	1.942
Communication	1.122	-2.633

Unstandardised canonical discriminant functions evaluated at group means

Part five: Structure matrix

	Function	
	1	2
Information	.228*	.066
Verbal expression	-.022	.446*
Performance IQ	-.075	-.173
Age	-.028	-.149

Pooled within-groups correlations between disciminanting variables and standardised canonical discriminant functions.

Variables ordered by absolute size of correlation within function

*Largest absolute correlation between each variable and any discriminant function

Source: Tabachnick & Fidell (2001: 465-470)

The results in Table 3.2 are just part of the SPSS output when discriminant function analysis is executed. The first part of Table 3.2 provides a summary of the canonical discriminant functions. This part indicates the number of canonical discriminant functions used in the analysis, together with the Eigenvalues, % of variance, cumulative percentage, and canonical correlation for each discriminant function. A central feature of this part of Table 3.2 is "% of variance" because it describes the proportion of variance in the solution that is accounted for by each discriminant function. The Eigenvalue associated with a particular discriminant function indicates the relative proportion of between – group variability accounted for by the function in question. In this case 70.7% of the variation is accounted for by the first discriminant function, while the remainder is accounted for by the second. In some cases, there are more than two discriminant functions, depending on the number of groups or number of predictors, whichever is smaller. In the case of the former, the maximum number of discriminant functions is less the number of groups by one (i.e. equal to the degrees of freedom for the groups). In case of the latter, the maximum number is equal to the number of predictors (Tabachnick & Fidell, 2001: 482). Of rather less importance in this part of the table are the canonical correlations for the respective discriminant functions. These correlations are a measure of association between the combinations of predictors in the linear discriminant functions and the grouping variable. These canonical correlations are of less significance, particularly for the current study because interest is more in the individual indicator/indicators in a LDF which share the most variation with that particular LDF than the joint canonical correlations. Such indicators which share the most variation with a given LDF are the ones which should define what attribute the LDF represents. This is a subject of part five of Table 3.2 (i.e. structure matrix) and as such, will be dealt with later on.

The second part of Table 3.2 -Wilks' Lambda – indicates the degree of association between the groups and the predictors. The table indicates the level of significance for discriminant functions as they are successively tested in the analysis. For instance, when both functions are tested simultaneously, a Chi square value of 20.514 is obtained which is significant at both 1% and 5% significance levels. When the first discriminant function is removed, the test of function 2 yields a Chi square value of 8.484 which is statistically significant at 5% but not 1% (i.e. Sig.

= 0.037). This means that the second discriminant function is also significant and should be considered in the analysis.

In situations involving many groups and predictors, more than two discriminant functions may turn out to be statistically significant. Caution needs to be taken when deciding on the number of discriminant functions to use while interpreting the results, as some functions may be statistically significant but not carrying worthwhile information. In most instances, the first one or two discriminant functions account for most of the between - group variation, necessitating to leave out the other discriminant functions which may not be adding on much in terms of description. The onus is upon the researcher to decide on the number of functions to use in the analysis, given that flexible statistical procedures do exist to provide assistance in this regard (Tabachnick & Fidell, 2001: 483).

Part three of Table 3.2 shows the canonical discriminant function coefficients in a standardised format. A standardised discriminant function consists of standardised coefficients (z_i) which when multiplied by standardized scores of each case and summed up, yield standardised scores for the cases in question. The mean of each discriminant function over all cases is zero with a standard deviation of 1. Standardised scores can also be derived for groups of cases using the standardised coefficients. The scores of cases in each group together have a mean score on a discriminant function that is the distance of the group, in standard deviation units, from the zero mean of the discriminant function. These group means are commonly referred to group centroids. Unstandardised scores for cases can be derived by using unstandardised discriminant functions. In such a situation a discriminant function score for a case is obtained by multiplying the row score on each predictor by the corresponding unstandardised discriminant function coefficient. The sum of the products over all predictors for a particular case yields its unstandardised score, after adding a constant to adjust for the means. Just like in standardised discriminant functions, group centroids for unstandardised discriminant functions reflect the average discriminant score for each group on each function; these form part four of Table 3.2. Group centroids can also be displayed graphically as part of the SPSS output if that option is highlighted.

As highlighted earlier on in this section, one crucial part of discriminant function analysis is the interpretation of the contribution of individual predictors to the LDF. Predictors in a LDF differ in influence and this is indicated by the magnitude with which particular indicators correlate (or load) with a LDF. If predictors X_1, X_2, and X_3 load highly with a particular function while others do not, the task is to try and establish the commonalities between X_1, X_2, and X_3 as opposed to the rest of the predictors. The task for the researcher is to understand the common features between the predictors which load highly with the LDF and how these features differ from those of the rest of the predictors. A particular LDF is defined and interpreted in terms of the predictors (or indicators in the case of the current study) which share the most variation with it. This variation is indicated in part five of Table 3.2. In this example the first discriminant function loads most highly with *Information* (r = 0.228) while the second function loads most highly with *Verbal Expression* (r = 0.446). Tabachnick & Fidell (2001: 485) go further to explain that a full interpretation of the findings requires relating the correlation values with the discriminant function plots. The latter provide a visual display of the centroids which makes it easy to see which factor separates a particular group from the others. In the case of the example used, the discriminant function plots relating to the described results are shown in Figure 11.1 (Tabachnick & Fidell, 2001:483). Interpretation is reportedly easy when one predictor loads highly with a discriminant function; it is more challenging and, interesting from a research perspective, when a number of predictors load highly with a discriminant function. The question of how high correlations should be for consideration in the interpretation process remains contestable. However, convention allows for correlations in excess of 0.33 to be considered eligible while lower ones are not (Tabachnick & Fidell, 2001:485).

The results of discriminant function analysis emanating from the data sets (i.e. OHS 1996 – OHS 1999) will be interpreted in a way similar to that described in the example above. Since the indicators of quality of life (i.e. predictors) used in discriminant function analysis are the same indicators used in cluster analysis, a comprehensive picture regarding QOL changes will be obtained by linking the interpretation of the results from both discriminant function analysis and cluster analysis. Recommendations regarding the steps to be taken to further improve QOL will be based on this interpretation.

3.4.11 The Quality of Life index

One needs to recall that in this study, cluster analysis makes it possible to group households into quality of life groups or clusters. This is achieved on the premise that households experience similar quality of life conditions because they access similar QOL indicators. As a result, households accessing different QOL indicators are grouped into different QOL groups, because they experience different quality of life conditions. As described above, the resultant clusters or QOL groups form the grouping variable which serves as the dependent variable in discriminant function analysis.

Emanating from discriminant function analysis in conjunction with cluster analysis are LDF's whose coefficients indicate the relative contribution or importance of indicators to household QOL. Discriminant function analysis, through the resultant coefficients of the LDF's, enables us to identify the indicator or indicators that share the most variation with the LDF's. The coefficients are derivatives of indictors accessed by households involved in the study. In other words, knowing the QOL groups and the indicators accessed by the households in those groups, enables us to describe and compare the QOL conditions experienced by the households in question. It is important at this stage to indicate that a comparison of QOL conditions in the resultant QOL groups requires a mechanism through which the QOL groups can be ranked. This is achieved through the use of the group centroids associated with the first LDF.

As indicated earlier on, discriminant function analysis provides a distribution of grouped cases along particular dimensions or discriminant functions. The first discriminant function (DF) accounts for most of the between - group variation. The clusters will have their centroids distributed along a particular DF on the basis of the indicator characteristics used in the analysis. A group of households with the best access to the selected QOL indicators will have its centroid located farthest on the positive side of the first dimension or discriminant function. Similarly a group of households with the poorest access to the selected QOL indicators will be have its centroid located farthest on the negative or left side of the first dimension. This enables this study to rank the QOL groups. The entire array of QOL group constitutes the QOL index.

Identifying indicators which account for differences in the QOL conditions of the QOL groups or clusters – linear discriminant function analysis- enables us to describe and synthesise the possible effect of such indicators in influencing quality of life. In this context, it becomes apparent that neither the results of cluster analysis alone nor those of discriminant function analysis, can independently provide us with a comprehensive picture of quality of life. The Quality of Life index therefore exists because of the results of the two models (i.e. cluster and discriminant analysis). Comparing the QOL groups emanating from cluster analysis is made possible through the ranking of the QOL groups. The ranking process is premised on the results of discriminant function analysis which would not have been achieved without linking the inputs for the two models [cluster and discriminant analysis]. The two therefore provide a clear picture of the actual quality of life conditions in the various groups and, what differentiates between the QOL conditions experienced in the different groups of households.

Since this study is dealing with data for four years (1996 – 1999), the results will consist of four separate indices, each having a set of QOL groups and a corresponding set of linear discriminant functions. A comparison of the changes in cluster composition and the indicators that load highly with the discriminant functions will provide grounds for commenting on the improvements in quality of life in South Africa. Recommendations regarding further improvements in quality of life will be based on the identified changes and interpretation of the study findings.

3.5 Summary

This chapter has dealt with issues relating to conceptualising QOL and the research methodology. With regard to the former, a conceptual model has been developed to indicate the interactions between QOL indicators and QOL. The model also shows the processes through which household QOL conditions are differentiated on account of the indicators accessed. Research questions have been raised. The theoretical linkages between the model variables and QOL have been highlighted. In the research methodology, the data sources, nature of data, and the sample sizes have been described.

Motivation for including or excluding certain indicators has been provided. The phases through which data are to be analysed have been described. A description of how the study's findings will be interpreted, particularly in respect of discriminant function analysis has been given. The chapter ends with a description of what constitutes the quality of life index and its interpretation. The following chapter (four to seven) will present the findings of the study.