

**ENVIRONMENTAL PERCEPTION, AWARENESS AND BEHAVIOUR OF HOUSEHOLDS IN
THE JOHANNESBURG METROPOLITAN AREA**

BY

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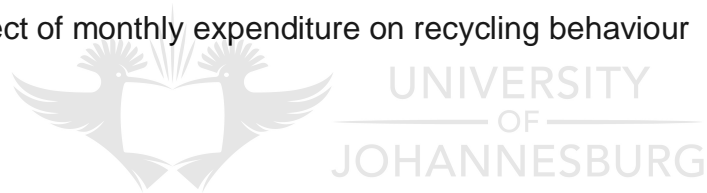
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ABSTRACT

In daily life, many of our experiences and much of the information directed at us relate to the poor state of the environment and the inadequate attempts of humankind to deal with it. Yet little attention is given to environmental hazards and environmental awareness at the level of the individual household. It is increasingly evident that the quality of our environment is being degraded. The poor state of the environment at the household level is generally associated with racial and ethnic differences, which in turn impact upon socio-economic conditions, which may be attributed in part to environmental injustice, whereby different sectors of the population experience differential exposure to environmental hazards. This study concentrates on the spheres of environmental perception, knowledge and behaviour on the household resolution level. The demographic factors of gender and race and the economic factor of household monthly expenditure are the selected variables used to determine whether these factors do in fact influence the variations in environmental perception, awareness and behaviour in the case of a sample of household respondents in the Johannesburg Metropolitan Area.

An analysis was performed on the data collected during the General Household Survey (GHS) (2006), which was conducted by Statistics South Africa. The survey, using a stratified random sample, was conducted on 873 households in the study area.

The findings of the study revealed differences in the number and range of concerns raised by male and female respondents on the reported environmental issues. Male

respondents are more conscious than females about environmental issues. It was also found that there are significant variations in the level of awareness between male and female respondents with respect to environmental recycling programmes. More male respondents engage in recycling behaviour than is the case with their female counterparts.

Respondents from Black population were more inclined to show concern for a wider range of environmental problems than was the case in the other racial groups. Waste is perceived as the most significant environmental problem for racial groups across the board in the Johannesburg Metropolitan Area. Variations were observed in the level of awareness concerning operative recycling programmes in the communities and also in the resultant behaviour with respect to the environment across the racial groups.

The number of environmental problems reported as being perceived across the monthly expenditure groups varies between the limited and moderate spending groups. Respondents limited in their monthly expenditure expressed their concern for the physical environment, while high-spending household respondents were more inclined to be concerned about land degradation. It was observed that the level of environmental awareness tends to increase with an increase in monthly expenditure. Furthermore, the findings of the study indicate that an increased level of awareness of community recycling programmes does not necessarily translate into positive behaviour to improve and upgrade the environment, as in the case of collecting waste for recycling.

CHAPTER 1: GENERAL ORIENTATION OF THE STUDY

1.1 Introduction

This chapter is divided into five sections and provides a general orientation to the study. The first section presents the background to the study, while the second section outlines its objectives. The third section postulates a hypothesis pertaining to the problem statement. The fourth section gives a brief discussion of the methods used to collect the data in this study, while the fifth section discusses the methodology applied in this study, and describes how the rest of the study is structured.

1.2 Background to the study

In daily life, we deal with many experiences and much information pertaining to both the poor state of the environment and the inadequate way in which humankind is dealing with it. It is increasingly evident that the quality of the environment is being degraded. The poor condition of the environment can be attributed to racial and ethnic differences impacting upon the socio-economic climate, which may in turn be attributed in part to environmental injustice, whereby low-income and/or minority populations are subjected negatively to environmental hazards as opposed to their more privileged counterparts (Preston *et al.*, 2000). However, environmental justice has given little attention to environmental hazards and environmental awareness at the level of the individual household (Preston *et al.* 2000).

Because of the historical context in which South Africa finds herself as she re-shapes her political, economic and social systems at the present time, this country offers a unique setting in which to examine community perceptions, behaviour and awareness regarding matters of environmental quality (Anderson *et al.*, 2006). This study seeks to contribute to the body of knowledge concerning environmental awareness as it attempts to analyse the afore-mentioned on the household resolution level.

1.3 Study Area

Johannesburg is the largest city in Gauteng Province (one of the nine provinces in the country) and South Africa. The Greater Johannesburg Metropolitan Area, the largest urban complex on the African continent, accommodates a total population in excess of 2.5 million people, 4 000 000 of whom live in informal settlements (GJMC, 2000). About 70 percent of Johannesburg's citizens are Black, about 25 percent are White, and the remaining five percent are Coloured, Indian or belong to other racial groupings (GJMC, 2000).

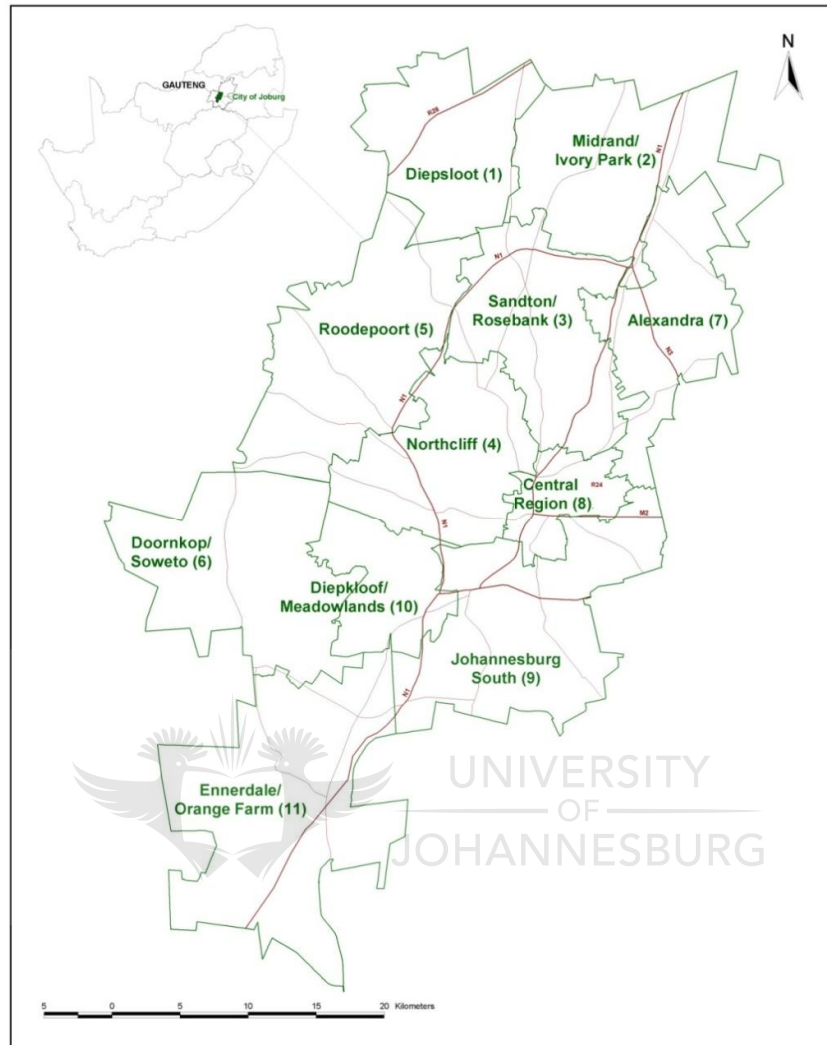


Figure 1.1: City of Johannesburg and its 11 regions (Greater Johannesburg Metropolitan Council, 2000).

1.4 Objectives of the study

The main objectives of this study are:

- to identify the greatest environmental problems as perceived by households in the Johannesburg Metropolitan Area;
- to ascertain whether demographic factors (i.e. gender and race) and the economic factor (i.e. monthly expenditure) contribute towards generating differences in environmental awareness, perception and behaviour in the case of households in the Johannesburg Metropolitan Area; and
- to assess whether an increased level of environmental knowledge necessarily results in successful behaviour in respect of environmentally-friendly activities.

1.5 Problem statement/ hypothesis

South Africa has in recent years seen the emergence of various private and public initiatives to help foster an environmentally-conscious society. In the Johannesburg Metropolitan Area in particular, the refuse company PIKITUP has organised various environmental education activities such as the “Pitch in and we’ll Pikitup” campaign and “My city, my future, let’s save it for 2010 and beyond”. The rights of South African citizens pertaining to the environment are enshrined in the constitution (Anderson *et al.*, 2006). According to Anderson *et al.* (2006), South Africa has had two parallel societies, one having at its disposal economic and social amenities equal to those found in the developed world and the other living under circumstances comparable to those prevailing in much of the developing world. With the advent of democracy in 1994, the ANC government presented various policies e.g.

Reconstruction and Development Programme (RDP) to redress economic and social disparities between these groups, one such vehicle being the policy of the Reconstruction and Development Programme (Donaldson and Marais, 2002). The fact that the government has attempted to address the disparities between the two “societies” has impacted upon, amongst other things, the environment.

Previously, the Department of Environmental Affairs and Tourism and the Department of Education engaged jointly in implementing an environmental education programme¹. In line with this initiative, it can be postulated that initiatives for promoting environmental awareness could heighten the environmental awareness, perceptions and behaviour of households in the Johannesburg Metropolitan Area. However, no scientific research has as yet been undertaken to investigate whether the level of environmental awareness in the case of households in the Johannesburg Metropolitan Area generally influences their perception of the environment and resultant behaviour that could promote an environmentally-friendly attitude. According to Abdul-Wahab (2007), determining what people know about the environment, how they feel about it, and what actions they might take to help or harm the environment, is critical to establishing the level of sustainability that the community in question has attained.

Thus, this study sets out to examine the perceptions of the environment held by respondents, to determine the level of awareness of these households to community and school recycling programmes, and to determine whether the behaviour of

¹ These two departments attempted to integrate their “new” programme into the Outcomes-based Curriculum, which has been abandoned in 2007.

households in the study area is environmentally-friendly in terms of environmental management.

1.6 Methodology and data

The data for this study were obtained from the General Household Survey of 2006. The General Household Survey (GHS) is a household survey that has been conducted annually by Stats SA since 2002. The survey was instituted as a result of the need identified by the Government of South Africa to determine on a regular basis the level of development in the country and the effectiveness of programmes and projects. The purpose of the survey was specifically to measure multiple aspects of the living conditions of South African households, as well as the quality of service delivery in a number of key service sectors. The GHS covers six broad areas, namely, education, health, activities related to work and unemployment, non-remunerated trips undertaken by the household, housing, and access by the household to services and facilities.

A multi-stage, stratified random sample was drawn using probability-proportional-to-size principles. First-level stratification was based on province and second-tier stratification on district council. Field staff employed and trained by Stats SA visited all the sampled dwelling units in each of the nine provinces during the first phase of the survey and, as part of the publicity campaign, informed the residents about the anticipated survey. This phase was subsequently followed up by face-to-face interviews.

Descriptive statistical indicators such as frequencies were employed to analyse the data, while contingency tables were used to summarise the data. Chi-square tests

were calculated to determine the significance of the findings and to assess the nature of any variations and associations between the variables across racial, gender and household expenditure lines.

1.7 Organisation of the study

This section incorporates a short review of research studies pertaining to environmental perceptions, awareness and behaviour patterns on the household resolution level. In order to achieve the objectives mentioned above, a logical framework was designed for each chapter to inform the reader about the course followed. These frameworks are represented as diagrams for each respective chapter (See Figure 1.2).

Chapter 1: This chapter presents a general orientation to the study, discusses the context of the study and provides an outline of the study objectives, the hypothesis, the methodology and the way in which the study material was structured.

Chapter 2: This chapter explores the theory of “*concern for the environment*”, frequently referred to as “*environmental concern*”, and reviews previous studies conducted on the subject. The chapter is structured as follows: The first section presents theories relating to concern for the environment. Section 2 presents a definition of environmental concern and focuses on the reasons why this concept is regarded as important. Section 3 deals with the components of environmental concern and is followed in Section 4 by a discussion on factors promoting an attitude of concern for the environment.

Chapter 3: This chapter investigates the environmental perceptions, awareness and behaviour of the sample households in the General Household Survey (2006) by comparing gender differences across the Johannesburg Metropolitan Area.

Chapter 4: This chapter presents an assessment of the perceptions of the environment held by the interviewees. The pertinent issue under investigation is whether households are aware of available recycling initiatives and whether they engage in waste collection for recycling. This chapter focuses on investigating and analysing how the differences in the environmental perceptions of the respondents vary across racial lines.

Chapter 5: The aim of this chapter is to assess whether household monthly expenditure as an economic factor has an impact on perceptions about specific environmental problems. This chapter assesses whether households are aware of available initiatives in the community to mitigate the impacts resulting from the perceived environmental problems in the study area, and also investigates whether an increase in the level of awareness of recycling programmes encourages households to engage in environmentally-friendly behaviour.

Chapter 6: This chapter incorporates the key findings of the study, summarises the limitations of the study, identifies areas for future research, presents the conclusions drawn and makes recommendations for future environmental initiatives.

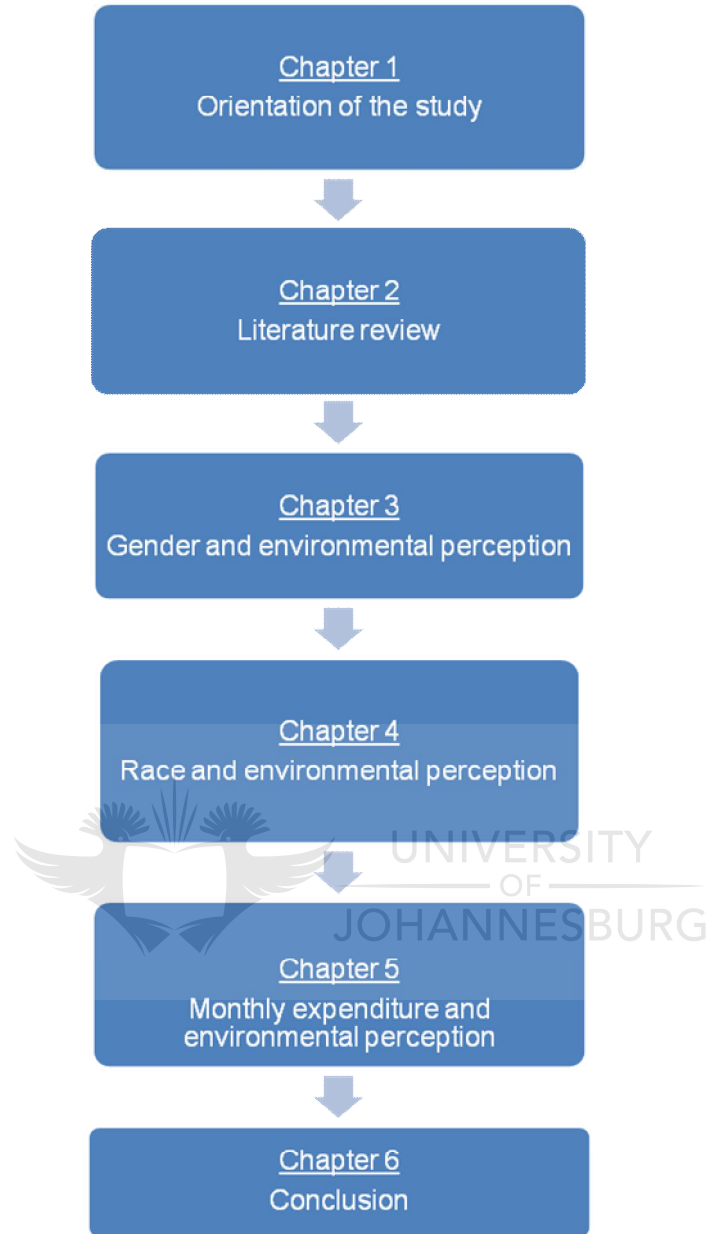


Figure 1.2: Logical framework of the study

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter explores the theory of an attitude of concern for the environment and presents an overview of previous studies conducted on this subject. Also presented is a selective review of literature relating to relevant empirical and theoretical studies addressing the issues of perceived environmental problems, level of awareness concerning initiatives such as recycling programmes for reducing waste, and resultant behaviour with respect to the environment.

Chapter 2 is structured as follows: The first section presents environmental concern theories. The second follows with a definition of environmental concern and its importance. Section 3 discusses the components of environmental concern, while Section 4 deals with factors that impact upon environmental concern. Selected literature on environmental concern is presented in section five and the final section is a summary of the afore-mentioned.

2.2 Environmental concern theories

The literature review focuses largely on four main theories concerning environmental attitudes and behaviour. These theories explain why individuals hold different attitudes to the environment and why there are differences in their behaviour. Detailed discussions of the respective theories are provided in the subsequent sub-sections. The first sub-section describes a theory called the “Environmental Paradigm”, the second elaborates on the Post-Materialist Theory, the third discusses the Cultural Theory and the fourth is an explanation of socio-demographic factors.

2.2.1 Environmental Paradigm Theory

The Environmental Paradigm, pioneered by Dunlap and Van Liere (1978), proposes that there is a growing public consciousness of and concern about the environment, a growing awareness of the destruction to the environment through economic growth, criticism of scientific and technological progress, and an assertion as to the fragility of nature (Kelly *et al.*, 2003).

Kelly *et al.* (2003) further state that environmental consciousness (awareness) links beliefs about a wide range of subjects including the relationship between humanity and nature, the importance of economic growth, and the value of technology: Human needs and values should no longer be of greater concern than the requirements of and demands made by Nature.

This paradigm proposes that less emphasis should be placed on economic growth, and a more sceptical attitude should be adopted towards science and technology. Emphasis is placed on the realisation that many of the resources available on the planet are limited and that people's expectations ought to adjust to reflect this reality. The expectation is raised that those who regard Nature as fragile, limited and in need of our care and attention will be more likely to have attitudes and behaviours that are more pro-environmental than those held by their counterparts (Kelly *et al.*, 2003).

2.2.2 Post Materialist Theory

Inglehart's 1977 Post Materialist Theory posits that the way individuals give priority to different sets of values reflects their socio-economic milieu and suggests that improvements in this socio-economic environment result in a shift in focus from

issues of physical sustenance to concerns related to quality of life. Thus, greater emphasis is placed on individual self-expression, greater participation in decision-making, freedom and quality of life (including caring for the environment). The Post Materialist Theory places caring for the environment as a higher-order need in terms of Maslow's Hierarchy of Needs. According to the Post-Materialist Theory, people in industrialised countries can be expected to care more about the environment than their counterparts in the developing world. However, contrary to Inglehart's initial claim, a number of studies reveal that citizens in both developed and developing countries exhibit a high level of concern for the environment (Goksen *et al.*, 2001).

2.2.3 Cultural Theory

The Cultural Theory, also known as the Grid Group Theory, is about social relations and cultural preferences. According to Kelly *et al.* (2003), the central aspects of this theory are the grid dimension and the group dimension of social relations. The Grid Dimension Theory focuses on individual behaviour and the extent to which rules and regulations are accepted, and is sometimes referred to as the 'legitimate aspect of external prescription'. The Group Dimension Theory of Social Relations explores the extent of the sense of responsibility and commitment that individuals have to units greater than themselves, and the extent to which they are incorporated into such units (Kelly *et al.*, 2003).

This theory claims that culture, defined as shared values and beliefs, is always closely related to a particular pattern of social relations. This means that a particular culture always corresponds with a particular pattern of social relations and that these cannot be combined in any other way. According to Coughlin and Lockhard (1998),

cultural theory also claims that there are only four ways in which culture and social relations can be combined in an individual's life, namely in terms of fatalism, hierarchy, individualism and egalitarianism. According to Coughlin and Lockhard (1998), these four ways can be measured in two dimensions, namely the legitimacy of external prescription (grid) and the strength of the affiliation with others (group). This explains how distinctive preferences for social relations are a consequence of various grid and group positions (Schwarz and Thompson, 1990).

2.2.4 Socio-demographic factors

According to Hollingshead (1975), social status is a multi-dimensional concept; it is premised upon three basic assumptions where a differentiated, unequal status structure exists in our society. The primary factors indicative of status are the occupation of an individual, the number of school years completed and other salient factors such as gender and marital status (Hollingshead, 1975). These factors may be combined so that a researcher can quickly and meaningfully estimate the status position that individuals occupy in our society. Socio-demographic factors, also known as 'position factors' (Olofsson and Ohman, 2006), have been identified in literature as factors influencing concern for the environment. Literature identifies race, gender, age, education, place of residence (urban/rural) and political affiliation as factors that influence an individual's concern for the environment. This study employs the socio-demographic and economic factors approach by exploring how gender, race and monthly expenditure influence the concern of households in the study area for the environment. Gender and race remain constant throughout the course of the life cycle of individuals, but these factors play an important part in the roles individuals play in the functioning of society.

2.3 Environmental awareness and its importance

There is no widely accepted definition of concern for the environment in the literature on this subject and there are in fact a number of interpretations of the concept. Although scholars and researchers have focused much of their attention over the past forty years on defining concern for the environment, the way in which the term, *environmental concern*, has been conceptualised and used, as well as its determinants, is still subject to a lively debate (Goksen *et al.*, 2001).

According to Takacs-Sanata (2007), two main approaches to environmental concern can be distinguished, namely, the policy and the theoretical approach. In accordance with the above-mentioned author's approach, this study adopts the theoretical approach definition of environmental concern, considering it to be an attitude towards the environment. According to the theoretical approach, attitudes consist of cognitive, affective and conative dimensions (Takacs-Sanata, 2007).

Cognitive dimensions are based on the beliefs and norms of people. Our level of awareness about a perceived problem does not necessarily mean that we are concerned about it (Takacs-Sanata, 2007). The essence of this theory can be drawn from a study conducted by Brinckerstaff and Walker (2001) which shows that a weak correlation can be observed between the perceived level of risk and the level of anxiety. This relationship is important because, in spite of the presence of a strong cognitive attitude, the weakness of the effective component is very likely to also weaken the predisposition to concomitant behaviour and thus the realisation of the behaviour itself (Takacs-Sanata, 2007).

The *affective dimension* involves an emotional and an evaluative element. According to Caine and Caine (1991), what we know or learn about is influenced and organised by our emotions and mind sets based on our expectations, personal biases and prejudices, our level of self-esteem, and our need for social interaction. It is further stated in Caine and Caine (1991) that if people feel good about themselves, they are willing to focus their attention on learning about environmental issues. It is difficult to distinguish between cognitive and affective elements.

The *conative dimension* relates to knowledge that is acquired or provided on an intuitive basis in order to assist in fulfilling a personal need (Caine and Caine, 1991). In order to have a predisposition to a particular type of behaviour, a positive correlation can be assumed to exist between affective and conative attitude and is likely to be stronger than that which exists between affective and cognitive attitudes (Takacs-Sanata, 2007). However, the reason for pro-environmental behaviour and the predisposition to it can be independent of an attitude of concern for the environment.

In many empirical studies, the meaning of environmental concern (consciousness or awareness) has been almost identical to the concept, *environmental attitude*. A high level of environmental concern is likely to be an important prerequisite for enduring pro-environmental behaviour, and thus a long-lasting decline in the ravages of negative impacts upon the environment. For the purposes of empirical research, environmental concern can be broken down into components of knowledge, attitudes, behavioural intentions and action (Karjalainen, 2006).

2.3.1 Components of environmental awareness

According to Zsoka (2006), the concept of environmental awareness has a multi-dimensional construct and includes the five components discussed below. These components are environmental knowledge, environmental values, environmental attitudes, willingness to act and actual behaviour respectively. The interrelations of these five factors shape and reflect an individual's awareness of the environment.

2.3.1.1 Environmental knowledge

Environmental knowledge can be defined as knowledge of facts, concepts and relationships concerning the natural environment and its major ecosystems. The importance of environmental knowledge lies in the fact that knowledge, in general, plays a determining role in shaping an individual's thinking, attitudes and values and indirectly, their behaviour (Zsoka, 2006).

Past research, for example, has shown that environmental awareness programmes are important in enhancing people's knowledge of the environment. The major role of environmental education programmes is to develop people's (households') internal locus of control and to allow them to acquire a strong awareness of the environment so that their attitudes to the environment, and ultimately their behaviour in respect of the environment, will be mindful of the environment (Zsoka, 2006). However, Barr (2007) reveals that an individual's knowledge and experience with respect to the environment differ significantly for a given behaviour.

A Korean study by Yang-hee and Yi-sun (1993) showed that participation in environmental education and pro-environment events is a positive means to raising people's level of awareness and understanding regarding the environment, and of

inciting people to act in environmentally-conscientious ways. The same study found that environmental education is more effective when disseminated through television programmes and newspaper articles. What also came to light in this study was that the effects of mass-communication, in providing the momentum for practising environmental behaviour, are stronger in women than in men; also, women appear to be more sensitive than men to anxiety-inducing information.

2.3.1.2 Environmental values

Environmental values are part of our value system. Values are defined as durable concepts or convictions which relate to the desired behaviour, unfold in various situations, facilitate orientation when influencing the evaluation of events and are organised in an order of relative importance. A value is also a multi-dimensional construct which comprises of cognitive (conscious), affective (emotional) and conative (behaviour tendency) components. Values, therefore, bear resemblance to attitudes (Zsoka, 2006). Research on environmental values, attitudes and concerns reveal that three continua emerge on which such values can be placed (Ying *et al.*, 2007 and Barr, 2007). Stern *et al.* (1993) reveal that social values play an important role in influencing individual waste-management behaviour.

The major difference between values and attitudes is that values are of an abstract nature and there are fewer of them than there are attitudes, which are related to concrete situations/objects and are actually based on values. Further characteristics of values are that they are not necessarily rational; we learn and assimilate them in the process of socialisation and in their interrelations, they constitute a system of values which is not necessarily harmonious (Zsoka, 2006).

The manifestation of ecological values frequently leads to value conflicts at individual and organisational levels, as well as between individuals and the organisation. In resolving this conflict, learned rules and the practice of prioritising ecological values in the value hierarchy play important roles. Measuring values is quite difficult because they cannot be observed directly; people are often not clear about their values or do not want to reveal them. Therefore, researchers often try to characterise values by observing the attitudes and behaviour motivated by such values and drawing conclusions from the results (Zsoka, 2006).

2.3.1.3 Environmental attitudes

Environmental attitudes also occupy a key position in the awareness-raising process. Such an attitude is recognised as an indicator and component of environmentalism. Environmental attitudes are generally accepted as responses from respondents to given environmental circumstances. An attitude toward any given object, idea, or person is an enduring orientation with cognitive, affective, and behavioural components. According to Asunta (2003), not all three elements need to be present in either the input or the output. The cognitive component consists of all the cognitions (or attitudes) the person has about that particular object - the facts, knowledge and beliefs concerning the object. The affective component consists of all the person's emotions toward the object, especially their evaluations (Zsoka, 2006). The behavioural component consists of the person's readiness to respond, or tendency to act, regarding the object. Obviously, this widely-accepted definition of attitudes (just like values) incorporates three components of environmental awareness. The above-mentioned components of attitude influence behaviour in different ways and intensities. The cognitive component (actually the knowledge) can

be changed quite rapidly once new facts become evident. The relatively simple affective component seems to be the major determinant of behaviour (Zsoka, 2006). However, the behavioural component is not always consistent with the affective and cognitive components, and applies only under certain conditions. On the other hand, attitude-discrepant behaviour influences the relevant attitude as well and may evoke its change. This phenomenon has important consequences for the activity of individuals with respect to the environment. Individual attitudes toward the protection of the environment as evaluated in the questionnaire often prove to be positive, while concrete environmental measures do not reflect these attitudes (Zsoka, 2006). Furthermore, polluting behaviour, if not penalised, can easily lead to negative or at least neutral attitudes. For the sake of clarity in this explanation, knowledge can be regarded as a condition and willingness to act as a reflection and result of an attitude. Actual behaviour can only be derived from an attitude if all influencing factors and conditions are favourable (Zsoka, 2006).

2.3.1.4 Revealed willingness to act

Revealed willingness to act in an environmentally-oriented way refers to a verbal commitment and can be considered as a consequence (often explained in the literature as a component) of values and attitudes, and as a step forward to actual behaviour (Zsoka, 2006).

2.3.1.5 Actual behaviour

Willingness to act does not necessarily mean that the behaviour will be consistent. There are certain obstacles preventing knowledge, revealed attitudes and values or revealed willingness to act from being reflected in the actual behaviour, or from being

reflected in a manner that differs from expectations. Therefore, it is advisable to monitor actual behaviour as an explicit indicator for success and stability in the awareness-shaping process, as well as in the interrelations between and the internal consistency of the awareness components (Zsoka, 2006).

2.4 Factors affecting environmental awareness

There are various factors that affect an individual's awareness of the environment. However, there is limited consensus among scholars about the reasons for the differences and similarities among population groups in their attitudes and behaviour regarding their concern for the environment. In literature, variables such as race, ethnicity, age, gender, level of income and background experiences are the most often mentioned (Taylor, 2002; McMillan *et al.*, 1997).

Positive experiences in natural areas, role models, level of education, exposure to issues in the media, and, on the other hand, negative experiences relating to environmental degradation and malpractices also tend to affect attitudes to the environment. Some studies indicate that relatively stronger pro-environmental attitudes are held by individuals who are younger, politically liberal and more educated than is the case with their counterparts (McMillan *et al.*, 1997). This study considers three variables (race, gender and household monthly expenditure) to determine how they affect the attitudes, environmental awareness and behaviour of households with respect to the environment.

2.4.1 Level of income and environmentalism

Level of income is cited in literature as an important factor that influences people's (households') attitudes of concern for the environment. Research has found that people with a higher level of income are more environmentally aware than are their counterparts (Arcury and Christianson, 1990). For example, owing to economic circumstances, low-income earners (households) tend to use resources uncontrollably, thus degrading the environment (Sudarmadi *et al.*, 2001). According to Harrera (1992), people with higher income levels are more accustomed to living in healthy environments. Hence, their beliefs support environmental conservation.

2.4.2 Level of education and environmentalism

Research has consistently shown that there is a correlation between higher levels of education and concern for the environment (Soni and Wehr, 2004). It is important, however, to make a distinction between education and environmental knowledge; being highly educated need not necessarily imply a comprehensive and in-depth knowledge of the environment. However, environmental knowledge and education are closely associated with each other. An understanding of modern environmental issues requires a high level of knowledge about the environment, and the likelihood that a person would be highly knowledgeable correlates with a high level of education (Soni and Wehr, 2004).

Although the effect of knowledge is not conclusive, several studies have suggested that knowledge plays an important role in enhancing the environmental attitude and behavioural relationship by providing individuals with the ability to better formulate alternative views and present arguments to support their beliefs and behaviour

(McFarlane and Boxall, 2003). A study about waste management in China, for example, found that knowledge about waste correlates with waste management behaviour (Ying *et al.*, 2007). A study by Gonzalez and Da Silveira (1997) about people's attitudes towards global environmental issues in Uruguay found that people who have been less exposed to formal education are also the least informed about environmental issues.

2.4.3 Race and environmentalism

Studies of racial differences with regard to attitudes to and concern for the environment have produced conflicting results (Kalof *et al.*, 2002). Early studies of Black/White differences in concern for the environment and related constructs have often found race to be a significant predictor of attitudes towards environmental issues. However, these studies have been inconclusive. In cases where a relationship has been found, especially in the United States of America (USA) and the developed world, the indication has generally been that concern for the environment is a higher priority among Whites than amongst other ethnic groups (Kalof *et al.*, 2002).

Two explanations are offered on the basis of race for differences in attitudes to and concern for the environment in the USA. It is speculated that because of the subordinate position of Afro-Americans in society, they feel helpless in their quests to alter environmental policies and regulations. The variations in socio-economic status that generally exist between Afro-Americans and Whites could also provide an explanation for the difference in environmental attitudes held by these two groups (McMillan *et al.*, 1997). According to McMillan *et al.* (1997), Whites generally attain

higher educational and income levels than Afro-Americans, and research has demonstrated that human capital (mainly level of education) variables are related to attitudes towards and concern for the environment.

However, the most recent studies have documented that Blacks and Whites are similar in their concern for particular environmental issues (e.g. air pollution, deforestation, etc.), while other studies have shown the opposite (e.g. Mohai and Bryant, 1998). Studies have shown differences in perceptions regarding an attitude of concern for the environment based on race. Research on the racial and ethnic aspects impacting upon concern for the environment generally reveals less variation across racial lines (White and Hunter, 2005).

Some studies have suggested that people who participate in outdoor recreational activities tend to express concern regarding natural conditions. Furthermore, these studies conclude that since Blacks have low levels of participation in traditional nature-based outdoor recreational activities; they are less environmentally aware and less likely to show concern for the environment than Whites. However, a counter argument to this view, posits that Blacks have limited resources for such activities as a result of their past and present economic circumstances (White and Hunter, 2005).

More recent research refutes the notion that Blacks may be less environmentally aware and sensitive than Whites. Some researchers even suggest that Blacks may show an equal concern for the environment as is the case with Whites. Therefore, conclusions about race and environmental awareness depend largely on the variable used to measure concern for the environment (White and Hunter, 2005).

Taylor (2002) examines the environmental experiences of middle- and working-class Whites and people of colour (Blacks) in the United States during the 19th and 20th

centuries. The study examines people's activism and how their environmental experiences influence the kinds of discourse they develop. The paper posits that race, class, and gender have profound effects on people's environmental experiences, and consequently on their environmental discourses and activism. The historical data used in Taylor (2002) show that while some middle-class Whites fled the cities and their urban ills to focus attention on outdoor exploration, wilderness and wildlife issues, some of their social contemporaries remained in the cities to develop urban parks and help improve urban environmental conditions. Although there were conflicts between White middle- and working-class activists over the use of open space, the White working class collaborated with White middle-class urban environmental activists to improve public health and worker health and safety. It is also mentioned in the study that Blacks developed activist agendas and environmental discourses that linked racism and oppression to worker health and safety issues, limited access to resources, loss of or denial of land ownership, and infringements on human rights.

2.4.4 Gender and environmentalism

Studies have generally found that women are significantly more concerned about the environment than men (e.g. Sia Su, 2008). In studies where a questionnaire included items and indicators that trigger risk perceptions in respondents, women were found to be more concerned about the environment than men (Sia Su, 2008). This can be explained in terms of women's perception of the association between health and personal well-being and environmental issues.

Thus gender differences concerning attitudes and concern for the environment are due to women's heightened perception of humankind's vulnerability to risk. Yang-hee and Yi-sun (1993) found that gender differences in environmental awareness are conditioned by the different responsibilities held by women and men respectively. The study by these authors on environmental attitudes and behaviours in Korea found that the relationship that women hold with the environment is conditioned by their responsibility for their family's health, drinking water, and waste management, whereas men are more apt to experience direct contact with smog and noise pollution. It is therefore possible that the natural caretaker role of some women influences their level of concern for the environment either directly or indirectly, through experimental behaviour. Furthermore, the study found no significant differences between men and women with respect to their environmental behaviour. However, women tended to show greater concern for the environment than men (Yang-hee and Yi-sun, 1993).

Other studies on the other hand have shown the opposite of what was observed by Yang-hee and Yi-sun (1993). A study by Arcury (2000) found that female respondents were less concerned about the environment than were their male counterparts. On the other hand, a study in Tehran, Iran, by Kalantari *et al.* (2007) found no difference in environmental attitudes between males and females.

McDonald and Hara (1994) reviewed several theories on gender differences in attitudes and concern for the environment, and then, using a sample of college students drawn from the Midwestern University (USA), tested the hypothesis that females express more concern for the environment than males. The data from the study were obtained from telephonic interviews conducted on a sample of 539 students and a factor analysis approach was applied. Contrary to the initial

hypothesis, results from the regression analysis suggested that male students were more concerned about the environment than were their female counterparts. The authors also concluded that gender is a weak predictor for estimating the level of concern for the environment. Furthermore, they stated that a possible explanation for their findings could have something to do with the political awareness argument, which postulates that women have only been able to participate marginally in the political arena and have therefore become marginally concerned with environmental issues.

2.4.5 Age and environmentalism

Studies (especially in industrialised countries) have generally found that younger people are more concerned about the environment than older people. Younger people are believed to be less integrated into society and are, therefore, more readily able to criticise industrial and governmental policies. This reasoning leads to the conclusion that their attitudes tend to become less sensitive to environmental issues as people age and become more established socially (McMillan *et al.*, 1997).

However, in South Africa, studies have shown the opposite. Studies conducted by Reynolds and Walberg (1992) reveal that adults seem to be more concerned about the environment than young people. This finding appears to be influenced by the fact that South African adults are more knowledgeable about the environment. Shen and Shaijo's study (2007) also found that older people in Shanghai, China, are more concerned about the environment than their younger counterparts.

2.4.6 Place of residence and environmentalism

Attitude to the environment is often correlated with another variable, namely place of residence, that is in an urban or a rural area. Several studies have concluded that residence in an urban area is generally associated with greater awareness of the environment. A possible explanation for this conclusion is that urban residents are more exposed to symptoms of environmental degradation such as air pollution. This study attempts to analyse sensitivity towards the environment in an urban setting and therefore concludes that households in the Johannesburg Metropolitan Area are expected to be more environmentally aware. As discussed in subsections 2.4.1 and 2.4.2 above, this could further be supported by the fact that on average urban residents have higher income and educational levels.

According to McMillan *et al.* (1997), an alternative explanation postulates that rural residents often depend on the land for economic purposes, such as agriculture and extractive industries, and so do not value Nature for the aesthetic, intrinsic qualities esteemed by adherents of the Environmental Paradigm. This explanation is somewhat contradictory; since one could hypothesise that rural residents, dependent on the land for their livelihood, would want to protect their source of survival from possible contamination (McMillan *et al.*, 1997). Thus, the relationship between rural residence and awareness of the environment has proved to be somewhat problematical.

2.5 An overview of literature on environmental awareness

This section presents a review of studies on environmental awareness. Special emphasis is placed on the methods used and the results obtained from such studies.

The study by Preston *et al.* (2000) deals with environmental awareness but from a slightly different perspective. The study assesses influencing factors such as the level of urbanisation of the community, income, racial and ethnic composition, the level of education with respect to environmental awareness and exposure to potential hazards among female-headed families in Mississippi, USA. A total of 763 low-income female heads of households were interviewed during the survey to determine the extent of their knowledge pertaining to environmental issues and the nature of their daily behaviour with respect to the environment that could affect the health of their families. In addition, a qualitative assessment was conducted of the environmental quality within the communities of the respondents. Subsequently, data on population size, racial and ethnic composition, and socio-economic indicators were collected to test the association between these factors and the responses of survey participants with respect to the quality of their immediate environment. The authors found that there were significant associations between both education and race and ethnicity and the responses of the participants in the survey with regard to environmental awareness and concern for the environment. They also found that education was more commonly and positively associated with indicators of heightened environmental awareness.

Abdul-Wahab (2007) investigated the Omani community's level of knowledge about basic, local and international environmental issues in order to determine the environmental attitudes and behaviour of the members towards their environment. He used a survey technique based on an administered questionnaire designed to assess the environmental awareness of the residents from three different perspectives: their environmental knowledge, environmental attitudes and environmental behaviour. A total of 425 respondents were interviewed during the

survey. The findings of the survey indicated that the community was generally lacking in its basic knowledge of the environment, whereas its members were better informed in terms of their local and international environment. In contrast, the study found that the community had a heightened awareness of the environment which was reflected in their more sensitive behaviour towards the environment, but also noted that the community achieved a higher score for their environmental attitudes rather than for their environmental behaviour.

Anderson *et al.* (2006) used data from the South African General Household Survey of 2004 to investigate the similarities and differences between Black and non-Black households with respect to their perceptions, awareness of environmental conditions and behaviour related to water and sanitation and that are associated with place of residence, specific living conditions, level of education and related factors. The study concluded that although there were similarities in perceptions and behaviour between Black and non-Black households, important differences do exist between these households in terms of these matters. The authors concluded that these differences are due to racial differences and the historically poor economic conditions to which the Black households were previously subjected.

Goksen *et al.* (2001) explored the impact of geographical proximity on problems relating to an attitude of concern for the environment and a willingness to pay for improvements in the environment, with emphasis on the relevance of Inglehart's post-materialist thesis on this matter. The study employed a questionnaire method for administering to 1 565 respondents in Istanbul. Sea pollution in Istanbul (local issue), soil erosion in Turkey (national issue), and ozone depletion (global issue)

were issues chosen for evaluation. The sample was differentiated into three subsamples, each being presented with only one issue chosen from each of those mentioned above. This study reveals that individuals distinguish between local and global environmental concerns. People with materialistic values rather than post-materialist values reveal greater concern for local environmental problems. The study conducted by Goksen *et al.* (2001) also found that making distinctions on the basis of showing concern for environmental issues [which are differentiated on the basis of geographical proximity] has relevance for the ongoing post-materialist values debate.

Hunter (2000) conducted a study comparing environmental attitudes, concern for the environment and environmental behaviour among individuals living at that time under circumstances generating environmental awareness. The data used to examine variations in environmental awareness across the study area involved both native- and foreign-born individuals and were derived from the 1993 environmental module of the General Social Survey. The findings indicated that immigrants living in the U.S.A did, indeed, express similar attitudes toward environmental issues as opposed to the native-born residents. However, shorter-term immigrants expressed significantly higher levels of concern with regard to environmental problems as opposed to the native-born residents. Furthermore, shorter-term immigrants were more likely to engage in "environmentally-friendly" behaviour as opposed to the native-born residents, although they appear less likely to have signed an environmentally-oriented petition.

Schahn and Holzer (1990) conducted a study which dealt with the analysis of individual attitudes of concern for the environment to assess the relationships of knowledge relevant to the environment, attitudes and behaviour towards the

environment, as well as gender differences in terms of concern for the environment and the role of "background variables" in the prediction of (self-reported) behaviour. The results of this study, conducted in Germany, where data relating to a sample of 167 German adults were collected, indicated that for 62 respondents, knowledge and gender tended to temper the relationship between attitudes and behaviour. For the second sample of 105 people active in conservation groups, however, these moderating effects were not as clear. In both samples, women showed greater concern for the environment in those spheres currently relevant to household behaviour, whereas men tended to know more about environmental problems.

Barr (2007) undertook a study which examined the use of a conceptual framework developed by the author on the three waste-management behaviours (waste reduction, re-use, and recycling). It was posited that environmental values, situational characteristics, and psychological factors all play a significant role in predicting waste-management behaviour within the context of a core intention-behaviour relationship. This framework was tested in a self-report questionnaire directed at 673 residents of Exeter in the United Kingdom (U.K). The study revealed that the predictors of reduction, re-use, and recycling behaviour differed significantly, with reduction and re-use being predicted in cases where there were underlying environmental values and knowledge, and variables based on attitudes of concern with respect to the environment. On the other hand, recycling behaviour was found to be regarded as highly normative behaviour.

In Mohai (1994), the gender gap between concern for the environment and activism was investigated with the results contributing to the limited volume of literature available on the association between gender differences and concern for and activism in respect of the environment. The study provided additional evidence from

national survey data, indicating that women tend to express greater concern for the environment than men do before and after multi-variate controls for age, education, labour force/homemaker status, and other variables are applied. However, the magnitude of the differences did not prove to be significant. The data used by Mohai (1994) also indicated that gender differences with respect to environmental activism provided an ironic contrast. Even though women indicated somewhat greater concern, rates of environmental activism for women were substantially lower than those for men. Furthermore, these differences were greater than differences in rates of general political participation and persisted in spite of multi-variate controls for socio-economic status, homemaker status, and other variables.

In general, the results of this study provide evidence of both the globalisation of environmental concern and the possibilities of influence brought about by the cultural context.



2.6 Summary

As its objective, this chapter set out to discuss the theories underpinning concern for the environment and went on to review past studies on this subject. Most studies apply the situational factor or the demographic variables approach in analysing an attitude of concern for the environment. The literature review shows that there appears to be no consensus on how the various demographic factors impact upon attitudes of concern for the environment. The differences in the results and the conclusions drawn in these studies can be explained in terms of the different methods and samples that were employed by the various researchers. Hence, there

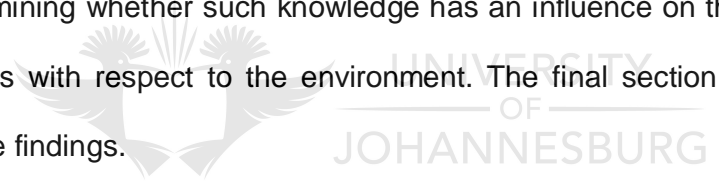
are contradictory results on how gender and race affect an attitude of concern for the environment. Albeit this difference, there is strong evidence that place of residence, level of education and income influence attitudes of concern for the environment. The general consensus is that residents living in an urban context, higher levels of education and higher incomes lead to a heightened awareness and sensitivity to the environment.

The following three chapters attempt to address the results of the research conducted for the purposes of this case study. Chapter 3 looks at the influence of gender. Chapter 4 establishes whether race has an influence on an attitude of concern for the environment. Lastly, Chapter 5 determines whether monthly expenditure has an impact on the perception of respondents with regard to problems and issues pertaining to their environment. In all three of the chapters, the awareness of the respondents with regard to recycling programmes in their communities, as well as their involvement in collecting waste for recycling, is analysed.

CHAPTER 3: THE INFLUENCE OF GENDER ON ENVIRONMENTAL PERCEPTION

3.1 Introduction

This chapter discusses the influence of gender on environmental issues, awareness of community recycling programmes and behaviour relating to the collection of waste for recycling within the Johannesburg Metropolitan Area. Section 3.2 investigates the perceptions held by respondents on various environmental aspects such as waste, water pollution, air pollution, land degradation and excessive noise pollution. A discussion as to whether respondents are aware of a community recycling programme in their area is presented in section 3.3. Section 3.4. follows with the focus on determining whether such knowledge has an influence on the behaviour of the respondents with respect to the environment. The final section of the chapter summarises the findings.



3.2 The effect of gender on the perception of environmental problems

For the purposes of this case study, conducted within the Johannesburg Metropolitan Area, the General Household Survey (GHS) of 2006 questionnaire was distributed amongst 873 households. Of the respondents who participated in the study, the majority of household heads were male (68.4%) as against those who were female (31.6%). According to the Sustainable Cities Programme (2000), the involvement of females in the study tends to impact upon social factors such as low literacy rates and a subordinate attitude, thus limiting the input of females in formal

household administrative arrangements. Other factors relevant to the involvement of females in the study include their low or non-existent incomes, cultural barriers, limited time and lack of interest. A larger number of males participated in the study than did females. Thus it was the low level of involvement of females in the survey that made a direct comparison in this chapter difficult.

Table 3.1: Gender of respondents

Gender	Frequency	Percentage (%)
Male	597	68.4
Female	276	31.6
Total	873	100

The following sub-sections present a discussion of the effects of gender on the different environmental aspects perceived by the respondents as environmental problems. The aspects under discussion include waste, water pollution, air pollution, land degradation and excessive noise.

3.2.1 The effect of gender on perceptions of waste

In this survey, only 34.4 percent of the respondents perceived waste as an environmental problem, while the remaining 65.6 percent did not identify this variable (See Table 3.2) as a problem. Table 3.2 shows that 71.2 percent of the male respondents were concerned about the environment, pinpointing waste as an environmental problem, while only 33.1 percent females downgraded the significance of this variable to one that posed no problem at all. This finding indicates

that males within the Johannesburg Metropolitan Area are more adversely affected by waste than are the female respondents. A possible reason for this could be that the majority of the respondents were from impoverished Black communities. In the informal settlements, where the majority of Blacks live, there are relatively few or no waste removal services at all. In this chapter the Chi-square test was applied to ascertain whether there is significant difference between gender and environmental awareness. The null hypothesis is that there is no difference between males and female in terms of perception on environmental problem.

Table 3.2: The effect of gender on perceptions of waste

Gender	Environmental problem	Not an environmental problem	Total
Male	213 (71.2 %)*	382 (66.9 %)*	595 (68.4 %)*
Female	86 (28.8 %)*	189 (33.1 %)*	275 (31.6 %)*
Total	299 (34.4 %)	571 (65.6 %)	870 (100.0 %)

*Column percentage only

The Chi-square test carried out came up with a value of 1.708 for the two variables. On a 0.05 significance level and one degree of freedom, the null hypothesis have to be accepted because the value is lower than 3.84. This value indicates that gender does indeed influence the perception of the respondents as to whether waste is an environmental problem.

3.2.2 The effect of gender on perceptions of water pollution

Table 3.3 shows that 20 percent of the total number of respondents in the survey perceived water pollution as an environmental problem compared to the 80 percent who did not. However, if the number of respondents who perceived this variable as a problem is examined more closely, it is clear that slightly more males (71.8%) regarded water pollution as an environmental problem as against the 67.5 percent who did not. It is thought-provoking that only 28.2 percent of the females indicated that water pollution posed a problem to them as against the 32.5 percent who had a different perception. A possible reason for females perceiving water pollution to be a problem can be associated with their responsibility of ensuring that the household has water for general use and consumption. Therefore, this finding is not a good representation of the actual situation. Consequently, the deduction that can be made for this subsection is that the results could possibly have been influenced by the number of male respondents who participated in the study.

Table 3.3: The effect of gender on perceptions of water pollution

Gender	Environmental problem	Not an environmental problem	Total
Male	125 (71.8%)*	470 (67.5%)*	595 (68.4%)*
Female	49 (28.2%)*	226 (32.5%)*	275 (31.6%)*
Total	174 (20%)	696 (80%)	870 (100.0%)

*Column percentage only

The Chi-square test came up with a value of 1.196 for the two variables. The null hypothesis have to be accepted because the value is lower than 3.84. On a 0.05 significance level, this value points to the fact that gender does influence the perception of the respondents as to whether water pollution is an environmental problem.

3.2.3 The effect of gender on perceptions of air pollution

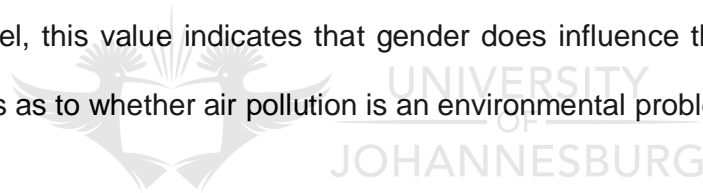
Only 26.3 percent of the respondents perceived air pollution as a problem. However, when the number of respondents who regarded this variable as a problem was analysed more closely, it became clear that slightly more males (69.9%) viewed air pollution as an environmental problem as against the 67.9 percent who did not. In addition to this, only 30.1 percent of the females regarded air pollution as a problem as against the 32.1 percent who had a different perception. The possibility that the majority of the respondents in the case study live in townships, where coal is extensively used on open fires or traditional stoves for either cooking or heating purposes, could therefore have added to their knowledge, enabling them to differentiate between clean air and the smoky polluted air that generally has a negative impact on their daily lives.

Table 3.4: The effect of gender on perceptions of air pollution

Gender	Environmental problem	Not an environmental problem	Total
Male	160 (69.9%)*	435 (67.9%)*	595 (68.4%)*
Female	69 (30.1%)*	206 (32.1%)*	275 (31.6%)*
Total	229 (26.3%)	641 (73.7%)	870 (100.0%)

* Column percentage only

The Chi-square test came up with a value of 0.314 for these two variables. The null hypothesis have to be accepted because the value is lower than 3.84. On a 0.05 significance level, this value indicates that gender does influence the perception of the respondents as to whether air pollution is an environmental problem.



3.2.4 The effect of gender on perceptions of land degradation

Land degradation was classified as a problem by only 8.8 percent of the respondents. But if the number of respondents who regarded this variable as a problem is examined more closely, it is clear that slightly more males (69.7%) perceived land degradation as an environmental problem as against the 68.2 percent who did not. Furthermore, only 30.3 percent of the females indicated that land degradation is a problem as against the 31.8 percent who had a different perception. The Johannesburg Metropolitan Area has an urban setting which is characterised by dense settlement. Both suburban and township residents are probably less

knowledgeable and aware when it comes to defining land degradation which limits their understanding and ability to identify the quality of the land.

Table 3.5: The effects of gender on perceptions of land degradation

Gender	Environmental problem	Not an environmental problem	Total
Male	53 (69.7%)*	540 (68.2%)*	593 (68.3%)*
Female	23 (30.3%)*	252 (31.8%)*	275 (31.7%)*
Total	76 (8.8%)	792 (91.2%)	868 (100.0%)

* Column percentage only



The Chi-square test came up with a value of 0.077 for these two variables. The null hypothesis have to be accepted because the value is lower than 3.84 on a 0.05 significance level. This value indicates that gender does influence the perception of the respondents as to whether land degradation is an environmental problem.

3.2.5 The effect of gender on perceptions of excessive noise

In the survey, only 27.1 percent of the respondents perceived excessive noise as a problem. Closer examination of the number of respondents who regarded this variable as a problem made it clear that slightly more males (72.5%) saw excessive noise as an environmental problem as against the 66.9 percent who did not. Only 27.5 percent of the female respondents indicated that excessive noise posed a

problem to them as opposed to the 33.1 percent who had the opposite perception. A possible reason for such findings is that the respondents in townships and informal settlements are extensively exposed to high noise levels caused by traffic, as well as their living arrangements, where houses are close to one another.

Table 3.6: The effect of gender on perceptions of excessive noise

Gender	Environmental problem	Not an environmental problem	Total
Male	171 (72.5%)*	424 (66.9%)*	595 (68.4%)*
Female	65 (27.5%)*	210 (33.1%)*	275 (31.6%)*
Total	236 (27.1%)	634 (72.9%)	870 (100.0%)

* Column percentage only

The Chi-square test came up with a value of 2.478 for these two variables. The null hypothesis have to be accepted because the value is lower than 3.84 on a 0.05 significance level. This value indicates that gender does influence the perception of the respondents as to whether excessive noise is an environmental problem.

3.3 The effect of gender on the awareness of community recycling programmes

This section examines the awareness of the respondents in respect of recycling programmes in their communities within the Johannesburg Metropolitan Area. Only

11 percent of the respondents who took part in the study are aware of school recycling programmes. But if the number of respondents who indicated that they are not aware of recycling programmes is scrutinised more closely, it is clear that slightly more males (62.5%) are aware of recycling programmes within their communities as against the 69 percent who are not. Contrary to this, only 37.5 percent of the females indicated that they are aware of recycling programmes as against the 31.0 percent who have no knowledge of these programmes (see Table 3.7). The findings of this study agree with those of a study conducted by Davidson and Freudenburg (1996) which revealed that women are more concerned about recycling programmes, not only because they know less, but because they care more particularly for the health and safety of their families and the community.

Table 3.7: The effect of gender on the awareness of community recycling programmes

Gender	Aware of school recycling programmes	Not aware of school recycling programmes	Total
Male	60 (62.5%)*	534 (69.0%)*	594 (68.3%)*
Female	36 (37.5%)*	240 (31.0%)*	276 (31.7%)*
Total	96 (11.0%)	774 (89.0%)	870 (100.0%)

* Column percentage only

The Chi-square test came up with a value of 1.669 for these two variables. The null hypothesis have to be accepted because the value is lower than 3.84 on a 0.05 significance level. This value indicates that gender does influence the knowledge of the respondents with respect to school recycling programmes.

3.4 The effect of gender on recycling behaviour

This section discusses the findings concerning the differences in male and female participation in recycling programmes. Respondents who collect waste for recycling purposes constituted only 2.5 percent of the study sample. If the number of respondents who indicated that they collect waste for recycling is examined more closely, it is apparent that 72.7 percent of the males engage in recycling waste as against the 68.2 percent who do not. In addition to this, only 27.3 percent of the females indicated that they collect waste for recycling as against the 31.8 percent who do not. Closer analysis of the awareness of recycling programmes and behaviour of the respondents with respect to the environment revealed that more males engage in recycling behaviour than do those who collect waste. Contradictory results were observed when the same comparison was drawn for female respondents where it was established that the number collecting waste for recycling were fewer than those who were said to know about community recycling programmes. These findings are in contrast to those of Steel (1995), who suggests that females are significantly more likely than males to become involved in conservation practices benefiting the environment. This analysis ascertains that an individual's level of awareness, as observed in the prior section, does not necessarily translate into actual recycling behaviour.

Table 3.8: The effect of gender on recycling behaviour

Gender	Collect waste for recycling	Do not collect waste for recycling	Total
Male	16 (72.7%)*	579 (68.2%)*	595 (68.3%)*
Female	6 (27.3%)*	270 (31.8%)*	276 (31.7%)*
Total	22 (2.5%)	849 (97.5%)	871 (100.0%)

* Column percentage only

The Chi-square test came up with a value of 0.203 for these two variables. The null hypothesis has to be accepted because the value is lower than 3.84 on 0.05 significance level, this value indicates that gender does have a bearing on recycling behaviour.



3.5 Summary

The primary objective of this chapter was to assess the gender differences relating to variations in the environmental perceptions held by household respondents and their awareness of recycling programmes. The assessment of how gender influences environmental behaviour was a secondary objective. The level of response from male-headed households was double that from the female-headed households, with 597 of the respondents being male as against the 276 female respondents. A possible reason for the larger number of male respondents in the study could be on account of the fact that the majority of households are headed by males. Other factors such as the prevailing low levels of literacy and lack of interest by Black females also play a role.

This study focused on variations in terms of their concerns raised by both male and females on environmental aspects. Male respondents identified more variables as problematical as opposed to those that were reported by their female counterparts. In this study, 34.4 percent of the respondents reported waste as the most prevalent perceived environmental problem, followed by excessive noise (27.1%), air pollution (26.3%) and water pollution (20%). The area causing the least concern for the environment and therefore being the least problematical for both male and female respondents proved to be land degradation (8.8%). Based on these findings, it is possible that the majority of the respondents live in informal settlements where basic services (e.g. the provision of clean water and electricity) are not readily available. It was established in this study that more male respondents (72.3%) are aware of community recycling programmes than is the case with female respondents (27.5%). An analysis of the results pertaining to an awareness of recycling programmes and the behaviour of the respondents with respect to the environment established that more males engage in recycling behaviour than those who collect waste. On the contrary, the same analysis came up with fewer female respondents collecting waste for recycling than those who are said to know about community recycling programmes.

The next chapter seeks to establish whether race has an influence on an attitude of concern for the environment. It also evaluates the effects of the awareness (knowledge) of the respondents on community recycling initiatives and their resultant recycling behaviour.

CHAPTER 4: THE INFLUENCE OF RACE ON ENVIRONMENTAL PERCEPTION

4.1 Introduction

This chapter sets out to assess whether race influences the perceptions of a sample population of respondents in the Johannesburg Metropolitan Area with regard to the particular environmental aspects of their milieu, their level of awareness in respect of recycling and other programmes, and their involvement in waste collection and recycling in the community. The aspects under scrutiny include waste, water pollution, air pollution, land degradation and excessive noise pollution.

This assessment was made possible by determining the proportion of each racial group within the sample population to the total number of respondents in the survey and by making comparisons between the racial groups. The association between the respective racial groups and their reactions to environmental issues was determined by drawing a comparison between the respective racial groups. Furthermore, the questions as to whether race affects the level of awareness of the respondents with regard to the recycling initiatives in their community and as to whether race influences the waste collection and recycling behaviour of the respondents were determined by comparing the proportion of those who are aware of recycling programmes with the proportion of those who collect waste for recycling.

The racial profile of this study indicates that 83.7 percent of the respondents in this survey were Black households, 10.1 percent were White, 3.9 percent were Coloured and 2.3 percent were Indian/Asian respondents (See Table 4.1). An important factor to note is that the sample population selected for this study provides a realistic representation of the racial composition of South Africa where the Black population is in the majority. The relatively large number of Black respondents in the study made a direct comparison between the different racial groups impossible, however.

Table 4.1: Racial groups to which the respondents belong

Race groups	Frequency	Percentage (%)
Black	731	83.7
White	88	10.1
Coloured	34	3.9
Indian/ Asian	20	2.3
Total	873	100

4.1.1 The effect of race on perceptions of waste

Table 4.2 shows that 34.4 percent of the total number of respondents participating in the survey perceived waste removal as an environmental problem whereas 65.6 percent of the total number of respondents did not; 37.6 percent of the Black respondents considered and reported waste as a problem as opposed to 21.1 percent of the Indian/Asian respondents, 18.2 percent of the Coloureds and 16.1 percent of the Whites. Of the total number of respondents who did not regard this environmental variable as a cause for concern, 83.9 percent of the Whites, 81.8

percent of the Coloureds, 78.9 percent of the Indians/Asians and 62.8 percent of the Blacks indicated that they were of this conviction.

This finding is in agreement with that of Anderson *et al.* (2006), who state that Black households are more likely than non-Black households to regard waste removal as a community problem. A possible explanation for this could be the historical outcomes emanating from the parallel but inequitable situations in which the Black and non-Black households co-existed in South African society during the apartheid era. In this chapter the Chi-square test was applied to ascertain whether there is significant difference between race groups and environmental awareness. The null hypothesis is that there is no difference between race groups in terms of perception on environmental problems.



Table 4.2: The effect of race on perceptions of waste removal

Race groups	Environmental Problem	Not an environmental problem	Total
Black	275 (37.6%)*	455 (62.4%)*	730 (84.0%)*
White	14 (16.1%)*	73 (83.9%)*	87 (10.0%)*
Coloured	6 (18.2%)*	27 (81.8%)*	33 (3.8%)*
Indian/ Asian	4 (21.1%)*	15 (79.8%)*	19 (2.2%)*
Total	299 (34.4%)	570 (65.6%)	869 (100%)

*Column percentage only

The Chi-square test came up with a value of 21.728 for the two variables. On a 0.05 significance level and three degrees the null hypothesis can be rejected because the Chi-square test is considerably greater than 7.82. This value confirms that race does have an influence on perceptions of waste in South Africa.

4.1.2 The effect of race on perceptions of water pollution

On being tested for their perceptions concerning water pollution, 20 percent of the total number of household respondents perceived this variable as an environmental problem compared to the 80 percent who did not. Furthermore, 22.5 percent of the Black population perceived and reported water pollution as a problem, as against 8.1 percent of the Whites, 6.1 percent of the Coloureds and 5.2 percent of the Indians/Asians. Table 4.3 also indicates that 91.9 percent of the White respondents, 93.9 percent of the Coloured respondents and 94.8 percent of the Indian/Asian respondents did not regard water pollution as a cause for concern, as opposed to the high percentage of Black household respondents (77.5%). A possible explanation for the significant negative response to this question from the Black population could be that the majority of these respondents live in areas with limited or no access to clean water as opposed to the other racial groups.

Table 4.3: The effect of race on perceptions of water pollution

Race groups	Environmental Problem	Not an environmental problem	Total
Black	164 (22.5%)*	566 (77.5%)*	730 (84.0%)*
White	7 (8.1%)*	80 (91.9%)*	87 (10.0%)*
Coloured	2 (6.1%)*	31 (93.9%)*	33 (3.8%)*
Indian/ Asian	1 (5.2%)*	18 (94.8%)*	19 (2.2%)*
Total	174 (20.0%)	695 (80.0%)	869 (100%)

*Column percentage only

The Chi-square test came up with a value of 17.116 for these two variables. On a 0.05 significance level the null hypothesis can be rejected because the Chi-square test is considerably greater than 7.82. This value indicates that race does influence perceptions of water pollution in the case study.

4.1.3 The effect of race on perceptions of air pollution

Table 4.4 indicates that 26.4 percent of the total number of respondents recognised air pollution as an environmental problem in their communities as opposed to the 73.6 percent who did not. More Black respondents (92.1%) reported air pollution as a problem compared to 11.5 percent of the White, 15.2 percent of the Coloured and 15.8 percent of the Indian/Asian respondents. The findings reveal that fewer households within the White, Coloured and Asian/Indian racial groups consider this variable to pose problems for the environment. In the study, the Black population perceived air pollution as problematical as, having no access to electricity, the

Blacks traditionally use open fires and traditional stoves and candles for heating and lighting purposes, thus releasing copious volumes of waste into the air. On the other hand, their counterparts have been privileged to have access to electricity connections, resulting in a “cleaner” environment for them.

Table 4.4: The effects of race on perceptions of air pollution

Race groups	Environmental problem	Not an environmental problem	Total
Black	211 (28.9%)*	519 (71.1%)*	730 (84.0%)*
White	10 (11.5%)*	77 (88.5%)*	87 (10.0%)*
Coloured	5 (15.2%)*	28 (84.8%)*	33 (3.8%)*
Indian/ Asian	3 (15.8 %)*	16 (84.2%)*	19 (2.2%)*
Total	229 (26.4%)	640 (73.6%)	869 (100%)

* Column percentage only

The Chi-square test came up with a value of 15.571 for the two variables. On a 0.05 significance level null hypothesis can be rejected because the Chi-square test is considerably greater than 7.82. This value indicates that race does influence the perceptions of the respondents with respect to air pollution.

4.1.4 The effect of race on perceptions of land degradation

A summary showing the results of perceptions of land degradation clearly shows that only 8.8 percent of the total number of respondents regarded this variable as a problem. Indians/Asians (15.8% of this respondent group) and Blacks (9.3% of this respondent group) were more vulnerable in that they felt themselves to be negatively affected by land degradation and therefore regarded this variable as problematical for the environment. On the other hand, only 4.6 percent of the White and 3 percent of the Coloured respondents negatively labelled land degradation as a problematical environmental variable. This study reveals that 84.2 percent of the Indian/Asian respondents were the least affected by land degradation. More Coloured respondents (97%) were of the opinion that land degradation should not be regarded as a problem, while 95.4 percent of the White respondents were of this same conviction. In this case study, it seems that Blacks and Indians are slightly more aware of land degradation than are their White and Coloured counterparts.

Table 4.5: The effect of race on perceptions of land degradation

Race groups	Environmental Problem	Not an environmental problem	Total
Black	68 (9.3%)*	660 (90.7%)*	728 (84.0%)*
White	4 (4.6%)*	83 (95.4%)*	87 (10.0%)*
Coloured	1 (3.0%)*	32 (97%)*	33 (3.8%)*
Indian/ Asian	3 (15.8%)*	16 (84.2%)*	19 (2.2%)*
Total	76 (8.8%)	791 (91.2%)	867 (100%)

* Column percentage only

The Chi-square test came up with a value of 4.720 for these two variables. On a 0.05 significance level null hypothesis can be accepted because the Chi-square test is less than 7.82. This value indicates that race does not influence perceptions of land degradation in the case study.

4.1.5 The effect of race on perceptions of excessive noise

Table 4.6 indicates that 72.8 percent of the total number of respondents did not perceive excessive noise as an environmental problem as opposed to the 27.2 percent who did. Slightly more of the Coloureds (18.2% of the respondents) than of the Whites (8.1% of the respondents) and Indians/Asians (5.3% of the respondents) consider excessive noise to be an environmental problem, but these low percentages stand in sharp contrast to the considerably larger proportion of Blacks (30.4% of the Black respondents) who regard this variable as an environmental problem. A possible reason for these findings could be that, being in the majority, the Black respondents live in areas that are close to major roads, that are always busy, or in a squatter camp setting, where the houses are close to one another.

Table 4.6: The effect of race on perceptions of excessive noise

Race groups	Environmental Problem	Not an environmental problem	Total
Black	222 (30.4%)*	508 (69.6%)*	730 (84.0%)*
White	7 (8.1%)*	80 (91.9%)*	87 (10.0%)*
Coloured	6 (18.2%)*	27 (81.8%)*	33 (3.8%)*
Indian/ Asian	1 (5.3%)*	18 (94.7%)*	19 (2.2%)*
Total	236 (27.2%)	633 (72.8%)	869 (100%)

* Column percentage only

The Chi-square test came up with a value of 25.917 for these two variables. On a 0.05 significance level null hypothesis can be rejected because the Chi-square test is considerably greater than 7.82. This value indicates that race does influence the perceptions of respondents in respect of excessive noise.

4.2 The effect of race on awareness of community recycling programmes

Analysis of the variable, awareness of respondents in respect of community recycling programmes, revealed that 14.7 percent of the total number who took part in the survey are aware of these initiatives, while 89.1 percent of the total number are not. More Coloureds (57.7% of the respondent group) are aware of the recycling programmes as opposed to 19.5 percent of the White, 10.5 percent of the

Asian/Indian and 10 percent of the Black respondents. It is evident from these figures that Black and Asian/Indian respondents are least aware of community recycling programmes as opposed to the White respondents. A possible explanation for this relatively high level of awareness by Coloured respondents could be associated with the benefits that are associated with recycling programmes (e.g. receiving payment for materials that can be recycled).

Table 4.7: The effect of race on awareness of recycling programmes

Race groups	Aware of school recycling programmes	Not aware of school recycling programmes	Total
Black	73 (10.0%)*	656 (90.0%)*	729 (80.5%)*
White	17 (19.5%)*	70 (80.5%)*	87 (9.6%)*
Coloured	41 (57.7%)*	30 (42.3%)*	71 (7.8%)*
Indian/ Asian	2 (10.5%)*	17 (89.5%)*	19 (2.1%)*
Total	133 (14.7%)	773 (85.3%)	906 (100%)

* Column percentage only

The Chi-square test came up with a value of 11.373 for these two variables. On a 0.05 significance level null hypothesis can be rejected because the Chi-square test is considerably greater than 7.82. This value indicates that race does influence the awareness of people in respect of community recycling programmes.

4.3 The effect of race on waste collection and recycling behaviour

This section establishes whether the perception by the respondents of an environmental problem leads to their involvement in waste collection operations for recycling.

The results in Table 4.8 indicate that only 2.5 percent of all respondent households collect waste for recycling. This figure is very low and further suggests that perceptions of waste removal as a solution to an environmental problem did not influence the behaviour of respondents taking part in the General Household Survey of 2006. Furthermore, Table 4.8 shows that the remaining 97.5 percent of the total number of respondents in this study do not collect waste for recycling. Only eight percent of the White respondents collect waste for recycling as opposed to the 5.9 percent of the Coloured respondents and the 5.6 percent of the Indian/Asian respondents who collect waste for recycling. It can be stated that the results pertaining to awareness by respondents of recycling programmes do not necessarily translate into the same level of involvement in the collection of waste for recycling. This observation can be confirmed by comparing the responses of the respective racial groups. As an example, 57.7 percent of the Coloured respondents are aware of recycling programmes while only 5.9 percent collect waste for recycling, 19.5% of the White respondents are aware of recycling programmes but only eight percent collect waste for recycling purposes. Similar results apply to the respondents from the other racial groups.

The findings of this study concur with those of Bullard (1990) who has argued at length that majorities such as Blacks face more substantial environmental risks than

Whites. However, other studies of racial differences and their effects on environmental perceptions have produced conflicting results. For example, Hershey and Hill (1978) found that Blacks tended to be less concerned about the environment than were Whites.

Table 4.8: The effect of race on recycling behaviour

Race groups	Do collect waste for recycling	Do not collect waste for recycling	Total
Black	12 (1.6%)*	718 (98.4%)*	730 (83.9%)*
White	7 (8.0%)*	80 (92.0%)*	87 (10.0%)*
Coloured	2 (5.9%)*	32 (94.1%)*	34 (3.9%)*
Indian/ Asian	1 (5.6%)*	18 (94.4%)*	19 (2.2%)*
Total	22 (2.5%)	848 (97.5%)	870 (100%)

* Column percentage only

The Chi-square test came up with a value of 15.191 for these two variables. On a 0.05 significance level null hypothesis can be rejected because the Chi-square test is considerably greater than 7.82. This value indicates that race does influence the perceptions of the respondents concerning recycling behaviour.

4.4 Summary

The objective of this chapter was to determine the effect of racial differences in the Johannesburg Metropolitan area on environmental perceptions, awareness of

recycling initiatives in the community, and the behaviour of respondents with regard to environmental problems. Waste was proved to be the environmental variable causing the most concern for 34.4 percent of the total number of respondents participating in the study. This variable was followed by excessive noise (27.2% of the total respondents answered to this effect). Air pollution (26.4%) and water pollution (20%) were also indicated as problems. Land degradation was reported as the environmental problem causing the least concern (8.8%). The results indicated that eight percent of the White respondents collect waste for recycling as opposed to 5.9 percent of the Coloured respondents and 5.6 percent of the Indian/Asian respondents. It can be stated that the results concerning awareness of recycling programmes by respondents do not necessarily translate into a concomitant level of involvement in the collection of waste for recycling. This observation can be confirmed by comparing the responses from the respective racial groups. As an example, 57.7 percent of the Coloured respondents are aware of recycling programmes while only 5.9 percent collect waste for recycling; 19.5 percent of the White respondents are aware of recycling programmes but only eight percent collect waste for recycling purposes. Similar results also apply to the respondents from the other racial groups.

The next chapter presents and examines a comparison between households with different monthly expenditure levels and their perceptions of environmental issues (problems). It will thus be possible to establish whether income influences the perceptions of the respondents, their awareness (knowledge) of recycling programmes in their communities and how the respondents behave in respect of the environment.

CHAPTER 5: THE INFLUENCE OF MONTHLY EXPENDITURE ON ENVIRONMENTAL PERCEPTION

5.1 Introduction

According to Kollmuss and Agyeman (2002), economic factors strongly influence people's decisions and behaviour. Economic factors are very complex and often poorly understood. This chapter sets out to assess the influence of the monthly expenditure of respondents - as an economic factor - on their perceptions of environmental problems such as waste, water pollution, air pollution, land degradation and excessive noise pollution. The study further investigates whether an increased level of awareness of recycling programmes encourages the respondents to engage in the collection of waste for recycling. The method used to make this assessment was to test the association between variations in the monthly expenditure levels and the perceptions of respondents with respect to their concerns for the environment.

5.2 The effect of monthly expenditure on perceptions of environmental problems

Table 5.1 presents a breakdown of the monthly expenditure of respondents. The profile for respondents who took part in the survey indicates that 53.2 percent of them are from households with a monthly expenditure of less than R1 200 (see table 5.1). Further facts that came to light in this study are that 21.8 percent and 20.7 percent of the respondents are from households where the monthly expenditure varies between R1 200 and R2 499 and between R2 500 and R9 999 respectively.

Only 4.3 percent of the respondents proved to be from affluent households where the monthly expenditure amounts to R10 000 and above.

Table 5.1: Categories of monthly expenditure of household heads

Categories	Frequency	Percentage
<R1 200	460	53.2 %
R1 200- R2 499	188	21.8 %
R2 500-R9 999	179	20.7 %
≥R10 000	37	4.3 %
Total	864	100.0 %

5.2.1 The effect of monthly income on perceptions of waste removal

A total of 34.3 percent of respondents perceived waste as an environmental problem as opposed to the 65.7 percent who did not (see Table 5.2). More respondents with a monthly expenditure of between R1 200 and R2 499 (46.3%) reported that they regarded this variable as an environmental problem as opposed to the 24.3 percent of the respondents with a monthly expenditure of between R2 500 and R9 999. The respondents with a monthly expenditure of more than R10 000 proved to be less concerned with waste in their areas (18.9%). A possible reason for this is that the poor are most probably living in squatter camps or informal housing settlements where waste is a problem. In this chapter the Chi-square test was applied to ascertain whether there is significant difference in monthly expenditure groups and environmental awareness. The null hypothesis is that there is no difference between monthly expenditure groups in terms of perception on environmental problems.

Table 5.2: The effect of monthly expenditure on perceptions of waste

Household monthly expenditure	Perceived environmental problem	Not an environmental problem	Total
<R1 200	158 (34.4%)*	302 (65.7%)*	460 (53.4%)
R1 200 - R2 499	88 (46.8%)*	100 (53.2%)*	188 (21.8%)
R2 500 – R9 999	43 (24.3%)*	134 (75.7%)*	177 (20.5%)
≥R10 000	7 (18.9%)*	30 (81.7%)*	37 (4.3%)
Total	296 (34.3%)	566 (65.7%)	862 (100%)

*Row percentage only

The Chi-square test came up with a value of 21.261 for these two variables. On a 0.05 significance level null hypothesis can be rejected because the Chi-square test is considerably greater than 7.82. This value indicates that monthly expenditure does influence the perception of the respondents as to whether waste is an environmental problem.

5.2.2 The effect of monthly expenditure on perceptions of water pollution

In the survey, 20.1 percent of the respondents perceived water pollution as an environmental problem compared to the 79.9 percent who did not. Households with a monthly expenditure of R10 000 or more stated that they are not affected by this variable. 21.5 percent of the total respondents with a monthly expenditure of less than R1 200 were more conscious of water pollution, while 27.1 percent of the respondents with a monthly expenditure of between R1 200 and R2 499 expressed their concern in respect of this environmental problem. From Table 5.3, it is clear that

as monthly expenditure increases in a household, so the perception of water pollution as an environmental problem becomes less of a concern. This can be observed in the results where it was found that no respondents perceived water pollution as an environmental problem. A possible reason for this finding could be that water supply infrastructures in areas where respondents with a high monthly expenditure live are properly maintained as opposed to those in the areas occupied by respondents with a lower monthly expenditure level.

Table 5.3: The effect of monthly expenditure on perceptions of water pollution

Household monthly expenditure	Perceived environmental problem	Not an environmental problem	Total
<R1200	99 (21.5%)*	361 (78.5%)*	460 (53.4%)
R1200- R2499	51 (27.1%)*	137 (72.9%)*	188 (21.8%)
R2500-R9999	23 (13.0%)*	154 (87%)*	177 (20.5%)
≥R10 000	0 (0.0%)*	37 (100%)*	37 (4.3%)
Total	173 (20.1%)	698 (79.9%)	862 (100%)

* Row percentage only

The Chi-square test came up with a value of 28.814 for these two variables. On a 0.05 significance level null hypothesis can be rejected because the Chi-square test is considerably greater than 7.82. This value indicates that monthly expenditure does influence the perception of the respondents as to whether water pollution is an environmental problem.

5.2.3 The effect of monthly expenditure on perceptions of air pollution

Air pollution is perceived as a problem by respondents with a lower monthly expenditure. Table 5.4 indicates that 26.2 percent of the total number of respondents perceived air pollution as an environmental problem compared to the 73.8 percent who did not. Fewer respondents (27.6%) with a monthly expenditure of less than R1 200 reported experiencing air pollution as an environmental problem as opposed to the 31.9 percent of those with a monthly expenditure of between R1 200 and R2 499. This finding is similar to those discussed in the previous section (waste and water pollution) where the observation was made that households with a higher spending power reported fewer environmental problems. A possible reason for this finding could be that those respondents who are most concerned about air pollution use coal stoves or open fires to heat their houses and to cook.

Table 5.4: The effect of monthly expenditure on perceptions of air pollution

Household monthly expenditure	Perceived environmental problem	Not an environmental problem	Total
<R1 200	127 (27.6%)*	333 (72.4%)*	460 (53.45%)
R1 200 to R2 499	60 (31.9%)*	128 (68.1%)*	188 (21.8%)
R2 500 to R9 999	36 (20.3%)*	141 (79.7%)*	177 (20.5%)
≥R10 000	3 (8.0%)*	34 (92.0%)*	37 (4.3%)
Total	226 (26.2%)	636 (73.8%)	862 (100%)

* Row percentage only

The Chi-square test came up with a value of 13.645 for these two variables. On a 0.05 significance level null hypothesis can be rejected because the Chi-square test is considerably greater than 7.82. This value indicates that monthly expenditure does

influence the perception of the respondents as to whether air pollution is an environmental problem.

5.2.4 The effect of monthly expenditure on perceptions of land degradation

The statistical results relating to the influence of monthly expenditure on the perception of respondents in respect of different environmental issues revealed that, relatively speaking, land degradation is not so much of a problem when it is compared with the other variables. Of the total number of people participating in the survey, only 8.7 percent of the respondents perceived land degradation as an environmental problem as against the 91.3 percent who did not. A larger proportion of respondents showing that they were concerned about this variable as an environmental problem were from households whose spending varied between R1 200 and R2 499. A total of 8.9 percent of the households spending less than R1 200 monthly reported that they perceive this variable as a problem in their communities. Table 5.5 demonstrates that respondents with a high monthly expenditure revealed less anxiety concerning the issue of land degradation.

A possible explanation for this finding could be the differences in settlement patterns that exist between these expenditure groups. The respondents with high monthly expenditure levels generally live in areas affording them large areas of personal space, while their counterparts, limited in their spending behaviour, live in densely populated informal settlements.

Table 5.5: The effect of monthly expenditure on perceptions of land degradation

Household monthly expenditure	Perceived environmental problem	Not an environmental problem	Total
<R1 200	41 (8.9%)*	419 (91.1%)*	460 (53.4%)
R1 200 - R2 499	23 (12.4%)*	163 (87.6%)*	186 (21.6%)
R2 500 - R9 999	10 (5.6%)*	167 (94.4%)*	177 (20.6%)
≥R10 000	1 (2.7%)*	36 (97.3%)*	37 (4.3%)
Total	75 (8.7%)	785 (91.3%)	860 (100%)

* Row percentage only

The Chi-square test came up with a value of 9.938 for these two variables. On a 0.05 significance level null hypothesis can be rejected because the Chi-square test is greater than 7.82. This value indicates that monthly expenditure does influence the perception of the respondents as to whether land degradation is as an environmental problem.

5.2.5 The effect of monthly expenditure on perceptions of excessive noise pollution

Table 5.6 indicates that 73 percent of the total number of respondents in this case study did not perceive excessive noise as an environmental problem, while only 27 percent did. A further observation is that only 2.7 percent of the respondents with a monthly expenditure of more than R10 000 reported that they perceived excessive noise as an environmental problem compared to the 28 percent for those households spending less than R1 200. More respondents (38%) with a monthly

expenditure of between R1 200 and R2 499 reported their concerns in terms of noise compared to the 18.6 percent of those with a monthly expenditure of between R2 500 and R4 999. Furthermore, it can be stated that these figures indicate that those respondents in the lower monthly expenditure category were more concerned about noise as an environmental issue than those whose monthly expenditure was higher. A possible reason for this finding may be directly related to the pattern of settlement among the respondents whose monthly expenditure varies. Poor respondents generally live in areas with limited space and are bombarded with noise from activities that are practised close to their quarters.

Table 5.6: The effect of monthly expenditure on perceptions of excessive noise

Household monthly expenditure	Perceived environmental problem	Not an environmental problem	Total
<R1 200	128 (28%)*	332 (72%)*	460 (53.4%)
R1 200- R2 499	71 (38%)*	117 (62%)*	188 (21.8%)
R2 500-R9 999	33 (18.6%)*	144 (81.4%)*	177 (20.5%)
≥R10 000	1 (2.7%)*	36 (97.3%)*	37 (4.3%)
Total	233 (27.0%)	629 (73.0%)	862 (100%)

* Row percentage only

The Chi-square test came up with a value of 31.868 for these two variables. On a 0.05 significance level null hypothesis can be rejected because the Chi-square test is greater than 7.82. This value indicates that monthly expenditure does influence the

perceptions of the respondents as to whether excessive noise pollution is an environmental problem.

5.3 The effect of monthly expenditure on awareness of recycling programmes

This section sets out to ascertain the level of awareness of respondents in respect of the waste recycling programmes operative in their communities.

Table 5.7 shows that only 11.1 percent of the total number of respondents in the survey are aware of waste recycling programmes in their communities. The remaining 88.9 percent of respondents are not aware of these programmes. An observation made in the case study indicates that as the monthly expenditure level decreases, so the number of respondents who are aware of recycling programmes decreases. More respondents (14%) with a monthly expenditure of between R2 500 and R9 999 are aware of recycling programmes as opposed to the 11.2 percent with a monthly expenditure of between R1 200 and R2 499 and the 8.9 percent who spend less than R1 200 per month. Furthermore, 24.3 percent of the respondents with high monthly expenditure levels are aware of recycling programmes. Therefore, the study reveals that respondents from households with high monthly expenditure levels are most likely to be aware of the programmes under discussion. The findings are in agreement with those of Vining and Ebreo (1990), who found that better educated individuals earning a higher income gather knowledge about the environment and recycling operations from available sources such as newspapers.

Table 5.7: The effect of monthly expenditure on awareness of school recycling programmes

Household monthly expenditure	Aware of school recycling programmes	Not aware of school recycling programmes	Total
<R1 200	41 (8.9%)*	418 (91.1%)*	459 (53.3%)
R1 200 - R2 499	21 (11.2%)*	166 (88.8%)*	187 (21.7%)
R2 500 - R9 999	25 (14.0%)*	154 (86.0%)*	179 (20.8%)
≥R10 000	9 (24.3%)*	28 (75.7%)*	37 (4.3%)
Total	96 (11.1%)	766 (88.9%)	862 (100%)

* Row percentage only

The Chi-square test came up with a value of 9.367 for these two variables. On a 0.05 significance level null hypothesis can be rejected because the Chi-square test is greater than 7.82. This value indicates that monthly expenditure does influence the awareness of the respondents with regard to community recycling programmes.

5.4 Monthly expenditure and recycling behaviour

Table 5.8 shows that only 2.5 percent of the total number of households participating in the survey collect waste for recycling. This figure is very low and further suggests that perceptions of waste removal as an environmental problem have not had an impact on changing the behaviour of the respondents who took part in the survey. However, it was observed that the majority (2.7%) of respondents that recycle are from affluent households; 2.6 percent of the respondents with a monthly expenditure of less than R1 200 form the majority of those said to collect waste for recycling. Worth noting is that respondents with low monthly expenditure levels are less

knowledgeable about and aware of recycling programmes, yet they recycle more. The respondents with higher expenditure levels showed less interest in collecting waste for recycling.

This finding is contrary to the findings of Arcury and Christianson (1990), who suggest that higher spending households are associated with higher levels of concern for the environment. A possible reason for the high level of involvement in recycling behaviour by the respondents with low monthly expenditure levels could be associated with their seeking out potential means to add to their disposable income, namely by selling materials that can be recycled.

Table 5.8: The effect of monthly expenditure on recycling behaviour

Household monthly expenditure	Recycle waste	Do not recycle waste	Total
<R1 200	12 (2.6%)*	448 (97.4%)*	460 (53.3%)
R1 200 - R2 499	4 (2.1%)*	183 (97.9%)*	187 (21.7%)
R2 500 – R9 999	5 (2.8%)*	174 (97.2%)*	179 (20.7%)
≥R10 000	1 (2.7%)*	36 (97.3%)*	37 (4.3%)
Total	22 (2.5%)	841 (97.5%)	863 (100%)

* Row percentage only

The Chi-square test came up with a value of 13.860 for the two variables. On a 0.05 significance level null hypothesis can be rejected because the Chi-square test is considerably greater than 7.82. This value indicates that monthly expenditure does influence the behaviour of respondents with respect to their concern for their environment.

5.5 Summary

The objective of this chapter was to determine the effect of the monthly expenditure levels of respondents on their perceptions of the environment, their awareness of recycling programmes and their behaviour with regard to the environment. On an overall scale, waste enjoys the most attention as the most perceived environmental problem. It was established in the study that concerns relating to excessive noise, air pollution and water pollution are not as significant as the concern relating to waste, while land degradation is perceived as the least important environmental problem. In terms of the entire range of environmental aspects analysed, it was revealed that the perceptions of the respondents with low monthly expenditure levels tended to be affected the most. Besides their concern for waste removal, respondents with high monthly expenditure levels on the other hand tended to show no concern for the other environmental issues.

The perceived and reported awareness of respondents of available recycling programmes in the communities varied across the spectrum of households in terms of the variations in monthly expenditure levels in the study area. The level of awareness of such programmes was observed to increase with an increase in the monthly expenditure levels of the respondents: 11.1 percent of the total number of households participating in the survey proved to be aware of the recycling programmes within their communities, while only 2.5 percent of the total number of respondents translated their knowledge and awareness of recycling programmes into an exercise in recycling behaviour - by collecting waste. Respondents aware of recycling programmes and involved in waste collection in their communities tended to outnumber their counterparts from households falling into the low monthly expenditure category who took part in the survey.

CHAPTER 6: CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter provides concluding remarks to the study. The main objective of this study was to establish the concern of the respondents in the survey for environmental aspects such as waste, water pollution, air pollution, land degradation and excessive noise pollution, all considered to be environmental problems. In addition, an assessment was conducted to determine the awareness of the respondents with regard to recycling programmes in their sample communities within the Johannesburg Metropolitan Area. The study further considered whether knowledge (awareness) of recycling initiatives results in the involvement of the respondents in recycling behaviour. Demographic factors such as gender and race and the economic factor of the monthly expenditure levels of the respondents were used to establish whether these variables influenced perception, environmental awareness and the behaviour of the respondents in respect of their environment. The data used in the study were based on the General Household Survey of 2006 that was conducted in the Johannesburg Metropolitan Area.

6.2 Interpretation of the key findings

The following sections outline the key findings of the study. The general discussion is divided into sections dealing with the respective roles that gender, race and the monthly expenditure levels of the respondents play in influencing environmental

perception, awareness of recycling programmes in the study area and the behaviour of the respondents in terms of these programmes.

6.2.1 The effect of gender on environmental perception, awareness and behaviour

Observations made in this study were that the respondents perceive environmental aspects differently, depending on whether they are male or female. Male respondents appear to be more conscious of and sensitive to the state of the environment as opposed to their female counterparts. In this study 34.4 percent of the total number of respondents indicated that waste is the environmental problem evoking the most concern, followed by excessive noise (27.1%), air pollution (26.3%) and water pollution (20%). Only 8.8 percent of the total number of respondents reported land degradation as a problem. As an explanation for these findings, the suggestion can be made that it is possible that the majority of the respondents live in informal settlements where basic services such as clean tapped water and electricity are not available.

More male respondents (62.5%) are aware of community recycling programmes as opposed to their female counterparts (37.5%). Furthermore, the study reveals that more male respondents (72.7%) collect waste for recycling than do their female counterparts (27.3%).

6.2.2 The effect of race on environmental perception, awareness and behaviour

By comparing statistics for race with those reflecting a particular attitude to the environment, it was possible to statistically quantify the influence of race on environmental perception. 34.4 percent of the total number of respondents reported waste as the most significant problem evoking the most concern, followed by excessive noise (27.2%), air pollution (26.4%) and water pollution (20%). Land degradation was reported by 8.8 percent of the total number of respondents as the least significant environmental problem. As opposed to the other racial groups, it appears that more Blacks are affected by a wider range of environmental problems as opposed to the other racial groups. The number of Black respondents who are aware of recycling programmes in their communities (54.9%) closely resembles the number of those who reported that they collect waste for recycling (54.5%). The response indicating an awareness of recycling programmes in their community in the case of the Indian/Asian respondents was also significant but the difference that was reported between their awareness (1.5%) and their actual behaviour with respect to waste collection and recycling was more significant (4.5%) than was the case with the Blacks . Fewer White respondents (12.8%) are aware of recycling programmes, with more respondents (31.8%) being involved in actual waste collection. Similarly, more Coloured respondents (57.7%) reported that they were familiar with the recycling programmes operative in their areas but this knowledge did not translate into significant efforts on their part at waste collection for recycling purposes. Their environmental behaviour with respect to waste collection operations was significantly more limited than their environmental awareness.

6.2.3 The effect of monthly expenditure on environmental perception, awareness and behaviour

The findings of this case study revealed that 34.3 percent of the total number of respondents viewed and reported waste as the most serious environmental problem. It was established in this study that excessive noise, air pollution and water pollution are perceived as less important environmental problems as opposed to the unsatisfactory services for the removal of waste in the respective sample areas. Land degradation proved to be the least significant of the wide range of environmental problems. In terms of all the environmental aspects, the respondents at the lower end of the monthly spending scale were the most seriously affected.

The observed level of awareness of recycling programmes operative in the communities varies across the study area. The level of awareness decreases with an increase in the monthly spending levels of the respondents. The study revealed that 11.1 percent of the total number of respondents are aware of recycling programmes in their communities, yet only 2.5 percent of them translate this knowledge into actually engaging in recycling behaviour. The opposite condition can also be stated in that recycling behaviour was observed to increase with a decline in the monthly spending levels of the respondents.

6.3 Limitations of the study

A number of problems were encountered while undertaking this research. These limitations need to be noted and considered in the interpretation of the research results. They include the following:

1. The General Household Survey on which the analyses for this particular study were based had different objectives from those set for this actual study. In all probability, it could be expected that attempts at assessing the actual behaviour of the respondents in respect of the environment by posing questions about their behaviour in the context of a survey on environmental awareness, would lead to answers reflecting too positive an impression of the actual situation - merely because interviewees were trying to please the interviewer by responding in line with his/her expectations.
2. The scope of this study, which included only the Johannesburg Metropolitan Area, was limited which means that the results did not demonstrate clearly whether the differences between the respondents in terms of gender, race and level of monthly expenditure would necessarily lead to heightened (or limited) awareness of recycling programmes and subsequently positive (or negative) behaviour with respect to the environment.

6.4 Areas for future research

In the light of the limitations mentioned above, this researcher recommends that future research should focus on the issues listed below.

The following recommendations are put forward:

Government policies should remedy the problem of a lack of awareness and knowledge with regard to recycling programmes operating in specific areas by implementing educational initiatives aimed at intensifying environmental awareness at the household resolution level. Future studies should establish the nature of the

relationship between knowledge of environmental problems and environmental awareness (a two-way relationship). Both concepts can be considered as prerequisites for and as consequences of solutions to environmental degradation.

6.5 Conclusion

One conclusion that may be drawn from this study is that even though people understand the scientific facts of environmental issues, they do not necessarily connect those facts with their own actions and behaviour. This study highlights the variations that exist in the concern that people show for environmental issues that have proved to be problematical in their communities. This is clearly observed when the demographic factors such as gender and race and the economic factor of monthly expenditure are tested in the study sample across the Johannesburg Metropolitan Area. Furthermore, this study has established that respondents are limited in their awareness of the community recycling programmes operative in their respective areas. This finding is also reflected in their behaviour towards the issue of waste recycling. The respondents' knowledge of the community recycling programmes in their areas has no influence on their environmentally-oriented behaviour, in this particular instance to collect waste for recycling, the objective being to reduce accumulations of waste on the urban landscape which have been perceived as a major environmental problem.

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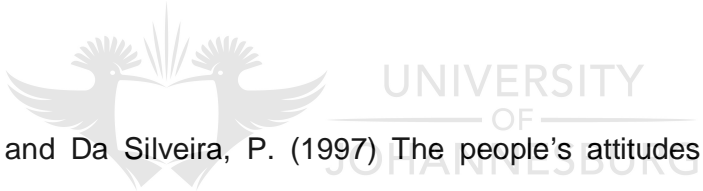
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The logo of the University of Johannesburg is centered in the background. It features two stylized birds facing each other with their wings spread, positioned above an open book. To the right of the birds, the text 'UNIVERSITY OF JOHANNESBURG' is written in a serif font, with 'UNIVERSITY' on the top line, 'OF' in the middle, and 'JOHANNESBURG' on the bottom line.

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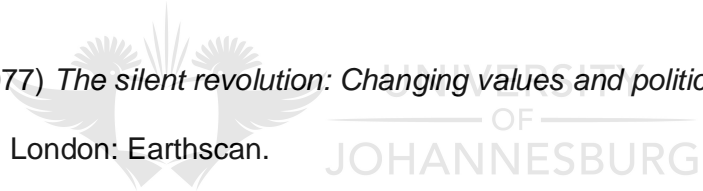
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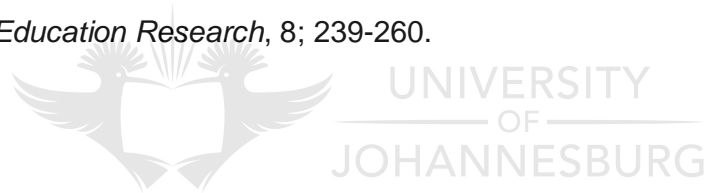
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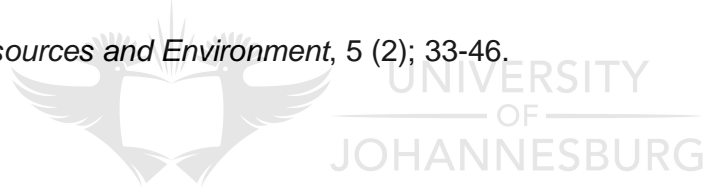
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APPENDIX- QUESTIONNAIRE

Environmental awareness questions extracted from 2006 GHS				
1	Gender of a household head is?	Male	1	
		Female	2	
2	What population group does belong to?	African/Black	1	
		Coloured	2	
		Indian/Asian	3	
		White	4	
		Other	5	
3	Which of the following environmental problems do you experience in your community?	Waste removal/littering	Yes =1	No=2
		Water pollution	Yes =1	No=2
		Outdoor/indoor air pollution	Yes =1	No=2
		Land degradation	Yes =1	No=2
		Excessive noise pollution	Yes =1	No=2

4	Does your neighborhood have a community/school programme for recycling?	Yes	1	
		No	2	
5	Does this household collect waste for recycling?	Yes	1	
		No	2	
		Don't know	3	
6	What was the total household expenditure in the last month?	R0-R399	01	
		R400-R700	02	
		R800-R1199	03	
		R1200-R1799	04	
		R1800-R2499	05	
		R2500-R4999	06	
		R5000-R999	07	
R10 000 or more	08			